



Mahidol University
International College

MUIC GENERAL CATALOG 2014-2015

Business Administration Division//Fine and Applied Arts Division//Science Division//
Social Science Division//Tourism and Hospitality Management Division//Course Descriptions

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GENERAL INFORMATION



Mahidol University International College



Vision

MUIC will be recognized internationally as a leader in providing quality liberal arts education.

Mission Statement

MUIC excels in multidisciplinary education in the liberal arts and selected professional fields in order to prepare global citizens for the 21st century and transform knowledge into action and contribute to society.





A MODERN COLLEGEⁱⁿ A HISTORIC UNIVERSITY

Founded in 1889 by His Majesty King Chulalongkorn the Great (Rama V), Mahidol University is one of the oldest educational institutions in Thailand.

Over the last one hundred and twenty five years (1889-2014), Mahidol has undergone many changes and advances. Including MUIC (established in 1986), there are now 17 faculties (responsible for both research and teaching), 7 institutes (focusing mainly on research) and 6 colleges (focusing mainly on teaching). Altogether, the university supports a student body of over 27,000, and over 400 academic programs. With over 3,400 faculty members, the teacher-student ratio is 1:8, the best ratio in any Thai institution of higher education.



Mahidol University International College (MUIC) was founded in 1986 to provide a high standard of international education and to develop a teaching culture that encourages independent and analytical thought and serves students who want an international style university education in English in a four-year program leading to a Bachelor's Degree in Science, the Arts, Business Administration, Engineering and Nursing Science.

A modern and forwarding thinking international college, MUIC continues to stress the key elements in university education: learning in math and science; literacy in the English language, literature, philosophy and the arts; and practice in communication skills.

Graduates are known for their problem-solving ability and communication skills. Following graduation, the majority of students enters management positions or pursues higher level postgraduate studies both in Thailand and abroad.

As part of its international role, MUIC has been involved in many collaborative activities with foreign universities. Visiting professors from overseas have taught many of the courses and have close links with a number of foreign universities and colleges.

ACADEMIC PROGRAMS

***Note:** The contents are subject to change without prior notice. Students are advised to check an up-to-date information with the relevant offices on departments.

BUSINESS AND ADMINISTRATION

DIVISION

BUSINESS ECONOMICS PROGRAM

DEGREES OFFERED

Bachelor of Business Administration (Business Economics) B.B.A. (Business Economics)

THE FIELD

The Business Economics Major is based on the economic foundations and developments that have occurred in this subject area over the last several decades. Business Economics majors will be well-equipped in both the micro and the macro aspects of economics and their analytical applications to the operational aspects of any business in any particular industry. The curriculum not only provides students with a solid foundation in economics but also prepares them with the tools to better understand the business environment, its market structures and the strategies necessary to compete in a global business world.

CAREER OPPORTUNITIES

Career choices for Business Economic majors include analysts and researchers for the Stock Exchange of Thailand, researchers at the Bank of Thailand, positions in the Ministries of Commerce and Finance, in addition to a variety of opportunities in private banks and financial institutions.

CURRICULUM STRUCTURE

Business Administration Program

Courses	Credits
General Education Courses	60
Core Business Courses	60
Required Major Courses	36
Elective Business Courses	24
Free Elective Courses	8
Total	188

COURSE LIST

General Education Courses

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)

ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'regular track' or 'advanced track' for their General Education requirement in English.

II. Students in 'regular track' are required to take the first 12 credits in ICCM 104, ICCM 105, and ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'advanced track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences	16 credits
ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 103 Fundamental Mathematics*	4 (4-0-8)
ICNS 104 Fundamental Statistics*	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People, and Society	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: 1. Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICNS 103.

2. All BBA students are required to pass ICNS 103* and ICNS 104* consecutively before taking any BBA courses.

Humanities	12 credits
Compulsory Humanities Courses	
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
Culture Track	
ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)
Language Track	
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)

ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

2. Business Economics students must take at least ONE of the six available compulsory Humanities courses: ICHM 101, ICHM 103, ICHM 106, ICHM 107, ICHM 140, or ICHM 225. These students must then either follow the 'culture track,' taking any 2 additional Humanities courses from compulsory courses or Culture Track courses (no order required), or follow the 'language track,' taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any ONE of the foreign languages.

Social Sciences	12 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400 - 1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763 - 1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914 - 1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945 - 2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America Since 1800	4 (4-0-8)
ICSS 243 North America c. 1763 – 1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)

ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance & Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Health Science and Physical Education 4 credits

ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Requirements to start taking BBA courses:

BBA students may commence taking BBA courses only if they have met the following requirements (there is no exception):

1. Passed ICCM 105 Intermediate English Communication II
2. Passed ICNS 104 Fundamental Statistics
3. Attained a minimum of 40 credits of General Education Courses

Business Administration Courses**Core Business Courses****60 credits**

ICMB 203 Microeconomics	4 (4-0-8)
ICMB 204 Macroeconomics	4 (4-0-8)
ICMB 211 Fundamental Financial Accounting	4 (4-0-8)
ICMB 212 Managerial Accounting	4 (4-0-8)
ICMB 221 Principles of Marketing	4 (4-0-8)
ICMB 231 Business Communication	4 (4-0-8)
ICMB 234 Management and Organizational Behavior	4 (4-0-8)
ICMB 282 Computer Software Usage Skills	4 (4-0-8)
ICMB 341 Business Law	4 (4-0-8)
ICMB 351 International Business Management	4 (4-0-8)
ICMB 363 Management Science	4 (4-0-8)
ICMB 364 Operations Management	4 (4-0-8)
ICMB 371 Business Finance	4 (4-0-8)
ICMB 431 Strategic Management	4 (4-0-8)
ICMB 432 Business Ethics	4 (4-0-8)

Required Business Economics Major Courses**36 credits**

ICBE 342 Intermediate Microeconomics	4 (4-0-8)
ICBE 343 Intermediate Macroeconomics	4 (4-0-8)
ICBE 345 Monetary Policy	4 (4-0-8)
ICBE 346 Public Economics	4 (4-0-8)
ICMF 377 Money and Capital Markets	4 (4-0-8)
ICMF 378 Banking and Financial Institution Management	4 (4-0-8)
ICBE 444 Industrial Organization	4 (4-0-8)
ICBE 448 Econometrics	4 (4-0-8)
ICBE 449 International Trade and Finance	4 (4-0-8)

Elective Business Courses**24 credits**

ICMB 481 Special Topics in Business (1)	4 (4-0-8)
ICMB 482 Special Topics in Business (2)	4 (4-0-8)
ICMB 483 Special Topics in Business (3)	4 (4-0-8)
ICMB 484 Special Topics in Business (4)	4 (4-0-8)
ICMB 485 Special Topics in Business (5)	4 (4-0-8)
ICMB 491 Practical Business Training - On Campus	8 (0-24-8)
ICMB 492 Practical Business Training - Off Campus	12 (0-36-12)
ICMB 494 Business Plan for Entrepreneur	8 (4-12-12)
ICMB 495 Business Practices	8 (4-12-12)

Note: 1. All BBA students are required to take either ICMB 491 or ICMB 492 or ICMB 494 or ICMB 495. To fulfill the Elective Business Courses credits requirement, students can take any required major courses offered by other majors in the Business Administration Division or take any courses in Elective Business.

2. Business Economics students can take ICHT 391 Hospitality Management: Internship I as a substitution for ICMB 492 Practical Business Training – off Campus upon the advisor's approval.

Free Elective Courses**8 credits**

Business Economics students are *not allowed to take* ICSS 114 Introduction to Economics as a social science course or as a free elective course. Other than that, students can take any course offered by Mahidol University as a free elective with approval from the advisor.

FINANCE PROGRAM

DEGREES OFFERED

Bachelor of Business Administration (Finance) B.B.A. (Finance)

THE FIELD

The Finance Major strongly emphasizes corporate finance and financial investment that facilitates the development of financial markets, improvement in corporate governance and financial strategies in emerging economies. The curriculum furnishes Finance majors with the necessary knowledge in econometrics, accounting, financial analysis, risk management, banking operations and corporate governance. The courses are further tailored to provide students with practical skills and an in-depth understanding of the application of financial theories in both the monetary and corporate investment systems, which are further developed through internships and research.

CAREER OPPORTUNITIES

Finance majors are prepared for careers as financial executives, investment managers, financial analysts as well as economic researchers in all types of corporate, banking and financial institutions.

CURRICULUM STRUCTURE

Business Administration Program

Courses	Credits
General Education Courses	60
Core Business Courses	60
Required Major Courses	36
Elective Business Courses	24
Free Elective Courses	8
Total	188

COURSE LIST

General Education Courses

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)

ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note I: Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'regular track' or 'advanced track' for their General Education requirement in English.

II. Students in 'regular track' are required to take the first 12 credits in ICCM 104, ICCM 105, and ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'advanced track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences	16 credits
ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 103 Fundamental Mathematics*	4 (4-0-8)
ICNS 104 Fundamental Statistics*	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People, and Society	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: 1. Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICNS 103

2. All BBA students are required to pass ICNS 103* and ICNS 104* consecutively before taking any BBA courses.

Humanities	12 credits
Compulsory Humanities Courses	
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)

ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
Culture Track	
ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)
Language Track	
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)

ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

2. Finance students must take at least ONE of the six available compulsory Humanities courses: ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225. These students must then either follow the 'culture track,' taking any 2 additional Humanities courses from compulsory courses or Culture Track courses (no order required), or follow the 'language track,' taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any ONE of the foreign languages.

Social Sciences	12 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400 - 1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763 - 1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914 - 1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945 - 2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America Since 1800	4 (4-0-8)
ICSS 243 North America c. 1763 – 1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)

ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance & Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Health Science and Physical Education 4 credits

ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Requirements to start taking BBA courses:

BBA students may commence taking BBA courses only if they have met the following requirements (there is no exception):

1. Passed ICCM 105 Intermediate English Communication II
2. Passed ICNS 104 Fundamental Statistics
3. Attained a minimum of 40 credits of General Education Courses

Business Administration Courses

Core Business Courses 60 credits

ICMB 203 Microeconomics	4 (4-0-8)
ICMB 204 Macroeconomics	4 (4-0-8)
ICMB 211 Fundamental Financial Accounting	4 (4-0-8)
ICMB 212 Managerial Accounting	4 (4-0-8)
ICMB 221 Principles of Marketing	4 (4-0-8)
ICMB 231 Business Communication	4 (4-0-8)
ICMB 234 Management and Organizational Behavior	4 (4-0-8)

ICMB 282 Computer Software Usage Skills	4 (4-0-8)
ICMB 341 Business Law	4 (4-0-8)
ICMB 351 International Business Management	4 (4-0-8)
ICMB 363 Management Science	4 (4-0-8)
ICMB 364 Operations Management	4 (4-0-8)
ICMB 371 Business Finance	4 (4-0-8)
ICMB 431 Strategic Management	4 (4-0-8)
ICMB 432 Business Ethics	4 (4-0-8)

Required Finance Major Courses 36 credits

ICMF 372 Financial Management	4 (4-0-8)
ICMF 375 Multinational Corporate Finance	4 (4-0-8)
ICMF 377 Money and Capital Markets	4 (4-0-8)
ICMF 378 Banking and Financial Institution Management	4 (4-0-8)
ICMF 379 Investment Analysis and Portfolio Management	4 (4-0-8)
ICBE 448 Econometrics	4 (4-0-8)
ICMF 478 Risk Management	4 (4-0-8)
ICMF 480 Cases and Financial Modeling	4 (4-0-8)
ICMF 481 Financial Derivatives	4 (4-0-8)

Elective Business Courses 24 credits

ICMB 481 Special Topics in Business (1)	4 (4-0-8)
ICMB 482 Special Topics in Business (2)	4 (4-0-8)
ICMB 483 Special Topics in Business (3)	4 (4-0-8)
ICMB 484 Special Topics in Business (4)	4 (4-0-8)
ICMB 485 Special Topics in Business (5)	4 (4-0-8)
ICMB 491 Practical Business Training - On Campus	8 (0-24-8)
ICMB 492 Practical Business Training - Off Campus	12 (0-36-12)
ICMB 494 Business Plan for Entrepreneur	8 (4-12-12)
ICMB 495 Business Practices	8 (4-12-12)

Note: 1. All BBA students are required to take either ICMB 491 or ICMB 492 or ICMB 494 or ICMB 495. To fulfill the Elective Business Courses credits requirement, students can take any required major courses offered by other majors in Business Administration division or take any courses in Elective Business.

2. Finance students can take ICHT 391 Hospitality Management: Internship I as a substitution for ICMB 492 Practical Business Training – Off Campus upon advisor approval.

Free Elective Courses 8 credits

Finance students are *not allowed to take* ICSS 114 Introduction to Economics as a social science course or as a free elective course. Other than that students can take any course offered by Mahidol University as a free elective with approval from the advisor.

INTERNATIONAL BUSINESS PROGRAM

DEGREES OFFERED

Bachelor of Business Administration (International Business) B.B.A. (International Business)

THE FIELD

Given the rapid and ever-increasing developments in globalization, the International Business Major has become one of the most popular academic programs at MUIC, particularly since it explores all facets of operating a business internationally. The curriculum offers a wide range of business issues and concerns in the areas of economics, trade, finance, marketing, human resources, operations, legal issues, ethics, import and export, the impact on foreign direct investment (FDI) as well as global business competition and co-operation. Business negotiations and international business management are emphasized in such a way as to provide students with a greater insight into global leadership development and identifying alternative approaches for entering various markets worldwide.

CAREER OPPORTUNITIES

Apart from pursuing graduate studies in their designated field, International Business majors can readily secure managerial positions in multinational corporations in such areas as import/exports, operations and sales, logistics and business development. Opportunities also exist in international business and strategic management as well as entrepreneurial endeavors.

CURRICULUM STRUCTURE

Business Administration Program

Courses	Credits
General Education Courses	60
Core Business Courses	60
Required Major Courses	36
Elective Business Courses	24
Free Elective Courses	8
Total	188

COURSE LIST

General Education Courses

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills

0 (4-0-0)

ICCM 104 Intermediate English Communication I

4 (4-0-8)

ICCM 105 Intermediate English Communication II

4 (4-0-8)

ICCM 106 Intermediate English Communication III

4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I

4 (4-0-8)

ICCM 112 Advanced English Communication II

4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities

4 (4-0-8)

ICCM 203 Introduction to Literary Analysis

4 (4-0-8)

ICCM 204 Creative Writing

4 (4-0-8)

ICEG 232 Advanced Oral Communication

4 (4-0-8)

ICEG 250 Introduction to Linguistics

4 (4-0-8)

ICEG 265 Literature into Film

4 (4-0-8)

ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'regular track' or 'advanced track' for their General Education requirement in English.

II. Students in 'regular track' are required to take the first 12 credits in ICCM 104, ICCM 105, ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'advanced track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences	16 credits
ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive mathematics	0 (4-0-0)
ICNS 103 Fundamental Mathematics*	4 (4-0-8)
ICNS 104 Fundamental Statistics*	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People, and Society	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: 1. Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICNS 103.

2. All BBA students are required to pass ICNS 103* and ICNS 104* consecutively before taking any BBA courses.

Humanities	12 credits
Compulsory Humanities Courses	
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
Language Track	
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

2. International Business students must take at least ONE of the six available compulsory Humanities courses: ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225. These students must then follow the 'language track,' taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any ONE of the foreign languages.

Social Sciences**12 credits**

ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400 - 1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763 - 1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914 - 1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945 - 2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America Since 1800	4 (4-0-8)
ICSS 243 North America c. 1763 – 1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)

ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance & Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Health Science and Physical Education 4 credits

ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Requirements to start taking BBA courses:

BBA students may commence taking BBA courses only if they have met the following requirements (there is no exception):

1. Passed ICCM 105 Intermediate English Communication II
2. Passed ICNS 104 Fundamental Statistics
3. Attained a minimum of 40 credits of General Education Courses

Business Administration Courses

Core Business Courses 60 credits

ICMB 203 Microeconomics	4 (4-0-8)
ICMB 204 Macroeconomics	4 (4-0-8)
ICMB 211 Fundamental Financial Accounting	4 (4-0-8)
ICMB 212 Managerial Accounting	4 (4-0-8)
ICMB 221 Principles of Marketing	4 (4-0-8)
ICMB 231 Business Communication	4 (4-0-8)
ICMB 234 Management and Organizational Behavior	4 (4-0-8)
ICMB 282 Computer Software Usage Skills	4 (4-0-8)
ICMB 341 Business Law	4 (4-0-8)
ICMB 351 International Business Management	4 (4-0-8)
ICMB 363 Management Science	4 (4-0-8)
ICMB 364 Operations Management	4 (4-0-8)
ICMB 371 Business Finance	4 (4-0-8)
ICMB 431 Strategic Management	4 (4-0-8)
ICMB 432 Business Ethics	4 (4-0-8)

Required International Business Major Courses	36 credits
ICMI 352 Legal Issues in International Business	4 (4-0-8)
ICMI 359 Strategic Human Resource Management	4 (4-0-8)
ICMK 361 Global Leadership Development	4 (4-0-8)
ICMF 375 Multinational Corporate Finance	4 (4-0-8)
ICMK 424 Global Marketing Strategy	4 (4-0-8)
ICBE 449 International Trade and Finance	4 (4-0-8)
ICMI 454 International Logistics Management	4 (4-0-8)
ICMI 456 Export-Import Management	4 (4-0-8)
ICMI 457 International Business Negotiations	4 (4-0-8)

Elective Business Courses	24 credits
ICMB 481 Special Topics in Business (1)	4 (4-0-8)
ICMB 482 Special Topics in Business (2)	4 (4-0-8)
ICMB 483 Special Topics in Business (3)	4 (4-0-8)
ICMB 484 Special Topics in Business (4)	4 (4-0-8)
ICMB 485 Special Topics in Business (5)	4 (4-0-8)
ICMB 491 Practical Business Training - On Campus	8 (0-24-8)
ICMB 492 Practical Business Training - Off Campus	12 (0-36-12)
ICMB 494 Business Plan for Entrepreneur	8 (4-12-12)
ICMB 495 Business Practices	8 (4-12-12)

Note: 1. All BBA students are required to take either ICMB 491 or ICMB 492 or ICMB 494 or ICMB 495. To fulfill the Elective Business Courses credits requirement, students can take any required major courses offered by other majors in Business Administration division or take any courses in Elective Business.

2. International Business students can take ICHT 391 Hospitality Management: Internship I as a substitution for ICMB 492 Practical Business Training – Off Campus upon advisor approval.

Free Elective Courses	8 credits
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International Business students are *not allowed to take* ICSS 114 Introduction to Economics as a social science course or as a free elective course. Other than that, students can take any course offered by Mahidol University as a free elective with the approval from the advisor.

INFORMATION SYSTEMS PROGRAM

DEGREES OFFERED

Bachelor of Business Administration (Information Systems) B.B.A. (Information Systems)

THE FIELD

In response to the unprecedented transformation of communication technology, the Information Systems Major provides its students with essential skills in managing the effective use of modern technology for both organizations and individuals. A well-designed curriculum that explores networking, programming, hardware and software applications and their implementation enables students to gain an in-depth understanding of the relevance of technology for organizational operations and social trends. The expectation is that Information Systems majors will be equipped with the expertise to succeed in their chosen field of information technology.

CAREER OPPORTUNITIES

Information Systems majors can look forward to careers in a variety of companies, particularly multi-national firms such as Google, Exxon Mobil, Reuters Software, Chevron and Accenture. Their expertise will enable them to secure positions as systems, data and network analysts, consultants, IT and database specialists, application developers, information security managers and web/e-commerce system developers.

CURRICULUM STRUCTURE

Business Administration Program

Courses	Credits
General Education Courses	52
Core Business Courses	60
Required Major Courses	56
Elective Business Courses	12
Free Elective Courses	8
Total	188

COURSE LIST

General Education Courses

English Communication

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

12 - 16 credits

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)

4 (4-0-8)
4 (4-0-8)
4 (4-0-8)
4 (4-0-8)
4 (4-0-8)
4 (4-0-8)
4 (4-0-8)
4 (4-0-8)

ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'regular track' or 'advanced track' for their General Education requirement in English.

II. Students in 'regular track' are required to take the first 12 credits in ICCM 104, ICCM 105, and ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'advanced track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences	12 credits
ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 103 Fundamental Mathematics*	4 (4-0-8)
ICNS 104 Fundamental Statistics*	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People, and Society	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: 1. Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICNS 103

2. All BBA students are required to pass ICNS 103* and ICNS 104* consecutively before taking any BBA courses.

Humanities	12 credits
Compulsory Humanities Courses	
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)

Culture Track

ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)

Language Track

ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

2. Information System students must take at least ONE of the six available compulsory Humanities courses: ICHM101, ICHM 103, ICHM 106, ICHM 107, ICHM 140, or ICHM 225. These students must then either follow the 'culture track,' taking any 2 additional Humanities courses from compulsory courses or Culture Track courses (no order required), or follow the 'language track,' taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any ONE of the foreign languages.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400 - 1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763 - 1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914 - 1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945 - 2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America Since 1800	4 (4-0-8)
ICSS 243 North America c. 1763 – 1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)

ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance & Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Health Science and Physical Education 4 credits

ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Requirements to start taking BBA courses:

BBA students may commence taking BBA courses only if they have met the following requirements (there is no exception):

1. Passed ICCM 105 Intermediate English Communication II
2. Passed ICNS 104 Fundamental Statistics
3. Attained a minimum of 40 credits of General Education Courses

Business Administration Courses

Core Business Courses 60 credits

ICMB 203 Microeconomics	4 (4-0-8)
ICMB 204 Macroeconomics	4 (4-0-8)
ICMB 211 Fundamental Financial Accounting	4 (4-0-8)
ICMB 212 Managerial Accounting	4 (4-0-8)
ICMB 221 Principles of Marketing	4 (4-0-8)
ICMB 231 Business Communication	4 (4-0-8)
ICMB 234 Management and Organizational Behavior	4 (4-0-8)
ICMB 282 Computer Software Usage Skills	4 (4-0-8)
ICMB 341 Business Law	4 (4-0-8)
ICMB 351 International Business Management	4 (4-0-8)
ICMB 363 Management Science	4 (4-0-8)
ICMB 364 Operations Management	4 (4-0-8)

ICMB 371 Business Finance	4 (4-0-8)
ICMB 431 Strategic Management	4 (4-0-8)
ICMB 432 Business Ethics	4 (4-0-8)

Required Information Systems Major Courses **56 credits**

ICIS 220 Computer Programming	4 (4-0-8)
ICIS 221 Computer and Information Systems Fundamentals Fundamentals	4 (4-0-8)
ICIS 222 Social and Professional Issues in Computing	4 (4-0-8)
ICIS 350 Computer Graphics	4 (4-0-8)
ICIS 360 Management Information Systems	4 (4-0-8)
ICIS 361 Database Systems	4 (4-0-8)
ICIS 362 Data Mining and Business Intelligence	4 (4-0-8)
ICIS 370 Web Programming	4 (4-0-8)
ICIS 371 Computer Networking	4 (4-0-8)
ICIS 385 Information Technology Economics	4 (4-0-8)
ICIS 387 Information Systems Security	4 (4-0-8)
ICIS 390 Data Structures and Algorithms	4 (4-0-8)
ICIS 482 Systems Analysis and Design	4 (4-0-8)
ICIS 490 Business Computer Project	4 (4-0-8)

Elective Business Courses **12 credits**

ICMB 481 Special Topics in Business (1)	4 (4-0-8)
ICMB 482 Special Topics in Business (2)	4 (4-0-8)
ICMB 483 Special Topics in Business (3)	4 (4-0-8)
ICMB 484 Special Topics in Business (4)	4 (4-0-8)
ICMB 485 Special Topics in Business (5)	4 (4-0-8)
ICMB 491 Practical Business Training - On Campus	8 (0-24-8)
ICMB 492 Practical Business Training - Off Campus	12 (0-36-12)
ICMB 494 Business Plan for Entrepreneur	8 (4-12-12)
ICMB 495 Business Practices	8 (4-12-12)

Note: 1. All BBA students are required to take either ICMB 491 or ICMB 492 or ICMB 494 or ICMB 495. To fulfill the Elective Business Courses credits requirement, students can take any required major courses offered by other majors in the Business Administration Division or take any courses in Elective Business.

2. Information Systems students can take ICHT 391 Hospitality Management: Internship I as a substitution for ICMB 492 Practical Business Training – Off Campus upon advisor approval.

Free Elective Courses **8 credits**

Information Systems students are *not allowed to take* ICSS 114 Introduction to Economics as a social science course or as a free elective course and ICNS 141 Computer Essentials/ICNS 142 Introduction to Internet Technology/ICNS 143 Fundamental of Computer Science as a natural science course or as a free elective course. Other than that, students can take any course offered by Mahidol University as a free elective with approval from advisor.

MARKETING PROGRAM

DEGREES OFFERED

Bachelor of Business Administration (Marketing) B.B.A. (Marketing)

THE FIELD

The Marketing Major provides students with relevant marketing skills, a crucial component of any business which includes conducting research to learn about the needs of customers, developing new products or refining existing ones, setting prices, determining where products should be sold and promoting the product to the final users. The curriculum furnishes Marketing majors with a sound foundation in the basics of marketing, consumer behavior and marketing research before advancing to the higher level modules of different marketing strategy courses. Students learn how to analyze situations and implement strategies under different market environments through lectures, class discussions, case studies and projects.

CAREER OPPORTUNITIES

Marketing majors are well qualified to meet the challenges of working in the business sector. Career opportunities in local and multinational companies include positions as marketing, brand and product managers, trade marketers in retail operations and research analysts, in addition to account executives in advertising agencies, marketing jobs in non-governmental organizations and entrepreneurial ventures. Many of our majors go on to pursue their graduate studies in Business Administration or Marketing Research, Communication and Logistics.

CURRICULUM STRUCTURE

Business Administration Program

Courses	Credits
General Education Courses	60
Core Business Courses	60
Required Major Courses	36
Elective Business Courses	24
Free Elective Courses	8
Total	188

COURSE LIST

General Education Courses

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills

0 (4-0-0)

ICCM 104 Intermediate English Communication I

4 (4-0-8)

ICCM 105 Intermediate English Communication II

4 (4-0-8)

ICCM 106 Intermediate English Communication III

4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I

4 (4-0-8)

ICCM 112 Advanced English Communication II

4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities

4 (4-0-8)

ICCM 203 Introduction to Literary Analysis

4 (4-0-8)

ICCM 204 Creative Writing

4 (4-0-8)

ICEG 232 Advanced Oral Communication

4 (4-0-8)

ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'regular track' or 'advanced track' for their General Education requirement in English.

II. Students in 'regular track' are required to take the first 12 credits in ICCM 104, ICCM 105, ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'advanced track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences	16 credits
ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 103 Fundamental Mathematics*	4 (4-0-8)
ICNS 104 Fundamental Statistics*	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People, and Society	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: 1. Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICNS 103.

2. All BBA students are required to pass ICNS 103* and ICNS 104* consecutively before taking any BBA courses.

Humanities	12 credits
Compulsory Humanities Courses	
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
Culture Track	
ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)
Language Track	
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)

ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

2. Marketing students must take at least ONE of the six available compulsory Humanities courses: ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225. These students must then either follow the 'culture track,' taking any 2 additional Humanities courses from compulsory courses or Culture Track courses (no order required), or follow the 'language track,' taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any ONE of the foreign languages.

Social Sciences	12 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400 - 1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763 - 1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914 - 1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945 - 2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America Since 1800	4 (4-0-8)
ICSS 243 North America c. 1763 – 1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)

ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance & Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Health Science and Physical Education 4 credits

ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Requirements to start taking BBA courses:

BBA students may commence taking BBA courses only if they have met the following requirements (there is no exception):

1. Passed ICCM 105 Intermediate English Communication II
2. Passed ICNS 104 Fundamental Statistics
3. Attained a minimum of 40 credits of General Education Courses

Business Administration Courses**Core Business Courses****60 credits**

ICMB 203 Microeconomics	4 (4-0-8)
ICMB 204 Macroeconomics	4 (4-0-8)
ICMB 211 Fundamental Financial Accounting	4 (4-0-8)
ICMB 212 Managerial Accounting	4 (4-0-8)
ICMB 221 Principles of Marketing	4 (4-0-8)
ICMB 231 Business Communication	4 (4-0-8)
ICMB 234 Management and Organizational Behavior	4 (4-0-8)
ICMB 282 Computer Software Usage Skills	4 (4-0-8)
ICMB 341 Business Law	4 (4-0-8)
ICMB 351 International Business Management	4 (4-0-8)
ICMB 363 Management Science	4 (4-0-8)
ICMB 364 Operations Management	4 (4-0-8)
ICMB 371 Business Finance	4 (4-0-8)
ICMB 431 Strategic Management	4 (4-0-8)
ICMB 432 Business Ethics	4 (4-0-8)

Required Marketing Major Courses**36 credits**

ICMK 314 Marketing Research	4 (4-0-8)
ICMK 316 Consumer Behavior	4 (4-0-8)
ICMK 319 New Product Management	4 (4-0-8)
ICMK 322 Brand Management	4 (4-0-8)
ICMK 323 Integrated Marketing Communications	4 (4-0-8)
ICMK 328 Marketing Channel Management	4 (4-0-8)
ICMK 420 Business-to-Business Marketing	4 (4-0-8)
ICMK 424 Global Marketing Strategy	4 (4-0-8)
ICMK 429 Pricing Strategy and Tactics	4 (4-0-8)

Elective Business Courses**24 credits**

ICMB 481 Special Topics in Business (1)	4 (4-0-8)
ICMB 482 Special Topics in Business (2)	4 (4-0-8)
ICMB 483 Special Topics in Business (3)	4 (4-0-8)
ICMB 484 Special Topics in Business (4)	4 (4-0-8)
ICMB 485 Special Topics in Business (5)	4 (4-0-8)
ICMB 491 Practical Business Training - On Campus	8 (0-24-8)
ICMB 492 Practical Business Training - Off Campus	12 (0-36-12)
ICMB 494 Business Plan for Entrepreneur	8 (4-12-12)
ICMB 495 Business Practices	8 (4-12-12)

Note: 1. All BBA students are required to take either ICMB 491 or ICMB 492 or ICMB 494 or ICMB 495. To fulfill the Elective Business Courses credits requirement, students can take any required major courses offered by other majors in the Business Administration Division or take any courses in Elective Business.

2. Marketing students can take ICHT 391 Hospitality Management: Internship I as a substitution for ICMB 492 Practical Business Training – Off Campus upon advisor approval.

Free Elective Courses**8 credits**

Marketing students are *not allowed to take* ICSS 114 Introduction to Economics as a social science course or as a free elective course. Other than that, students can take any course offered by Mahidol University as a free elective with approval from the advisor.

FINE AND APPLIED ARTS

DIVISION

ENTERTAINMENT MEDIA PRODUCTION PROGRAM

ANIMATION PRODUCTION

DEGREES OFFERED

Bachelor of Arts (Animation Production)

B.A. (Animation Production)

THE FIELD

The Entertainment Media Program offers a strong liberal arts education in modern media creation and visual literacy. The courses are taught within the context of aesthetics, history, theory and personal expression and require intensive hands-on participation in each of the specific majors of entertainment media.

The Animation Production Major builds a solid foundation of visual and animation theory and practice in the development of traditional and digital animation production skills. Students are encouraged to become original media creators with an emphasis on storytelling and conceptualization. The major offers an international cultural and industry outlook through guest lectures, international professional and academic collaborations and an opportunity to participate in an international field study.

The completion of the courses gives graduates a broad overview of the creative and technical aspects of the animation industry, including drawing, color theory, traditional and digital painting, storyboarding, character and layout design, 3D animation technology and animation management.

CAREER OPPORTUNITIES

- Animators, storyboard artists, character designers, concept artists, illustrators, colorists, composers, visual effects artists, 3D technical directors and CG artists.
- Entertainment media entrepreneurs and producers.
- Media research, media policy development and creative management.
- Graduate Studies in Animation, Media and Communication Studies, Technology and New Media, Computer Graphic Design, Technology Education, etc. (within Thailand and internationally).
- MBA, MA in Sociology, Humanities, International Marketing, Advertising, the Creative Industry, etc. (in Thailand and internationally)

CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	52
Core Courses in Entertainment Media	28
Major Required Courses	84
Elective Major Courses	16
Free Elective Courses	8
Total	188

COURSE LIST

General Education Courses 52 credits

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills

0 (4-0-0)

ICCM 104 Intermediate English Communication I

4 (4-0-8)

ICCM 105 Intermediate English Communication II

4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I

4 (4-0-8)

ICCM 112 Advanced English Communication II

4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'regular track' or 'advanced track' for their General Education requirement in English.

II. Students in 'regular track' are required to take the first 12 credits in ICCM 104, ICCM 105, ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'advanced track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences

8 credits

ICNS 105 Basic Mathematics *	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: past, present and future	4 (4-0-8)

Note: ICNS 105 Basic Mathematics is a mandatory course for Fine and Applied Arts students.

Humanities	16 credits
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 105 Music Appreciation**	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II***	4 (4-0-8)
ICHM 143 Introduction to Photography**	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)

ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

2. EMP students must take four Humanities courses to fulfill their General Education requirements. None of the Humanities courses are compulsory, however, it is recommended that they take the following courses: ICHM 105**, ICHM 142*** (a special section open specifically for Entertainment Media Production students) and ICHM 143**.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications *	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)

ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behavior	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Note: ICSS 118 * is recommended for Entertainment Media Production students.

Health Science and Physical Education	4 credits
ICHE 101 Health Education *	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Note: ICHE 101* is recommended for Entertainment Media Production students

Entertainment Media Courses	128 credits
Entertainment Media Core Courses	28 credits
ICEM 111 Introduction to Entertainment Media	4 (4-0-8)
ICEM 112 Visual Communication	4 (4-0-8)
ICEM 113 Storytelling	4 (4-0-8)
ICEM 114 Storyboarding	4 (4-0-8)
ICEM 211 Media Research and Analysis	4 (4-0-8)
ICEM 212 Basic Acting Techniques	4 (0-8-4)
ICEM 213 Audio Communication	4 (0-8-4)

Animation Production Major

Required Courses

84 credits

ICAP 101 Introduction to Animation	4 (4-0-8)
ICAP 102 Character Design	4 (4-0-8)
ICAP 111 Animation Production Studio I	4 (0-8-4)
ICAP 112 Animation Production Studio II	4 (0-8-4)
ICAP 201 Computer Programs for Animation	4 (4-0-8)
ICAP 202 Drawing for Animation	4 (0-8-4)
ICAP 203 Layout Design	4 (4-0-8)
ICAP 204 3D Animation Design	4 (4-0-8)
ICAP 211 Animation Production Studio III	4 (0-8-4)
ICAP 212 Animation Production Studio IV	4 (0-8-4)
ICAP 301 Animation Theory and Analysis	4 (4-0-8)
ICAP 302 3D Character Setup and Animation	4 (0-8-4)
ICAP 303 Animation Production Management	4 (4-0-8)
ICAP 304 Sound for Animation	4 (4-0-8)
ICAP 305 3D Digital Video Compositing	4 (0-8-4)
ICAP 306 Professional Internship in Animation Production	4 (0-12-4)
ICAP 311 Animation Production Studio V	4 (0-8-4)
ICAP 312 Animation Production Studio VI	4 (0-8-4)
ICAP 401 Seminar in Animation Production Senior Project and Ethics	4 (4-0-8)
ICAP 402 Animation Production Senior Project I	4 (0-12-4)
ICAP 403 Animation Production Senior Project II	4 (0-12-4)

Elective Courses

16 credits

ICAP 321 Advanced Layout Design	4 (0-8-4)
ICAP 322 Motion Graphics	4 (0-8-4)
ICAP 323 International Field Study in Animation Production	4 (0-12-4)
ICAP 324 Computer and Video Games	4 (4-0-8)
ICAP 325 Stop Motion Animation Production	4 (0-8-4)
ICAP 326 Selected Topics in Animation Production	4 (0-8-4)
ICAP 327 Independent Study in Animation Production	4 (0-8-4)

Free Elective Courses

8 credits

Entertainment Media students can take any courses offered by Mahidol University as a free elective course with approval from the advisor.

ENTERTAINMENT MEDIA PRODUCTION PROGRAM

FILM PRODUCTION

DEGREES OFFERED

Bachelor of Arts (Film Production)

B.A. (Film Production)

THE FIELD

The Entertainment Media Program offers a strong liberal arts education in modern media creation and visual literacy. The courses are taught within the context of aesthetics, history, theory and personal expression and require intensive hands-on participation in each of the specific majors of entertainment media.

The Film Production Major builds a solid foundation in both film theory and production practice in intensive hands-on courses that build and develop student's creative and analytical skills. The skills fostered in courses such as Media Production, Introduction to Film, Film Analysis and Screenwriting for Film are put into practice in practical courses such as Film Directing and Advanced Film Production, where students make both group and individual short films under the guidance of experienced film professionals and university lecturers. The major offers both an international cultural industry outlook through guest lecturers, international professional and academic collaborations and participation in international field studies and, with direct links to the Thai film Industry, a domestic foothold, opening doors for students' professional film careers.

CAREER OPPORTUNITIES

- Storyboard artists, character designers, concept artists, illustrators, colorists, composers, visual effects artists, 3D technical directors and CG artists.
- Entertainment media entrepreneurs, writers, directors, editors, producers.
- Media research, media policy development and creative management.
- Graduate Studies in Animation, Media and Communication Studies, Technology and New Media, Computer Graphic Design, Technology Education, etc. (within Thailand and internationally).
- MBA, MA in Sociology, Humanities, International Marketing, Advertising, the Creative Industry, etc. (in Thailand and internationally)

CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	52
Core Courses in Entertainment Media	28
Required Major Courses	84
Elective Major Courses	16
Free Elective Courses	8
TOTAL	188

COURSE LIST

General Education Courses 52 credits

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills

0 (4-0-0)

ICCM 104 Intermediate English Communication I

4 (4-0-8)

ICCM 105 Intermediate English Communication II

4 (4-0-8)

ICCM 106 Intermediate English Communication III

4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I

4 (4-0-8)

ICCM 112 Advanced English Communication II

4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'regular track' or 'advanced track' for their General Education requirement in English.

II. Students in 'regular track' are required to take the first 12 credits in ICCM 104, ICCM 105, and ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'advanced track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences**8 credits**

ICNS 105 Basic Mathematics *	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: past, present and future	4 (4-0-8)

Note: ICNS 105 Basic Mathematics is a mandatory course for Fine and Applied Arts students.

Humanities**16 credits**

ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)

ICHM 105 Music Appreciation**	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II***	4 (4-0-8)
ICHM 143 Introduction to Photography**	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)

ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

2. EMP students must take four Humanities courses to fulfill their General Education requirements. None of the Humanities courses are compulsory, however, it is recommended that they take the following courses: ICHM 105**, ICHM 142*** (a special section open specifically for Entertainment Media Production students) and ICHM 143**.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications *	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)

ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behavior	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Note: ICSS 118 * is recommended for Entertainment Media Production students.

Health Science and Physical Education	4 credits
ICHE 101 Health Education *	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Note: ICHE 101* is recommended for Entertainment Media Production students.

Entertainment Media Courses	128 credits
Entertainment Media Core Courses	28 credits
ICEM 111 Introduction to Entertainment Media	4 (4-0-8)
ICEM 112 Visual Communication	4 (4-0-8)
ICEM 113 Storytelling	4 (4-0-8)
ICEM 114 Storyboarding	4 (4-0-8)
ICEM 211 Media Research and Analysis	4 (4-0-8)
ICEM 212 Basic Acting Techniques	4 (0-8-4)
ICEM 213 Audio Communication	4 (0-8-4)

Film Production Major

Required Courses

84 credits

ICFP 101 Introduction to Film	4 (4-0-8)
ICFP 102 Film Analysis	4 (4-0-8)
ICFP 111 Film Production Studio I	4 (0-8-4)
ICFP 112 Film Production Studio II	4 (0-8-4)
ICFP 201 Film Screenwriting	4 (4-0-8)
ICFP 202 Cinematography	4 (0-8-4)
ICFP 203 Film Directing	4 (4-0-8)
ICFP 204 Film Editing Concepts	4 (4-0-8)
ICFP 211 Film Production Studio III	4 (0-8-4)
ICFP 212 Film Production Studio IV	4 (0-8-4)
ICFP 301 Film Genre Studies	4 (4-0-8)
ICFP 302 Documentary Film Production	4 (0-8-4)
ICFP 303 Film Authorship	4 (4-0-8)
ICFP 304 Film Producing	4 (0-8-4)
ICFP 305 Film Compositing and Post Production	4 (0-8-4)
ICFP 306 Professional Internship in Film Production	4 (0-12-4)
ICFP 311 Film Production Studio V	4 (0-8-4)
ICFP 312 Film Production Studio VI	4 (0-8-4)
ICFP 401 Seminar in Film Production Senior Project and Ethics	4 (4-0-8)
ICFP 402 Film Production Senior Project I	4 (0-12-4)
ICFP 403 Film Production Senior Project II	4 (0-12-4)

Elective Courses

16 credits

ICFP 321 Major Directors	4 (4-0-8)
ICFP 322 Cinema Through the 1950s	4 (4-0-8)
ICFP 323 International Field Study in Film Production	4 (0-12-4)
ICFP 324 Cinema Through the 1960s	4 (4-0-8)
ICFP 325 Writing and Producing 3D for Film	4 (0-8-4)
ICFP 326 Selected Topics in Film Production	4 (0-8-4)
ICFP 327 Independent Study in Film Production	4 (0-8-4)
ICFP 328 Music Video Production	4 (0-8-4)

Free Elective Courses

8 credits

Entertainment Media students can take any courses offered by Mahidol University as a free elective course with approval from the advisor.

ENTERTAINMENT MEDIA PRODUCTION PROGRAM

TELEVISION PRODUCTION

DEGREES OFFERED

Bachelor of Arts (Television Production)

B.A. (Television Production)

THE FIELD

The Entertainment Media Program offers a strong liberal arts education in modern media creation and visual literacy. The courses are taught within the context of aesthetics, history, theory and personal expression and require intensive hands-on participation in each of the specific majors of entertainment media.

The Television Production Major provides a core education in the creation of television productions and the mastery of television related professions. In addition to hands-on class experience, students learn the history and theory of television studies as well as take classes that employ a critical look at television programming. As they proceed through the program, students learn the principles of storyboarding, pre-production, directing, producing, editing and camerawork. Additional classes deal with principles of news gathering, documentary and public affairs programming, performing before the camera and sound editing. Both required and elective classes within the major also give students an opportunity to study television programming, marketing and sales, theories of production and audience response, and critical studies of television. The faculty includes full-time scholars in the field as well as part-time and visiting faculty, all of whom are specialists in the creation of television production and aesthetics.

CAREER OPPORTUNITIES

- Producers, production managers, directors of photography and scriptwriters in regional and global media companies.
- Television entrepreneurs
- Producers of news, travel, and cultural documentary programming
- Associates involved in the production of television advertising and commercials
- Graduate Studies in Television and Media as well as Mass Communication, Television Management, Television Technology and New Media, both in Thailand and internationally
- MBA or MA in Sociology, Humanities, International Marketing, Advertising and Communications, both in Thailand and inter-nationally

CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	52
Core Courses in Entertainment Media	28
Required Major Courses	84
Elective Major Courses	16
Free Elective Courses	8
TOTAL	188

COURSE LIST

General Education Courses 52 credits

English Communication

Regular Track

ICME 100 English Resource Skills

ICCM 104 Intermediate English Communication I

ICCM 105 Intermediate English Communication II

ICCM 106 Intermediate English Communication III

12 - 16 credits

0 (4-0-0)

4 (4-0-8)

4 (4-0-8)

4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'regular track' or 'advanced track' for their General Education requirement in English.

II. Students in 'regular track' are required to take the first 12 credits in ICCM 104, ICCM 105, and ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'advanced track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences**8 credits**

ICNS 105 Basic Mathematics *	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: past, present and future	4 (4-0-8)

Note: ICNS 105 Basic Mathematics is a mandatory course for Fine and Applied Arts students.

Humanities	16 credits
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 105 Music Appreciation**	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II***	4 (4-0-8)
ICHM 143 Introduction to Photography**	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)

ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

2. EMP students must take four Humanities courses to fulfill their General Education requirements. None of the Humanities courses are compulsory, however, it is recommended that they take the following courses: ICHM 105**, ICHM 142*** (a special section open specifically for Entertainment Media Production students) and ICHM 143**.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications *	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)

ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behavior	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Note: ICSS 118 * is recommended for Entertainment Media Production students

Health Science and Physical Education	4 credits
ICHE 101 Health Education *	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Note: ICHE 101 * is recommended for Entertainment Media Production students

Entertainment Media Courses	128 credits
Entertainment Media Core Courses	28 credits
ICEM 111 Introduction to Entertainment Media	4 (4-0-8)
ICEM 112 Visual Communication	4 (4-0-8)
ICEM 113 Storytelling	4 (4-0-8)
ICEM 114 Storyboarding	4 (4-0-8)
ICEM 211 Media Research and Analysis	4 (4-0-8)
ICEM 212 Basic Acting Techniques	4 (0-8-4)
ICEM 213 Audio Communication	4 (0-8-4)

Television Production Major

Required Courses

84 credits

ICTP 101 Introduction to Television	4 (4-0-8)
ICTP 102 Television Production Techniques	4 (4-0-8)
ICTP 111 Television Production Studio I	4 (0-8-4)
ICTP 112 Television Production Studio II	4 (0-8-4)
ICTP 201 Television Scriptwriting	4 (4-0-8)
ICTP 202 Television Directing and Production Procedures	4 (0-8-4)
ICTP 203 Television Genre Studies	4 (4-0-8)
ICTP 204 Television Pre-Production	4 (4-0-8)
ICTP 211 Television Production Studio III	4 (0-8-4)
ICTP 212 Television Production Studio IV	4 (0-8-4)
ICTP 301 Television Drama	4 (4-0-8)
ICTP 302 Television Post-Production	4 (0-8-4)
ICTP 303 Television Marketing, Sales, and Business Development	4 (4-0-8)
ICTP 304 Television Production Design	4 (0-8-4)
ICTP 305 Television Documentary Production	4 (4-0-8)
ICTP 306 Professional Internship in Television Production	4 (0-12-4)
ICTP 311 Television Production Studio V	4 (0-8-4)
ICTP 312 Television Production Studio VI	4 (0-8-4)
ICTP 401 Seminar in Television Production Senior Project and Ethics	4 (4-0-8)
ICTP 402 Television Production Senior Project I	4 (0-12-4)
ICTP 403 Television Production Senior Project II	4 (0-12-4)

Elective Courses

16 credits

ICTP 321 Television Series Scriptwriting	4 (0-8-4)
ICTP 322 News and Current Affairs Programs	4 (0-8-4)
ICTP 323 International Field Study in Television Production	4 (0-12-4)
ICTP 324 Wardrobe for Television and Film	4 (0-8-4)
ICTP 325 Special Effects Make-up for Television and Film	4 (0-8-4)
ICTP 326 Selected Topics in Television Production	4 (0-8-4)
ICTP 327 Independent Study in Television Production	4 (0-8-4)
ICTP 328 3D Production for Television	4 (0-8-4)
ICTP 329 Television Criticism	4 (4-0-8)

Free Elective Courses

8 credits

Entertainment Media students can take any courses offered by MUIC as a free elective course with approval from the advisor.

COMMUNICATION DESIGN PROGRAM

DEGREES OFFERED

Bachelor of Arts (Communication Design)

B.A. (Communication Design)

THE FIELD

Communication Design is a studio art program that provides a strong foundation in general design principles, theories and skills. Its majors are visual thinkers who not only engage in critical analysis and innovation but also have access to the latest state-of-the-art computer software in order to communicate their ideas, images and messages to targeted audiences. In addition, they gain practical experience by being actively involved in a community of professionals whose practice keeps pace with contemporary society, technology and culture.

CAREER OPPORTUNITIES

Communication Design graduates will have developed a professional portfolio of personally directed design work in preparation for either graduate studies or a career in advertising agencies, publication or graphic design, exhibitions, interior design or architecture, in-house art and design or interactive, multimedia and web production.

CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	48
Major Required Courses	108
Elective Major Courses	24
Free Elective Courses	8
TOTAL	188

COURSE LIST

General Education Courses 48 credits

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)

ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'regular track' or 'advanced track' for their General Education requirement in English.

II. Students in 'regular track' are required to take the first 12 credits in ICCM 104, ICCM 105, ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'advanced track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences	8 credits
ICNS 105 Basic Mathematics *	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: past, present and future	4 (4-0-8)

Note: ICNS 105 Basic Mathematics is a mandatory course for Fine and Applied Arts students.

Humanities	12 credits
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 105 Music Appreciation*	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II*	4 (4-0-8)
ICHM 143 Introduction to Photography*	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)

ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar, a non-credit course.

2. Communication Design students must take three Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended that they should take these three following courses: ICHM 105*, ICHM 142* and ICHM 143*.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)

ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)

ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behavior	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Health Science and Physical Education 4 credits

ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Major Courses 132 credits

Required Courses 108 credits

ICCD 100 Observational Drawing	4 (0-8-4)
ICCD 101 Perspective Drawing	4 (0-8-4)
ICCD 110 Visual Dynamics I	4 (0-8-4)
ICCD 111 Visual Dynamics II	4 (0-8-4)
ICCD 120 Space, Form and Materials I	4 (0-8-4)
ICCD 220 Space, Form and Materials II	4 (0-8-4)
ICCD 230 Visual Statement	4 (0-8-4)
ICCD 240 Typography I	4 (0-8-4)
ICCD 241 Typography II	4 (0-8-4)
ICCD 242 Design Technology I	4 (0-8-4)
ICCD 243 Design Technology II	4 (0-8-4)
ICCD 244 Communication Design I	4 (0-8-4)
ICCD 245 Communication Design II	4 (0-8-4)
ICCD 340 Design Technology III	4 (0-8-4)
ICCD 350 Advertising	4 (0-8-4)
ICCD 351 Environmental Graphics	4 (0-8-4)
ICCD 352 Integrated Branding	4 (0-8-4)
ICCD 360 Graphic Design History	4 (4-0-8)
ICCD 370 Professional Writing for Designers	4 (4-0-8)
ICCD 380 Communication Design Practicum	4 (0-8-4)
ICCD 440 Senior Seminar: Thesis Research and Development	4 (4-0-8)
ICCD 470 Professional Ethics	4 (4-0-8)
ICCD 471 Senior Writing Seminar	4 (4-0-8)
ICCD 472 Professional Portfolio Development and Presentation	4 (4-0-8)
ICCD 490 Communication Design Thesis I	4 (0-8-4)
ICCD 491 Communication Design Thesis II	4 (0-8-4)
ICCD 492 Public Exhibition	4 (0-8-4)

Elective Courses	24 Credits
ICCD 306 Intermediate Observational Drawing	4 (0-8-4)
ICCD 356 Information Graphics	4 (0-8-4)
ICCD 357 Animation	4 (0-8-4)
ICCD 358 Web Design	4 (0-8-4)
ICCD 366 History of Modern Design	4 (4-0-8)
ICCD 376 Communication Design Materials and Processes	4 (4-0-8)
ICCD 377 Critical Issues in Communication Design	4 (4-0-8)
ICCD 416 Printmaking	4 (4-0-8)
ICCD 426 Hand-made Books	4 (0-8-4)
ICCD 456 Package Design	4 (0-8-4)
ICCD 457 Illustration	4 (0-8-4)
ICCD 466 History of Advertising	4 (4-0-8)
ICCD 476 Green Design Seminar	4 (4-0-8)
ICCD 486 Advanced Communication Design Practicum	4 (0-8-4)

Free Electives	8 Credits
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Students can take any courses offered by Mahidol University as a free elective course with approval from the advisor.

SCIENCE

DIVISION

APPLIED MATHEMATICS PROGRAM

DEGREE OFFERED

Bachelor of Science (Applied Mathematics)

B.Sc. (Applied Mathematics)

THE FIELD

Mathematics is one of the oldest human disciplines dating back to the earliest civilizations. Since its origins, it has proved to be an indispensable tool for understanding the world around us. Mathematics is the language of modern science and basic training in the discipline. It is essential for those who want to understand the important scientific developments of our time.

MUIC offers a mathematics major that combines the benefits of a well-rounded general education in science and humanities with applied mathematics to produce high caliber graduates capable of undertaking graduate studies, secondary school teaching and careers in IT related professions, finance, banking and actuarial science.

Mathematics is the study of and search for patterns and permeates almost every aspect of life. It plays a fundamental role both in the sciences and in the world of commerce and finance. It also provides the tools and skills we need for dealing with the most abstract concepts. An understanding of mathematics is also extremely useful for students in the social sciences and valuable for anyone interested in the full range of human culture and the development of abstract thought.

CAREER OPPORTUNITIES

Excellent career opportunities for bilingual and multi-lingual applied mathematics graduates exist. Even in areas where the application of mathematics may not be obvious, a mathematical education provides training in logical and analytical skills, which are invaluable in many industries. Apart from the obvious careers in teaching and science, opportunities exist in insurance companies, industry and commerce, economics, genetics, meteorology and forestry.

CURRICULUM STRUCTURE

Applied Mathematics Major

Courses	Credits
General Education Courses	52
Core Science Courses	34
Required Major Courses	48
Elective Major Courses	44
Free Elective Courses	8
TOTAL	186

COURSE LIST

General Education Courses 52 credits

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'Regular Track' or 'Advanced Track' for their General Education requirement in English.

II. Students in 'Intermediate Track' are required to take the first 12 credits in ICCM 104, ICCM 105, and ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'Advanced Track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences

12 credits

ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)

ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICMA 106.

Humanities 12 credits

Compulsory Humanities Courses

ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)

Culture Track

ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)

Language Track

ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)

ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

2. All Applied Mathematics students must take at least ONE of the six available compulsory Humanities courses: ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225. These students must then either follow the 'culture track,' taking any 2 additional Humanities courses from compulsory courses or Culture Track courses (no order required), or follow the 'language track,' taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any ONE of the foreign languages.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia	4 (4-0-8)

ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behavior	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social change	4 (4-0-8)

Health Science and Physical Education	4 credits
ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Major Courses	126 credits
Core Science Courses	34 credits
ICBI 101 Biology	4 (4-0-8)
ICBI 102 Integrated Laboratory in Biological Sciences I	2 (0-4-2)
ICCH 210 General Chemistry I	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICMA 106 Calculus I	4 (4-0-8)
ICMA 213 Calculus II	4 (4-0-8)
ICPY 132 Principles of Physics	4 (4-0-8)
ICPY 341 Integrated Laboratory in Physics I	2 (0-4-2)
ICSC 302 Scientific Research and Presentations	4 (4-0-8)
ICSC 303 Statistics	4 (4-0-8)
Required Major Courses	48 credits
ICCS 100 Computer Fundamentals and Concepts	4 (4-0-8)
ICCS 101 Introduction to Computer Programming	4 (3-2-7)
ICMA 214 Ordinary Differential Equations	4 (4-0-8)
ICMA 219 Calculus of Several Variables	4 (4-0-8)
ICMA 200 Principles and Mathematical Concepts	4 (4-0-8)
ICMA 321 Linear Algebra	4 (4-0-8)
ICMA 322 Advanced Calculus	4 (4-0-8)
ICMA 335 Complex Variables	4 (4-0-8)
ICMA 337 Numerical Methods	4 (3-2-7)
ICMA 424 Abstract Algebra	4 (4-0-8)
ICMA 444 Research Project in Applied Mathematics	6 (6-0-12)
ICMA 445 Seminar in Applied Mathematics	2 (2-0-4)
Elective Major Courses	44 credits
ICSC 301 Data Collection and Laboratory Methods	4 (3-2-7)
ICCH 333 Physical Chemistry I	4 (4-0-8)
ICCH 334 Physical Chemistry II	4 (4-0-8)
ICCS 200 Data Structures and Algorithms	4 (4-0-8)
ICCS 202 Intermediate Computer Programming	4 (3-2-7)
ICMA 222 Introduction to Mathematical Software	4 (3-2-7)
ICMA 231 Theory of Interest	4 (4-0-8)
ICMA 242 Discrete Mathematics	4 (4-0-8)
ICMA 313 Number Theory	4 (4-0-8)
ICMA 316 Introduction to Graph Theory	4 (4-0-8)
ICMA 319 Introduction to Combinatorial Mathematics	4 (4-0-8)
ICMA 323 Partial Differential Equations	4 (4-0-8)
ICMA 324 Real Analysis	4 (4-0-8)
ICMA 331 Special Functions	4 (4-0-8)
ICMA 333 Boundary Value Problems	4 (4-0-8)
ICMA 341 Fluid Dynamics	4 (4-0-8)
ICMA 344 Time Series Analysis	4 (4-0-8)
ICMA 346 Optimization	4 (4-0-8)
ICMA 348 Numerical Methods for Partial Differential Equations	4 (4-0-8)
ICMA 350 Probability	4 (4-0-8)
ICMA 352 Experimental Design	4 (4-0-8)
ICMA 353 Actuarial Mathematics I	4 (4-0-8)
ICMA 354 Actuarial Mathematics II	4 (4-0-8)
ICMA 355 Introduction to Operation Research	4 (4-0-8)
ICMA 356 Decision Analysis	4 (4-0-8)
ICMA 360 Sampling Techniques	4 (4-0-8)
ICMA 393 Special Topics in Applied Mathematics I	4 (4-0-8)
ICMA 395 Special Topics in Applied Mathematics II	4 (4-0-8)
ICMA 423 Set Theory	4 (4-0-8)
ICMA 425 Introduction to Topology	4 (4-0-8)
ICMA 432 Multivariate Analysis	4 (4-0-8)

ICMA 434 Introduction to Fourier Analysis	4 (4-0-8)
ICMA 435 Regression Analysis	4 (4-0-8)
ICMA 441 Viscous Fluid	4 (4-0-8)
ICMA 450 Introduction to Mathematical Modeling	4 (4-0-8)
ICMA 484 Special Topics in Applied Mathematics III	4 (4-0-8)
ICMA 485 Special Topics in Applied Mathematics IV	4 (4-0-8)
ICMB 203 Microeconomics	4 (4-0-8)
ICMB 204 Macroeconomics	4 (4-0-8)
ICMB 211 Fundamental Financial Accounting	4 (4-0-8)
ICMB 363 Management Science	4 (4-0-8)
ICMB 371 Business Finance	4 (4-0-8)
ICMF 372 Financial Management	4 (4-0-8)
ICMF 379 Investment Analysis and Portfolio Management	4 (4-0-8)
ICBE 342 Intermediate Microeconomics	4 (4-0-8)
ICBE 343 Intermediate Macroeconomic	4 (4-0-8)
ICBE 448 Econometrics	4 (4-0-8)

Free Elective Courses

8 credits

Applied Mathematics students can take any courses offered by Mahidol University as a free elective course with approval from the advisor. Students are not allowed to take the following courses or their equivalents as a natural science course or as a free elective course:

ICNS 101 Introduction to Mathematics
 ICNS 102 Principles of Mathematics
 ICNS 103 Fundamental Mathematics
 ICNS 104 Fundamental Statistics
 ICNS 105 Basic Mathematics
 ICNS 111 Fundamental Biology
 ICNS 112 Integrated Biology
 ICNS 121 Fundamental Chemistry
 ICNS 122 Principles of Chemistry
 ICNS 131 Fundamental Physics
 ICNS 132 Principles of Physics
 ICMA 211 General Mathematics I
 ICMA 212 General Mathematics II
 ICMA 215 Calculus

BIOLOGICAL SCIENCE PROGRAM

DEGREE OFFERED

1. Bachelor of Science (Biological Sciences: Biology)
 2. Bachelor of Science (Biological Sciences: Biomedical Science)
 3. Bachelor of Science (Biological Sciences: Biotechnology)
- B.Sc. (Biological Sciences)**

THE FIELD

The Biological Science Program of MUIC offers quality education which allows students entry into a wide variety of occupations, professional degree programs and advanced research degree programs. The courses offered are surprisingly diverse for a college as small as MUIC, and are both interesting and challenging. Required courses emphasize the basic principles required for all advanced programs. These principles cover every field from environmental science, population biology and regulatory biology to cell and molecular biology. The program offers three modules: Biology, Biomedical Science, and Biotechnology.

Biology is the science of life. The vast scope of its subject matter makes biology an extremely diverse field of study. This diversity stems not only from the tremendous variety of life forms with which we share our planet but also from the multiple levels of organization available for biological investigation. Given an organism, a biologist might choose to investigate how it behaves, how it fits into its ecosystem, the mechanisms by which its genes shape its appearance, what its ancestors were like, how its cells divide, how it grows and develops or how it derives energy from nourishment. Biological inquiry encompasses perspectives from the planetary to the sub- microscopic.

Biomedical science provides an understanding of the human body and the way it works. Graduates are prepared to pursue professions allied with medical research. These include areas such as human anatomy and physiology, pharmacology and toxicology, pathobiology, neurobiology, epidemiology and tropical medicine.

Biotechnology is a discipline in which technology is applied in the production or modification of molecules, or manipulation of living organisms, to develop useful products, processes or services. Biotechnology encompasses a wide range of fields, including biological science, biochemistry, medicine, agriculture, environmental science and many more. It also includes various technologies, for example, recombinant DNA technology, gene transfer, embryo manipulation and transfer, monoclonal antibody production and fermentation process for the production of various microbial cells and metabolites.

CAREER OPPORTUNITIES

For many biology majors, undergraduate studies is the preliminary step in pursuing an advanced degree that will lead to a career as a medical doctor, dentist, veterinarian, academic or scientist. A graduate degree is not required; however, it is encouraged in pursuing a career related to biology. A bachelor's degree in biology can also lead to employment in the large and growing biotechnology, health care or pharmaceutical industries. Many openings in the dynamic, high-tech fields require a degree in the life sciences.

Biology majors are likewise well prepared for careers as secondary-school science teachers and in certain government agencies, including the departments of natural resources and health, state or national parks and environmental regulatory offices. Businesses and industries also hire biologists to conduct technical research to sell scientific equipment and supplies and to work as lab technicians. Many students interested in medical careers major in biology as undergraduates. Teaching biology in high school or middle school is another career choice of biology majors.

The aim of the biomedical science concentration is to provide graduates with the scientific, technical, communication and team-work skills suitable for direct entry into a wide range of biomedical careers. Graduates are able to work in industry, hospitals, medical schools or graduate programs in all fields of biological sciences and medical sciences (anatomy, physiology, microbiology, pathobiology, pharmacology). Biomedical researchers apply their scientific knowledge to a range of problems in medicine and the health sciences. Depending on their area of interest, they investigate aspects of the structure and function of the human body, disease and disease prevention.

Biotechnology graduates can pursue their careers in a number of ways, i.e., research science positions in laboratories applying biotechnology to problems in food and pharmaceutical industry and agricultural products; management positions in the biotechnology industry; positions at companies that are investing in biotechnology; and working for law firms in biotechnology.

CURRICULUM STRUCTURE

Biological Science Major

Courses	Credits
General Education Courses	52
Core Science Courses	30
Major Core Courses	22
Required Major Courses	50
Elective Major Courses	26
Free Elective Courses	8
Total	188

COURSE LIST

General Education Courses 52 credits

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'Regular Track' or 'Advanced Track' for their General Education requirement in English.

II. Students in 'Intermediate Track' are required to take the first 12 credits in ICCM 104, ICCM 105, ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'Advanced Track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences	12 credits
ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on ICMA 106.

Humanities	12 credits
Compulsory Humanities Courses	
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)

Culture Track	
ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)

Language Track	
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)

ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

2. All Biological Sciences students must take at least ONE of the six available compulsory Humanities courses: ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225. These students must then either follow the 'culture track,' taking any 2 additional Humanities courses from compulsory courses or Culture Track courses (no order required), or follow the 'language track,' taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any ONE of the foreign languages.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)

ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behavior	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social change	4 (4-0-8)

Health Science and Physical Education	4 credits
ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)
Major Courses	128 credits
Core Science Courses	30 credits
ICBI 101 Biology	4 (4-0-8)
ICBI 102 Integrated Laboratory in Biological Sciences I	2 (0-4-2)
ICCH 210 General Chemistry I	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICMA 106 Calculus I	4 (4-0-8)
ICMA 213 Calculus II	4 (4-0-8)
ICPY 132 Principles of Physics	4 (4-0-8)
ICPY 341 Integrated Laboratory in Physics I	2 (0-4-2)
ICSC 302 Scientific Research and Presentations	4 (4-0-8)
Major Core Courses	22 credits
ICBI 214 General Microbiology	4 (4-0-8)
ICBI 271 General Microbiology Laboratory	2 (0-4-2)
ICBI 215 General Biochemistry	4 (4-0-8)
ICBI 272 General Biochemistry Laboratory	2 (0-4-2)
ICCH 221 Organic Chemistry I	4 (4-0-8)
ICCH 390 Organic Chemistry Laboratory Techniques	2 (0-4-2)
ICSC 335 Statistics for Biological Science	4 (4-0-8)
Required Major Courses	50 credits
ICBI 381 Evolutionary Biology	4 (4-0-8)
ICBI 207 Ethics for Bioscience	4 (4-0-8)
ICBI 213 Genetics	4 (4-0-8)
ICBI 216 Cell Biology	4 (4-0-8)
ICBI 308 Molecular Biology	4 (4-0-8)
ICBI 221 Animal Biology	4 (3-2-7)
ICBI 231 Plant Biology	4 (3-2-7)
ICBI 382 Systemic Biology and Biodiversity	4 (4-0-8)
ICBI 261 Ecology and Conservation	4 (4-0-8)
ICBI 384 Field Study on Ecology and Biodiversity	2 (0-4-2)
ICBI 491 Seminar in Biological Sciences	2 (2-0-4)
ICBI 498 Research Project in Biological Sciences	6 (0-12-6)
ICCH 211 General Chemistry II	4 (4-0-8)

Elective Major Courses**26 credits**

(At least 20 credits of the selective module subjects)

A. The Biology Module

ICBI 202 Integrated Laboratory in Biological Science II	2 (0-4-2)
ICBI 255 Introduction to Oceanography	4 (3-2-7)
ICBI 256 Sustainable Development	4 (4-0-8)
ICBI 257 Environmental Issues: Past, Present and Future	4 (4-0-8)
ICBI 314 Tropical Ecology	4 (3-2-7)
ICBI 312 Aquatic Ecology	4 (4-0-8)
ICBI 318 Aquatic Ecology Field Course	4 (0-8-4)
ICBI 313 Conservation Biology	4 (0-8-4)
ICBI 320 Population and Community Ecology	4 (3-2-7)
ICBI 321 Invertebrate Zoology	4 (3-2-7)
ICBI 322 Vertebrate Zoology	4 (3-2-7)
ICBI 344 Environmental Science	4 (4-0-8)
ICBI 421 Entomology	4 (3-2-7)
ICBI 441 Marine Biology	4 (3-2-7)
ICBI 330 Biology of Fungi	4 (4-0-8)
ICBI 432 Plant Biotechnology	4 (4-0-8)
ICBI 438 Current Issues in Biology	2 (2-0-4)

B. The Biomedical Science Module

ICBI 204 Developmental Biology	4 (4-0-8)
ICBI 301 Functional Histology	4 (3-2-7)
ICBI 304 Basic Immunology	2 (2-0-4)
ICBI 305 Human Anatomy I	4 (2-4-6)
ICBI 306 Human Anatomy II	4 (2-4-6)
ICBI 307 Nutrition and Dietetics	4 (4-0-8)
ICBI 309 Pathobiology	4 (3-2-7)
ICBI 310 Mammalian Physiology	4 (3-2-7)
ICBI 328 Essential Pharmacology	4 (4-0-8)
ICBI 329 Medical Toxicology	4 (4-0-8)
ICBI 332 Medical Microbiology	4 (4-0-8)
ICBI 341 Neurobiology	4 (3-2-7)
ICBI 391 Health Psychology	4 (4-0-8)
ICBI 402 Epidemiology	4 (3-2-7)
ICBI 403 Introduction to Tropical Medicine	4 (4-0-8)
ICBI 405 Community Health	4 (3-2-7)
ICBI 406 Ergonomics	2 (2-0-4)
ICBI 407 Occupational Health and Safety	4 (4-0-8)
ICBI 411 Psychopathology	4 (4-0-8)
ICBI 412 Parasitology	4 (3-2-7)
ICBI 439 Current Issues in Biomedical Science	2 (2-0-4)

C. The Biotechnology Module

ICBI 315 Microbial Physiology and Genetics	4 (4-0-8)
ICBI 316 Environmental Microbiology	4 (3-2-7)
ICBI 330 Biology of Fungi	4 (4-0-8)
ICBI 372 Utilization of Water and Wastewater Treatment	4 (3-2-7)
ICBI 414 Industrial Microbiology	4 (4-0-8)
ICBI 415 Biotechnology	4 (4-0-8)
ICBI 432 Plant Biotechnology	4 (4-0-8)
ICBI 433 Fermentation Technology	4 (4-0-8)
ICBI 434 Food Biotechnology	4 (4-0-8)
ICBI 435 Molecular Techniques in Biotechnology	4 (4-0-8)
ICBI 436 Industrial Enzymology	4 (3-2-7)
ICBI 437 Current Issues in Biotechnology	2 (2-0-4)
ICBI 461 Cell Technology	4 (3-2-7)
ICCH 311 Analytical Chemistry	4 (3-2-7)
ICCH 316 Modern Methods of Analysis	4 (3-2-7)

Free Elective Courses

8 credits

Biological Science students can take any course offered by Mahidol University as a free elective, except for the following:

- ICNS 101 Introduction to Mathematics
- ICNS 102 Principles of Mathematics
- ICNS 103 Fundamental Mathematics
- ICNS 104 Fundamental Statistics
- ICNS 105 Basic Mathematics
- ICNS 111 Fundamental Biology
- ICNS 112 Integrated Biology
- ICNS 121 Fundamental Chemistry
- ICNS 122 Principles of Chemistry
- ICNS 131 Fundamental Physics
- ICNS 132 Principles of Physics
- ICNS 141 Computer Essentials
- ICNS 142 Introduction to Internet Technology

CHEMISTRY PROGRAM

DEGREES OFFERED

Bachelor of Science (Chemistry)

1. Bachelor of Science (Chemistry: Biochemistry)
2. Bachelor of Science (Chemistry: Chemistry)
3. Bachelor of Science (Chemistry: Industrial Chemistry)
4. Bachelor of Science (Chemistry: Organic Chemistry)

B.Sc. (Chemistry)

THE FIELD

Chemistry plays an important role in the shaping of our everyday lives. The applications of its concepts are the genesis of many modern-day objects and useful materials. It is chemistry that forms the foundations of other scientific disciplines, such as pharmaceuticals, petroleum, petrochemical, biological sciences, polymer sciences and even automotive-catalysts. Modern-day chemistry has developed to such an extent that physics, particularly quantum mechanics, has become interwoven and indispensable towards the understanding of chemical reactions and molecular structural characterizations. In modern-day chemical research, the notion of interdisciplinary disciplines, such as the crossovers into the realm of biological and physical problems which include nano phenomenon, is now the norm.

The Chemistry Program at Mahidol University International College reflects and is built upon the changes that have occurred in the discipline over the last few decades. Chemistry majors are taught with full rigor the essential and key subjects such as General Chemistry, Organic Chemistry, Inorganic Chemistry, Analytical Chemistry and Physical Chemistry. One trimester is allotted for mandatory Quantum Mechanics. Reflecting the modern trends of chemistry, the students, by means of selecting appropriate elective courses, can choose physical chemistry, biochemistry or biological chemistry, industrial chemistry or advanced organic chemistry elective courses. The elective courses in the Chemistry Program offer the Chemistry students the opportunity to shape their own track of preferred courses after completing the core and required chemistry courses. In the elective courses, we offer 4 different modules, equivalent to concentrations, which are biochemistry, chemistry, industrial chemistry and organic chemistry.

CAREER OPPORTUNITIES

Career opportunities include lucrative positions with pharmaceutical companies and other related industries. There are many opportunities for chemists in governmental positions. In addition, chemists are engaged in a large number of related and sometime diverse fields that include medicine, dentistry, law, international secondary school education, administration, technical sales, scientific journalism, the illustrative arts and even banking. Chemists are also desirable in research positions in all fields of sciences.

CURRICULUM STRUCTURE

Chemistry Major

Courses	Credits
General Education Courses	52
Core Science Courses	34
Required Major Courses	68
Elective Major Courses	26
Free Elective Courses	8
TOTAL	188

COURSE LIST

General Education Courses 52 credits

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'Regular Track' or 'Advanced Track' for their General Education requirement in English.

II. Students in 'Intermediate Track' are required to take the first 12 credits in ICCM 104, ICCM 105, and ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'Advanced Track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences

8 credits

ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)

ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICMA 106.

Humanities 12 credits

Compulsory Humanities Courses

ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)

Culture Track

ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)

Language Track

ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)

ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

3. All Chemistry students must take at least ONE of the six available compulsory Humanities courses: ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225. These students must then either follow the 'culture track,' taking any 2 additional Humanities courses from compulsory courses or Culture Track courses (no order required), or follow the 'language track,' taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any ONE of the foreign languages.

Social Sciences	12 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)

ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
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ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social change	4 (4-0-8)

Health Science and Physical Education	4 credits
ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Major Courses	128 credits
Core Science Courses 34 credits	
ICBI 101 Biology	4 (4-0-8)
ICBI 102 Integrated Laboratory in Biological Sciences I	2 (0-4-2)
ICCH 210 General Chemistry I	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICMA 106 Calculus I	4 (4-0-8)
ICMA 213 Calculus II	4 (4-0-8)
ICPY 132 Principles of Physics	4 (4-0-8)
ICPY 341 Integrated Laboratory in Physics I	2 (0-4-2)
ICSC 302 Scientific Research and Presentations	4 (4-0-8)
ICSC 303 Statistics	4 (4-0-8)
Required Major Courses	68 credits
ICCH 211 General Chemistry II	4 (4-0-8)
ICCH 221 Organic Chemistry I	4 (4-0-8)
ICCH 222 Organic Chemistry II	4 (4-0-8)
ICCH 311 Analytical Chemistry	4 (3-2-7)
ICCH 316 Modern Methods of Analysis	4 (3-2-7)
ICCH 321 Organic Spectroscopy	4 (4-0-8)
ICCH 322 Advanced Organic Chemistry	4 (4-0-8)
ICCH 329 Integrated Laboratory Techniques in Chemistry II	2 (0-4-2)
ICCH 333 Physical Chemistry I	4 (4-0-8)
ICCH 334 Physical Chemistry II	4 (4-0-8)
ICCH 371 Biochemistry I	4 (4-0-8)
ICCH 373 Biochemistry Laboratory	2 (0-4-2)
ICCH 390 Organic Chemistry Laboratory Techniques	2 (0-4-2)
ICCH 441 Inorganic Chemistry I	4 (4-0-8)
ICCH 442 Inorganic Chemistry II	4 (4-0-8)
ICCH 445 Integrated Laboratory Techniques in Chemistry III	2 (0-4-2)
ICCH 454 Seminar in Chemistry	2 (2-0-4)
ICCH 455 Senior Project in Chemistry	6 (0-12-6)
ICPY 211 General Physics I	4 (4-0-8)
Elective Major Courses	26 credits
(At least 24 credits of the selective module subjects)	
The Biochemistry Module	
ICBI 214 General Microbiology	4 (4-0-8)
ICBI 213 Genetics	4 (4-0-8)
ICBI 216 Cell Biology	4 (4-0-8)
ICBI 308 Molecular Biology	4 (4-0-8)
ICBI 435 Molecular Techniques in Biotechnology	4 (4-0-8)
ICCH 372 Biochemistry II	4 (4-0-8)
ICCH 473 Special Topics in Biochemistry	2 (2-0-4)
The Chemistry Module	
ICCH 335 Physical Chemistry III	4 (4-0-8)
ICCH 336 Computational Chemistry	4 (3-2-7)
ICCH 372 Biochemistry II	4 (4-0-8)
ICCH 381 Mathematics for Chemists	4 (4-0-8)
ICCH 421 Physical Organic Chemistry	4 (4-0-8)
ICCH 422 Organic Synthesis	4 (4-0-8)
ICCH 423 Heterocyclic Chemistry	4 (4-0-8)
ICCH 424 Natural Product Chemistry	4 (4-0-8)
ICCH 431 Advanced Physical Chemistry	4 (4-0-8)
ICCH 432 Special Topics in Physical Chemistry	2 (2-0-4)
ICCH 443 Special Topics in Inorganic Chemistry	2 (2-0-4)
ICCH 444 Environmental Chemistry	4 (3-2-7)

ICCH 451 Industrial Chemistry	4 (3-2-7)
ICCH 452 Polymer Science and Technology	4 (4-0-8)
ICCH 453 Special Topics in Industrial Chemistry	2 (2-0-4)
ICCH 456 Nuclear and Radiochemistry	4 (3-2-7)
ICCH 457 Industrial Chemical Processes	4 (3-2-7)
ICCH 461 Pharmacological Chemistry	4 (4-0-8)
ICCH 462 Macromolecules	4 (4-0-8)
ICCH 471 Bioorganic Chemistry	4 (4-0-8)
ICCH 472 Secondary Metabolism	4 (4-0-8)
ICCH 473 Special Topics in Biochemistry	2 (2-0-4)
ICFS 312 Food Chemistry I	4 (3-2-7)
ICFS 313 Food Chemistry II	4 (3-2-7)

The Industrial Chemistry Module

ICCH 444 Environmental Chemistry	4 (3-2-7)
ICCH 451 Industrial Chemistry	4 (3-2-7)
ICCH 452 Polymer Science and Technology	4 (4-0-8)
ICCH 453 Special Topics in Industrial Chemistry	2 (2-0-4)
ICCH 456 Nuclear and Radiochemistry	4 (3-2-7)
ICCH 457 Industrial Chemical Processes	4 (3-2-7)
ICCH 461 Pharmacological Chemistry	4 (4-0-8)
ICFS 312 Food Chemistry I	4 (3-2-7)
ICFS 313 Food Chemistry II	4 (3-2-7)

The Organic Chemistry Module

ICCH 372 Biochemistry II	4 (4-0-8)
ICCH 421 Physical Organic chemistry	4 (4-0-8)
ICCH 422 Organic Synthesis	4 (4-0-8)
ICCH 423 Heterocyclic Chemistry	4 (4-0-8)
ICCH 424 Natural Product Chemistry	4 (4-0-8)
ICCH 452 Polymer Science and Technology	4 (4-0-8)
ICCH 461 Pharmacological Chemistry	4 (4-0-8)
ICCH 471 Bioorganic Chemistry	4 (4-0-8)
ICCH 472 Secondary Metabolisms	4 (4-0-8)
ICCH 473 Special Topics in Biochemistry	2 (2-0-4)

Free Elective Courses

8 credits

Chemistry students can take any course offered by Mahidol University as a free elective, except for the following:

ICNS 101 Introduction to Mathematics
 ICNS 102 Principles of Mathematics
 ICNS 103 Fundamental Mathematics
 ICNS 104 Fundamental Statistics
 ICNS 105 Basic Mathematics
 ICNS 111 Fundamental Biology
 ICNS 112 Integrated Biology
 ICNS 121 Fundamental Chemistry
 ICNS 122 Principles of Chemistry
 ICNS 131 Fundamental Physics
 ICNS 132 Principles of Physics

COMPUTER ENGINEERING PROGRAM

DEGREE OFFERED

Bachelor of Engineering (Computer Engineering)

B.Eng. (Computer Engineering)

THE FIELD

Computer Engineering is defined as the discipline that embodies the science and technology of design, construction, implementation and maintenance of software and hardware components of modern computing systems and computer controlled equipment. Computer engineering has traditionally been viewed as a combination of both computer science and electrical engineering. It has evolved over the past three decades as a separate, although intimately related, discipline. Computer engineering is solidly grounded in the theories and principles of computing, mathematics, science and engineering; it applies these theories and principles to solve technical problems through the design of computing hardware, software, networks and processes.

Technological advances and innovation continue to drive computer engineering. There is now a convergence of several established technologies (such as television, computer and networking technologies) resulting in widespread and ready access to information on an enormous scale. This has created many opportunities and challenges for computer engineers. This convergence of technologies and the associated innovation lie at the heart of economic development and the future of many organizations. The situation bodes well for a successful career in computer engineering.

CAREER OPPORTUNITIES

Increasingly, computer engineers are involved in the design of computer-based systems to address highly specialized and specific application needs. Computer engineers work in most industries, including the computer, aerospace, telecommunications, power production, manufacturing, defense and electronics industries. They design high-tech devices ranging from tiny microelectronic integrated-circuit chips to powerful systems that utilize those chips and efficient telecommunication systems that interconnect those systems. A wide array of complex technological systems, such as power generation and distribution systems and modern processing and manufacturing plants, rely on computer systems developed and designed by computer engineers.

CURRICULUM STRUCTURE

Computer Engineering Major

Courses	Credits
General Education Course	48
Core Courses	41
Required Major Courses	65
Elective Major Courses	24
Free Elective Courses	8
TOTAL	186

COURSE LIST

General Education Courses 48 credits

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'Regular Track' or 'Advanced Track' for their General Education requirement in English.

II. Students in 'Intermediate Track' are required to take the first 12 credits in ICCM 104, ICCM 105, and ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'Advanced Track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences

12 credits

ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 102 Principles of Mathematics*	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)

ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: 1. Computer Engineering students are not allowed to take ICNS 141, ICNS 142 and ICNS 143 as a natural sciences course or as a free elective course.

2. Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICNS 102 Principles of Mathematics, which is a mandatory course for Computer Engineering students.

Humanities 8 credits

Compulsory Humanities Courses

ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)

Culture Track

ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)

Language Track

ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)

ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar, a non-credit course.

2. Computer Engineering students must take at least ONE of the six available compulsory Humanities courses: ICHM 101, ICHM 103, ICHM 106, ICHM 107, ICHM 140, or ICHM 225.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)

ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
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ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behavior	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social change	4 (4-0-8)

Health Science and Physical Education	4 credits
ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Major Courses

130 credits

Core Courses

41 credits

EGCI 100 Introduction to Computer Engineering	1 (0-2-1)
EGCI 111 Computer Programming	4 (3-2-7)
EGCI 200 Engineering Mathematics	4 (4-0-8)
EGCI 204 Engineering Mechanics	4 (4-0-8)
EGCI 206 Engineering Mathematics II	4 (4-0-8)
EGCI 230 Electric Circuit Analysis	4 (4-0-8)
EGCI 232 Engineering Electronics	4 (3-2-7)
EGCI 305 Statistics for Research in Computer Engineering	4 (4-0-8)
ICMA 215 Calculus	4 (4-0-8)
ICPY 132 Principles of Physics	4 (4-0-8)
ICPY 211 General Physics I	4 (4-0-8)

Required Major Courses

65 credits

EGCI 201 Discrete Mathematics	4 (4-0-8)
EGCI 205 Numerical Methods for Engineers	4 (4-0-8)
EGCI 212 Programming Techniques	4 (4-0-8)
EGCI 213 Programming Paradigms	4 (4-0-8)
EGCI 221 Data Structures and Algorithms	4 (4-0-8)
EGCI 233 Digital Circuit Design Lab	1 (0-2-1)
EGCI 234 Digital Circuit Design	4 (4-0-8)
EGCI 252 System Programming	4 (4-0-8)
EGCI 312 Professional Practices I	1 (0-2-1)
EGCI 313 Professional Practices II	1 (0-2-1)
EGCI 319 Internship in Computer Engineering	2 (0-12-2)
EGCI 321 Database Systems	4 (4-0-8)
EGCI 330 Microprocessors and Interfacing	4 (4-0-8)
EGCI 332 Embedded Systems	4 (4-0-8)
EGCI 333 Computer Architecture	4 (4-0-8)
EGCI 341 Software Engineering	4 (4-0-8)
EGCI 351 Operating Systems	4 (4-0-8)
EGCI 372 Data Communication and Computer Networks	4 (4-0-8)
EGCI 400 Morals and Ethical Studies for Computer Engineers	1 (1-0-2)
EGCI 491 Project Seminar	1 (0-2-1)
EGCI 492 Computer Engineering Project	2 (0-4-2)

Elective Major Courses

24 credits

Network and Security Elective Courses

EGCI 432 Distributed Systems	4 (4-0-8)
EGCI 474 Internetworking Technologies I	4 (3-2-7)
EGCI 475 Internetworking Technologies II	4 (3-2-7)
EGCI 476 Cryptography and Computer Security	4 (4-0-8)
EGCI 477 Penetration Testing and Prevention	4 (4-0-8)

System and Signal Elective Courses

EGCI 463 Pattern Recognition	4 (4-0-8)
EGCI 467 Natural Language and Speech Processing	4 (4-0-8)
EGCI 486 Image Processing	4 (4-0-8)

Intelligent System Elective Courses

EGCI 425 Data Mining	4 (4-0-8)
EGCI 461 Artificial Intelligence	4 (4-0-8)
EGCI 465 Fuzzy Sets and Neural Networks	4 (4-0-8)

Linguistic Software and Theory Elective Courses

EGCI 301 Computer Graphics	4 (4-0-8)
EGCI 331 Introduction to IC Design	4 (4-0-8)
EGCI 404 Theory of Computation	4 (4-0-8)

EGCI 427 Web Programming	4 (4-0-8)
EGCI 428 Mobile Device Programming	4 (4-0-8)
EGCI 429 Web Application Architecture	4 (4-0-8)
EGCI 494 Fundamental of Digital Forensics	4 (4-0-8)

Field Work Elective Course

EGCI 493 Cooperative Education	8 (0-40-8)
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Free Elective Courses

8 credits

Computer Engineering students can take any course offered by MUIC or other faculties as a free elective course with approval from the advisor, except for the following:

- ICNS 101 Introduction to Mathematics
- ICNS 103 Fundamental Mathematics
- ICNS 104 Fundamental Statistics
- ICNS 105 Basic Mathematics
- ICNS 111 Fundamental Biology
- ICNS 121 Fundamental Chemistry
- ICNS 131 Fundamental Physics
- ICNS 132 Principles of Physics
- ICNS 141 Computer Essentials
- ICNS 142 Introduction to Internet Technology
- ICNS 143 Fundamental of Computer Science

COMPUTER SCIENCE PROGRAM

DEGREE OFFERED

Bachelor of Science (Computer Science)

B.Sc. (Computer Science)

THE FIELD

Computer Science is one of the promising disciplines for career opportunities. It emphasizes a wide range of computing fields from theoretical foundations to state-of-the-art technology development in large-scale system development, database, mobile and internet programming, computer networks, intelligent systems and more. Students majoring in Computer Science will receive solid foundations in the areas of theoretical computing, programming, systems analysis, design and development, information management, database and computer security.

The Computer Science Program at MUIC offers students the opportunity to become qualified professionals in many areas of interest in terms of theory, software, applications and hardware. This includes programming languages, software engineering, system analysis and design, database, operating systems, computer architecture, computer graphics, distributed systems, computer networks, numerical analysis, artificial intelligence, data warehousing and mining, and information technology management.

CAREER OPPORTUNITIES

The Computer Science major is designed to prepare students for the following career paths:

- System development: Jobs in this category includes system analysis and design, web development, interface design, security issues and mobile computing. Career opportunities are available in a wide variety of software companies, computer services companies and organizations (industry, government, banking, healthcare, etc.).
- Innovation of computer technology application: Career opportunities in this area can involve a position at a research university or industrial research and development laboratory, entrepreneurial activity or a combination of the two.
- Computing solution development: This involves applying and developing computer science theory algorithms for the best possible solutions for computationally intensive problems. Career opportunities typically require graduate work on a Ph.D. level, followed by a position at a research university or an industrial research and development laboratory.
- Organizational technology infrastructure planning and management: This also offers the type of work aimed at those who study information technology (IT).

CURRICULUM STRUCTURE

Computer Science Major

Courses	Credits
General Education Courses	52
Core Science Courses	20
Required Major Courses	70
Elective Major Courses	36
Free Elective Courses	8
TOTAL	186

COURSE LIST

General Education Courses 52 credits

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'Regular Track' or 'Advanced Track' for their General Education requirement in English.

II. Students in 'Intermediate Track' are required to take the first 12 credits in ICCM 104, ICCM 105, and ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'Advanced Track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences

16 credits

ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 102 Principles of Mathematics*	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)

ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: 1. Computer Science students are not allowed to take ICNS 141, ICNS 142 and ICNS 143 as a natural science course or as a free elective course.

2. Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICNS 102 Principles of Mathematics, which is a mandatory course for Computer Science students.

Humanities 8 credits

Compulsory Humanities Courses

ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)

Culture Track

ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)

Language Track

ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)

ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar, a non-credit course.

2. Computer Science students must take at least ONE of the six available compulsory Humanities courses: ICHM 101, ICHM 103, ICHM 106, ICHM 107, ICHM 140, or ICHM 225.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)

ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social change	4 (4-0-8)

Health Science and Physical Education	4 credits
ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Major Courses

126 credits

Core Science Courses

20 credits

ICCS 200 Data Structures and Algorithms	4 (4-0-8)
ICCS 314 Numerical Methods	4 (4-0-8)
ICMA 211 General Mathematics I	4 (4-0-8)
ICMA 242 Discrete Mathematics	4 (4-0-8)
ICSC 303 Statistics	4 (4-0-8)

Required Major Courses

70 credits

ICCS 100 Computer Fundamentals and Concepts	4 (4-0-8)
ICCS 101 Introduction to Computer Programming	4 (3-2-7)
ICCS 202 Intermediate Computer Programming	4 (3-2-7)
ICCS 207 Introduction to File Processing	4 (4-0-8)
ICCS 220 Digital Logic Design	4 (4-0-8)
ICCS 221 Computer Architectures	4 (4-0-8)
ICCS 222 Operating Systems	4 (4-0-8)
ICCS 223 Data Communications and Networks	4 (4-0-8)
ICCS 230 Systems Analysis and Design	4 (4-0-8)
ICCS 240 Database Management	4 (4-0-8)
ICCS 300 Computer Science Internship	2 (0-6-2)
ICCS 310 Computation Theory	4 (4-0-8)
ICCS 313 Algorithm Analysis	4 (4-0-8)
ICCS 330 Object-Oriented Design and Methodology	4 (4-0-8)
ICCS 331 Organization of Programming Languages	4 (4-0-8)
ICCS 401 Computer Science Senior Project	4 (0-8-16)
ICPY 211 General Physics I	4 (4-0-8)
ICSC 302 Scientific Research and Presentations	4 (4-0-8)

Elective Major Courses

36 credits

ICCS 307 Design Patterns	4 (4-0-8)
ICCS 317 Systems Simulation and Modeling	4 (4-0-8)
ICCS 318 Compilers	4 (4-0-8)
ICCS 320 Computer Networks	4 (4-0-8)
ICCS 326 Enterprise Network Design	4 (4-0-8)
ICCS 334 Software Engineering	4 (4-0-8)
ICCS 335 Software Project Management	4 (4-0-8)
ICCS 336 Programming Languages	4 (4-0-8)
ICCS 340 Web Application Development	4 (4-0-8)
ICCS 342 Data Warehousing and Data Mining	4 (4-0-8)
ICCS 366 Management Information Systems	4 (4-0-8)
ICCS 410 Image Processing	4 (4-0-8)
ICCS 414 Information Storage and Retrieval	4 (4-0-8)
ICCS 417 Computer Graphics	4 (4-0-8)
ICCS 418 Computer System Security	4 (4-0-8)
ICCS 419 Computer Visualization	4 (4-0-8)
ICCS 440 Human Computer Interaction	4 (4-0-8)
ICCS 442 Decision Support Systems	4 (4-0-8)
ICCS 443 Database Application Development	4 (4-0-8)
ICCS 444 E-Commerce	4 (4-0-8)
ICCS 445 Enterprise Application Design and Development	4 (4-0-8)
ICCS 446 Business Intelligence	4 (4-0-8)
ICCS 447 Knowledge Management	4 (4-0-8)
ICCS 448 Mobile Application Programming	4 (4-0-8)
ICCS 449 Business Application Programming	4 (4-0-8)
ICCS 450 Intelligent Systems	4 (4-0-8)
ICCS 460 Computing Ethics and Professionalism	4 (4-0-8)
ICCS 478 Pattern Recognition	4 (4-0-8)

ICCS 480 Special Topics in Computer Science I	4 (4-0-8)
ICCS 481 Special Topics in Computer Science II	4 (4-0-8)
ICCS 482 Professional Practices on Database Management I	4 (4-0-8)
ICCS 483 Professional Practices on Database Management II	4 (4-0-8)
ICCS 484 Professional Practices on Software Technology I	4 (4-0-8)
ICCS 485 Professional Practices on Software Technology II	4 (4-0-8)
ICCS 486 Professional Practices on Network Technology I	4 (4-0-8)
ICCS 487 Professional Practices on Network Technology II	4 (4-0-8)
ICCS 490 Independent Study in Computer Science	4 (4-0-8)
ICMA 212 General Mathematics II	4 (4-0-8)
ICMA 214 Ordinary Differential Equations	4 (4-0-8)
ICMA 316 Introduction to Graph Theory	4 (4-0-8)
ICMA 321 Linear Algebra	4 (4-0-8)
ICMA 356 Decision Analysis	4 (4-0-8)
ICMB 204 Macroeconomics	4 (4-0-8)
ICMB 211 Fundamental Financial Accounting	4 (4-0-8)
ICMB 221 Principles of Marketing	4 (4-0-8)
ICMB 371 Business Finance	4 (4-0-8)

Note: * Students must take at least 20 credit hours of elective courses with the code ICCS.

Free Elective Courses

8 credits

Computer Science students can take courses offered by MUIC or courses offered by other faculties with permission from the advisors as free electives, except for the following:

- ICNS 101 Introduction to Mathematics
- ICNS 103 Fundamental Mathematics
- ICNS 104 Fundamental Statistics
- ICNS 105 Basic Mathematics
- ICNS 111 Fundamental Biology
- ICNS 121 Fundamental Chemistry
- ICNS 131 Fundamental Physics
- ICNS 141 Computer Essentials
- ICNS 142 Introduction to Internet Technology
- ICNS 143 Fundamental of Computer Science

ENVIRONMENTAL SCIENCE PROGRAM

DEGREE OFFERED

Bachelor of Science (Environmental Science)

B.Sc. (Environmental Science)

THE FIELD

Contemporary society is being challenged by a diverse array of extremely complex environmental problems driven by rapid increases in population and the demands on our life-support systems. Increased environmental pollution from the physical, chemical, and biological contaminants generated by industrial activities, agriculture and food production, and poor natural resource management continue to threaten the ecological and economic stability of our planet. Environmental studies have become necessary to meet the needs of the present age.

The Environmental Science Program provides educational and technical services in the fields of environment and natural resource management. The program trains students to explore environmental issues in Thailand and to conduct research projects with an aim towards sustainable development. Environment students learn how to follow a rigorous interdisciplinary approach to measure, quantify, predict and resolve serious environmental threats by integrating knowledge from appropriate disciplines. Students are expected to respond to issues such as natural resources conservation, ecosystem restoration, global warming, waste management, ground and surface water contamination, chemical toxicity, pollution prevention and control, and environmental planning and decision making.

CAREER OPPORTUNITIES

The B.Sc. degree in Environmental Science leads to a variety of career opportunities in private industry and governmental agencies concerned with environmental quality assessment, community environment programs and interagency coordination in environmental quality maintenance. Graduates can work as scholars, researchers, experts on the national and international levels, as well as in the public sector in the supervision of the environment and its resources in addition to private and business sectors in the production of goods and services, which require secured technology to the environment, monitoring environment and reducing pollution in the environmental organization for competition and sustenance.

Graduates are well prepared for their further studies in postgraduate levels in environmental and resources management, environmental biology, applied biology, conservation biology, environmental toxicology and environmental technology.

CURRICULUM STRUCTURE

Environmental Science Major

Courses	Credits
General Education Courses	52
Core Science Courses	32
Required Major Courses	66
Elective Major Courses	28
Free Elective Courses	8
TOTAL	186

COURSE LIST

General Education Courses 52 credits

English Communication 12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'Regular Track' or 'Advanced Track' for their General Education requirement in English.

II. Students in 'Intermediate Track' are required to take the first 12 credits in ICCM 104, ICCM 105, and ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'Advanced Track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences 12 credits

ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICMA 102 Principles of Mathematics, which is a mandatory course for Environmental Science students.

Humanities	12 credits
Compulsory Humanities Courses	
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
Culture Track	
ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)
Language Track	
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)

ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

4. All Environmental Science students must take at least ONE of the six available compulsory Humanities courses: ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225. These students must then either follow the 'culture track,' taking any 2 additional Humanities courses from compulsory courses or Culture Track courses (no order required), or follow the 'language track,' taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any ONE of the foreign languages.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)

ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social change	4 (4-0-8)

Health Science and Physical Education	4 credits
ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Major Courses

126 credits

Core Science Courses

32 credits

ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICMA 102 Principles of Mathematics	4 (4-0-8)
ICPY 132 Principles of Physics	4 (4-0-8)
ICCH 210 General Chemistry I	4 (4-0-8)
ICSC 302 Scientific Research and Presentations	4 (4-0-8)
ICSC 303 Statistics	4 (4-0-8)
ICSC 304 Computer for Research	4 (3-2-7)

Required Major Courses

66 credits

ICEN 211 Fundamentals and Applications of Environmental Microbiology	4 (3-2-7)
ICEN 212 Ecological Systems Analysis	4 (4-0-8)
ICEN 241 Environmental Pollution I	4 (4-0-8)
ICEN 312 Environmental Toxicology	4 (4-0-8)
ICEN 331 Soil, Land Use and Degradation	4 (4-0-8)
ICEN 341 Environmental Quality Analysis I	4 (2-4-6)
ICEN 342 Environmental Pollution II	4 (4-0-8)
ICEN 343 Environmental Quality Analysis II	4 (2-4-6)
ICEN 351 Population and the Environment	4 (4-0-8)
ICEN 361 Principles of Environmental Impact Assessment	4 (4-0-8)
ICEN 393 Practical Training in Environment	2 (0-4-2)
ICEN 491 Seminar in Environmental Science	2 (2-0-4)
ICEN 492 Environmental Field Excursions	2 (0-4-2)
ICEN 496 Senior Project in Environmental Science	6 (0-12-6)
ICCH 211 General Chemistry II	4 (4-0-8)
ICCH 221 Organic Chemistry I	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICMA 215 Calculus	4 (4-0-8)

Elective Major Courses

28 credits

ICBI 102 Integrated Laboratory in Biological Sciences I	2 (0-4-2)
ICBI 215 General Biochemistry	4 (4-0-8)
ICBI 231 Plant Biology	4 (3-2-7)
ICBI 261 Ecology and Conservation	4 (4-0-8)
ICBI 310 Mammalian Physiology	4 (3-2-7)
ICBI 321 Invertebrate Zoology	4 (3-2-7)
ICBI 322 Vertebrate Zoology	4 (3-2-7)
ICBI 421 Entomology	4 (3-2-7)
ICBI 441 Marine Biology	4 (3-2-7)
ICCH 311 Analytical Chemistry	4 (3-2-7)
ICEN 301 Basic Environmental Statistics	4 (4-0-8)
ICEN 313 Waste Minimization and Clean Technology	4 (4-0-8)
ICEN 314 Tropical Ecology	4 (3-2-7)
ICEN 317 Aquatic Ecology	4 (3-2-7)
ICEN 318 Aquatic Ecology Field Course	4 (0-8-4)
ICEN 319 Conservation Ecology	4 (4-0-8)
ICEN 320 Population and Community Ecology	4 (3-2-7)
ICEN 332 Introduction to Oceanography	4 (3-2-7)
ICEN 352 Environmental and Resource Economics	4 (4-0-8)
ICEN 362 Natural Resource Conservation and Management	4 (4-0-8)
ICEN 391 Sustainable Development	4 (4-0-8)
ICEN 392 Environmental Issues: Past, Present and Future	4 (4-0-8)
ICEN 401 Applied Mathematics for Environmental Studies	4 (4-0-8)
ICEN 402 Geo informatics	4 (3-2-7)
ICEN 403 Principle of Environmental Informatics	4 (4-0-8)
ICEN 411 Climate Change and Its Impact	4 (4-0-8)

ICEN 413 Environmental Remediation Technology	4 (4-0-8)
ICEN 414 Waste Utilization	4 (4-0-8)
ICEN 415 Biodiversity	4 (4-0-8)
ICEN 416 Ecotoxicology	4 (4-0-8)
ICEN 421 Water and Wastewater Treatment	4 (4-0-8)
ICEN 422 Solid and Hazardous Waste Management	4 (4-0-8)
ICEN 431 Land Use and Urban Environmental Planning	4 (4-0-8)
ICEN 432 Global Geomorphology	4 (4-0-8)
ICEN 441 Occupational Health and Safety	4 (4-0-8)
ICEN 460 Ecotourism	4 (2-4-6)
ICEN 461 Energy Conservation and Development	4 (4-0-8)
ICEN 462 Coastal and Marine Resources	4 (4-0-8)
ICEN 464 Water Resource Management	4 (4-0-8)
ICEN 465 Resource Inventory and Baseline Studies Methods	4 (3-2-7)
ICEN 466 Environmental Management Systems	4 (4-0-8)
ICEN 467 Environmental Risk Assessment and Management	4 (4-0-8)
ICEN 468 Environmental Management Policy	4 (4-0-8)
ICEN 469 Heritage Conservation	4 (2-4-6)
ICEN 483 Physical Planning and Environment	4 (4-0-8)

Free Elective Courses

8 credits

Students can take any courses offered by Mahidol University as a free elective course with approval from their advisors except for the following:

- ICNS 101 Introduction to Mathematics
- ICNS 102 Principles of Mathematics
- ICNS 103 Fundamental Mathematics
- ICNS 104 Fundamental Statistics
- ICNS 105 Basic Mathematics
- ICNS 111 Fundamental Biology
- ICNS 112 Integrated Biology
- ICNS 121 Fundamental Chemistry
- ICNS 122 Principles of Chemistry
- ICNS 131 Fundamental Physics
- ICNS 132 Principles of Physics
- ICNS 153 Ecosystems and Natural Resources

FOOD SCIENCE AND TECHNOLOGY PROGRAM

DEGREE OFFERED

Bachelor of Science (Food Science and Technology)

B.Sc. (Food Science and Technology)

THE FIELD

Food Science and Technology involves the application of a variety of scientific disciplines to food manufacturing. Food Science and Technology students learn the chemistry, microbiology, structure, engineering, safety and nutrition of food as it is processed, packed, distributed, stored and used.

Food manufacturing is the mass production of food products from raw animal and plant materials, utilizing principles of food technology. It is one of the largest industries in Thailand and involves the selection, preservation, processing, packaging, distribution and use of safe, nutritious, and wholesome food. Modern consumers generally take for granted the vast array of foods available in their modern diet and do not know about the extensive research and development that has been done in order to deliver tasty, nutritious, safe and convenient foods.

A Food Scientist studies the physical, microbiological and chemical makeup of food and compiles information about foods and their components. Depending on their area of specialization, Food Scientists may develop ways to process, preserve, package or store food according to industry and government specifications and regulations, either domestically or internationally.

CAREER OPPORTUNITIES

In Thailand, the food manufacturing industry caters to both the local market and export-oriented opportunities. Our international clients include neighboring ASEAN countries as well as the larger export markets of Europe, North America and Japan. Thus there is often a need for highly trained technical personnel who are able to communicate well in English because in these countries most people concerned with food imports use English as a second language. In the Food Science and Technology Program at MUIC, students receive rigorous theoretical and practical training in the basic sciences as well as in applied food technology, similar to what is found in most food technology programs.

The difference at MUIC is that all lectures, written materials, special lectures and trips are in English. International graduate studies programs, either in Thailand or abroad, typically require a strong command of English, as demonstrated in standard English exams such as TOEFL or IELTS. This gives the MUIC Food Science and Technology graduates a huge competitive advantage upon completion of their degrees. Because of their broad scientific and technical background, graduates are well prepared to work in the food manufacturing industry or to continue their studies toward a master's or doctorate degree in either Food Science or other related subjects.

CURRICULUM STRUCTURE

Food Science and Technology Major

Courses	Credits
General Education Courses	52
Required Major Courses	108
Elective Major Courses	20
Free Elective Courses	8
TOTAL	188

COURSE LIST

General Education Courses 52 credits

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'Regular Track' or 'Advanced Track' for their General Education requirement in English.

II. Students in 'Intermediate Track' are required to take the first 12 credits in ICCM 104, ICCM 105, ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'Advanced Track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences

16 credits

ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 102 Principles of Mathematics*	4 (4-0-8)
ICNS 112 Integrated Biology*	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials*	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology, and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)

ICNS 211 The Science of Food*	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: 1. Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICNS 102 Principles of Mathematics, which is a mandatory course for Food Science and Technology students.

2. ICNS 211 The Science of Food, ICNS 112 Integrated Biology, and ICNS 141 Computer Essentials are mandatory courses for Food Science and Technology students.

Humanities	8 credits
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy*	4 (4-0-8)
ICHM 103 Introduction to Logic*	4 (4-0-8)
ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 106 Moral and Ethical Studies*	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy*	4 (4-0-8)
ICHM 140 Elementary Art Theory*	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 225 The Western Classical Ideal*	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)

ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar*, a non-credit course.

2. Food Science and Technology students must take at least ONE of the six available compulsory Humanities courses: ICHM 101, ICHM 103, ICHM 106, ICHM 107, ICHM 140, or ICHM 225.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Thai Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)

ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behavior	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Health Science and Physical Education 4 credits

ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Major Courses 128 credits

Required Major Courses 108 credits

ICCH 210 General Chemistry I	4 (4-0-8)
ICCH 211 General Chemistry II	4 (4-0-8)
ICCH 221 Organic Chemistry I	4 (4-0-8)

ICCH 222 Organic Chemistry II	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICFS 212 General Biochemistry for Food Science and Technology	4 (3-2-7)
ICFS 213 General Microbiology for Food Science and Technology	4 (3-2-7)
ICFS 311 Physical Chemistry for Food Science and Technology	4 (4-0-8)
ICFS 312 Food Chemistry I	4 (3-2-7)
ICFS 313 Food Chemistry II	4 (3-2-7)
ICFS 314 Food Analysis	4 (3-2-7)
ICFS 315 Food Processing I	4 (3-2-7)
ICFS 316 Food Processing II	4 (3-2-7)
ICFS 321 Principles of Quality Assurance in Food Processing	4 (4-0-8)
ICFS 331 Food Hygiene and Sanitation	4 (4-0-8)
ICFS 332 Food Law and Standard of Commercial Food Products*	4 (4-0-8)
ICFS 372 Utilization of Water and Wastewater Treatment	2 (2-0-4)
ICFS 433 Food Microbiology I	4 (3-2-7)
ICFS 434 Food Microbiology II	4 (3-2-7)
ICFS 441 Food Engineering I	4 (3-2-7)
ICFS 442 Food Engineering II	4 (3-2-7)
ICFS 491 Seminar in Food Science and Technology	2 (2-0-4)
ICFS 492 Senior Project in Food Science and Technology	6 (0-12-6)
ICFS 494 Internship in Food Science and Technology	4 (0-12-4)
ICMA 215 Calculus	4 (4-0-8)
ICPY 210 General Physics	4 (3-2-7)
ICSC 302 Scientific Research and Presentations	4 (4-0-8)
ICSC 303 Statistics	4 (4-0-8)

Elective Major Courses

20 credits

ICFS 322 Fruits and Vegetables Technology	4 (3-2-7)
ICFS 325 Dairy Products Technology	4 (3-2-7)
ICFS 326 Meat, Poultry and Marine Product Technology	4 (3-2-7)
ICFS 371 Food Products Development	4 (4-0-8)
ICFS 381 Production Management and Marketing of Food Products	4 (4-0-8)
ICFS 421 Food and Nutrition	4 (4-0-8)
ICFS 423 Beverage Technology	4 (3-2-7)
ICFS 424 Fat and Oil Technology	4 (3-2-7)
ICFS 425 Cereal Science and Technology	4 (3-2-7)
ICFS 426 Bakery Product Technology	4 (3-2-7)
ICFS 427 Confectionary and Chocolate Technology	4 (3-2-7)
ICFS 432 Sensory Evaluation of Food Products	4 (3-2-7)
ICFS 435 Current Topics in Food Science and Technologies	2 (2-0-4)
ICFS 452 Food Packaging	4 (3-2-7)
ICFS 463 Field Trip	2 (0-6-2)
ICMB 211 Fundamental Financial Accounting	4 (4-0-8)
ICMB 221 Principles of Marketing	4 (4-0-8)
ICMB 341 Business Law	4 (4-0-8)

Free Elective Courses

8 credits

Food Science and Technology students can take any course offered by MU as a free elective with the permission of the student's advisor and Program Director except for the following:

ICNS 101 Introduction to Mathematics
 ICNS 103 Fundamental Mathematics
 ICNS 104 Fundamental Statistics
 ICNS 105 Basic Mathematics
 ICNS 111 Fundamental Biology
 ICNS 121 Fundamental Chemistry
 ICNS 122 Principles of Chemistry
 ICNS 131 Fundamental Physics

PHYSICS PROGRAM

DEGREE OFFERED

Bachelor of Science (Physics)

B.Sc. (Physics)

THE FIELD

Physics, one of the major basic sciences, essentially focuses on the elements of matter, their interaction, energy and applications. Physics plays a fundamental role both in the sciences and in the world of technology. It also provides the skills for dealing with all of the scientific concepts. An understanding of physics is also useful for students in social sciences and valuable for anyone interested in the full range of human culture. MUIC offers a Physics Major to produce graduates who are knowledgeable and highly qualified in this scientific discipline. There is a great demand for graduates in physics who can contribute to both national development in science and technology and international scientific advancement.

CAREER OPPORTUNITIES

Excellent career opportunities for Physics and Applied Physics graduates exist. Graduates in physics can work as researchers or laboratory assistants in industrial R&D and government agencies, including the departments of science and technology. Graduates are able to work in hospitals, medical schools or graduate programs in all fields of medical physics and physical science. For many Physics majors, undergraduate studies are only a preliminary to the pursuit of an advanced degree that will lead to a career as an academic, scientist or researcher.

CURRICULUM STRUCTURE

Physics Major

Courses	Credits
General Education Courses	52
Core Science Courses	34
Required Major Courses	76
Elective Major Courses	16
Free Elective Courses	8
TOTAL	186

COURSE LIST

General Education Courses 52 credits

English Communication

Regular Track

ICME 100 English Resource Skills

ICCM 104 Intermediate English Communication I

ICCM 105 Intermediate English Communication II

ICCM 106 Intermediate English Communication III

12 - 16 credits

0 (4-0-0)

4 (4-0-8)

4 (4-0-8)

4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I

ICCM 112 Advanced English Communication II

4 (4-0-8)

4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities

ICCM 203 Introduction to Literary Analysis

ICCM 204 Creative Writing

ICEG 232 Advanced Oral Communication

ICEG 250 Introduction to Linguistics

4 (4-0-8)

4 (4-0-8)

4 (4-0-8)

4 (4-0-8)

4 (4-0-8)

ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'Regular Track' or 'Advanced Track' for their General Education requirement in English.

II. Students in 'Intermediate Track' are required to take the first 12 credits in ICCM 104, ICCM 105, ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'Advanced Track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences	12 credits
ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICMA 106 Calculus I, which is a mandatory course for Physics students.

Humanities	12 credits
Compulsory Humanities Courses	
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)

Culture Track

ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)

Language Track

ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: 1. All students must take ICID 100 Freshman Seminar, a non-credit course.

2. All Physics students must take at least ONE of the six available compulsory Humanities courses: ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225. These students must then either follow the 'culture track,' taking any 2 additional Humanities courses from compulsory courses or Culture Track courses (no order required), or follow the 'language track,' taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any ONE of the foreign languages.

Social Sciences	8 credits
ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)

ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behavior	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social change	4 (4-0-8)

Health Science and Physical Education 4 credits

ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Major Courses 126 credits

Core Science Courses 34 credits

ICBI 101 Biology	4 (4-0-8)
ICBI 102 Integrated Laboratory in Biological Science I	2 (0-4-2)
ICCH 210 General Chemistry I	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICMA 106 Calculus I	4 (4-0-8)
ICMA 213 Calculus II	4 (4-0-8)
ICPY 132 Principles of Physics	4 (4-0-8)
ICPY 341 Integrated Laboratory in Physics I	2 (0-4-2)
ICSC 302 Scientific Research and Presentations	4 (4-0-8)
ICSC 303 Statistics	4 (4-0-8)

Required Major Courses 76 credits

ICPY 211 General Physics I	4 (4-0-8)
ICPY 212 General Physics II	4 (4-0-8)
ICPY 221 Computer Programming for Physics	4 (4-0-8)
ICPY 321 Intermediate Mechanics	4 (4-0-8)
ICPY 322 Electricity and Magnetism	4 (4-0-8)

ICPY 323 Electrodynamics	4 (4-0-8)
ICPY 324 Waves and Optics	4 (4-0-8)
ICPY 331 Mathematical Methods in Physics I	4 (4-0-8)
ICPY 332 Mathematical Methods in Physics II	4 (4-0-8)
ICPY 342 Integrated Laboratory In Physics II	2 (0-4-2)
ICPY 343 Integrated Laboratory In Physics III	2 (0-4-2)
ICPY 361 Quantum Mechanics I	4 (4-0-8)
ICPY 371 Thermal Physics	4 (4-0-8)
ICPY 436 Seminar in Physics I	2 (2-0-4)
ICPY 441 Senior Project in Physics	6 (0-12-6)
ICPY 451 Analytical Mechanics	4 (4-0-8)
ICPY 452 Statistical Mechanics	4 (4-0-8)
ICPY 471 Atomic and Molecular Physics	4 (4-0-8)
ICPY 472 Solid State Physics	4 (4-0-8)
ICPY 473 Nuclear and Particle Physics	4 (4-0-8)

Elective Major Courses **16 credits**

ICCH 211 General Chemistry II	4 (4-0-8)
ICCS 201 Computer Programming I	4 (3-2-7)
ICCS 203 Computer Programming II	4 (3-2-7)
ICPY 325 Advanced Optics	4 (4-0-8)
ICPY 326 Special Topics in Optics	2 (2-0-4)
ICPY 327 Laser and Applications	4 (4-0-8)
ICPY 333 Mathematical Methods in Physics III	4 (4-0-8)
ICPY 334 Numerical Methods in Physics	4 (4-0-8)
ICPY 421 Theoretical Physics	4 (4-0-8)
ICPY 431 Surface Analysis	4 (4-0-8)
ICPY 453 Theory of Relativity	4 (4-0-8)
ICPY 461 Quantum Mechanics II	4 (4-0-8)
ICPY 462 Molecular Dynamics	4 (4-0-8)
ICPY 474 Astrophysics	4 (4-0-8)
ICPY 475 Plasma Physics	4 (4-0-8)
ICPY 476 High Energy Physics	4 (4-0-8)
ICPY 477 Special Topics in Nuclear Physics	2 (2-0-4)
ICPY 478 Advanced Topics on Solid State Physics	4 (4-0-8)
ICPY 481 Nanomaterial Physics	4 (4-0-8)
ICPY 482 Special Topics in Nanomaterials	2 (2-0-4)
ICPY 490 Computational Physics	4 (4-0-8)
ICPY 492 Electronics	4 (4-0-8)
ICPY 493 Geophysics	4 (4-0-8)
ICPY 495 Special Topics in Geophysics	2 (2-0-4)
ICPY 496 Biophysics	4 (4-0-8)
ICPY 497 Special Topics in Biophysics	2 (2-0-4)

Free Elective Courses **8 credits**

Physics students can take any course offered by MUIC as a free elective, except for the following:

- ICNS 101 Introduction to Mathematics
- ICNS 102 Principles of Mathematics
- ICNS 103 Fundamental Mathematics
- ICNS 104 Fundamental Statistics
- ICNS 105 Basic Mathematics
- ICNS 111 Fundamental Biology
- ICNS 112 Integrated Biology
- ICNS 121 Fundamental Chemistry
- ICNS 122 Principles of Chemistry
- ICNS 131 Fundamental Physics
- ICNS 132 Principles of Physics

SOCIAL SCIENCE

DIVISION

SOCIAL SCIENCE PROGRAM

DEGREE OFFERED

Bachelor of Arts (Social Science)

B.A. (Social Science)

There are 3 concentrations:

1. International Studies
2. Modern World History
3. Southeast Asian Studies

THE FIELD

All students in the Social Science major take a set of common core courses designed to introduce them to the key elements of theory and methodology in the Social Sciences as well as various issues and aspects of the modern world. They are also required to conduct some independent research and write a dissertation in their chosen subject area. Critical and original thinking is encouraged. Students also have the opportunity to attend and help organize MUIC Social Science conferences and to participate in seminar discussions. The whole program is subject to regular review so that course materials and content can be improved. A consultative relationship between faculty and students is fostered.

International Studies:

The International Studies concentration offers students an introduction to selected aspects of contemporary world affairs. Students can choose from a range of courses dealing with international relations, the global society and economy and selected area studies. In addition, all International Studies students are given an extensive introduction to modern world history, study various global issues and are able to take intensive courses on various world regions.

Modern World History:

The Modern World History concentration provides students with an introduction to world history in the modern period (c. 1450 to the present). Students can choose from a range of courses in comparative history, Asian studies, European and Russian studies and studies of the Americas (Latin America and North America). Some courses on other world regions are also available.

Southeast Asian Studies:

The Southeast Asian Studies concentration provides students with a comprehensive introduction to modern Southeast Asia, with required courses on the geography, history, religions, political systems, economics and gender relations of the region, and electives in a wide range of specific topics relating to the societies, culture and arts of Southeast Asia, some with a particular reference to Thailand.

CAREER OPPORTUNITIES

Studying for a degree in Social Science (International Studies/Modern World History/ Southeast Asian Studies) should accomplish two objectives: (1) to give students a good knowledge of a particular subject area and (2) to train students in the critical analysis of systems of ideas, enabling them to analyze, evaluate and correlate new information and apply theory to practice. Both of these objectives are relevant in pursuing a career. Thus, the analytical skills which the students acquire in the process of studying their subject areas can be used in entirely different types of careers. Careers which may be of particular interest to Social Science graduates include: international business, work in international and non-governmental organizations, journalism and the media, and higher education both in teaching and administration. A Social Science undergraduate degree also provides an excellent basis for many higher degrees, including International Relations.

CURRICULUM STRUCTURE

Social Science Major

Courses	Credits
General Education Courses	60
Core Social Science Courses	28
Required Major Courses	
- International Studies	24
- Modern World History	24
- Southeast Asian Studies	36
Elective Major Courses	
- International Studies	60
- Modern World History	60
- Southeast Asian Studies	48
Free Elective Courses	8
TOTAL	180

COURSE LIST

General Education Courses 60 credits

Social Science Students are not permitted to take General Education Classes in the Natural & Social Sciences which are recoded versions of classes they are taking for their major.

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'Regular Track' or 'Advanced Track' for their General Education requirement in English.

II. Students in 'Intermediate Track' are required to take the first 12 credits in ICCM 104, ICCM 105, ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'Advanced Track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences	16 credits
ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 101 Introduction to Mathematics*	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People, and Society	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: I. Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICNS 101, ICNS 102 and ICNS 103.

Note: II. ICNS 101 Introduction to Mathematics is a mandatory course for all Social Sciences students.

Humanities	12 credits
Compulsory Humanities Courses	
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
Culture Track	
ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)

ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)

Language Track

ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Note: I. All students must take ICID 100 Freshman Seminar, a non-credit course.

II. All Social Science students must take at least ONE of the six available compulsory Humanities courses: ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225. These students must then either follow the 'culture track,' taking any 2 additional Humanities courses from compulsory courses or Culture Track courses (no order required), or follow the 'language track,' taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any ONE of the foreign languages.

Social Sciences**12 credits**

ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics in Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Thai Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)

ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance & Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration in the Modern World	4 (4-0-8)
ICSS 374 Introduction to International Organizations	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Health Science and Physical Education 4 credits

ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Major Courses 112 credits

Core Social Science Courses 28 credits

ICSO 202 Major Social Institutions	4 (4-0-8)
ICSO 204 Academic Methodologies for the Social Sciences	4 (4-0-8)
ICSO 205 Paradigms in the Social Sciences I	4 (4-0-8)
ICSO 206 Paradigms in the Social Sciences II	4 (4-0-8)
ICSO 301 Research Methods in the Social Sciences	4 (4-0-8)
ICSO 401 Independent Study in the Social Sciences	4 (4-0-8)
ICSO 402 Research Seminar	4 (4-0-8)

Required Courses

1. International Studies Concentration 24 credits

ICSO 203 Global Change in the Late Twentieth Century	4 (4-0-8)
ICSO 210 World History A (c. 1400-1763)	4 (4-0-8)
ICSO 211 World History B (c. 1763-1914)	4 (4-0-8)
ICSO 212 World History C (c. 1914-1945)	4 (4-0-8)
ICSO 213 World History D (c. 1945-2000)	4 (4-0-8)
ICSO 332 Human Rights	4 (4-0-8)

Elective Major Courses 60 credits

Note:

Electives: Electives can be chosen from any approved higher level Social Science courses. We require students to take at least two elective theory courses; in addition, we normally expect them to take elective courses from any two focus areas in their concentration (at least 5 electives from each area where available). However, if a student wants to take most (at least 10) or all of their elective focus area courses from one area rather than two, this is acceptable. In all cases, the choice of electives requires the approval of the concentration's advisor.

Focus areas: For International Studies the focus areas which are presently available are as follows:

- Comparative Studies
- International Relations
- Global Society and Economy

Social Theory Courses

Students must study at least two of the following:

ICSO 256 The European Renaissance: Culture and Context	4 (4-0-8)
ICSO 283 International Cultural Studies	4 (4-0-8)
ICSO 302 Historiography	4 (4-0-8)
ICSO 303 Modern Social Theory	4 (4-0-8)
ICSP 250 History and Systems of Psychology	4 (4-0-8)

Focus Areas

Students must take elective courses from any two focus areas in their concentration (at least 5 electives from each area where available).

1. Comparative Studies Focus Area

ICSA 312 Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSO 201 Human Geography	4 (4-0-8)
ICSO 207 The History of the World Economy	4 (4-0-8)
ICSO 276 History of War	4 (4-0-8)
ICSO 280 Gender Issues in the Modern World	4 (4-0-8)
ICSO 281 The Social Impact of Science and Technology on Society	4 (4-0-8)
ICSO 282 Global Media and Social Change	4 (4-0-8)
ICSO 284 History of Disease and Medicine	4 (4-0-8)
ICSO 364 Slavery and Human Trafficking	4 (4-0-8)
ICSO 365 Genocide and Ethnic Cleansing	4 (4-0-8)
ICSO 373 Conflict Resolution	4 (4-0-8)
ICSO 374 Revolution, Terrorism and the Modern State	4 (4-0-8)
ICSO 376 War, the Military, Society, and the State	4 (4-0-8)
ICSO 378 International Law and the State	4 (4-0-8)
ICSO 381 Ethnicity, Society and the State	4 (4-0-8)
ICSO 382 Religion, Society and the State	4 (4-0-8)

2. International Relations Focus Area

ICSO 271 International Relations	4 (4-0-8)
ICSO 272 Comparative Political Systems	4 (4-0-8)
ICSO 273 World Politics and World Order	4 (4-0-8)
ICSO 274 International Organizations	4 (4-0-8)
ICSO 275 Democracy as a Political System	4 (4-0-8)
ICSO 309 Political Movements	4 (4-0-8)
ICSO 310 Labor Movements	4 (4-0-8)
ICSO 370 Diplomacy and Negotiation	4 (4-0-8)
ICSO 371 Foreign Policy of the Major Powers Since 1945	4 (4-0-8)
ICSO 377 Devolution, Privatization and the State	4 (4-0-8)
ICSO 378 International Law and the State	4 (4-0-8)

3. Global Society and Economy Focus Area

ICSO 261 Economic Geography	4 (4-0-8)
ICSO 262 Global Resources	4 (4-0-8)
ICSO 263 Population and Migration in the Modern World	4 (4-0-8)
ICSO 264 The World Economy since 1945	4 (4-0-8)
ICSO 285 Drugs and Society	4 (4-0-8)
ICSO 360 Patterns and Consequences of Development	4 (4-0-8)
ICSO 366 Indigenous Cultures in the Modern World	4 (4-0-8)
ICSO 367 Environmental Issues in Social Context	4 (4-0-8)
ICSO 368 Environmental Sociology	4 (4-0-8)
ICSO 369 NGOs and Political and Business Contexts	4 (4-0-8)

ICSO 383 International Crime and Law Enforcement	4 (4-0-8)
ICSO 384 Migration, Diasporas and Culture	4 (4-0-8)
ICSO 390 Tourism: Development and Cultural Change	4 (4-0-8)

Other available electives (with approval from the concentration coordinator)

ICSO 396 Special Topics in History I	2 (2-0-4)
ICSO 397 Special Topics in History II	2 (2-0-4)
ICSO 398 Special Topics in Social Science I	2 (2-0-4)
ICSO 399 Special Topics in Social Science II	2 (2-0-4)

Note: Other Approved Courses.

- Area Studies: Courses chosen from the Modern World History (MWH) and Southeast Asian Studies (SEA) courses NB. If 6 courses are chosen from one specific area, this can count as an International Studies (INS) focus area.

Areas presently available:

- Asian Studies (MWH). See Modern World History Concentration
- European and Russian Studies (MWH). See Modern World History Concentration
- American and Australasian Studies (MWH). See Modern World History Concentration
- Southeast Asian Studies (SEA). See Southeast Asian Studies Concentration

Courses on African and Middle Eastern History can also be taken when available.

- Approved Courses from Other Majors (with approval of the Program Director)

Free Elective Courses **8 credits**

Students can take any courses offered by Mahidol University as a free elective with approval from their advisors.

Required Courses

2. Modern World History Concentration **24 credits**

ICSO 210 World History A (c. 1400-1763)	4 (4-0-8)
ICSO 211 World History B (c. 1763-1914)	4 (4-0-8)
ICSO 212 World History C (c. 1914-1945)	4 (4-0-8)
ICSO 213 World History D (c. 1945-2000)	4 (4-0-8)
ICSO 302 Historiography	4 (4-0-8)
ICSO 332 Human Rights	4 (4-0-8)

Elective Major Courses **60 credits**

Note:

Electives: Electives can be chosen from any approved higher-level Social Science courses. Normally we expect students to take most of their elective courses from any two focus areas in their concentration (at least 5 electives from each area where available), but if a student wants to take most (at least 10) or all of their elective courses from one focus area, this is acceptable. In all cases, the choice of electives requires approval from the concentration's advisor.

Focus areas: For Modern World History the focus areas which are presently available are as follows:

- Comparative and General History
- Asian Studies
- American and Australasian Studies
- European and Russian Studies

NB. General survey courses on African & Middle Eastern History may be made available over the next two years and will be provisionally included in the Comparative and General History section until an appropriate focus area can be developed.

Focus Areas

Students must take elective courses from any two focus areas in their concentration (at least 5 electives from each area where available).

1. Comparative and General History Focus Area:

Comparative History

ICSA 312 Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSO 201 Human Geography	4 (4-0-8)
ICSO 203 Global Change in the Late Twentieth Century	4 (4-0-8)
ICSO 364 Slavery and Human Trafficking	4 (4-0-8)
ICSO 365 Genocide and Ethnic Cleansing	4 (4-0-8)
ICSO 374 Revolution, Terrorism and the Modern State	4 (4-0-8)
ICSO 376 War, the Military, Society, and the State	4 (4-0-8)
ICSO 378 International Law and the State	4 (4-0-8)
ICSO 381 Ethnicity, Society and the State	4 (4-0-8)
ICSO 382 Religion, Society and the State	4 (4-0-8)

General History

ICSO 207 The History of the World Economy	4 (4-0-8)
ICSO 276 History of War	4 (4-0-8)
ICSO 284 History of Disease and Medicine	4 (4-0-8)
ICSO 371 Foreign Policy of the Major Powers Since 1945	4 (4-0-8)

African and Middle Eastern Studies

ICSO 238 Africa Since 1800	4 (4-0-8)
ICSO 239 The Middle East Since 1800	4 (4-0-8)
ICSO 344 Society, Politics and Economics in Contemporary Africa	4 (4-0-8)
ICSO 345 Society, Politics and Economics in the Contemporary Middle East	4 (4-0-8)

2. Asian Studies Focus Area:

Asian Studies

ICSO 231 Modern History of East Asia	4 (4-0-8)
ICSO 232 Civilizations of East Asia	4 (4-0-8)
ICSO 233 Civilizations of East Asia II	4 (4-0-8)
ICSO 341 Society, Politics and Economics in Contemporary East Asia	4 (4-0-8)
ICSO 350 Contemporary China and the Chinese World	4 (4-0-8)
ICSO 352 Society, Politics, and Economics in Contemporary Japan	4 (4-0-8)
ICSO 353 Society, Politics, and Economics in The Two Koreas	4 (4-0-8)
ICSO 354 Japan and Southeast Asia	4 (4-0-8)

South Asian Studies

ICSO 234 The Indian Sub-Continent up to c. 1500	4 (4-0-8)
ICSO 235 The Indian Sub-Continent since c. 1500	4 (4-0-8)
ICSO 342 Society, Politics and Economics in Contemporary South Asia	4 (4-0-8)

Southeast Asia Studies (All SEA Courses)

ICSA 203 The History of Southeast Asia up to 1800	4 (4-0-8)
ICSA 211 Economics of Southeast Asia	4 (4-0-8)
ICSA 255 Thai Economic History	4 (4-0-8)
ICSA 311 International Politics in Southeast Asia	4 (4-0-8)
ICSA 312 Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSA 321 Religion, Society and Politics in Mainland Southeast Asia	4 (4-0-8)
ICSA 322 Religion, Society and Politics in Maritime Southeast Asia	4 (4-0-8)

3. American and Australasian Studies Focus Area:

Latin America

ICSO 241 Latin America Since 1800	4 (4-0-8)
ICSO 346 Society, Politics and Economics in Contemporary Latin America & the Caribbean	4 (4-0-8)

North America

ICSO 243 North America c. 1763-1900	4 (4-0-8)
ICSO 244 The United States and Canada since 1900	4 (4-0-8)
ICSO 347 Society, Politics and Economics in Contemporary North America	4 (4-0-8)

The Americas: North and South	
ICSO 355 Religion in the Americas	4 (4-0-8)

Australasia	
ICSO 237 Australasia Since 1770	4 (4-0-8)
ICSO 343 Society, Politics and Economics in Contemporary Australasia	4 (4-0-8)

4. European and Russian Studies Focus Area:

Europe	
ICSO 246 Europe Since 1945	4 (4-0-8)
ICSO 247 The European Union: Development, Institutions and Politics	4 (4-0-8)
ICSO 250 European Classical Heritage	4 (4-0-8)
ICSO 252 Early Modern Europe, c. 1450 - c.1700	4 (4-0-8)
ICSO 253 The European Ancient Regime and Revolution, c. 1700 - c.1830	4 (4-0-8)
ICSO 254 European Society and Culture, c. 1830 - c. 1945	4 (4-0-8)
ICSO 255 Medieval and Renaissance Europe	4 (4-0-8)
ICSO 256 The European Renaissance: Culture and Context	4 (4-0-8)
ICSO 348 Society, Politics and Economics in Contemporary Europe	4 (4-0-8)

Russia	
ICSO 259 Russia and The Soviet Union up to 1825	4 (4-0-8)
ICSO 260 Russia and The Soviet Union since 1825	4 (4-0-8)
ICSO 349 Society, Politics and Economics in Contemporary Russia and the Former Soviet Republics	4 (4-0-8)

Other available electives (with approval of concentration coordinator)	
ICSO 396 Special Topics in History I	2 (2-0-4)
ICSO 397 Special Topics in History II	2 (2-0-4)
ICSO 398 Special Topics in Social Science I	2 (2-0-4)
ICSO 399 Special Topics in Social Science II	2 (2-0-4)

Note: Other Approved Courses.

Approved Courses from Other Majors (with approval of Program Director)

Free Elective Courses	8 credits
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Students can take any courses offered by Mahidol University as a free elective with approval from their advisors.

Required Courses

3. Southeast Asian Studies Concentration	36 credits
ICSA 201 Geography of Southeast Asia	4 (4-0-8)
ICSA 203 The History of Southeast Asia up to 1800	4 (4-0-8)
ICSA 208 Modern History of Southeast Asia, c. 1800-1948	4 (4-0-8)
ICSA 209 Contemporary History of Southeast Asia, 1948-Present	4 (4-0-8)
ICSA 211 Economics of Southeast Asia	4 (4-0-8)
ICSA 312 Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSA 321 Religion, Society and Politics in Mainland Southeast Asia	4 (4-0-8)
ICSA 322 Religion, Society and Politics in Maritime Southeast Asia	4 (4-0-8)
ICSO 332 Human Rights	4 (4-0-8)

Elective Major Courses	48 credits
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Note:

Electives: SEA students must take a total of 12 elective courses in SEA Studies. Normally three of these are taken as part of the language requirement, one is a Social Theory course and the remaining eight are from other SEA electives (below). In all cases, the choice of electives requires the approval of the concentration's advisor.

Language Requirement:

Students must take three sequent courses in any one Southeast Asian language (Thai, Bahasa Indonesia, Burmese, and Cambodian are offered).

-Thai Language Minor: Any student taking the Minor in Thai language in the Humanities and Modern Language Division is excused from the Southeast Asian Studies language requirement. They may instead take either three courses in any Southeast Asian Language or any three courses from the main SEA Studies electives.

Language Courses**Thai**

ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)

Indonesian

ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)

Burmese

ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)

Cambodian

ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

Social Theory Courses

SEA students must study one of the following:

ICSO 283 International Cultural Studies	4 (4-0-8)
ICSO 302 Historiography	4 (4-0-8)
ICSO 303 Modern Social Theory	4 (4-0-8)

Southeast Asian Electives.

Students can choose elective courses from both SEA economy and society focus area and SEA culture focus area. However, SEA students must study at least two courses from the country studies list.

SEA Economy and Society

ICSA 202 Ecology of Southeast Asia	4 (3-2-7)
ICSA 206 Political Systems of Southeast Asia	4 (4-0-8)
ICSA 207 Southeast Asian Archaeology	4 (4-0-8)
ICSA 212 Peasant Societies in Southeast Asia	4 (4-0-8)
ICSA 213 Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSA 253 Thai Society and Culture	4 (4-0-8)
ICSA 254 Introduction to Thai History	4 (4-0-8)
ICSA 255 Thai Economic History	4 (4-0-8)
ICSA 311 International Politics in Southeast Asia	4 (4-0-8)
ICSA 313 Economic History of Southeast Asia	4 (4-0-8)
ICSA 314 Economic Problems in Southeast Asia	4 (4-0-8)
ICSA 315 Globalization in Southeast Asia	4 (4-0-8)
ICSA 316 Democratization in Southeast Asia	4 (4-0-8)
ICSA 317 Political Systems of Southeast Asia I	4 (4-0-8)
ICSA 318 Political Systems of Southeast Asia II	4 (4-0-8)
ICSA 329 Indigenous Peoples of Southeast Asia	4 (4-0-8)
ICSA 411 Law and Society in Southeast Asia	4 (4-0-8)
ICSA 412 Population Movements and Diasporas in Southeast Asia	4 (4-0-8)

Aspects of SEA Culture

ICSA 231 Southeast Asian Arts I	4 (4-0-8)
ICSA 233 Dance and Theatre in Southeast Asia	4 (4-0-8)
ICSA 234 Southeast Asian Cinema	4 (4-0-8)
ICSA 251 Thai Arts (SAS Majors)	4 (4-0-8)
ICSA 331 Southeast Asian Arts II	4 (4-0-8)
ICSA 333 Media and Politics in Southeast Asia	4 (4-0-8)
ICSA 334 Gender and Identity in Southeast Asia	4 (4-0-8)
ICSA 431 Urban Anthropology of Southeast Asia	4 (4-0-8)

Country Studies

ICSA 420 Contemporary Issues in Thailand	4 (4-0-8)
ICSA 421 Contemporary Issues in Burma	4 (4-0-8)
ICSA 422 Contemporary Issues in Malaysia	4 (4-0-8)
ICSA 423 Contemporary Issues in Indonesia	4 (4-0-8)
ICSA 424 Contemporary Issues in Vietnam	4 (4-0-8)
ICSA 425 Contemporary Issues in the Philippines	4 (4-0-8)
ICSA 426 Contemporary Issues in Cambodia	4 (4-0-8)

Other available electives (with approval of the concentration's coordinator)

ICSO 396 Special Topics in History I	2 (2-0-4)
ICSO 397 Special Topics in History II	2 (2-0-4)
ICSO 398 Special Topics in Social Science I	2 (2-0-4)
ICSO 399 Special Topics in Social Science II	2 (2-0-4)

Free Elective Courses**8 credits**

Students can take any courses offered by Mahidol University as a free elective with approval from their advisors.

TOURISM AND HOSPITALITY MANAGEMENT

DIVISION

INTERNATIONAL HOSPITALITY MANAGEMENT PROGRAM

DEGREE OFFERED

Bachelor of Business Administration (International Hospitality Management) B.B.A. (International Hospitality Management)

There are 3 Modules:

1. Hotel and Restaurant Management
2. Event and MICE Management
3. Tourism Management

THE FIELD

The tourism and hospitality industry is one of the fastest growing and most dynamic industries in the world. This is especially true in Thailand where this industry has enormous importance for both the public and private sectors.

In line with industry needs, the focus of the International Hospitality Management (IHM) Major is the critical interface between theory and practice. This is clearly demonstrated by the curriculum's strong vocational nature, its analytical approach to this global industry and its commitment to sustainable development.

As part of its commitment to both students and industry, MUIC operates its own fully functional hotel and training center, the Salaya Pavilion, where students can gain genuine insight into the running and management of a live hotel and experience real-life situations, guests, functions and events.

At MUIC, the integration of faculty expertise, industry connections and state-of-the-art facilities provides the most comprehensive learning and training environment in Asia.

To provide students with a greater range of career options, the IHM major provides three specialized modules from which students can choose: 1) Hotel and Restaurant Management, 2) Event and MICE Management and 3) Tourism Management.

Hotel and Restaurant Management Module:

The Hotel and Restaurant Management Module focuses on the importance of quality services within hotels, strategic management, service marketing, human resource training and development, food and beverage management, event management, and feasibility studies and business development in the industry. In this module students are trained within the individual departments of a hotel, and more importantly, are trained from a managerial perspective. The students also have an opportunity to put the management training and theory into practice during their internships with industry practitioners.

Event and MICE Management Module:

The MICE and Event Management Module prepares students for careers in event and MICE management businesses. In this module, students gain knowledge and experiences in planning, budgeting and implementing special events, sport events, meetings, incentives, conventions, conferences, exhibitions and expositions. It also provides students with professional preparation, focusing on the concepts and principles involved in event and MICE management, budgets and finance, site selection, contracts, vendors, negotiations, marketing and promotions, food and beverage management, modern technology, hospitality law and event logistics. The event and MICE industry is an exciting, fast-paced field that allows and encourages creativity and innovation.

Tourism Management Module:

The Tourism Management Module engages students in the areas of tourism business planning and development, product innovation in tourism, destination promotion strategies, creating tourism competitiveness and interpretation of heritage tourism. The module aims to enhance students' analytical skills towards tourism-related business planning and development, creating value innovation in tourism business, strategic development in destination marketing and creating tourism business competitiveness.

CAREER OPPORTUNITIES

According to leading authorities, including the World Tourism Organization (WTO), the Thai Hotels Association (THA) and the Tourism Authority of Thailand (TAT), the tourism and hospitality industry in Thailand has continued to expand in both scope and scale. Therefore, the industry provides unique opportunities for career advancement and professional development. There are significantly increasing demands for graduates in tourism and hospitality programs, who are outstanding in international skills and experiences. Due to the up-to-date knowledge and skills from our tourism and hospitality management curriculum, our graduates are well-equipped with the necessary tools for their work lives, including a high level of English proficiency and practical experience from the national and international internship programs. For more than 20 years, our graduates have become more widely accepted by organizations in the tourism and hospitality industry, not only in Thailand but also in other countries around the world.

MUIC's Tourism and Hospitality Management (THM) Division is now one of the most respected educational institutions in Thailand, aiming to provide training and knowledge for middle and senior management professionals of the future. The THM Division has established excellent links with the tourism and hospitality industry in various sectors (e.g. hotels, airlines, food & beverages, event organizers and tourism organizations) and has a growing national and international reputation for quality in tourism and hospitality education.

CURRICULUM STRUCTURE

International Hospitality Management Major

Courses	Credits
General Education Courses	40
Core Courses	36
Required Major Courses	40
Elective Major Courses	40
Free Elective Courses	8
Internship Courses	24
TOTAL	188

COURSE LIST

General Education Courses 40 credits

English Communication

12 - 16 credits

Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)

ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

Note: I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'Regular Track' or 'Advanced Track' for their General Education requirement in English.

II. Students in 'Intermediate Track' are required to take the first 12 credits in ICCM 104, ICCM 105, ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

III. Students in 'Advanced Track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

Natural Sciences	8 credits
ICNS 105 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 103 Fundamental Mathematics*	4 (4-0-8)
ICNS 104 Fundamental Statistics*	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds, and Mankind	4 (4-0-8)
ICNS 117 Plants, People, and Society	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: 1. Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICNS 103 Fundamental Mathematics.

2. * ICNS 103 Fundamental Mathematics and ICNS 104 Fundamental Statistics are the Mandatory Courses for all International Hospitality Management students.

Humanities	8 credits
Compulsory Humanities Courses	
ICID 100 Freshman Seminar*	0 (1-0-0)
ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)

Culture Track

ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)

Note: 1. All students must take ICID 100 Freshman Seminar*, non-credit course.

2. International Hospitality Management students must take at least ONE of the six available compulsory Humanities courses: ICHM 101, ICHM 103, ICHM 106, ICHM 107, ICHM 140, or ICHM 225. Then students must take 1 additional Humanities course available in 'culture track'.

Social Sciences

4 credits

ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics*	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Thai Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)

ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

Note: *ICSS 114 is mandatory course for International Hospitality Management students.

Health Science and Physical Education	4 credits
ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-2-1)
ICPE 102 Physical Education: Basketball	1 (0-2-1)
ICPE 103 Physical Education: Golf	1 (0-2-1)
ICPE 105 Physical Education: Swimming	1 (0-2-1)
ICPE 106 Physical Education: Tennis	1 (0-2-1)
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
ICPE 115 Physical Education: Self Defense	1 (0-2-1)
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
ICPE 121 Physical Education: Soccer	1 (0-2-1)
ICPE 123 Physical Education: Cycling	1 (0-2-1)
ICPE 124 Selected Topics in Sports	1 (0-2-1)

Major Courses in Business Administration Courses**116 credits****Core Courses****36 credits**

ICHT 200 Business Communication	4 (4-0-8)
ICHT 212 Principles of Accounting	4 (4-0-8)
ICHT 213 Corporate Finance	4 (4-0-8)
ICHT 214 Business Economics	4 (4-0-8)
ICHT 221 Fundamental Marketing	4 (4-0-8)
ICHT 301 Management and Organization Behavior	4 (4-0-8)
ICHT 311 Human Resources Management and Development	4 (4-0-8)
ICHT 331 Business Law	4 (4-0-8)
ICHT 401 Strategic Planning and Management	4 (4-0-8)

Required International Hospitality Management Courses**40 credits**

ICHT 232 Introduction to Hospitality and Tourism Industry	4 (4-0-8)
ICHT 371 Sustainable Development for Hospitality and Tourism Industry	4 (3-2-7)
ICHT 490 Hospitality and Tourism Research Methodology	4 (4-0-8)
ICIH 321 Marketing and Sales for Hospitality Industry	4 (4-0-8)
ICIH 322 Consumer Behavior in Hospitality Industry	4 (4-0-8)
ICIH 341 Information Technology in Hospitality Industry	4 (4-0-8)
ICIH 351 International Service Quality Management	4 (4-0-8)
ICIH 361 Ethics in Hospitality Operation	4 (4-0-8)
ICIH 402 Entrepreneurship in Hospitality Business	4 (4-0-8)
ICIH 403 Revenue Management in Hospitality Industry	4 (4-0-8)

Elective International Hospitality Management Major Courses**20 credits**

Students can take courses from the three modules as follows

Hotel and Restaurant Management Module

ICIH 411 Culinary Management	4 (3-2-7)
ICIH 412 Front Office Management	4 (4-0-8)
ICIH 413 Housekeeping Management	4 (4-0-8)
ICIH 414 Food and Beverage Management	4 (4-0-8)
ICIH 415 Lodging Property Management	4 (4-0-8)

Event and MICE Management Module

ICIH 421 Event Management	4 (3-2-7)
ICIH 422 Sport Event Management	4 (4-0-8)
ICIH 423 Introduction to MICE Industry	4 (4-0-8)
ICIH 424 Incentive and Convention Management	4 (4-0-8)
ICIH 425 Exhibition and Exposition Management	4 (4-0-8)

Tourism Management Module

ICIH 431 Tourism Planning and Development	4 (4-0-8)
ICIH 432 Airline Business Management	4 (4-0-8)
ICIH 433 Tourism Package Management	4 (4-0-8)
ICIH 434 Destination Marketing and Management	4 (4-0-8)
ICIH 435 Principles of Tour Guiding	4 (3-2-7)

Elective Foreign Language Courses for Hospitality and Tourism Industry**20 credits**

Students can take five sequential courses in one of the foreign languages. Course level placement is based on the results of placement exam given by MUIC

Japanese for Hospitality and Tourism Industry Module

ICHL 101 Japanese I for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 102 Japanese II for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 103 Japanese III for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 104 Japanese IV for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 105 Japanese V for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 106 Japanese VI for Hospitality and Tourism Industry	4 (4-0-8)

ICHL 107 Japanese VII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 108 Japanese VIII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 109 Japanese IX for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 110 Japanese X for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 111 Japanese XI for Hospitality and Tourism Industry	4 (4-0-8)

Chinese for Hospitality and Tourism Industry Module

ICHL 121 Chinese I for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 122 Chinese II for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 123 Chinese III for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 124 Chinese IV for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 125 Chinese V for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 126 Chinese VI for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 127 Chinese VII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 128 Chinese VIII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 129 Chinese IX for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 130 Chinese X for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 131 Chinese XI for Hospitality and Tourism Industry	4 (4-0-8)

French for Hospitality and Tourism Industry Module

ICHL 141 French I for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 142 French II for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 143 French III for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 144 French IV for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 145 French V for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 146 French VI for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 147 French VII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 148 French VIII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 149 French IX for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 150 French X for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 151 French XI for Hospitality and Tourism Industry	4 (4-0-8)

German for Hospitality and Tourism Industry Module

ICHL 161 German I for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 162 German II for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 163 German III for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 164 German IV for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 165 German V for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 166 German VI for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 167 German VII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 168 German VIII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 169 German IX for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 170 German X for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 171 German XI for Hospitality and Tourism Industry	4 (4-0-8)

Spanish for Hospitality and Tourism Industry Module

ICHL 181 Spanish I for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 182 Spanish II for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 183 Spanish III for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 184 Spanish IV for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 185 Spanish V for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 186 Spanish VI for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 187 Spanish VII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 188 Spanish VIII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 189 Spanish IX for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 190 Spanish X for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 191 Spanish XI for Hospitality and Tourism Industry	4 (4-0-8)

Free Elective Courses

8 credits

Students can take any courses offered by Mahidol University as a free elective course with an approval of the advisor.

Co-operative Education Courses

24 credits

ICHT 391 Hospitality Management: Internship I

12 (0-36-12)

ICHT 491 Hospitality Management: Internship II

12 (0-36-12)

Note: Students are required to take both Hospitality and Tourism Management: Internship I (ICHT 391) and Hospitality and Tourism Management: Internship II (ICHT 491)

COURSE DESCRIPTIONS

EGCI 100 Introduction to Computer Engineering	1 (0-2-1)
Prerequisites: -	
Introduction to computer engineering. Computer systems. Hardware and Software. Operating System Open-source technology: Linux. Fundamental of computer network. Internet and World Wide Web (WWW). Practical exercises with Office application. Introduction to computer programming.	
EGCI 111 Computer Programming	4 (3-2-7)
Prerequisites: -	
Introduction to computer concepts, computer components, hardware and software, hardware and software interaction, and Electronic Data Processing (EDP) concepts. Introduction to program design and implementation using a high-level language: types and expressions, iterative and conditional control statements, functions, Boolean logic, array and record structures, pointers, and introduction to recursion.	
EGCI 200 Engineering Mathematics	4 (4-0-8)
Pre-requisite: ICMA 215	
Ordinary Differential Equations of the first and second order; Laplace Transform and its application to solve differential equations; Linear Algebra including operations with matrices, determinants, eigenvalue problem and diagonalization; Vector Differential Calculus.	
EGCI 201 Discrete Mathematics	4 (4-0-8)
Pre-requisite:-	
Basic set theory, mathematical reasoning, relations, functions, graphs, trees, introduction to number theory.	
EGCI 204 Engineering Mechanics	4 (4-0-8)
Pre-requisite: ICPY 132	
Force system; resultant; equilibrium; fluid statics; kinematics and kinetics of particles and rigid bodies; Newton's second law of motion.	
EGCI 205 Numerical Methods for Engineers	4 (4-0-8)
Pre-requisite: EGCI 111	
General principles of numerical calculations; accuracy estimation in numerical calculations; roots of polynomial and nonlinear functions; systems of linear algebraic equations; interpolation; differentiation and integration; numerical solution of ordinary differential equations; Fourier methods; curve fitting and approximation of functions; Optimization; application of numerical methods for engineering problems.	
EGCI 206 Engineering Mathematics II	4 (4-0-8)
Pre-requisite: ICMA 215	
Basic complex analysis, Probability and random variables; Gaussian process, Ergodic process, Mathematics for linear systems; Superposition, Convolution, Fourier Analysis; Discrete time Fourier transform (DTFT), Z-transform and Inverse Z-transform.	
EGCI 212 Programming Techniques	4 (4-0-8)
Pre-requisite: EGCI 111	
Programming techniques and concepts. Various techniques for Efficient Programming, Software-Bug Prevention, Debugging, Testing, and Source-Code Maintenance. Scope/Lifespan of variables, Pointers, Data Abstraction, Error Handling, and Object-Oriented Programming Concept.	
EGCI 213 Programming Paradigms	4 (4-0-8)
Pre-requisite: EGCI 212	
Introduction to programming paradigms and programming languages; fundamental programming concepts: data types, basic programming statements, functions, memory management; object oriented programming, concurrent programming, event-driven programming.	

EGCI 221 Data Structures and Algorithms**4 (4-0-8)****Pre-requisite: EGCI 111**

Analysis of algorithms; abstract data type; linear data structures: linked lists, stacks, queues; nonlinear data structures: trees, hash tables, graphs; sorting and searching algorithms; recursion, divide and conquer, dynamic programming, greedy algorithms; introduction to NP-completeness.

EGCI 230 Electric Circuit Analysis**4 (4-0-8)****Pre-requisite: EGCI 206**

Circuit elements; Kirchhoff's laws and reference direction; elementary concepts of network graphs; resistive circuits; node and mesh analysis; Thevenin theorem and Norton theorem; Op-amp, inductor and capacitor, first-order and second order circuit; step responses; zero input and zero-state responses; DC transient and AC steady-state response; elementary transfer functions; sinusoidal waveforms; phasor representations; impedance and admittance; sinusoidal steady-state analysis; complex power; frequency response.

EGCI 232 Engineering Electronics**4 (3-2-7)****Pre-requisite: -**

Introduction to solid-state electronics as circuit elements, including diodes, bipolar transistor, rectifier circuits, Zener diodes regulators, power supplies, power amplification, MOSFETs, applications in operational amplifiers in various feedback configurations.

EGCI 233 Digital Circuit Design Lab**1 (0-2-1)****Pre-requisite: EGCI 234**

Laboratory experiments related to EGCI 234 course. Examples of included experimental topics are Introduction to Digital Systems Lab, Basic Gates' Operations, Boolean algebra, Design of Adder and Subtractor Circuits, Encoder and Decoder Circuits, Multiplexer and Demultiplexer Circuits, Design of Sequential Circuits.

EGCI 234 Digital Circuit Design**4 (4-0-8)****Pre-requisite : -**

Digital Circuit Design, Basic Gates, Boolean Algebra, Combination Logic Circuit Design (e.g. Decoder, Encoder, Multiplexer, and Comparator circuits), Logic Minimization, Number Systems, Binary Codes, Flip Flops and register, Counter Circuits, Synchronous and Asynchronous Circuit Design, A/D and D/A converters, Memory Organization.

EGCI 252 System Programming**4 (4-0-8)****Pre-requisite : -**

Students will be introduced the basic concepts of system programming. Fundamental concepts in process management, concurrency and communication will be described including signals, thread, and thread synchronization, semaphores, Inter-Process Communication.

EGCI 301 Computer Graphics**4 (4-0-8)****Pre-requisite: EGCI 111**

Principles of computer graphics, graphics systems and models, graphics programming, graphic devices and their controls, color model, geometric objects and transformations, viewing, shading, clipping, and hidden-surface removal.

EGCI 305 Statistics for Research in Computer Engineering**4 (4-0-8)****Pre-requisite: ICMA 215**

The design of experiments and the methods for collection and presentation of data; descriptive statistics; elementary probability and normal distributions; estimation of parameters; hypothesis testing; analysis of variance; regression and correlation analysis of frequencies and non-parametric methods.

EGCI 312 Professional Practices I**1 (0-2-1)****Pre-requisite : -**

Introduction to Matlab/Octave, Programming environment in Matlab, commands, variables. Matrices and vectors. Loops, conditions, scripts, user-defined functions.

EGCI 313 Professional Practices II**1 (0-2-1)****Pre-requisite : -**

Study and develop skills to utilize modern technology in Computer: hardware and software, Open-Source technology, Communication technology, Computer graphic tools, Microprocessor interfacing techniques, input/output, and peripheral devices. I/O technology and intelligent system and other relevant topics.

EGCI 319 Internship In Computer Engineering**2 (0-12-2)****Pre-requisite: -**

Practical training in an industrial factory or an organization with computer-related systems, computer control system, or systems using computer processing. The training with the minimum period of 144 hours. Students must present a paper to the department, including the report of the training outcome from the employer.

EGCI 321 Database Systems**4 (4-0-8)****Pre-requisite : -**

Data model: entity-relationship, relational. Logical and Physical database design, Query Language, Data Dependencies and Normalization, Transaction, Crash Recovery, Concurrency control, Internet Databases.

EGCI 330 Microprocessor and Interfacing**4 (4-0-8)****Pre-requisite : -**

Introduction to microprocessor, microprocessor architecture and instruction set, addressing modes, assembly language, memory interfacing, interrupts & DMA, interfacing with I/O devices, microprocessor's interfacing programming and applications.

EGCI 331 Introduction to IC Design**4 (4-0-8)****Pre-requisite: EGCI 234**

N MOS and C MOS integrated circuit technologies; properties of N MOS and C MOS circuits; calculation of parameters in circuits, static and dynamic MOS circuits; system design; circuit drawing and testing; computer arithmetic; performance evaluation; synthesis of digital circuits from HDL models; modeling and simulation; fault models and testing the use of CAD tools in circuit design.

EGCI 332 Embedded Systems**4 (4-0-8)****Pre-requisite : -**

Embedded system design and development process; portable battery operated embedded systems; high-level language programming for embedded system applications; real-time operating system; advanced peripheral interfacing; DAC and ADC converters; Sensors and signal conditioners.

EGCI 333 Computer Architecture**4 (4-0-8)****Pre-requisite: EGCI 234**

Computer components: design of logic circuits; working of and designing register level components used in computer systems; data representation in computer systems; clock signal; datapath design; design of control unit using microprogram (CISC architecture) and logic circuit (RISC architecture); working of computer of each architecture; performance enhancement; pipeline systems of computer; memory systems; principles and working of cache memory; input-output system design; fundamentals of serial and parallel communication; parallel processing architecture. Fault tolerance.

EGCI 341 Software Engineering**4 (4-0-8)****Pre-requisite: EGCI 321**

Software life cycle; need and specification; large-scale software development; scheduling, developing, constructing, testing and maintenance of software system; object-oriented analysis and design; software reuse; documentation; management of software project; case study of software system in the market.

EGCI 351 Operating Systems**4 (4-0-8)****Pre-requisite: EGCI 252**

Contemporary concepts of computer operating systems; Thread; CPU scheduling; definition and details of harmonizing cooperating process; system resources management; deadlock handling; main memory management and design; virtual memory management; auxiliary memory management; file systems; protection and security; introduction to distributed operating systems.

EGCI 372 Data Communication and Computer Networks**4 (4-0-8)****Pre-requisite : -**

Introduction to data communication. Network Topology. OSI and TCP/IP model. Ethernet Fundamental. Principle of physical layer. Principle of data transmission and data link control protocol. Circuit Switching and Packet Switching. Principle of transport layer. Principle of network layer. Routing fundamentals and protocol. TCP/IP protocol and IP addressing. Application layer and wireless network.

EGCI 400 Morals and Ethical Studies for Computer Engineers**1 (1-0-2)****Pre-requisite : -**

History and overview; public policy; methods and tools of analysis, professional and ethical responsibilities; risks and liabilities; intellectual properties; privacy and civil liberties; computer crime and economic issues for computer engineering.

EGCI 404 Theory of Computation**4 (4-0-8)****Pre-requisite: EGCI 201**

Introduction to structure of languages and characteristic of languages: formal languages, regular languages and non-regular languages, context-free grammar and context-free languages. Describe the characteristic of state machines that are used to check the membership of languages: finite state machines, transducers, state transition machines, non-deterministic finite state machines, push-down state machines, Turing machines. Advanced theory of computation: Kleene's theorem, recursively enumerable languages, decision problems.

EGCI 425 Data Mining**4 (4-0-8)****Pre-requisite: -**

Knowledge discovery in database; data preparation, data visualization, and data transformation; clustering, association analysis, classification and ensemble classification; metrics and evaluation; data warehouse, online analytical processing (OLAP); effects of data mining, current technology and trend, applications of data mining.

EGCI 427 Web Programming**4 (4-0-8)****Pre-requisite: -**

Semi-structured data models for the Web (such as XML, etc.), semi-structured data management, associated query languages and query systems for Web data, query processing and optimization over semi-structured data as well as over multiple distributed sources. Data integration over the Web, warehousing of Web data. Mappings from relational and object-oriented database servers to web data. Discussion on some novel data-intensive applications on the Web such as electronic commerce, digital libraries, and distance education relating to web database issues.

EGCI 428 Mobile Device Programming	4 (4-0-8)
Pre-requisite: -	
Fundamental of the mobile device programming; concept of mobile device technology; basic mobile device programming; user-interface design; database connection; remote sensors controlling; mobile web services; Develop a prototype for the mobile device application for with notification services.	
EGCI 429 Web Application Architecture	4 (4-0-8)
Pre-requisite: -	
Fundamental concepts of Web application development from a managerial perspective; extensible Markup Language (XML) and Hypertext Markup Language (HTML) technology; fundamental principles of architecture, process, and elements of Web applications; Web services application development; mobile applications such as geographical information system and social networks.	
EGCI 432 Distributed Systems	4 (4-0-8)
Pre-requisite: EGCI 111	
Naming, consistency, concurrency, and security and reviews some of the current best practices in distributed computing models: peer-to-peer, grid computing, and distributed object model.	
EGCI 461 Artificial Intelligence	4 (4-0-8)
Pre-requisite: -	
Foundations of artificial intelligence, solving problems by searching, knowledge representation, first-order logic, inference in first-order logic, planning, probabilistic reasoning systems, introduction to Prolog, natural language processing, genetic algorithm, and machine learning techniques.	
EGCI 463 Pattern Recognition	4 (4-0-8)
Pre-requisite: Consent of instructor	
Preprocessing for data recognition: features extraction, classification or linear techniques for recognition. Parametric and nonparametric techniques, Bayesian classifiers, methods, neural networks, hybrid method, learning techniques. Applications in pattern recognition	
EGCI 465 Fuzzy Sets and Neural Networks	4 (4-0-8)
Pre-requisite: EGCI 201	
Basic principles of fuzzy logic, fuzzy numbers, fuzzy sets, fuzzy relations, fuzzy rules and reasoning, fuzzy inference systems, fuzzy system design, structure and characteristic of various artificial neural networks, supervised and non-supervised learning, classification, fuzzy techniques and neural networks application in engineering.	
EGCI 467 Natural Language and Speech Processing	4 (4-0-8)
Pre-requisite: -	
Algorithms for the processing of linguistic information, computational properties of natural languages. Morphological, syntactic, and semantic processing from a linguistic and an algorithmic perspective, modern quantitative techniques in NLP: using large corpora, statistical models for acquisition, and representative systems.	
EGCI 474 Internetworking Technologies I	4 (3-2-7)
Pre-requisite: Consent of instructor	
Theoretical and practical aspects of routing, including internetworking models, internet protocol, and routing technologies. Laboratory work is required.	
EGCI 475 Internetworking Technologies II	4 (3-2-7)
Pre-requisite: EGCI 474	
Theoretical and practical aspects of advanced routing and switching technologies, including Hierarchical Network Design Model, Layer 2 Switching, Internet Protocol version 6, Spanning Tree Concepts, Inter-VLAN, WAN Technologies, Network Security, Network Services, and Network Troubleshooting. Laboratory work is required.	

EGCI 476 Cryptography and Computer Security	4 (4-0-8)
Pre-requisite : -	
Introduction to basic theory and techniques in cryptography. Symmetric and Asymmetric encryption. Cryptanalysis techniques. Security in computer network. Security threats and Vulnerabilities. Authentication mechanisms. Identification schemes. Security in operating system and application. Firewall, Intrusion Detection system.	
EGCI 477 Penetration Testing and Prevention	4 (4-0-8)
Pre-requisite : -	
Process of penetration testing. Collection and analysis of computer network vulnerabilities. Tools for penetration testing. Ethics of penetration testing processes. Summarizing and reporting the result from penetration testing. Planning and Design of prevention systems to protect computer network form vulnerabilities.	
EGCI 486 Image Processing	4 (4-0-8)
Pre-requisite: Consent of instructor	
Image processing systems, Introduction to digital image processing, Digital image fundamentals, Image Enhancement, Image Transformation, Image Restoration, Color image processing, Image compression, Morphological image processing, Image segmentation, Object recognition.	
EGCI 491 Project Seminar	1 (0-2-1)
Pre-requisite: Consent of instructor	
Write a project proposal for an approved topic, for further research and implementation in the Computer Engineering Project course.	
EGCI 492 Computer Engineering Project	2 (0-4-2)
Pre-requisite: EGCI 491	
The computer engineering project supervised by the faculty. Students complete the project. A complete project report and an oral examination is required.	
EGCI 493 Cooperative Education	8 (0-40-8)
Pre-requisite: -	
Integrate and adapt all classroom knowledge into real practice in corporate environment, gain working experience and teamwork experience under supervision of mentors from the companies and advisors from the department, in order to prepare the students from transition from school to work after graduation.	
EGCI 494 Fundamental of Digital Forensics	4 (4-0-8)
Pre-requisite: -	
Introduction to basic of digital forensics. Data Collection and Investigation from Operating System such as Windows and Unix. Computer files system storage. Collecting and analyzing network traffic. Data analysis and validation. Digital Forensic Tools.	
ICAP 101 Introduction to Animation	4 (4-0-8)
Prerequisites: -	
General theories and principles of animation, history of animation, overview of animation production technology, the animation business and industry, key concepts of visual language and composition.	
ICAP 102 Character Design	4 (4-0-8)
Prerequisites: -	
Creation of characters for animation, character appeal and personality, character design options and limitations, the look and appeal of a character, psychology, context within an environment and within a cast of supporting characters.	

ICAP 111 Animation Production Studio I**4 (0-8-4)****Prerequisites: -**

Introduction to animation production, fundamental drawing skills for traditional black and white animation, color theory and applications, visual language of drawing with an emphasis on depicting objects and the human form in space, visual compositions.

ICAP 112 Animation Production Studio II**4 (0-8-4)****Prerequisites: -**

Studio practice of hand-drawn exercises to develop basic principles of animation including the illusion of movement, basic character movement cycles, key frames, in-betweens, beats, posing, timing, squash and stretch, anticipation, slow in and out follow through.

ICAP 201 Computer Programs for Animation**4 (4-0-8)****Prerequisites: -**

Introduction to computer programs for animation production, technical and artistic use of computer programs as a tool for creating art.

ICAP 202 Drawing for Animation**4 (0-8-4)****Prerequisites: -**

Exploration of human and animal muscular and skeletal structure, volumetric drawing from a model, realistic drawing, light, value, techniques for making 2D drawings into 3-dimensional drawings and models.

ICAP 203 Layout Design**4 (4-0-8)****Prerequisites: -**

Layout design principles, use of field guides for animation, basic lighting and shape concepts, creating illusion of 3D space, environment perspective illusion, blocking actions, visual storytelling.

ICAP 204 3D Animation Design**4 (4-0-8)****Prerequisites: ICAP 201**

Foundation skills for 3D computer animation, developing a working knowledge of the underlying process of 3D animation, polygonal modeling techniques, NURBS, procedural and raster image mapping, lighting, camera, shader and rendering methods, hierarchical linking and pre-production fundamentals.

ICAP 211 Animation Production Studio III**4 (0-8-4)****Prerequisites: -**

Introduction to a variety of painting and digital painting techniques used in 2D and 3D animations, gathering and archiving of textures for use in traditional and digital painting, using various combinations of software programs for visual paint effects, pre-production and production uses, developing finished animation artwork using a combination and variety of production techniques.

ICAP 212 Animation Production Studio IV**4 (0-8-4)****Prerequisites: -**

Develop animation skills in character acting, dialogue, and perspective in action, exploration of the 2D animation production process from script to screen, animation roughs, breakdown, and clean-up.

ICAP 301 Animation Theory and Analysis**4 (4-0-8)****Prerequisites: -**

Detailed research and analysis of critical theories and theoretical readings of animation text; narrative structure and strategies and codes.

ICAP 302 3D Character Setup and Animation	4 (0-8-4)
Prerequisites: ICAP 204	
Develop skills for character animation using 3D animation software, creating believable characters with personality, applying the principles of animation to 3D characters, developing a working knowledge of the process of 3D animation, character rigging, keyframe animation, and pre-production fundamentals.	
ICAP 303 Animation Production Management	4 (4-0-8)
Prerequisites: -	
Managing an animation production, economics of the animation business, supply and demand of the global animation industry, production process and pipeline from development to postproduction.	
ICAP 304 Sound for Animation	4 (4-0-8)
Prerequisites: -	
Develop an understanding and use of sound in animation, lip-synch, motion and action synchronization to sound (choreography), dialogues, narratives, music, ambience, rhythm, atmospherics.	
ICAP 305 3D Digital Video Compositing	4 (0-8-4)
Prerequisites: ICAP 302	
Advanced skills for integrating 3D computer animation and live action footage, developing a working knowledge of the underlying the process of integration of 3D and digital footage, HDRI creation process, pixel based camera tracking, lighting, shader and rendering layer methods, matte painting techniques and pre-production fundamentals.	
ICAP 306 Professional Internship in Animation Production	4 (0-12-4)
Prerequisites: -	
Practical on-the-job training and experience in a professional media station/ production house, film company, or animation production house.	
ICAP 311 Animation Production Studio V	4 (0-8-4)
Prerequisites: -	
Develop skills in narrative animation storytelling; research narrative story telling for structure; write an original story or adapt existing narrative text for animation. Create concept art, storyboard, layout, character designs and animatic. Create a proposal submission presentation towards a goal of producing a film to be submitted for a senior project and/or to an animation competition or festival.	
ICAP 312 Animation Production Studio VI	4 (0-8-4)
Prerequisites: -	
Continued development of skills in the animation production process and narrative animation storytelling, create an animated film based on pre conceived and prepared story and pre-production, produce a finished soundtrack for animation, gain experience submitting completed film to an animation competition or festival.	
ICAP 321 Advanced Layout Design	4 (0-8-4)
Prerequisites: ICAP 203	
Build on the foundations of Layout Design I; in-depth research and practice in creating and staging of the environments in which characters act; implementation of film language and principles; exploring and experimenting with color and stylization in 2D and 3D animation techniques; parallels in live action filmmaking will be discussed. Taking a sequence from layout through to rendered animation production.	
ICAP 322 Motion Graphics	4 (0-8-4)
Prerequisites: -	
Researching, defining and exploring the integrating of text and images in motion; Experimenting to develop creative motion graphics; logo animation design; title animation and design animated graphics to sound.	

ICAP 323 International Field Study in Animation Production 4 (0-12-4)

Prerequisites: ICAP 312

Introduction to the management styles of international media corporations; international artistic and business trends, and international media markets; foreign regulations and legal considerations; innovations, and technology.

ICAP 324 Computer and Video Games 4 (4-0-8)

Prerequisites: -

Introduction to computer and video game design theory, principles, technical aspects and process of video game creation; ethical and marketing factors. Application of educational theory to adjust level of game design and activities to the intended user.

ICAP 325 Stop Motion Animation Production 4 (0-8-4)

Prerequisites: ICAP 203

Introduction to stop motion animation production techniques, exploration of various stop motion techniques, developing short stop motion animation.

ICAP 326 Selected Topics in Animation Production 4 (0-8-4)

Prerequisites: -

Selected topics researched and explored in animation production, investigation of new or emerging trends in animation, topics determined by student interest and instructor.

ICAP 327 Independent Study in Animation Production 4 (0-8-4)

Prerequisites: -

Independent study in a specific process of animation production.

ICAP 401 Seminar in Animation Production Senior Project and Ethics 4 (4-0-8)

Prerequisites: ICAP 312

Special subject seminars determined by student interest. Expected to research topics related to proposed senior project. Create and present a senior project proposal, including reference, treatment and final script. A faculty member will have regular meetings with students to supervise the progression of the project over the course of the trimester.

ICAP 402 Animation Production Senior Project I 4 (0-12-4)

Prerequisites: ICAP 401

Preparation and preproduction for an animated film using the medium of their choice. A faculty member will have regular meetings with students to supervise the progression of the project over the course of the trimester.

ICAP 403 Animation Production Senior Project II 4 (0-12-4)

Prerequisites: ICAP 402

Completion of the short film prepared in Animation Final Project part I. A faculty member will have regular meetings with students to supervise the progression of the project over the course of the trimester. Upon completion, all final projects will be presented together in a film festival/job fair setting.

ICBE 342 Intermediate Microeconomics 4 (4-0-8)

Prerequisite: ICMB 203

Consumer theory, theory of production and cost, market structure, price determination in factor market, general equilibrium analysis, introduction to welfare economics theory.

ICBE 343 Intermediate Macroeconomics 4 (4-0-8)

Prerequisite: ICMB 204

Relationship between product, money, security, labour markets and foreign economy, classical theory, Keynesian theory, analysis of macroeconomic problem and policy.

ICBE 345 Monetary Policy Prerequisite: ICMB 204 Monetary theory, the supply of money, level and growth rate of money, transmission of monetary policy, theory and practice of monetary policy, central bank operations, evolution of monetary institutions.	4 (4-0-8)
ICBE 346 Public Economics Prerequisite: ICMB 203 Welfare economics theory, public policy analysis, public goods, the distribution of income and wealth, analysis of taxation.	4 (4-0-8)
ICBE 444 Industrial Organization Prerequisite: ICMB 203 Development of microeconomic models to explain the structure and performance of markets, analysis of firm's behavior in imperfectly competitive markets, monopoly, oligopoly, and monopolistic competition, relationship between profit rates and size of firm, interindustry comparisons, analysis of antitrust policy.	4 (4-0-8)
ICBE 448 Econometrics Prerequisite: ICMB 203, ICMB 204 Statistical and economic theory for analyzing economic data, simple regression analysis, multiple regression analysis and limitations.	4 (4-0-8)
ICBE 449 International Trade and Finance Prerequisite: ICMB 203, ICMB 204 International trade theory, current issue of international trade, international finance theory, fixed exchange rate, flexible exchange rate, role of international financial institutions.	4 (4-0-8)
ICBI 101 Biology Prerequisites: - Chemistry of life; structure and function of macromolecules; cell structure and function; metabolism; genetics; microbial forms and functions; plant forms and functions; animal forms and functions; Bio-technology.	4 (4-0-8)
ICBI 102 Integrated laboratory in Biological Sciences I Prerequisites: - Cell structure and function, tissue, cell division, ecology, movement of molecules, respiration, and photosynthesis.	2 (0-4-2)
ICBI 202 Integrated Laboratory in Biological Science II Prerequisites: ICBI 101 and ICBI 102 Integrated laboratory exercises on cell biology, genetics and molecular biology	2 (0-4-2)
ICBI 204 Developmental Biology Prerequisites: ICBI 101 Embryogenesis, molecular and cellular aspects of differentiation morphogenesis in a variety of vertebrates and invertebrates, comparative study of normal and deviate development in well-known mammals.	4 (4-0-8)
ICBI 207 Ethics for Bioscience Prerequisites: - Ethical issues in research in various fields of biology; publication and plagiarism; experiments and research involving human volunteers and experimental animals; medical practice, design of field and clinical trials.	4 (4-0-8)

ICBI 213 Genetics Prerequisites: ICBI 101 DNA as genetic material, Mendelian genetics, chromosomal basis of heredity, complex traits, evolutionary genetics, molecular genetics, formulation of genetic hypotheses.	4 (4-0-8)
ICBI 214 General Microbiology Prerequisites: ICBI 101 Structure, physiology and ecology of viruses, bacteria, protozoa and fungi especially bacteria, aspects of microbiology importance in health, sanitation, food processing and industry. Practical exercises are included.	4 (4-0-8)
ICBI 215 General Biochemistry Prerequisites: ICBI 101 and ICCH 210 Prerequisites: (For Environmental Science Students ONLY) ICCH 210 Structure and function of biomolecules, controls and processes of metabolism at the cellular and molecular levels.	4 (4-0-8)
ICBI 216 Cell Biology Prerequisites: ICBI 101 and ICBI 215 Prerequisites: (For Chemistry Students Only) ICBI 101 and ICCH 371 Analysis of the structures and functions of cells, cell activity, especially the fundamental relationships between structure and function at the cellular and molecular levels.	4 (4-0-8)
ICBI 221 Animal Biology Prerequisites: ICBI 101 A survey of the animal kingdom with emphasis on function, structure, evolution, and ecology. Demonstration and practical exercises are included.	4 (3-2-7)
ICBI 231 Plant Biology Prerequisites: ICBI 101 Prerequisites: (For Environmental Science Students Only) ICNS 112 A survey of plants and their relatives especially their functional anatomy and morphology, physiology, evolution, diversity and utilization. Practical exercises are included.	4 (3-2-7)
ICBI 255 Introduction to Oceanography Prerequisites: ICBI 101 History of oceanography; introduction to the earth and geomorphology; evolution of the ocean; plate tectonics; the sea floor; nature of seawater; atmosphere-ocean interactions; circulation patterns and ocean currents; waves and tides; coasts and estuaries; human impact on oceanic system; field trip with practical exercises included.	4 (3-2-7)
ICBI 256 Sustainable Development Prerequisites: - Sustainable development: guiding principles and approaches; 1972 Stockholm Earth Summit; 1992 Rio Earth Summit; Agenda 21; 2002 Johannesburg World Summit; outcomes of the summits; the role of UN agencies, NGOs, governments, businesses and individuals; industry and farming and the environment; population; poverty and inequality; food and agriculture.	4 (4-0-8)
ICBI 257 Environmental Issues: Past, Present and Future Prerequisites: - Environmental issues e.g. Exxon Valdez and other oil spills; Bhopal and other chemical leaks; Chernobyl and other radiation leaks; ozone depletion; global warming; loss of biodiversity; deforestation; genetic engineering and GMOs; water issues; urban issues; contemporary and likely future environmental issues.	4 (4-0-8)

- ICBI 261 Ecology and Conservation** **4 (4-0-8)**
Prerequisites: ICBI 101
Prerequisites: (For Environmental Science Students ONLY) No Prerequisites
 Living things and their environment; ecosystems and natural cycles; human intervention, technological progress and ecological balance; ecological and genetic basis for conservation of species, population, and communities; practical exercises and field trips are included.
- ICBI 271 General Microbiology Laboratory** **2 (0-4-2)**
Co-requisite: Taking along with ICBI 214
 Basic Techniques in Microbiological experiments; Microscopic examination of microbial cells and spores; simple staining; Gram staining; colony morphology; viable cells count; hemacytometer; cultivation on liquid and solid media; identification using differential media.
- ICBI 272 General Biochemistry Laboratory** **2 (0-4-2)**
Co-requisite: Taking along with ICBI 215
 Buffer and buffering efficiency; spectrophotometry; starch hydrolysis; biochemical method for determination of cholesterol concentration, amino acid and protein; enzyme assay; fermentation; protein purification; DNA gel electrophoresis.
- ICBI 301 Functional Histology** **4 (3-2-7)**
Prerequisites: ICBI 101
 Microscopic characteristics of cells, tissues, and organs of the human body; systematic and sequential consideration of fundamental cytology; normal histology of basic tissues; embryological development and microscopic organization of the major organs and organ systems.
- ICBI 304 Basic Immunology** **2 (2-0-4)**
Prerequisites: ICBI 214
 Current understanding of the cellular and molecular interactions in the inductions, expression, and regulation of the cellular and humeral immune responses; recent knowledge and applications concerning immunity to various microbial infections as well as antigen-antibody interactions; serodiagnosis and detection of cell-mediated immune response.
- ICBI 305 Human Anatomy I** **4 (2-4-6)**
Prerequisites: ICBI 204
 Human anatomy and function, Laboratory exercises are dissections of human cadavers: head, neck, back, anterior chest wall and upper limb.
- ICBI 306 Human Anatomy II** **4 (2-4-6)**
Prerequisites: ICBI 305
 Human anatomy and function. Laboratory exercises are dissections of human cadavers: thorax, abdomen, pelvis, perineum and lower limb.
- ICBI 307 Nutrition and Dietetics** **(4-0-8)**
Prerequisites:
 Importance of food and nutrients for good health; significance of physiological, biochemical and sociological factors of nutritional requirements; practical application of food and nutrition to diet planning and implementation suited to vulnerable groups and individual therapeutic needs.
- ICBI 308 Molecular Biology** **4 (4-0-8)**
Prerequisites: ICBI 213
 Critical thinking styles, brief of key instruments, reviews on basic functional interactions of macromolecules, molecular biology of genes and genomes, genetic engineering and genome analysis. Group discussion is included.

- ICBI 309 Pathobiology** **4 (3-2-7)**
Prerequisites: ICBI 216
 Pathophysiological mechanism of diseases; cell injury and cell death; inflammation and repair; bacterial, viral, fungal and parasitic infections; disturbances of minerals and pigments; disorders of immune response; disturbance of body fluid and blood flow; fever and hypothermia; cellular differentiation and neoplasia; practical exercises are included.
- ICBI 310 Mammalian Physiology** **4 (3-2-7)**
Prerequisites: ICBI 215
 Function and control mechanisms of nervous, muscular, circulatory, respiratory, excretory, digestive, endocrine and reproductive systems; their interrelationships in homeostasis; demonstration and practical exercise are included.
- ICBI 312 Aquatic Ecology** **4 (4-0-8)**
Prerequisites: ICBI 101
 Hydrological cycle; physico-chemical properties of water; light in aquatic environment; physical limnology; biological activity in lakes; nutrient limitation; trophic interaction in lakes; characteristics of and material flow in streams and rivers; tides and estuaries; practical exercises included.
- ICBI 313 Conservation Biology** **4 (0-8-4)**
Prerequisites: ICBI 101
 The aims and origins of conservation biology, conservation problems and issues, causes of habitat degradation and extinction, conservation genetics, small population biology, the values of communities and ecosystems, reducing and management of endangered species, social and ethical issues in conservation.
- ICBI 314 Tropical Ecology** **4 (3-2-7)**
Prerequisites: ICBI 101
 The tropical environment; tropical rainforests and biodiversity; tropical streams, rivers, floodplains and estuaries; tropical lakes; wetlands; mangroves; sea grasses; coral reefs; biogeography; practical exercises and field trips included.
- ICBI 315 Microbial Physiology and Genetics** **4 (4-0-8)**
Prerequisites: ICBI 214
 Microbial growth, metabolism; microbial structures and functions; gene structure regulation of microbial metabolism; microbial genetic structure; maintenance, expression, and exchange of genetic materials in microbial cells.
- ICBI 316 Environmental Microbiology** **4 (3-2-7)**
Prerequisites: ICBI 214
 Fundamental aspect of microbial physiology and ecology, influence of environment on microorganisms, effect of microbial metabolic processes on the environment, biogeochemical cycle, microbial activity in augmentation.
- ICBI 318 Aquatic Ecology Field Course** **4 (0-8-4)**
Prerequisites: ICBI 101
 Field course providing experience in ecological assessments and surveys of aquatic habitats; parameters measured/ascertained include water quality, riparian land use, in-stream and in-lake habitat types, algal communities, benthic invertebrates, fish communities; student presentations of their results.
- ICBI 320 Population and Community Ecology** **4 (3-2-7)**
Prerequisites: ICBI 101
 Introduction to population growth and dynamics of age-structured populations, population control, theory of competition, herbivory, predations, community trophic structure and control, community diversity, theories of evolution and maintenance of diversity; field trips, sampling and modeling exercises and experiments included.

- ICBI 321 Invertebrate Zoology** 4 (3-2-7)
Prerequisites: ICBI 101
Prerequisites: ICNS 112 (For Environmental Science Students Only)
 Morphology, anatomy, physiology and taxonomy of the invertebrates from protozoa to coelomates; phylogenetic relationships; ecology and behavior; demonstration and practical exercises are included.
- ICBI 322 Vertebrate Zoology** 4 (3-2-7)
Prerequisites: ICBI 101
 Prerequisites: ICNS 112 (For Environmental Science Students Only)
 Morphology, physiology, behavior and taxonomy of various vertebrate groups; comparative anatomy in relationship to the evolution of the vertebrates; demonstration and laboratory exercises are included.
- ICBI 328 Essential Pharmacology** 4 (4-0-8)
Prerequisites: ICBI 215
 Basic Knowledge regarding the use of drugs and chemical to treat diseases, drug metabolism, mechanism of drug actions in the body, indication contraindication caution in using drugs to treat diseases. A study of adverse drug reaction, drug interaction, Pharmacokinetics, pharmacodynamics. The basics of how drugs are used to treat diseases of the nervous system, respiratory system, cardiovascular system, infectious diseases and endocrine system are integrated with basic knowledge in physiology, immunology, bacteriology, virology, biochemistry, molecular biology, metabolic and biotransformation both in normal and diseased states.
- ICBI 329 Medical Toxicology** 4 (4-0-8)
Prerequisites: ICBI 215
 The process of illness and disease as it pertains to the human exposure to drugs, chemicals, gases and heavy metal in non-therapeutic situations, both accidental and intentional and the biotransformation of drugs and chemicals during these situations. The basics of life support measures in poisoned patients, skin and gastric decontamination procedures, the indications and mechanism of action of specific antidote, enhance elimination and the management of chemical hazardous material incidents and mass casualty events involving toxic chemicals.
- ICBI 330 Biology of Fungi** 4 (4-0-8)
Prerequisites: ICBI 214, ICBI 215 and ICBI 213
 Kingdom of fungi, fungal like microorganisms (slime mold and water mold), morphology and physiology, nutrition and metabolism, growth and differentiation, reproduction, life cycle, classification, ecological roles, culture collection, advantage of fungi and fungal products.
- ICBI 332 Medical Microbiology** 4 (4-0-8)
Prerequisites: ICBI 214 and ICBI 215
 The nature and epidemiology of infectious disease and the role of microorganisms in health and disease, clinical effects of microbial infection on the human host, microorganisms commonly encountered by physician assistants in clinical practice.
- ICBI 341 Neurobiology** 4 (3-2-7)
Prerequisites: ICBI 204
 Developmental neurobiology, neuroanatomy, and neurophysiology, some clinical aspects as the results of neuropathological defects or lesions; practical exercises included.
- ICBI 344 Environmental Science** 4 (4-0-8)
Prerequisites:
 Ecological concepts related to the problems of pollution and their impact on agriculture and wildlife communities, natural resources, sustainable development and maintenance of clean environment.

- ICBI 372 Utilization of Water and Wastewater Treatment** 4 (3-2-7)
Prerequisites:
 Principles and methods in treatment and utilization of water and wastes, basic concepts of water and wastewater treatment, treatment of wastes from food and beverage industries.
- ICBI 381 Evolutionary Biology** 4 (4-0-8)
Prerequisites: ICBI 101, ICBI 214 and ICBI 215
 Mechanism of evolution; evolution of population; the origin of species; the history of life; phylogeny; evolution of three domains of lives on earth.
- ICBI 382 Systemic Biology and Biodiversity** 4 (4-0-8)
Prerequisites: ICBI 101
 Classification and Taxonomy of all living organisms into kingdom, phylum, class, order, family, genus and species; morphology; , physiology, evolution, diversity and roles in the ecosystem and environment.
- ICBI 384 Field Study on Ecology and Biodiversity** 2 (0-4-2)
Prerequisites: ICBI 261 and ICBI 382 or have completed one and taking this subject along with the other Field course providing experience in ecological assessments and surveys of different forms of living organisms and their habitats; ecosystems; living organisms and environmental relationship; environmental conservation; student presentations of their results.
- ICBI 391 Health Psychology** 4 (4-0-8)
Prerequisites:
 An individual's psychology and the ways that it can affect adjustment to illness; prevention of illness through health promotion.
- ICBI 402 Epidemiology** 4 (3-2-7)
Prerequisites: ICBI 214
 Prevalence of endemic health problems caused by infectious diseases or non-infectious disorders; diseases of Southeast Asia in comparison with those occur in tropical Africa and America. Field studies are included.
- ICBI 403 Introduction to Tropical Medicine** 4 (4-0-8)
Prerequisites: ICBI 214
 Environmental factors in tropical countries which facilitate endemic diseases; geographical distribution and transmission of commonly found diseases caused by microbes, protozoa, and helminthes with special reference to Southeast Asia; non-infectious diseases existing in the region such as nutritional disorders, food poisoning, snake and other venomous bites and stings ; Prevention of the tropical diseases.
- ICBI 405 Community Health** 4 (3-2-7)
Prerequisites:
 Survey of community health status, primary health care concept, health system analysis and health manpower development. Practical sessions in local hospitals and field trips are included.
- ICBI 406 Ergonomics** 2 (2-0-4)
Prerequisites:
 Physiological and psychological aspects in the workplace emphasizing the interface of the man, machine and environment as efficient as possible; work station design; work posture; manual materials handling; work-rest cycle, and seating.

- ICBI 407 Occupational Health and Safety** 4 (4-0-8)
Prerequisites:
 Environmental factors at work regarding workers' health and safety, such as air, water, food, chemical or biological materials handled in the production line, including waste and waste disposal; evaluation harmful effects of such factors for controlling them; prevention of unsatisfaction and risk assessment in the workplace.
- ICBI 411 Psychopathology** 4 (4-0-8)
Prerequisites:
 Nature and causes of maladjusted behavior, factors which may affect personality and development.
- ICBI 412 Parasitology** 4 (3-2-7)
Prerequisites: ICBI 214
 Biology, ecology and physiology of parasites of man and some domestic animals, molecular parasitology, basic research in control and diagnosis of parasite infection. Demonstration and laboratory exercises are included.
- ICBI 414 Industrial Microbiology** 4 (4-0-8)
Prerequisites: ICBI 214
 Physiology, nutrition and growth of microorganisms important to various industries. Control of microbial growth in industrial production process. Application of microorganisms in production of cells, primary and secondary metabolites.
- ICBI 415 Biotechnology** 4 (4-0-8)
Prerequisites: ICBI 213 and ICBI 308
 Technology and the applications of scientific principles in relation to animals, plants, microorganisms; production of cellular compounds in public health, agriculture and industry.
- ICBI 421 Entomology** 4 (3-2-7)
Prerequisites: ICBI 101
Prerequisites: ICNS 112 (For Environmental Science Students Only)
 Insect morphology, physiology, systematics, natural history, and relationships with human; field survey with laboratory exercises are included.
- ICBI 432 Plant Biotechnology** 4 (4-0-8)
Prerequisites: ICBI 231
 Concepts of plant biotechnology; quality and quantity improvement of plant and their products; technique for micropropagation, germplasm collection, bioactive compound from plants; technology for crop improvement.
- ICBI 433 Fermentation Technology** 4 (4-0-8)
Prerequisites: ICBI 214 and ICBI 215
 Principle of biological fermentation process; submerged fermentation; solid state fermentation; disinfection of the equipment; factors affecting the process; raw material for fermentation; media design, optimization of fermentation condition; process control, downstream processing; quality control of products.
- ICBI 434 Food Biotechnology** 4 (4-0-8)
Prerequisites: ICBI 215
 Concept of food biotechnology; food components and qualities of food; chemical property of food; biochemical changes in food; condition and factors affecting the process and quality of food; food sanitation and hygiene; food preservation; industrial process for food production; e.g. flour, oil, meat, dairy, cereal products, etc.

- ICBI 435 Molecular Techniques in Biotechnology** 4 (4-0-8)
Prerequisites: ICBI 214, ICBI 215 and ICBI 213
Prerequisites: (For Chemistry Students Only) ICBI 214, ICBI 213 and ICCH 271
 Principle of recombinant DNA technology; restriction endonuclease; DNA cloning; transformation; gene library; screening for the right clone; manipulation of gene expression; DNA sequencing, PCR, directed mutagenesis, DNA fingerprint; pulsed-field-gel electrophoresis; stem cell technology; gene therapy.
- ICBI 436 Industrial Enzymology** 4 (3-2-7)
Prerequisites: ICBI 214 and ICBI 215
 Industrial applications of enzyme in: alcohol production; analytic enzymes; animal feed; baking; brewing; cheese and whey; chemical biotransformation; detergents; effluent and waste treatment; fruit juices; immobilized enzymes; leather; olive and other edible oils; protein modification; pulp and paper; textiles; and wine. Experimental practice is imitating the research process to discover a new product of enzyme from bacteria: i.e. isolation and selection, optimization for growth and production, purification, immobilization of the enzyme, enzyme assay.
- ICBI 437 Current Issues in Biotechnology** 2 (2-0-4)
Prerequisites: ICBI 214 and ICBI 215
 This course is organized to give lecture and discuss on the recent advances in biotechnology research and development. A lecture topic on bioinformatics will be included. Local and foreign expert will also be invited according to the opportunity.
- ICBI 438 Current Issues in Biology** 2 (2-0-4)
Prerequisites: ICBI 214 and ICBI 215
 This course is organized to give lecture and discuss on the recent advances in biological research and development. A lecture topic on environmental biology will be included. Local and foreign expert will also be invited according to the opportunity.
- ICBI 439 Current Issues in Biomedical Science** 2 (2-0-4)
Prerequisites: ICBI 214 and ICBI 215
 This course is organized to give lecture and discuss on the recent advances in biomedical research and development. A lecture topic on clinical research will be included. Local and foreign expert will also be invited according to the opportunity.
- ICBI 441 Marine Biology** 4 (3-2-7)
Prerequisites: ICBI 101
Prerequisites: (For Environmental Science Students Only) ICNS 112
 Natural history of marine organisms, exclusive of protozoa and insects; types of environment in the ocean, with special reference to shallow tropical seas; the relation of biological distributions to the physical and chemical environment; the effects of environmental change; the application of ecological techniques to local problems; field survey with laboratory exercises included.
- ICBI 461 Cell Technology** 4 (3-2-7)
Prerequisites: ICBI 216
 Structure, growth and function of plant and animal cells. Technology involved in cell and tissue culture, cell preservation, protoplast culture and fusion, cell cloning and fusion, monoclonal antibody production, breeding and genetic engineering. Applications of stem cells for agriculture and therapeutic purposes.
- ICBI 491 Seminar in Biological Sciences** 2 (2-0-4)
Prerequisites: ICBI 101, ICBI 214 and ICBI 215
 Student presentations and discussions of research or review of topics of current interest in biological sciences.

ICBI 498 Research Project in Biological Sciences**6 (0-12-6)****Prerequisites:** ICBI 101, ICBI 214, ICBI 215, ICBI 271 and ICBI 272

Small research project in Biological Sciences under supervision of an advisor.

ICCD 100 Observational Drawing**4 (0-8-4)****Prerequisites:** -

An introduction to the visual language of drawing with an emphasis on depicting objects and the human form in space. How the parts of the drawing relate to each other and to the composition as a whole. Fundamental skills in using traditional black-and-white media.

ICCD 101 Perspective Drawing**4 (0-8-4)****Prerequisites:** ICCD 100

A continuation of the investigation of analytical seeing and drawing that began in Observational Drawing I: understanding of perspective systems and application of those systems to analytical and observational drawing. More advanced skills in using black-and-white media, fundamental skills in using color.

ICCD 110 Visual Dynamics I**4 (0-8-4)****Prerequisites:** -

A problem solving course that explores the fundamental elements and principles of two-dimensional design, and that broadens the beginner student understanding of composition in terms of concept, methods and materials. Development and improvement of technical and media skills.

ICCD 111 Visual Dynamics II 4 (0-8-4)**Prerequisites:** ICCD 110

A further exploration of two-dimensional design elements and principles, with a focus on color. Investigation of the physical, perceptual, psychological, and organizational properties of color through the study of color theories in conjunction with studio problems.

ICCD 120 Space, Form and Materials I**4 (0-8-4)****Prerequisites:** -

Introduction to basic concepts and skills of three-dimensional design. Conception and construction of simple to increasingly complex three-dimensional forms. In-depth critiques requiring student participation and evaluation of own and others' projects according to principles learned in lectures.

ICCD 220 Space, Form and Materials II**4 (0-8-4)****Prerequisites:** ICCD 120

Building on basic concepts and skills of three-dimensional design learned in Space, Form and Materials I. Hands-on projects requiring increasingly complex concept development and production processes. Critiques requiring student participation and evaluation of own and others' projects according to principles learned in lectures. Heightened expectations for appropriate investment in design process, attention to detail, and awareness of functional requirements of designed forms.

ICCD 230 Visual Statement**4 (0-8-4)****Prerequisites:** -

Seminar/studio hybrid course in which research and process are emphasized over product. Content-based assignments intended to challenge students' conceptual, critical and communicative skills. Emphasis on visual literacy, with field trips to view contemporary art and other forms of cultural production. Encouragement of experimentation, exploration of self-developed concepts and risk-taking. Evaluation of projects by discussion and critique in terms of their conceptual development and effective use of visual language.

- ICCD 240 Typography I** 4 (0-8-4)
Prerequisites: ICCD 111
 Study of the use of typography in the overall design concept: type as communicative and creative element, organizational skills necessary for clear communication, and formative aspects of typographic symbols and arrangement.
- ICCD 241 Typography II** 4 (0-8-4)
Prerequisites: ICCD 240
 An advanced study of typography I, the analysis of the perceptual aspects of type, the exploration and clarification of typographic variables, the logical issues of planning and organizing paginated and information systems (2D and 3D).
- ICCD 242 Design Technology I** 4 (0-8-4)
Prerequisites: ICCD 111
 An introduction to the general function-based Macintosh software for publication design including the incorporation of the graphics applications platform and the design process.
- ICCD 243 Design Technology II** 4 (0-8-4)
Prerequisites: ICCD 242
 An introduction to the general function-based software for publication design including the incorporation of the graphics applications platform and the design process.
- ICCD 244 Communication Design I** 4 (0-8-4)
Prerequisites: ICCD 240
 Introduction to the fundamentals of communication design through theoretical and applied studies in design, problem solving, communication and presentation.
- ICCD 245 Communication Design II** 4 (0-8-4)
Prerequisites: ICCD 244
 Continued investigation of topics introduced in Communication Design I. Further study of the fundamentals of Communication Design through theoretical and applied studies in design, problem solving, communication and presentation.
- ICCD 306 Intermediate Observational Drawing** 4 (0-8-4)
Prerequisites: ICCD 100
 A continuation of the investigation of analytical seeing and drawing that began in Observational Drawing and Perspective Drawing. Study and employment of more advanced skills using black-and-white and color media. Weekly homework assignments requiring dedicated recording of observations in sketchbook. Assembly of portfolio for end-of-semester evaluation.
- ICCD 340 Design Technology III** 4 (0-8-4)
Prerequisites: ICCD 243
 An introduction to multimedia authoring software.
- ICCD 350 Advertising** 4 (0-8-4)
Prerequisites: ICCD 245
 A study of the foundation of advertising from historical to current marketing strategies, including research, account service, copywriting, art direction, illustration, photography and self-promotion.
- ICCD 351 Environmental Graphics** 4 (0-8-4)
Prerequisites: ICCD 244
 A study of professional design techniques, mechanics and practices examined through problems related to environmental graphics.

- ICCD 352 Integrated Branding** 4 (0-8-4)
Prerequisites: ICCD 245
 An advanced study of design systems as applied to corporate identity, integrated branding material, and symbology as a component of communication systems.
- ICCD 356 Information Graphics** 4 (0-8-4)
Prerequisites: ICCD 243
 A study of visual communication for the presentation of information including the organization and the structure of information flow, hierarchy and graphics arrangement.
- ICCD 357 Animation** 4 (0-8-4)
Prerequisites: ICCD 340
 An advanced study of kinetic media applications through software, platform related information, and the design of animated graphic elements and environments.
- ICCD 358 Web Design** 4 (0-8-4)
Prerequisites: ICCD 340
 Elective course focusing on the construction and management of web-based design, and building on the course content of ICCD 244. Focus on problem- solving through projects related to design and redesign of elements of web presence. Exploration of current software dedicated to the process of web graphics generation. Lectures introducing projects and related technical and theoretical concerns.
- ICCD 360 Graphic Design History** 4 (4-0-8)
Prerequisites: ICCD 230
 Historical survey of graphic design, presenting work from various perspectives, cultural and crosscultural, historical and timeless. Focused on shaping visual sensibilities and broadening the palette of references essential to the process of design thinking.
- ICCD 366 History of Modern Design** 4 (4-0-8)
Prerequisites: ICCD 360
 History of Modern design presented in all its forms from late 19th to late 20th century, tracing and relating major movements. Lectures providing visual examples and contextual information accompanied by weekly reading assignments. Term paper based on research into selected topic.
- ICCD 370 Professional Writing for Designers** 4 (4-0-8)
Prerequisites: ICCD 350
 Introduction to and practical experience in professional writing, with a specific focus on genres essential to the designer. Emphasis on correct tone, format, and polished grammar and punctuation. Use of research skills to build appropriate content. Peer editing /proofreading and professional criticism.
- ICCD 376 Communication Design Materials and Processes** 4 (4-0-8)
Prerequisites: ICCD 340
 A study of processes and materials involved communication design production including pre-press, paper selection and specification, ink systems, output technology in printing and electronic media.
- ICCD 377 Critical Issues in Communication Design** 4 (4-0-8)
Prerequisites: ICCD 245
 Examining the role of design in contemporary with emphasis on issues pertaining to communication design. Critical readings of essays with response through writing and discussion. Field trips to local events, exhibitions, and design instances for study and analysis. Student research and presentations on selected topics.

ICCD 380 Communication Design Practicum**4 (0-8-4)****Prerequisites: ICCD 352**

Application of theoretical and practical training to professional projects intended for actual publication. Individual and group projects for non-profit clients selected by the instructor. Student engagement and responsibility from conception through production of the finished product.

ICCD 416 Printmaking**4 (4-0-8)****Prerequisites: ICCD 245**

Introduction to the history and methods of printmaking through lectures, demonstrations and studio projects. Exploration of woodblock, lithograph, screen and monotype printing techniques. Lectures providing historical and contemporary examples of each technique.

ICCD 426 Hand-made Books**4 (0-8-4)****Prerequisites: ICCD 245**

Studio course using hand-made books as a means to investigate type, image, narrative and sequence. Lectures including historical and contemporary examples. Demonstrations of classic and experimental methods of production, including folding and binding techniques. Project assignments requiring the student to consider book-specific problems and solutions, while marrying form to content.

ICCD 440 Senior Seminar: Thesis Research and Development**4 (4-0-8)****Prerequisites: ICCD 380**

Initiation to the process of concept development of the senior thesis project in both written and visual forms. Engagement in various forms of traditional and non-traditional research in order to identify the thesis, and develop the parameters of the visual and written project. Peer and faculty support to engage student in process of critical inquiry.

ICCD 456 Package Design**4 (0-8-4)****Prerequisites: ICCD 245**

Elective course focusing on package design as a vital and particular area of communication design, involving form, structure, materials, color, imagery, typography and product information. Examination of how packages contain, protect, transport, dispense, identify and distinguish the product. Project assignments involving students in problem-solving various aspects of package design, while considering of the relationship between package design and related fields, such as branding, advertising and information graphics.

ICCD 457 Illustration**4 (0-8-4)****Prerequisites: ICCD 245**

Study of basic illustration process from production of thumbnails to finished artwork. Projects requiring response to brief given by the instructor, using both traditional media and digital applications. Fostering of creativity and concept development. Emphasis on visual research skills, craftsmanship, and professionalism. Submission of process book for each project. Presentations by guest professional.

ICCD 466 History of Advertising**4 (4-0-8)****Prerequisites: ICCD 360**

An introduction to the history of advertising from the pre-industrial period to the present. Consideration of advertising in its relationship to communication design, and from the fields of sociology, psychology, critical theory, political science, etc. Discussion of the connection between the growth of advertising and parallel technological developments. Lectures and presentation of historical examples and assignment of weekly readings. Completion of research paper and visual presentation.

- ICCD 470 Professional Ethics** 4 (4-0-8)
Prerequisites: ICCD 352
 Examination of contemporary design practice through various ethical scenarios, ranging from practical to philosophical. Projects, workshops, writings, research and critical discussions as preparation to enter the field as well-informed and critical participants. Readings and examples chosen by instructor, drawn from current local and international sources. Client/designer relationships, contractual obligations, spec work, copyright, etc.
- ICCD 471 Senior Writing Seminar** 4 (4-0-8)
Prerequisites: ICCD 380
 Advanced academic writing course focused on the production of the senior thesis and statement of intent for inclusion in the public exhibition of thesis projects. Various strategies to lead students from research, through drafting and editing, to finished formal document.
- ICCD 472 Professional Portfolio Development and Presentation** 4 (4-0-8)
Prerequisites: ICCD 440
 Instruction and criticism toward development of professional portfolio for review by prospective employers, clients or graduate school admission committees. Print and digital formats. Improvements and revisions to existing work and/or the creation of new work to best showcase the individual student's skills. Portfolio presentation skills honed through presentations to and coaching from peers and guest critics.
- ICCD 476 Green Design Seminar** 4 (4-0-8)
Prerequisites: ICCD 352
 An introduction to integrating the principles of sustainability into design practices. Exploration of innovative alternatives to materials and processes harmful to the environment. Research, presentations and design projects promote critical consideration and involvement with issues affecting design professionals.
- ICCD 486 Advanced Communication Design Practicum** 4 (0-8-4)
Prerequisites: ICCD 380
 Advanced application of theoretical and practical training to professional projects intended for actual publication. Individual and group projects of increasing depth and complexity for non-profit clients selected by the instructor. Student engagement and responsibility from conception through production of the finished product.
- ICCD 490 Communication Design Thesis I** 4 (0-8-4)
Prerequisites: ICCD 440
 Two trimesters project growing from research conducted in Senior Seminar. Further development and investigation of thesis question and development of design system or concept to address it, employing communication design theory and practical synthesis and application of visual principles.
- ICCD 491 Communication Design Thesis II** 4 (0-8-4)
Prerequisites: ICCD 490
 Continuation of ICCD 490. Development of design system or concept to address research conducted in ICCD 440, employing communication design theory and practical synthesis and application of visual principles. Primarily independent study with peer and instructor criticism and support. Coordination with course content of ICCD 492.
- ICCD 492 Public Exhibition** 4 (0-8-4)
Prerequisites: ICCD 490
 Exhibition of Senior Thesis Project required for graduation from the Communication Design major. Emphasis on skillfully presenting a consistent thematic body of work. Details of presentation relating to publicity and display are determined and realized.

- ICCH 210 General Chemistry I** 4 (4-0-8)
Prerequisites:
Comprehensive general concepts and principles of chemistry; atomic structure; chemical bonding; stoichiometry; gases, solids, liquids and solutions; chemical thermodynamics and kinetics.
- ICCH 211 General Chemistry II** 4 (4-0-8)
Prerequisites: ICCH 210
Concepts of general chemistry: chemical and ionic equilibria, electrochemistry, periodic properties and the periodic table; transition metals; nuclear chemistry.
- ICCH 221 Organic Chemistry I** 4 (4-0-8)
Prerequisites: ICCH 210
Concepts and mechanistic considerations of organic chemistry; molecular structures and properties; methane and alkane chemistries; stereochemistry; acyclic compounds; alkyl halides; alkenes; conjugation and resonance; alcohols; ethers and epoxides; alkynes.
- ICCH 222 Organic Chemistry II** 4 (4-0-8)
Prerequisites: ICCH 221
Concepts of organic reactions through mechanistic approach; aromaticity and electrophilic aromatic substitution; spectroscopy and structure; aldehydes and ketones; carboxylic acids and derivatives; carbanions, amines, phenol and aryl halides; fats; carbohydrates; amino acids.
- ICCH 224 Integrated Laboratory Techniques in Chemistry I** 2 (0-4-2)
Prerequisites: ICCH 210
Laboratory practicals for general chemistry: measurements; stoichiometry; solids, liquids and solutions; gases; thermochemistry; equilibrium; acids and bases; electrochemistry; kinetics.
- ICCH 311 Analytical Chemistry** 4 (3-2-7)
Prerequisites: ICCH 210
Techniques of separation and concepts of modern analytical methods essential for quantitative and qualitative characterization; treatment of analytical data; principles and applications of chemical equilibria; electrochemical methods; separation methods; practicals exercises involving uses of spectroscopic analytical equipment included.
- ICCH 316 Modern Methods of Analysis** 4 (3-2-7)
Prerequisites: ICCH 311
Concepts of modern analytical methods for quantitative and qualitative analyses and molecular structure characterization; gas and liquid chromatography, molecular absorption and emission spectroscopy; atomic absorption and emission spectroscopy; practicals exercises involving uses of spectroscopic analytical equipment included.
- ICCH 321 Organic Spectroscopy** 4 (4-0-8)
Prerequisites: ICCH 222
Concepts and applications of spectroscopy used in organic molecular structure determination; mass spectrometry; UV-Visible spectroscopy; Infrared spectroscopy; proton and carbon-13 nuclear magnetic resonance.
- ICCH 322 Advanced Organic Chemistry** 4 (4-0-8)
Prerequisites: ICCH 222
Advance concepts of organic chemistry through physical chemistry and mechanistic approaches; stereochemistry; kinetics and equilibria thermodynamics; conformation and reactivity; molecular orbital theory and pericyclic reactions.

ICCH 329 Integrated Laboratory Techniques in Chemistry II	2 (0-4-2)
Prerequisites: ICCH 224 and ICCH 311	
Laboratory practicals for physical chemistry and related analytical chemistry: thermodynamics laws and enthalpy; kinetics and rate laws; computational chemistry; molecular spectroscopy; atomic absorption spectrometry; infrared spectrometry; UV-vis spectrometry; gas chromatography-mass spectrometry; titration; electrochemistry.	
ICCH 333 Physical Chemistry I	4 (4-0-8)
Prerequisites: ICCH 210	
Concepts of classical physical chemistry; behaviour of gases; First Law of thermodynamics, Second and Third Laws of thermodynamics; chemical equilibrium; phases and solutions; phase equilibria.	
ICCH 334 Physical Chemistry II	4 (4-0-8)
Prerequisites: ICCH 333	
Concepts of classical and non-classical physical chemistry; electrochemical cells; kinetics; composite reaction mechanisms; quantum mechanics; atom structure and chemical bond.	
ICCH 335 Physical Chemistry III	4 (4-0-8)
Prerequisites: ICCH 334	
A detailed and highly mathematical study of chemical spectroscopy and molecular statistics.	
ICCH 336 Computational Chemistry	4 (3-2-7)
Prerequisites: ICCH 333 and ICCH 334	
Introduction to molecular modeling methods to study geometries, properties and reactivities of compounds; molecular mechanics, semi-empirical and ab-initio methods and density functional theory.	
ICCH 371 Biochemistry I	4 (4-0-8)
Prerequisites: ICNS 112, ICCH 221 and ICCH 222	
Biomolecules, structure, conformation and function of proteins and DNA, controls and processes of metabolism at cellular and molecular levels.	
ICCH 372 Biochemistry II	4 (4-0-8)
Prerequisites: ICCH 371	
Biosynthesis of macromolecular precursors; storage, transmission and expression of genes; molecular physiological processes.	
ICCH 373 Biochemistry Laboratory	2 (0-4-2)
Prerequisites: ICCH 371	
Laboratory practicals in biochemistry: physical and chemical properties of biological molecules; DNA protein extractions; enzyme kinetic and activity analysis; buffers; carbohydrate metabolism mechanism.	
ICCH 381 Mathematics for Chemists	4 (4-0-8)
Prerequisites:	
Mathematics essential for chemists for the study of advanced physical chemistry topics such as quantum mechanics and statistical thermodynamics; partial differential equations; special functions; complex variables; the theory of analytic functions.	
ICCH 390 Organic Chemistry Laboratory Techniques	2 (0-4-2)
Prerequisites: ICCH 221, ICCH 222 and ICCH 224	
Prerequisites: (For Biological Sciences Students Only) ICCH 221 and ICCH 224	
Supplementary organic laboratory practicals for those interested in developing more and advanced organic laboratory techniques through running more advanced organic reactions; Grignard reaction; Friedel-Crafts; Diazonium salts; Diels-Alder and spectroscopic analysis.	

- ICCH 421 Physical Organic Chemistry** 4 (4-0-8)
Prerequisites: ICCH 222
A study of organic chemistry via mechanistic approach; aliphatic nucleophilic substitution reactions; aromatic electrophilic reactions; aromatic nucleophilic substitutions; photochemistry.
- ICCH 422 Organic Synthesis** 4 (4-0-8)
Prerequisites: ICCH 222
A detailed and mechanistic study of organic reactions and synthesis; the generation and synthetic uses of enolates; oxidation methods; reduction reactions via catalytic reduction and group III hydrides; halogenations.
- ICCH 423 Heterocyclic Chemistry** 4 (4-0-8)
Prerequisites: ICCH 222
Introduction to heterocyclic chemistry; synthesis and reactions of thiophene, furan, pyrrole, indole, benzofuran, benzothiophene, oxazole, pyridine, pyrilium salts, quinoline, isoquinoline and pyridazine.
- ICCH 424 Natural Product Chemistry** 4 (4-0-8)
Prerequisites: ICCH 222
Natural product chemistry; classification of natural products, isolation techniques and physiochemical data, terpenes, steroids, fatty acids and related compounds, sugars, carboaromatic and related compounds, alkaloids and non-alkaloids containing nitrogen; aspects of natural product photochemistry.
- ICCH 431 Advanced Physical Chemistry** 4 (4-0-8)
Prerequisites: ICCH 334
A detailed study of specialised topics; solid state and liquid state, surface chemistry, colloids and transport properties.
- ICCH 432 Special Topics in Physical Chemistry** 2 (2-0-4)
Prerequisites: ICCH 334
A detailed study of quantum chemistry and statistical thermodynamics.
- ICCH 441 Inorganic Chemistry I** 4 (4-0-8)
Prerequisites: ICCH 221
Concepts of inorganic chemistry; structure of the atom; bonding models in inorganic chemistry; covalent bond; structure and reactivity; chemical forces.
- ICCH 442 Inorganic Chemistry II** 4 (4-0-8)
Prerequisites: ICCH 441
Remaining concepts of inorganic chemistry; solid state; acid-base chemistry in inorganic chemistry; physical properties and characterization of coordination compounds; reaction mechanism of coordination compounds; oxidative-reductive ligand substitution reactions.
- ICCH 443 Special Topics in Inorganic Chemistry** 2 (2-0-4)
Prerequisites: ICCH 442
A detailed study of the chemistries of transition metals, organometallic chemistry and inorganic chains, rings and clusters.
- ICCH 444 Environmental Chemistry** 4 (3-2-7)
Prerequisites:
Introduction to chemical aspects of problems and solution in the environment; field trips and practical exercises included.

- ICCH 445 Integrated Laboratory Techniques in Chemistry III** 2 (0-4-2)
Prerequisites: ICCH 311, ICCH 316 and ICCH 441
 Laboratory practicals covering inorganic chemistry and related analytical chemistry techniques: inorganic complex formation; property of and inorganic compound synthesis and characterization; organo-metallic chemistry; inorganic spectroscopy; titration; gravimetric quantification; liquid chromatography, gas chromatography, chromatography techniques.
- ICCH 451 Industrial Chemistry** 4 (3-2-7)
Prerequisites:
 Introduction to the industrial chemistry; automatic process control; construction materials; calculation of pressure and temperature stresses; management in industrial organization; feasibility studies; material and energy balances; industrial water treatment; finally the control of air and water pollutions; field trips included.
- ICCH 452 Polymer Science and Technology** 4 (4-0-8)
Prerequisites: ICCH 222
 Introduction to polymers, syntheses, applications and implications to industry of polymers: polymerization reactions; the structures and properties of polymers; polymer processing; common polymers and their applications.
- ICCH 453 Special Topics in Industrial Chemistry** 2 (2-0-4)
Prerequisites: ICCH 451
 Application of organic chemical reactions and mechanisms in the petrochemical industry.
- ICCH 454 Seminar in Chemistry** 2 (2-0-4)
Prerequisites: Seniors or with special permission of instructor
 Current topics of interest in the frontier of chemical research discussed with emphasis on searching chemical database for research papers for in-class discussion.
- ICCH 455 Senior Project in Chemistry** 6 (0-12-6)
Prerequisites: Seniors or with special permission of instructor
 Small research project in chemistry under the supervision of an advisor. The course is designed for the chemistry major to be acquainted with the techniques, management and the implementation of a research project.
- ICCH 456 Nuclear and Radiochemistry** 4 (3-2-7)
Prerequisites: ICCH 221
 Concept of nuclear and radiochemistry; law of radioisotope decay; reaction between nuclear radiation and matter; detection of radiation and dose determination; hazard from radiation; the application of radioisotope in chemistry; field trips and practical exercises included.
- ICCH 457 Industrial Chemical Processes** 4 (3-2-7)
Prerequisites: ICCH 451
 Various industrial chemical processes and their industries; pulp and paper, soap and detergent, fermentation, potassium and nitrogen industries; field trips and practical exercises included.
- ICCH 461 Pharmacological Chemistry** 4 (4-0-8)
Prerequisites: ICCH 221 and ICCH 222
 Introduction to pharmacological chemistry; application of organic chemistry to pharmacology and the synthesis of drugs; chemical mediators; chemotherapy.
- ICCH 462 Macromolecules** 4 (4-0-8)
Prerequisites: ICCH 221 and ICCH 222
 Structures and functions of biological active polymers; polypeptides, protein structures and folding; DNA, RNA and carbohydrates.

ICCH 471 Bioorganic Chemistry Prerequisites: Mechanisms and the reactions of selected enzymes from the perspective of mechanistic organic chemistry and physical organic chemistry; three-dimensional structure of enzymes; chemical catalysis; enzyme kinetics; stereochemistry of enzyme reactions.	4 (4-0-8)
ICCH 472 Secondary Metabolisms Prerequisites: ICCH 221 and ICCH 222 Selected classes of secondary metabolites; biosynthetic pathways and mechanistic syntheses of fatty acids, polyketides, isoprenoids, aromatics and amino acids.	4 (4-0-8)
ICCH 473 Special topics in Biochemistry Prerequisites: ICCH 372 Frontier in Biochemical topics	2 (2-0-4)
ICCM 104 Intermediate English Communication I Prerequisites: Placement test or ICME 100 Rhetorical patterns, basic academic research and writing.	4 (4-0-8)
ICCM 105 Intermediate English Communication II Prerequisites: ICCM 104 Academic research and writing.	4 (4-0-8)
ICCM 106 Intermediate English Communication III Prerequisites: ICCM 105 Basic elements of public speaking in an academic context, presentation skills, informative and persuasive speeches.	4 (4-0-8)
ICCM 111 Advanced English Communication I Prerequisites: Placement test Academic literacy and presentation skills in reading, writing and public speaking, with an emphasis on rhetorical patterns of development.	4 (4-0-8)
ICCM 112 Advanced English Communication II Prerequisites: ICCM 111 Academic literacy and presentation skills in reading, writing and public speaking, with an emphasis on secondary research and argumentation.	4 (4-0-8)
ICCM 202 Exploring Global Realities Prerequisites: ICCM 106 or ICCM 112 Contemporary issues; critical/analytical writing, oral presentations based on class materials and research; assignments; portfolio, debated and term paper.	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis Prerequisites: ICCM 106 or ICCM 112 Selected literary genres: short story, novel, poetry and drama; assignments: portfolio, debate, and term paper.	4 (4-0-8)
ICCM 204 Creative Writing Prerequisites: ICCM 106 or ICCM 112 Fiction, poetry, drama and media production; introduction and practice writing in different genres; publication of a small literary magazine for MUIC.	4 (4-0-8)

ICCS 100 Computer Fundamentals and Concepts	4 (4-0-8)
Prerequisites:	
Broad overview of the following topics: computers and their operations; algorithms and problem solving; computer arithmetic and number systems; computer hardware and software components.	
ICCS 101 Introduction to Computer Programming	4 (3-2-7)
Prerequisites: ICCS 100	
Fundamental principles of computer programs; basic three programming constructs, namely sequence, conditions, and iterations; logic of programs in the problem solving process; object-oriented programming fundamentals.	
ICCS 200 Data Structures and Algorithms	4 (4-0-8)
Prerequisites: ICCS 101	
Basic data structures including linear data structures, trees, and graphs; storage allocation, design and evaluation of algorithms for manipulating data structures, data structure in programming languages, criteria for selecting data structures to fit their applications.	
ICCS 201 Computer Programming I	4 (3-2-7)
Prerequisites:	
Fundamental principles of computer programs. Programming languages from various paradigms and programming languages as tools for problem solving. Flow of control. Input - Output. Practical exercises are included.	
ICCS 202 Intermediate Computer Programming	4 (3-2-7)
Prerequisites: ICCS 101	
Solid basis on object-oriented program design; development of comprehensive text-based applications, GUI-based applications, multi-tasking applications, and network applications.	
ICCS 203 Computer Programming II	4 (3-2-7)
Prerequisites: ICCS 201	
A systematic approach to the design and construction of more advanced computer programs. Structured programming concepts. Program debugging and testing. Dynamic data structures. Practical exercises are included.	
ICCS 207 Introduction to File Processing	4 (4-0-8)
Prerequisites: ICCS 200	
Records and files, database management systems, data structures, random access and file manipulation, file I/O, characteristics of physical files and storage devices, selection of file organization under various criteria.	
ICCS 220 Digital Logic Design	4 (4-0-8)
Prerequisites: ICCS 100	
Digital arithmetic, number systems, binary and hexadecimal base codes and logic; Boolean algebra; the Karnaugh's map simplification; digital electronic circuits: logic gates, flip-flops, combinational circuits, gate minimization; arithmetic logic circuit, adder and subtractor circuits; counters and registers, MOD count up and count down, asynchronous and synchronous counters design.	
ICCS 221 Computer Architectures	4 (4-0-8)
Prerequisites: ICCS 101 and ICCS 220	
Stored procedure concept, digital computer architecture, logical control, processor, arithmetic unit, I/O channels, cache and pipelining, machine structures, system interfaces, large computer systems architectures.	

- ICCS 222 Operating Systems** **4 (4-0-8)**
Prerequisites: ICCS 200
 Definition of functions and components of operating systems; survey of contemporary multiprocessing/ multiprogramming systems; exploration of systems programs: their design, internal structure and implementation; CPU scheduling, hierarchical and virtual memory management; advanced topics in operating systems, performance measurement and evaluation and design of operating system modules.
- ICCS 223 Data Communications and Networks** **4 (4-0-8)**
Prerequisites: ICCS 100
 Basic communication theory; principal components of data communications and networks; local area networks; network protocol and line control procedures; communication carrier facilities.
- ICCS 230 Systems Analysis and Design** **4 (4-0-8)**
Prerequisites: ICCS 202
 Design concepts and principles; basic design patterns; structure-oriented and object-oriented analysis and design and other approaches; design quality; internal efficiency; external performance; open-source software; application programming interfaces (APIs); tools and environments.
- ICCS 240 Database Management** **4 (4-0-8)**
Prerequisites: ICCS 200
 Development of relational database systems: data modeling, conceptual database design principles, Structure Query Language programming, model transformation, schema normalization based on functional dependencies and first to fifth normal forms, transactions, concurrency control, recovery, distributed database; introduction to industry-leading database management systems; development of actual databases.
- ICCS 300 Computer Science Internship** **2 (0-6-2)**
Prerequisites: Junior Standing
 Junior students are required to take an internship in Computer Science with a company under the industry guidance of a staff member for a period of 72 working hours during the summer term in order to extend their knowledge beyond classroom and gain direct practical experience in the computer industry.
- ICCS 307 Design Patterns** **4 (4-0-8)**
Prerequisites: ICCS 330
 An introduction to design patterns covering the rationale and benefits of object-oriented design patterns. Examples will be used to scrutinize the development of good design patterns. This course will discuss in specific patterns, such as Observer, State, Adapter and Abstract Factory. Furthermore, distributed object frameworks, such as RMI and Jini, will be studied for their effective use of design patterns.
- ICCS 310 Computation Theory** **4 (4-0-8)**
Prerequisites: ICCS 101 and ICMA 242
 Context free grammar; finite state automata; Turing machine, Post machine, Post's theorem, Minsky's theorem; determinism and non-determinism; undecidability, the halting problem; recursive function theory.
- ICCS 313 Algorithm Analysis** **4 (4-0-8)**
Prerequisites: ICCS 200
 Asymptotic algorithm analysis; algorithm selection strategies; algorithms of well-defined problems in computer science; recognizing strength and weakness of algorithms; distributed algorithms; introduction to P and NP classes of problems.
- ICCS 314 Numerical Methods** **4 (4-0-8)**
Prerequisites: ICCS 101
 Introduction to the use of computers to solve scientific problems, numerical solution of nonlinear equations, linear algebra systems, the interpolation and approximation of functions, differentiation and integration, and differential equations.

ICCS 317 Systems Simulation and Modeling**4 (4-0-8)****Prerequisites: ICCS 230**

Mathematical modeling of systems, stochastic processes, analytical and discrete- event simulation models, verification and validation procedures, programming techniques, special purpose simulation languages, simulation experiments.

ICCS 318 Compilers**4 (4-0-8)****Prerequisites: ICCS 200 and ICCS 202**

Preliminary elements of modern compilers; Backus-Naur Form notation, syntax and semantics of formal grammars, scanners and parsers; programming assignments to reinforce theory; code generation and code optimization.

ICCS 320 Computer Networks**4 (4-0-8)****Prerequisites: ICCS 223**

Standard network protocol operations; systematic analysis approach; network troubleshooting techniques; efficient network design practices; network efficiency optimization; practical insights of Local Area Network protocols and their implementations as well as the common Internet-scale protocols; hands-on practiced with standard network analysis tools and techniques; development of the understandings of further network-related topics such as networked application development, implementations and administrations of system and network infrastructures, and network security.

ICCS 326 Enterprise Network Design**4 (4-0-8)****Prerequisites: ICCS 320**

Data networking; TCP/IP protocol suite; routing protocols; IP networking technologies at core; distribution and access layers; IP Quality of Service; wireless networks; commercial network services; network design method; network management and security; hands-on workshops of practical network configurations within a Network Operation Center-like environment, equipped with the sets of real industry-leading network equipment: Ethernet cabling, router and switch configuration basics, routing protocols.

ICCS 330 Object-Oriented Design and Methodology**4 (4-0-8)****Prerequisites: ICCS 202**

Fundamental concepts of object-oriented software analysis and design, use case analysis, class design, encapsulation, inheritance, abstract class, interface and polymorphism. UML modeling. Advanced topics including design by abstraction, refactoring, design patterns, multi-tier architecture, and reusability.

ICCS 331 Organization of Programming Languages**4 (4-0-8)****Prerequisites: ICCS 200 and ICCS 202**

Language definition structure; programming language processors; data types and structures; control structures and data flow; storage management; syntax and translation; operating and programming environments; programming languages such as C, C++, LISP, and SQL; comparison.

ICCS 334 Software Engineering**4 (4-0-8)****Prerequisites: ICCS 230**

Software lifecycle and process models; requirement modeling and analysis; prototyping; specification techniques; software verification and validation of code and non-code components; testing types and fundamentals; software inspection, reviews, and audits; software maintenance; reengineering and refactoring; software reuse; introduction to software project management.

ICCS 335 Software Project Management**4 (4-0-8)****Prerequisites: ICCS 230**

Management of the software development process, including: how projects arise, choosing the right project, software life cycles, human factors in project management, basic project management techniques including planning, estimating, monitoring progress, advanced project management techniques (e.g. risk management, configuration management, quality management, process improvement); fundamentals of requirements engineering, namely, requirements elicitation and analysis, requirements definition and specification, requirements validation, requirements management, overview of specification techniques.

ICCS 336 Programming Languages**4 (4-0-8)****Prerequisites: ICCS 202**

An introductory to a specific programming language in term of its paradigm, syntax, and semantics; its role in practical problem solving; a term project in the language of the course.

ICCS 340 Web Application Development**4 (4-0-8)****Prerequisites: ICCS 230**

Learning to develop application on the Internet including the Web-based applications; concepts of the Internet specific application along with development tools; students must develop simple Internet based application.

ICCS 342 Data Warehousing and Data Mining**4 (4-0-8)****Prerequisites: ICCS 230 and ICCS 240**

Data warehouse modeling and implementation; data extraction, cleansing, transformation and loading, data cube computation, materialized view selection, OLAP query processing. For Data Mining includes fundamentals of data mining process and system architecture, relationship of data mining with data warehouse and OLAP systems, data pre-processing, mining techniques and application: association rules, mining sequence and time-series data, text mining.

ICCS 366 Management Information Systems**4 (4-0-8)****Prerequisites: ICCS 230**

Design, development, applications, and organizational impact of Management Information Systems (MIS) and Decision Support System (DSS) from the managerial perspective; assessing information needs; sources, organization, characteristics and users of data; database and file management systems; evaluating information systems effectiveness and efficiency.

ICCS 401 Computer Science Senior Project**4 (0-8-16)****Prerequisites: Senior standing**

Small research project in Computer Science and related fields under the supervision of an advisor; learning to investigate a research problem and submit a scientific report of the findings; required before graduation.

ICCS 410 Image Processing**4 (4-0-8)****Prerequisites: ICCS 200 and ICCS 202**

Digital image, histogram, color image, point operations, edge and contour, filters, morphological filter, mathematic transformations, geometric operations such as mapping and interpolation, image comparison; basic rendering techniques, such as Bresenham algorithm; basic visualization functions for viewing and interrogation; introduction to information visualization.

ICCS 414 Information Storage and Retrieval**4 (4-0-8)****Prerequisites: ICCS 200**

Advanced data structures, file structure databases, key decoding by tree and Rainzd techniques, document retrieval and question and answering systems, algorithms and techniques for automatic classification and storage of documents.

- ICCS 417 Computer Graphics** **4 (4-0-8)**
Prerequisites: ICCS 200 and ICCS 202
 Mathematical concepts for graphics, line drawing algorithms, clipping algorithms, polygon filling algorithms, physical and logical input and output devices, graphical standard for software, data structures for graphics; space curves, surfaces in three dimensions, hidden line and hidden surface algorithms, illumination models, rendering techniques, color and ray tracing; practical exercises included.
- ICCS 418 Computer System Security** **4 (4-0-8)**
Prerequisites: ICCS 223
 Security trends; information security and risk managements; access control, security architecture and design; physical and environmental security; telecommunications and network security; cryptography; business continuity and disaster recovery; legal/regulation compliance and investigations; application security; operation security; practical workshops of basic firewall appliance, DMZ and IPS.
- ICCS 419 Computer Visualization** **4 (4-0-8)**
Prerequisites: ICCS 200 and ICCS 202
 Introductory concepts of the following topics: cameras and projection models, low-level image processing methods, e.g. filtering and edge detection; mid-level vision topics, e.g. segmentation and clustering; shape reconstruction from stereo and high-level vision tasks, e.g. object recognition, scene recognition, face detection and human motion categorization.
- ICCS 440 Human Computer Interaction** **4 (4-0-8)**
Prerequisites: ICCS 230
 Contexts for HCI in various types of applications, systems, and devices; user-centered development process including iterative design and empirical testing; measurements on utility, efficiency, learnability, and user satisfaction; HCI design models; social issues related to HCI design and use; accommodation to human diversity and accessibility; common interface design mistakes; user interface standards.
- ICCS 442 Decision Support Systems** **4 (4-0-8)**
Prerequisites: ICCS 230 and ICCS 240
 Concepts of decision support systems (DSS), DSS framework, decision making process, components of DSS, DSS modeling and analysis, group decision support systems, business intelligent technology for DSS, DSS development. This course provides an overview of Decision Support Systems (DSS)/Business Intelligence (BI), and some of the areas that they have been used successfully.
- ICCS 443 Database Application Development** **4 (4-0-8)**
Prerequisites: ICCS 240
 Exposure to a number of popular commercial DBMSs, such as Oracle, Microsoft SQL Server, MySQL, and SQLite, via practical development of database systems.
- ICCS 444 E-Commerce** **4 (4-0-8)**
Prerequisites: ICCS 230
 Electronic commerce (EC) and electronic business (EB) implementation; E-business topics and concepts including EC business models, electronic payment systems, EC infrastructure, implementation concerns, design criteria, solution of business problems through case studies; new trends in e-commerce such as use of social media and location-based technologies.
- ICCS 445 Enterprise Application Design and Development** **4 (4-0-8)**
Prerequisites: ICCS 230
 Discussion of the why, what, and when businesses start the Internet Enterprise, including the tools used to create and channel information, along with techniques of doing this; ways to design and organize content; how to develop an Internet presence, selecting vendors, securing a domain name and its trademark, and selecting an ISP; students will be expected to develop a complete web-site.

- ICCS 446 Business Intelligence** 4 (4-0-8)
Prerequisites: ICCS 230 and ICCS 240
Introduction to decision support systems, data, text, and web mining, data warehousing, collaborative-supported technologies, and management support systems; overview of concepts, methodologies, technologies, and emerging trends of these systems.
- ICCS 447 Knowledge Management** 4 (4-0-8)
Prerequisites: ICCS 240
Concepts and definitions of knowledge and knowledge management, organizational issues and knowledge management, management of intangible assets and intellectual capital; managing organizational knowledge and knowledge processes, complex nature of knowledge in organizations; development of skills to analyze, understand and implement knowledge management practices in organizations.
- ICCS 448 Mobile Application Programming** 4 (4-0-8)
Prerequisites: ICCS 230
Investigation of various mobile platforms; development of mobile of application on a specific platform; memory management; design patterns useful to mobile application development; graphic user interface design and development; design for user experience; OpenGL and Quartz.
- ICCS 449 Business Application Programming** 4 (4-0-8)
Prerequisites: ICCS 230 and ICCS 240
Adaption of existing business application to changes in business requirements; introduction to some of the widely recognized business application programming; the standard industry implementation methodology; applications including ORACLE and SAP.
- ICCS 450 Intelligent Systems** 4 (4-0-8)
Prerequisites: ICCS 200 and ICCS 230
History of artificial intelligence; basic and heuristic search strategies; knowledge-based reasoning including propositional and predicate logic; resolution and theorem proving, and probabilistic reasoning; agents and their types and architectures.
- ICCS 460 Computing Ethics and Professionalism** 4 (4-0-8)
Prerequisites: Junior standing
History of computing; basic cultural, social, legal, and ethical issues in computing disciplines; professional ethics; awareness of social impact of computing; basic legal rights of software and hardware vendors and users; ethical argument analysis; software risk and risk assessment.
- ICCS 478 Pattern Recognition 4 (4-0-8)**
Prerequisites: ICCS 200 and ICCS 202
Artificial Intelligence; statistical decision theory, pattern recognition and image processing; pattern classification techniques, adaptive classifier; feature selection methods; learning algorithms; the syntactic approach; decision problems; visual and speech recognition machines.
- ICCS 480 Special Topics in Computer Science I** 4 (4-0-8)
Prerequisites:
Topic(s) from various areas of computer are chosen according to students' interest or trends in the industry.
- ICCS 481 Special Topics in Computer Science II** 4 (4-0-8)
Prerequisites:
Topic(s) from various areas of computer are chosen according to students' interest or trends in the industry.

- ICCS 482 Professional Practices on Database Management I** 4 (4-0-8)
Prerequisites:
 Topic(s) from various areas of database management are chosen according to current trends in the industry.
- ICCS 483 Professional Practices on Database Management II** 4 (4-0-8)
Prerequisites:
 Topic(s) from various areas of database management are chosen according to current trends in the industry.
- ICCS 484 Professional Practices on Software Technology I** 4 (4-0-8)
Prerequisites:
 Topic(s) from various areas of software technology are chosen according to current trends in the industry.
- ICCS 485 Professional Practices on Software Technology II** 4 (4-0-8)
Prerequisites:
 Topic(s) from various areas of software technology are chosen according to current trends in the industry.
- ICCS 486 Professional Practices on Network Technology I** 4 (4-0-8)
Prerequisites:
 Topic(s) from various areas of computer network technology are chosen according to current trends in the industry.
- ICCS 487 Professional Practices on Network Technology II** 4 (4-0-8)
Prerequisites:
 Topic(s) from various areas of computer network technology are chosen according to current trends in the industry.
- ICCS 490 Independent Study in Computer Science** 4 (4-0-8)
Prerequisites: Consent of the instructor
 Directed study of a specific topic that is of interest of the student and the advisor; a research paper or article is required to complete the course.
- ICEG 232 Advanced Oral Communication** 4 (4-0-8)
Prerequisites: ICCM 106 or ICCM 112
 Persuasion, non-verbal techniques and voice control for advanced presenters. Activities include study of film clips. Debate strategies, stage and sales presentation will also be examined.
- ICEG 250 Introduction to Linguistics** 4 (4-0-8)
Prerequisites: ICCM 106 or ICCM 112
 Characteristics and components of human language, focusing on the power and complexity of language, its influence on interactions and its contributions to understanding; definitions and applications of syntax, semantics, pragmatics and other related topics.
- ICEG 265 Literature into Film** 4 (4-0-8)
Prerequisites: ICCM 106 or ICCM 112
 This course explores the interplay between film and literature. Selected short stories, novels and plays are analyzed in relation to film versions of the same works in order to gain an understanding of the possibilities and problems in the transposition to film. The course will require extensive reading, independent research, writing numerous response essays as well as a formal oral presentation.

ICEG 342 Diverse English Speaking Cultures**4 (4-0-8)****Prerequisites: ICCM 106 or ICCM 112**

Images of Europeans and non-Europeans abound in the writings of each other. Language and Culture: Postcolonialism introduces students to the study and appreciation of this literature. It begins by providing students with a basic introduction to the postcolonial approach, before using it to examine how the “Orient” and the “West” have been represented in a variety of literary texts. Examples are drawn from short stories, novels, travel writing, music and film. The overall aim is to help students develop the ability to understand images/representations in new ways. Evaluation activities include mock trials, debates, plays, presentations, reading notes and essays.

ICEG 344 Language and Culture**4 (4-0-8)****Prerequisites: ICCM 106 or ICCM 112**

Examination of the interplay between language and culture; the Sapir/Whorf hypothesis, culture and vocabulary, culture and interaction styles, culture and discourse styles, contrastive semantics, and contrastive rhetoric, including non-verbal and paralanguage.

ICEG 355 The Story of English**4 (4-0-8)****Prerequisites: ICCM 106 or ICCM 112**

The Story of English examines the development of English from its Indo-European origins to its contemporary varieties and dialects. English will be shown to have changed and grown in structure and vocabulary, depending on time and place. The Public Broadcasting Service production and selections from other media will be shown.

ICEG 461 Topics in Comparative Literature A: Poetry**4 (4-0-8)****Prerequisites: ICCM 106 or ICCM 112**

Poetry, including: metrics, forms, themes, eras, ethnic voices, bilingual verse throughout history.

ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel**4 (4-0-8)****Prerequisites: ICCM 106 or ICCM 112**

This course is a study of the elements of fiction as exemplified in the short story and the novel. The first half of the term is devoted to discussions of short stories, each of which was chosen for its strength in a certain element: characters, dialogue, language use, plot, atmosphere, and point of view. The discussions also analyze how these various elements work in harmony – or discord – to create theme. In the second half of the term, the same analytical process is applied to a novel in chapter-by-chapter class discussions. To prepare the class for these discussions, the instructor will assign each student an aspect of the socio-historical background of the story of the novel to research on and present to the class. Then each student chooses a second novel which he/she responds to in the form of a reading journal. He/she presents the novel to the class near the end of the term. Learning is evaluated through critical response essays, journal writing, presentations, and class participation.

ICEG 463 Topics in Comparative Literature C: Drama**4 (4-0-8)****Prerequisites: ICCM 106 or ICCM 112**

This course explores the ways to understand and appreciate drama both by reading, watching, and analyzing theatrical performances and by staging a theatrical production. This course will require extensive reading, independent research, writing critical essays, theater workshops, and a stage production. The choice between a one-act play (or flash drama) and a reader's theater will be decided upon as a class.

ICEG 484 First and Second Language Development**4 (4-0-8)****Prerequisites: ICCM 106 or ICCM 112**

This course develops students' understanding of how children develop their first language within the first few years of life and then compares and contrasts this development to that of a second language, often later in life. Students investigate various theories of language development, from behaviorism to nativism, to more recent cognitive and functional approaches, and explore the implications of these theories.

ICEM 111 Introduction to Entertainment Media	4 (4-0-8)
Prerequisites: -	
Introduction to the modern entertainment industry, history of mass media production process with concentration on animation, film, and television, roles of media producer in the history of modern mass media.	
ICEM 112 Visual Communication	4 (4-0-8)
Prerequisites: -	
Basic visual components in the process of communication, relation between visual elements and their impact on viewer perception, still and moving pictures production techniques, affect of social, cultural, and aesthetic factors toward viewer perception.	
ICEM 113 Storytelling	4 (4-0-8)
Prerequisites: -	
Fundamentals of storytelling, the art of storytelling, elements and structure of a story, narrative techniques, story development.	
ICEM 114 Storyboarding	4 (4-0-8)
Prerequisites: -	
Introduction to creation and development of a storyboard, combination of cinematic storytelling skills with drawing, application of film language and narratives, study of scripts for film, television and animation.	
ICEM 211 Media Research and Analysis	4 (4-0-8)
Prerequisites: -	
Introduction to media research, methods of framing key questions, procedures of conducting media research, tools and techniques for gathering, organizing, and analyzing research data.	
ICEM 212 Basic Acting Techniques	4 (0-8-4)
Prerequisites: -	
Understanding the actor's body control and voice training, movements and blockings, physical and mental exercises, directing actors as part of the mise-en-scene, script interpretation for performers.	
ICEM 213 Audio Communication	4 (0-8-4)
Prerequisites: -	
Using sound to complement the images in the process of communication, exploring the meaning and feeling that the audience perceives from various kinds of sound, including music, learning how to use audio equipment that suits the purposes and the existing conditions.	
ICEN 211 Fundamentals and Applications of Environmental Microbiology	4 (3-2-7)
Prerequisites:	
Principles, concepts and techniques of environmental microbiology including; morphology, physiology, metabolism and growth of organisms in Kingdoms of Monera, Protista and Fungi; methods and factors influencing in microbial control in the environment; types, isolation and determination of microorganisms in the environment including water, air and soil; roles and relation of microorganisms to the environment; roles of microorganisms related to biodegradation of environmental contaminated substances.	
ICEN 212 Ecological Systems Analysis	4 (4-0-8)
Prerequisites:	
Mechanisms and interactions in ecosystems; some important ecosystem theories such as control theory, information theory, thermodynamics, and hierarchy theory, the overview of different scientific philosophies for the better understanding of ecosystem theory.	

- ICEN 241 Environmental Pollution I** 4 (4-0-8)
Prerequisites: ICCH 210
 Problems concerning environmental pollution, especially physical, chemical, and biological properties of water and soil; sources and effects of pollutants; technological alternatives for the control, prevention, reduction, and treatment of water and soil pollutions; methods for monitoring and management of environmental pollution.
- ICEN 301 Basic Environmental Statistics** 4 (4-0-8)
Prerequisites: ICSC 303
 Basic probability and statistics, elementary sampling and monitoring, statistical inferences for means and proportions, detecting and estimating trends, regression and non-parametric statistics, all relate to environmental application.
- ICEN 312 Environmental Toxicology** 4 (4-0-8)
Prerequisites: ICEN 241
 Principles of environmental toxicology; concepts underlying absorption, distribution, metabolism and excretion of toxic agents in living organisms; nature, sources and fate of contaminants in the environment; potential for harmful exposure, especially to the environment; and applied aspects, including ecological test methods, regulation and similar consideration.
- ICEN 313 Waste Minimization and Clean Technology** 4 (4-0-8)
Prerequisites: ICEN 241
 Reduction or elimination of waste production; reduction in pollution at source, the changes in procedure, technology and material input; economic production process; significance and application of waste minimization or clean technology; practical exercises included.
- ICEN 314 Tropical Ecology** 4 (3-2-7)
Prerequisites:
 The tropical environment; tropical rainforests and biodiversity; tropical streams, rivers, floodplains and estuaries; tropical lakes; wetlands; mangroves; sea grasses; coral reefs; biogeography; practical exercises and field trips included.
- ICEN 317 Aquatic Ecology** 4 (3-2-7)
Prerequisites:
 Hydrological cycle; physico-chemical properties of water; light in the aquatic environment; physical limnology; biological activity in lakes; nutrient limitation; trophic interaction in lakes; characteristics of and material flow in streams and rivers; tides and estuaries; practical exercises included.
- ICEN 318 Aquatic Ecology Field Course** 4 (0-8-4)
Prerequisites: ICEN 317
 Field course providing experience in ecological assessments and surveys of aquatic habitats; parameters measured/ascertained include water quality, riparian land use, in-stream and in-take habitat types, algal communities, benthic invertebrates, fish communities; student presentations of their results.
- ICEN 319 Conservation Biology** 4 (4-0-8)
Prerequisites:
 The aims and origins of conservation biology, conservation problems and issues, causes of habitat degradation and extinction, conservation genetics, small population biology, the values of communities and ecosystems, reducing and management of endangered species, social and ethical issues in conservation.

- ICEN 320 Population and Community Ecology** 4 (3-2-7)
Prerequisites: ICEN 351
 Introduction to population growth and dynamics of age-structured populations, population control, theory of competition, herbivory, predations, community, trophic structure and control, community diversity, theories of evolution and maintenance of diversity; field trips, sampling and modeling exercises and experiments included.
- ICEN 331 Soil, Land Use and Degradation** 4 (4-0-8)
Prerequisites:
 A basic introduction to soil science; its relationship to land resource management and the environment; soil problems and their solutions.
- ICEN 332 Introduction to Oceanography** 4 (3-2-7)
Prerequisites:
 History of oceanography; introduction to the earth and geomorphology; evolution of the ocean; plate tectonics; the sea floor; nature of seawater; atmosphere-ocean interactions; circulation patterns and ocean currents; waves and tides; coasts and estuaries; human impact on oceanic system; field trip with practical exercises included.
- ICEN 341 Environmental Quality Analysis I** 4 (2-4-6)
Prerequisites: ICEN 241
 Basic knowledge; the importance and the analysis of representative samples; analysis for environmental quality monitoring using physical, chemical and biological parameters etc.; handling and storage of sample from water, soil, plant and animal; analytical methods and data interpretation.
- ICEN 342 Environmental Pollution II** 4 (4-0-8)
Prerequisites: ICEN 241
 Air, noise, solid waste, hazardous waste, and also radioactive pollution; types, sources, and effects of air and noise pollution; methods for prevention, control and measures of air and noise pollution; source, type, effect, and management of solid waste and hazardous waste; utilization and management of radioactive waste.
- ICEN 343 Environmental Quality Analysis II** 4 (2-4-6)
Prerequisites: ICEN 241 and ICEN 342
 Practices on environmental quality monitoring concerning soil, solid waste, air and noise analysis, as well as toxicity testing; data sampling; sample preservation and sampling analysis; data evaluation.
- ICEN 351 Population and the Environment** 4 (4-0-8)
Prerequisites:
 An introduction to demography; population growth; fertility, mortality and migration; social and economic factors; population and its impact on the environmental system.
- ICEN 352 Environmental and Resource Economics** 4 (4-0-8)
Prerequisites:
 Basic economic theories including market failure, externality and common right problem before taking on economic theories and analyses of environment and natural resources; market instruments and their applications; environment and resource valuation techniques, cost-benefit analysis, problem on National Income Account concerning environment and natural resources and any contemporary related issues.
- ICEN 361 Principles of Environmental Impact Assessment** 4 (4-0-8)
Prerequisites: ICEN 241 and ICEN 342
 Environmental changes and its impact on communities; environmental impact analysis, statement techniques, assessment methodology, tools such as EIA (Environmental Impact Assessment) for environmental planning and decision making.

- ICEN 362 Natural Resource Conservation and Management** 4 (4-0-8)
Prerequisites:
 The principles of environmentalism and the history of the conservation movement, natural resource and environment, intra- and inter-relationship of ecosystem, causes of natural resource and environment destruction, management direction of natural resource and environment.
- ICEN 391 Sustainable Development** 4 (4-0-8)
Prerequisites:
 What is sustainable development: guiding principles and approaches; 1972 Stockholm Earth Summit; 1992 Rio Earth Summit; Agenda 21; 2002 Johannesburg World Summit; outcomes of the summits; the role of UN agencies, NGOs, governments, businesses and individuals; industry and farming and the environment; population; poverty and inequality; food and agriculture.
- ICEN 392 Environmental Issues: Past, Present and Future** 4 (4-0-8)
Prerequisites:
 An in-depth study of environmental issues e.g. Exxon Valdez and other oil spills; Bhopal and other chemical leaks; Chernobyl and other radiation leaks; ozone depletion; global warming; loss of biodiversity; deforestation; genetic engineering and GMOs; water issues; urban issues; contemporary and likely future environmental issues.
- ICEN 393 Practical Training in Environment** 2 (0-4-2)
Prerequisites:
 Practical training in the real situations related to environmental science and technology in the projects and/or activities of either public or private organization; industries, environmental policy organizations and environmental laboratory units.
- ICEN 401 Applied Mathematics for Environment Studies** 4 (4-0-8)
Prerequisites:
 The use of quantitative methods for decision in environmental problems; mathematical reasoning and analytical tools in resource management and environmental planning; operation research, simulation and environmental monitoring techniques.
- ICEN 402 Geoinformatics** 4 (3-2-7)
Prerequisites:
 The figure and rotation of the earth, great circles, latitude-longitude and time; introduction to marginal information, map symbol, scale ratio, direction, elevation and relief, position, measurement, and map projection; interpretation of the serial photograph with the naked eye, pocket and mirror stereoscope; related technology: Imagery, Geographic Information System (GIS) and Global Positioning System (GPS); practical exercises included.
- ICEN 403 Principle of Environmental Informatics** 4 (4-0-8)
Prerequisites:
 Introduction to principles of information technology implementation in environmental study and management The information technology applications for environmental data manipulation and management. Basic principles of the integrated information technology for sustainable environmental management.
- ICEN 411 Climate Change and Its Impact** 4 (4-0-8)
Prerequisites:
 Climate and weather pattern, greenhouse gases, causes and effect of greenhouse gases on climate, natural catastrophe, which are related to human behavior and vice versa; human activity and changes in natural ecosystems.

ICEN 413 Environmental Remediation Technology**4 (4-0-8)****Prerequisites: ICEN 241**

Basic environmental remediation technology; types of contaminants; transport of contaminants; transformation of contaminants; characterization of contaminated sites; methods for remediation: physical, chemical, and biological methods; factors effected on remediation technologies; criteria to select appropriate environmental remediation technology; sites selection; basic experimental design.

ICEN 414 Waste Utilization**4 (4-0-8)****Prerequisites: ICEN 241**

Characteristic, composition and sources of agricultural; technologies for agricultural waste management; separation and product recovery technology; enzyme technology; pulp production; bioplastic and valuable compounds production; renewable energy; biogas, biodiesel, compost production; effective microorganism (EM) utilization.

ICEN 415 Biodiversity**4 (4-0-8)****Prerequisites:**

Biological resources; genetic and species including ecological diversities; the importance of biodiversity; measurements of biodiversity; factors affecting biodiversity and its impacts: production and consumption patterns, commercial agriculture, population growth, destruction of natural habitat, pollution, global environmental changes impacts from GMOs; sustainable use of biodiversity; biodiversity conservation; relating international convention and law; policy and plans including security issues concerning biodiversity in Thailand.

ICEN 416 Ecotoxicology**4 (4-0-8)****Prerequisites: ICEN 312**

Toxicants mediate interactions between organisms and their biotic and abiotic environments; biochemical and physiological mechanisms of toxicity; defenses against toxicants; population, community, ecosystems and evolutionary ecotoxicology; quantifying and measuring ecotoxicological effects; case studies.

ICEN 421 Water and Wastewater Treatment**4 (4-0-8)****Prerequisites: ICEN 241**

Principle of water treatment technology; aeration process, pH adjustment, coagulation and flocculation, sedimentation and filtration, ion exchange and adsorption, membrane process and disinfection; the basic of water supply; raw water source, characteristics, water quality inspection and water supply technology; source of supply, distribution system, quantity of water supply and design of water supply capacity; wastewater characteristics, wastewater forecasting, wastewater collecting system, wastewater treatment system, basic design of wastewater treatment plant, wastewater reuse.

ICEN 422 Solid and Hazardous Wastes Management**4 (4-0-8)****Prerequisites: ICEN 241**

Principles of solid and hazardous waste management; sources, types and composition of municipal solid waste, hazardous waste, infection waste, and radioactive waste; solid waste generation and prediction of solid waste quantity; storage, collection and transportation, waste transformation, physical chemical and biological treatment processes, recycling, remediation.

ICEN 431 Land Use and Urban Environmental Planning**4 (4-0-8)****Prerequisites: ICEN 331**

Basic concept, components and processes, land uses and classification; land use controlling factors; land use planning and process, suitability analysis; land use and natural resources; the economics and regulation of land use; land use management and control.

- ICEN 432 Global Geomorphology** 4 (4-0-8)
Prerequisites:
 The form of land surface and the process which creates it; the study of submarine features planetary exploration and landscapes of the major solid bodies of the solar system; relationship between landforms and the processes currently acting on them.
- ICEN 441 Occupational Health and Safety** 4 (4-0-8)
Prerequisites:
 Appropriate design of various environmental sanitation facilities; health assessment and safety measures and works for the industrial factory workers, officers etc; controlling work-related risks; workable strategy in managing occupational health and safety; practical exercises included.
- ICEN 460 Ecotourism** 4 (2-4-6)
Prerequisites:
 Ecological principles applied to tourism; principles of human behavior used in eco-tourism issues; the relationship between natural resources and tourism; planning and management of natural, cultural resources and people's way of life for sustainable use in tourism with special focus on rural areas, wildlife sanctuaries and other areas of forests, mountains, beaches and islands.
- ICEN 461 Energy Conservation and Development** 4 (4-0-8)
Prerequisites:
 World and local energy situation; energy policies and strategies; the relationship between energy, the environment and the economy; renewable resources and social energy requirements; conservation, substitution and technology options; integrated energy management systems.
- ICEN 462 Coastal and Marine Resources** 4 (4-0-8)
Prerequisites:
 Coastal areas or coastal zones; coastal utilization, impacts on coastal ecosystems, regulations and laws as well as the principles for coastal conservation and managements.
- ICEN 464 Water Resources Management** 4 (4-0-8)
Prerequisites:
 The processes in the hydrologic cycle that includes measurement, computation, estimation and determination in each area; water resources problems, the conception, planning and design of functional elements and facilities to control and utilize water, basic to all water management.
- ICEN 465 Resource Inventory and Baseline Studies Methods** 4 (3-2-7)
Prerequisites: ICEN 331
 Appropriate techniques and methodologies for resource inventory, including the survey on geology, soils, hydrology, aquatic and terrestrial ecosystems, such as wetlands, plants, wildlife, etc; integrated approaches and methods; practical exercises included.
- ICEN 466 Environmental Management Systems** 4 (4-0-8)
Prerequisites: ICEN 241
 Principles of environmental management system (EMS) of ISO14001; development and setting of environmental policy, environmental management system planning; EMS implementation and operating, EMS checking and correction; management review, including management audit.
- ICEN 467 Environmental Risk Assessment and Management** 4 (4-0-8)
Prerequisites: ICEN 312
 Concept of risk assessment, human health risk assessment and ecological risk assessment, major risk, risk sources, primary control mechanism, transport and secondary control mechanism, target, exposure assessment, risk decision making and risk management, risk communication, environmental risk inventory system.

ICEN 468 Environmental Management Policy**4 (4-0-8)****Prerequisites:**

Environmental management, public policy and government decision making on environmental issues; the management of environmental research and education; introduction to environmental law, the legal aspects of environmental protection in theory and practice; the role of environmental movements.

ICEN 469 Heritage Conservation**4 (2-4-6)****Prerequisites:**

Introduction of heritage; cultural, natural, and cross cutting heritages; global and regional extent and distribution of world heritages; asian heritage sites; heritage functions and values; heritage threats; heritage loss and degradation; wise use of heritages; heritage restoration; law and regulation; world heritage conservation, UNESCO world heritage mission; conservation and management issues.

ICEN 483 Physical Planning and Environment**4 (4-0-8)****Prerequisites:**

Theory of physical planning in community and regional levels, human settlement and community development process, land use and infrastructure planning based on physical factors, potential of natural resources and appropriate data from scientific method analysis, and planning between urban and rural area in terms of ecology, environmental planning in urban and rural area based on their potentials and development plan, integrated survey and planning.

ICEN 491 Seminar in Environmental Science**2 (2-0-4)****Prerequisites:**

Student presentations and discussions of research or topics of current interest in environment such as conflict resolution, trade and environment, sustainable development, environmental ethics, public communication, decentralization, etc.

ICEN 492 Environmental Field Excursions**2 (0-4-2)****Prerequisites:**

On-site study emphasizes on pollution prevention technology and pollution reduction in various types of industry and industrial estate, including resource management in both regional and local areas; public participation on environmental and resource management; case studies.

ICEN 496 Senior Project in Environmental Science**6 (0-12-6)****Prerequisites:**

Independent study on a research project in environmentally related filed under the supervision of an advisor; planning and conducting a good research work; data analyzing and interpretation; scientific writing and presentation.

ICFP 101 Introduction to Film**4 (4-0-8)****Prerequisites: -**

An in-depth look at the nature of film language, how images work and what they might be trying to tell us.

ICFP 102 Film Analysis**4 (4-0-8)****Prerequisites: -**

Expanding student's knowledge of film through the study of selected filmmakers and their work, extrapolating meaning within the images and storyline.

ICFP 111 Film Production Studio I**4 (0-8-4)****Prerequisites: -**

Hands-on practical training with equipment in both production and post-production.

ICFP 112 Film Production Studio II	4 (0-8-4)
Prerequisites: -	
Small group projects, research reference material for character, lighting design, locations, specific referencing of scenes from individual films, how to line a script, key concepts to best time manage a set.	
ICFP 201 Film Screenwriting	4 (4-0-8)
Prerequisites: -	
Standard elements of a film script: theme, plot, character, and dialogue, students will write Act I of an original feature film script, taking it through each stage of preproduction to completed professionally formatted Script. Act II and III will be outlined only.	
ICFP 202 Cinematography	4 (0-8-4)
Prerequisites: ICFP 111	
Technical standards of cinematography in feature films: principles and methods of visualization; use of camera movement; lens selection; lighting techniques; basic film manipulation.	
ICFP 203 Film Directing	4 (4-0-8)
Prerequisites: ICFP 201	
The study of Film directing as an artistic and technical craft: script analysis, rehearsal, blocking, developing storyboards and shot list, director's collaboration with production crew, working with actor(s) on set. Projects#1 through Project#4 will be produced and evaluated in ICFP 211.	
ICFP 204 Film Editing Concepts	4 (4-0-8)
Prerequisites: -	
Theory and Practice in the technique of Film and Video Editing.	
ICFP 211 Film Production Studio III	4 (0-8-4)
Prerequisites: -	
The practical application of the work of a Film Director.	
ICFP 212 Film Production Studio IV	4 (0-8-4)
Prerequisites: -	
The development of skills in film post-production.	
ICFP 301 Film Genre Studies	4 (4-0-8)
Prerequisites: -	
Genre studies in film and television, theoretical and historical contexts, case studies, ranging from melodrama and horror to westerns and science fiction.	
ICFP 302 Documentary Film Production	4 (0-8-4)
Prerequisites: -	
History and technical understanding of documentary filmmaking.	
ICFP 303 Film Authorship	4 (4-0-8)
Prerequisites: -	
Origins in the film authorship, case studies of filmmakers visual techniques, plot structures, narrative features, dialogue, and preoccupations of character.	
ICFP 304 Film Producing	4 (0-8-4)
Prerequisites: -	
Role and responsibilities of the film producer: script selection, director and crew recruitment, actor negotiations, pitching investors, director-producer collaboration, publicity, and distribution.	

ICFP 305 Film Compositing and Post Production	4 (0-8-4)
Prerequisites: -	
Introduction to principles and techniques of media compositing; conceptualizing many layers of visual material to create a complete picture; visualization of and combination of live action and computer generated pictures, concepts and techniques to plan and shoot for compositing; the marriage of multiple sources of visual material, each obtained at differing times in the production process.	
ICFP 306 Professional Internship in Film Production	4 (0-12-4)
Prerequisites: -	
Internship in the field through placement in film companies. At the end of the internship, a seminar will be conducted in order to summarize the main concepts in Film Production within a context of Mass Communication.	
ICFP 311 Film Production Studio V	4 (0-8-4)
Prerequisites: -	
Professional Film Production Skills.	
ICFP 312 Film Production Studio VI	4 (0-8-4)
Prerequisites: -	
Professional Film Post-Production skills in Sound Design, as well as Video Editing and Compositing.	
ICFP 321 Major Directors	4 (4-0-8)
Prerequisites: -	
A critical study of the first films of major world directors.	
ICFP 322 Cinema Through the 1950s	4 (4-0-8)
Prerequisites: -	
Historical context through the use of a formal, analytical critique, select and develop a "close analysis" of a particular film of their own choosing from a list provided by the instructor and present a critical study of one or several important scenes before the class.	
ICFP 323 International Field Study in Film Production	4 (0-12-4)
Prerequisites: ICFP 312	
Introduction to the management styles of international media corporations; international artistic and business trends, and international media markets; foreign broadcasting regulations and legal considerations; innovations and technology.	
ICFP 324 Cinema Through the 1960s	4 (4-0-8)
Prerequisites: -	
Important trends in filmmaking since the 1960s, providing an historical context through the use of a formal, analytical critique, select and develop a close analysis of a particular film of their own choosing from a list provided by the instructor and present a critical study of one or several important scenes before the class.	
ICFP 325 Writing and Producing 3D for Film	4 (0-8-4)
Prerequisites: -	
Fundamental technical and conceptual skills to work in 3D production will be introduced. Students will be exposed to actual 3D pre and post production.	
ICFP 326 Selected Topics in Film Production	4 (0-8-4)
Prerequisites: -	
Selected topics including specific film genres, styles analysis, culture and television, national cinemas, film criticism and theory, technological developments, detailed investigation of new or emerging trends in film, etc.	

ICFP 327 Independent Study in Film Production	4 (0-8-4)
Prerequisites: -	
Independent study tailored to fit individual interests in a specific area of film production.	
ICFP 328 Music Video Production	4 (0-8-4)
Prerequisites: -	
Principles of music video production: aesthetics and technology; introduction to the stages involved in producing a music video.	
ICFP 401 Seminar in Film Production Senior Project and Ethics	4 (4-0-8)
Prerequisites: ICFP 312	
Integration of knowledge, skills, and techniques acquired throughout the course of study in developing a film proposal and planning the production of the final project, including legal and ethical considerations.	
ICFP 402 Film Production Senior Project I	4 (0-12-4)
Prerequisites: ICFP 401	
Production of an approved final project.	
ICFP 403 Film Production Senior Project II	4 (0-12-4)
Prerequisites: ICFP 402	
Post-production of the approved project including editing, post-production, and screening. Completion of Final Project Book.	
ICFS 212 General Biochemistry for Food Science and Technology	4 (3-2-7)
Prerequisites: -	
Basic knowledge of structure and function of biomolecules, controls and processes of metabolism at the cellular and molecular levels related to food science and technology. Practical exercises are included.	
ICFS 213 General Microbiology for Food Science and Technology	4 (3-2-7)
Prerequisites: ICNS 112	
Basic knowledge related to structure, physiology and ecology of microorganisms such as viruses, bacteria, and fungi, aspects of microbiology importance in food science and technology. Practical exercises are included.	
ICFS 311 Physical Chemistry for Food Science and Technology	4 (4-0-8)
Prerequisites: ICPY 210	
The first law of thermodynamics, heat, work, internal energy, enthalpy and thermo chemistry; the second law of thermodynamics, entropy and Gibbs function in reversible and irreversible process; fluid mechanics, heat and mass transfer, and chemical kinetics of food.	
ICFS 312 Food Chemistry I	4 (3-2-7)
Prerequisites: ICCH 211, ICCH 222	
Chemistry and biochemistry of foods; changes that occur during processing and utilization of water, carbohydrates, colloids, lipids; practical exercises included.	
ICFS 313 Food Chemistry II	4 (3-2-7)
Prerequisites: ICFS 312	
Chemistry and biochemistry of foods: proteins, enzymes; changes that occur during processing and utilization; proteins, enzymes, basic concepts of biotechnology and genetic modification of organisms; colors and pigments; food toxicology; changes in nutrition of vitamins and minerals during processing; practical exercises included.	

- ICFS 314 Food Analysis** 4 (3-2-7)
Prerequisites: ICCH 224
Principles of chemical and instrumental methods for the qualitative and quantitative analysis of moisture, protein, carbohydrate, lipids, dietary fiber, minerals and vitamins. Practical exercises are determination of major food components using chemical and instrumentals methods.
- ICFS 315 Food Processing I** 4 (3-2-7)
Prerequisites: ICCH 211, ICFS 311
Introduction to the food processing industry; general characteristics of raw food materials; processing, and preservation of food materials by blanching, pasteurization, sterilization canning, evaporation, dehydration; processing factors that influence quality; field trips to processing plants are included.
- ICFS 316 Food Processing II** 4 (3-2-7)
Prerequisites: ICFS 315
Continuation of food processing sequence; food processing techniques by chilling, freezing, fermentation, mechanical separation, extrusion, and other emerging technologies; processing factors that influence quality; plant design; clean technology for food processing; field trips to processing plants are included.
- ICFS 321 Principles of Quality Assurance in Food Processing** 4 (4-0-8)
Prerequisites: ICFS 316, ICSC 303
Methods of quality control and management in food processing; Total Quality Control Management, HACCP, ISO 9000 and 14,000 series; control of raw materials, process, and finished products; sampling, evaluation of sensory properties, and other factors; statistical analysis for quality control.
- ICFS 322 Fruits and Vegetables Technology** 4 (3-2-7)
Prerequisites: ICFS 313, ICFS 316
Raw material handling, storage and preparation; processing and preservation of fruits and vegetables; production of fermented food products from vegetables; application of HACCP to fruit and vegetable processing; post-harvest changes in fruits and vegetables.
- ICFS 325 Dairy Products Technology** 4 (3-2-7)
Prerequisites: ICFS 313, ICFS 316
Processing and technologies of fluid milk plant operation from milk receiving to various finished products. Fluid milk, yogurt, cheese, and frozen dairy desserts; physical, microbiological, and chemical properties of fluid milk and milk components; milk quality supply; good manufacturing practices (GMPs); HACCP, and basic concepts of quality assurance and quality control.
- ICFS 326 Meat, Poultry and Marine Product Technology** 4 (3-2-7)
Prerequisites: ICFS 313, ICFS 316
Raw Material sources, raw material handling, storage and preparation; processing and preservation of meat, poultry and marine products; physical, microbiological, and chemical properties of products; HACCP and GMPs applicable to storage and processing products and basic concepts of quality assurance and quality control.
- ICFS 331 Food Hygiene and Sanitation** 4 (4-0-8)
Prerequisites: ICFS 213
Biological and chemical hazard in food that result from improper processing, packaging, handling and storage; cleaning of food plant equipment and facilities including characteristics of soil on equipment surfaces, cleaning compounds, clean-in-place, clean-out-of-place, sanitizers and their characteristics, and GMPs.

ICFS 332 Food Law and Standard of Commercial Food Products	4 (4-0-8)
Prerequisites: -	
Thai and international food regulations and standards applicable to the food industry.	
ICFS 371 Food Products Development	4 (4-0-8)
Prerequisites: ICFS 313, ICFS 316	
Principles and steps used in a new product-developing process: formulation, lab-scale production, quality control, and commercial feasibility study; sensory evaluation of food products; data and statistical analysis of sensory test results; practical exercises.	
ICFS 372 Utilization of Water and Wastewater Treatment	2 (2-0-4)
Prerequisites: ICFS 213	
Sources and uses of water, municipal and agricultural water uses; ecological and biological characteristics of water; chemical characteristics of water; biological indicators of rivers and streams; water quality in streams, rivers and estuaries; water quality in lakes and reservoirs; water and wastewater treatment; biological treatment methods.	
ICFS 381 Production Management and Marketing of Food Products	4 (4-0-8)
Prerequisites: -	
Factors affecting food plant organization, production, procurement, distributing, and also the interactions required to develop food plant operation; principles of marketing, marketing systems and management with emphasis on food products; market research and analysis, consumer behavior and marketing strategies.	
ICFS 421 Food and Nutrition	4 (4-0-8)
Prerequisites: ICFS 212	
Elements of human nutrition including vitamins, minerals, micronutrients, and antioxidants including sources, metabolism, and functions in the human body; nutritive values of foods; requirements for human health, nutraceuticals, and functional foods and their effects on human health beyond basic nutrition.	
ICFS 423 Beverage Technology	4 (3-2-7)
Prerequisites: ICFS 313, ICFS 316	
Processing and technologies of alcoholic and non-alcoholic beverages including tea and coffee; physical, microbiological, and chemical properties of both raw materials and finished products; packing and packaging; food safety for beverages.	
ICFS 424 Fat and Oil Technology	4 (3-2-7)
Prerequisites: ICFS 313, ICFS 316	
Processing and technologies of edible fats and oils; physical and chemical properties of both raw materials and finished products; GMPs, ISO 9002, HACCP, basic concepts of quality assurance and quality control applicable to fat and oil technology.	
ICFS 425 Cereal Science and Technology	4 (3-2-7)
Prerequisites: ICFS 313, ICFS 316	
The structure, composition and utilization of rice, wheat and other cereal grains for the production of starches, flours, milling by-products, and cereal-based human food products; cereal processing technologies such as dry and wet milling, baking, extrusion cooking, breakfast cereals and noodle and pasta manufacturing; the Quality/Sanitary Control and Quality Assurance aspects of production; practical exercises.	
ICFS 426 Bakery Product Technology	4 (3-2-7)
Prerequisites: ICFS 313, ICFS 316	
The knowledge of processing and some technology used in bakery product industry. The information on baking product from the principle of raw materials and major ingredients to the finished products will be described.	

- ICFS 427 Confectionary and Chocolate Technology** 4 (3-2-7)
Prerequisites: ICFS 313, ICFS 316
 Basic understanding of the principle of confectionery and chocolate technology; the chemical and physical properties of the important ingredients, some techniques involved in their preparation and processing as well as the application of food additives generally use in the industry.
- ICFS 432 Sensory Evaluation of Food Products** 4 (3-2-7)
Prerequisites: ICFS 313, ICFS 316
 Basic discrimination/difference tests, data analysis and interpretation of results; basic scaling procedures such as ranking, interval scaling and magnitude estimation; descriptive analysis; analytical instrumental methods of sensory evaluation and correlation with consumer sensory evaluation; anatomy and physiology of the sensory systems (sight, taste, smell, touch, and hearing); physiological and psychological factors that affect performance on sensory tests.
- ICFS 433 Food Microbiology I** 4 (3-2-7)
Prerequisites: ICFS 213
 Microorganisms that are important to food; pathogenic microorganisms in food and microorganisms related to food spoilage; factors affecting the growth of microorganisms; standards and microbial examination.
- ICFS 434 Food Microbiology II** 4 (3-2-7)
Prerequisites: ICFS 433
 The application of microorganisms in food manufacture and food preservation; microorganisms beneficial to human health; the effects of food processing on the microorganisms; food sanitation and control.
- ICFS 435 Current Topics in Food Science and Technologies** 2 (2-0-4)
Prerequisites: -
 Current topics in food science and related field.
- ICFS 441 Food Engineering I** 4 (3-2-7)
Prerequisites: ICPY 210, ICMA 215, ICFS 311
 Introduction to engineering operations in food processing, process control, and instrumentation. Engineering principles including material and energy balances, thermodynamics, fluid flow, heat transfer, refrigeration, and psychometrics as applied to foods; practical exercises included.
- ICFS 442 Food Engineering II** 4 (3-2-7)
Prerequisites: ICFS 441
 Continuation of Food Engineering I; the principles and measurement of various physical properties of foods that measure the overall quality of fresh and prepared foods. These are properties that are important in handling, preparing, processing, preserving, packaging, storing, and distribution of foods, also the principles and limitations of instrumental methods that are currently used to determine physical properties of foods; practical exercises included.
- ICFS 452 Food Packaging** 4 (3-2-7)
Prerequisites: ICFS 313, ICFS 316
 Materials, systems, and applications of food packaging materials and methods; properties, fabrication, and function of metal, glass, paper and plastic packaging, sanitation of packaging materials, forming, filling, joining and enclosure operations and related equipment for packaging systems and equipment; selected topics for food packaging applications including aseptic packaging, food package interactions, sealing integrity, handling of packages, and modified atmospheric packaging.
- ICFS 463 Field Trip** 2 (0-6-2)
Prerequisites: -
 Visits and industrial plant studies of food manufacturing industry or related organizations.

- ICFS 491 Seminar in Food Science and Technology** 2 (2-0-4)
Prerequisites: Seniors
 Senior student presentations, discussion of research, and review of topics of current interest. Staff and invited speakers from Mahidol University and from other universities or the food processing industry.
- ICFS 492 Senior Project in Food Science and Technology** 6 (0-12-6)
Prerequisites: Seniors
 Small research projects in Food Science and Technology or related fields under the supervision of a research advisor.
- ICFS 494 Internship in Food Science and Technology** 4 (0-12-4)
Prerequisites: -
 Industrial work-internship program in the food manufacturing industry, the industrial internship program will focus on actual work and on-the-job training at production line, process control, quality control of process and product, laboratory work; chemical, physical, microbiological analysis.
- ICHE 101 Health Education** 2 (2-0-4)
Prerequisites: -
 Practical approach to health behavior and obtain an understanding of risk factors as they relate to disease; develop a practical approach to health behavior and obtain an understanding of risk factors as they relate to disease.
- ICHL 101 Japanese I for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): -
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level for situations related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry.
- ICHL 102 Japanese II for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): ICHL 101
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Continuation of level 1 – ICHL 101.
- ICHL 103 Japanese III for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): ICHL 102
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Continuation of level 2 – ICHL 102.
- ICHL 104 Japanese IV for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): ICHL 103
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing Continuation of level 3 – ICHL 103.
- ICHL 105 Japanese V for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): ICHL 104
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Continuation of level 4 – ICHL 104.

- ICHL 106 Japanese VI for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): ICHL 105
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Continuation of level 5 – ICHL 105.
- ICHL 107 Japanese VII for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): ICHL 106
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Japanese speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 6 – ICHL 106
- ICHL 108 Japanese VIII for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): ICHL 107
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Japanese speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 7 – ICHL 107
- ICHL 109 Japanese IX for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): ICHL 108
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Japanese speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 8 – ICHL 108.
- ICHL 110 Japanese X for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): ICHL 109
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Japanese speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 9 – ICHL 109.
- ICHL 111 Japanese XI for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): ICHL 110
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Japanese speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 10 – ICHL 110.
- ICHL 121 Chinese I for Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisite(s): -
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level for situations related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry.

ICHL 122 Chinese II for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 121**

Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry at a level that is higher than ICHL 121.

ICHL 123 Chinese III for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 122**

Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry at a level that is higher than ICHL 122.

ICHL 124 Chinese IV for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 123**

Further knowledge of grammar and essential vocabulary in order to lead the students to a pre intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach at a level higher than ICHL 123.

ICHL 125 Chinese V for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 124**

Further knowledge of grammar and essential vocabulary in order to lead the students to a preintermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach at a level higher than ICHL 124.

ICHL 126 Chinese VI for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 125**

Further knowledge of grammar and essential vocabulary in order to lead the students to a pre intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach at a level higher than ICHL 125.

ICHL 127 Chinese VII for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 126**

Further knowledge of grammar and essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Chinese speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand at a level higher than ICHL 126.

ICHL 128 Chinese VIII for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 127**

Further knowledge of grammar and essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Chinese speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand at a level higher than ICHL 127.

ICHL 129 Chinese IX for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 128**

Further knowledge of grammar and essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Chinese speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand at a level higher than ICHL 128.

ICHL 130 Chinese X for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 129**

Further knowledge of grammar and essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Chinese speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand at a level higher than ICHL 129.

ICHL 131 Chinese XI for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 130**

Further knowledge of grammar and essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Chinese speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand at a level higher than ICHL 130.

ICHL 141 French I for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): -**

Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level for situations related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry.

ICHL 142 French II for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 141**

Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Continuation of level 1 – ICHL 141

ICHL 143 French III for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 142**

Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Continuation of level 2 – ICHL 142.

ICHL 144 French IV for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 143**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Continuation of level 3 – ICHL 143.

ICHL 145 French V for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 144**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Continuation of level 4 – ICHL 144.

ICHL146 French VI for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 145**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Continuation of level 5 – ICHL 145.

ICHL147 French VII for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 146**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with French speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 6 – ICHL 146.

ICHL148 French VIII for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 147**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with French speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 7 – ICHL 147.

ICHL 149 French IX for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 148**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with French speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 8 – ICHL 148.

ICHL150 French X for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 149**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with French speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 9 – ICHL 149.

ICHL151 French XI for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 150**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with French speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 10 – ICHL 150.

- ICHL 161 German I for Hospitality and Tourism Industry** **4 (4-0-8)**
Prerequisite(s): -
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level for situations related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry.
- ICHL 162 German II for Hospitality and Tourism Industry** **4 (4-0-8)**
Prerequisite(s): ICHL 161
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Continuation of level 1 – ICHL 161
- ICHL 163 German III for Hospitality and Tourism Industry** **4 (4-0-8)**
Prerequisite(s): ICHL 162
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Continuation of level 2 – ICHL 162.
- ICHL 164 German IV for Hospitality and Tourism Industry** **4 (4-0-8)**
Prerequisite(s): ICHL 163
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach Continuation of level 3 – ICHL 163 ICHL 163.
- ICHL 165 German V for Hospitality and Tourism Industry** **4 (4-0-8)**
Prerequisite(s): ICHL 164
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Continuation of level 4 – ICHL 164.
- ICHL 166 German VI for Hospitality and Tourism Industry** **4 (4-0-8)**
Prerequisite(s): ICHL 165
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Continuation of level 5 – ICHL 165.
- ICHL 167 German VII for Hospitality and Tourism Industry** **4 (4-0-8)**
Prerequisite(s): ICHL 166
 Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with German speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 6 – ICHL 166.

ICHL 168 German VIII for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 167**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with German speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 7 – ICHL 167.

ICHL 169 German IX for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 168**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with German speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 8 – ICHL 168.

ICHL 170 German X for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 169**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with German speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 9 – ICHL 169.

ICHL 171 German XI for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 170**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with German speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 10 – ICHL 170.

ICHL 181 Spanish I for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): -**

Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level for situations related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry.

ICHL 182 Spanish II for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 181**

Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Continuation of level 1 – ICHL 181.

ICHL 183 Spanish III for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 182**

Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple-sentence level related to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Continuation of level 2 – ICHL 182.

ICHL 184 Spanish IV for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 183**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Continuation of level 3 – ICHL 183.

ICHL 185 Spanish V for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 184**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Continuation of level 4 – ICHL 184.

ICHL 186 Spanish VI for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 185**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to a pre-intermediate level of proficiency with regards to basic interactions with customers, clients, and colleagues in the tourism and hospitality industry. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Continuation of level 5 – ICHL 185.

ICHL 187 Spanish VII for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 186**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Spanish speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 6 – ICHL 186.

ICHL 188 Spanish VIII for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 187**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Spanish speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 7 – ICHL 187.

ICHL 189 Spanish IX for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 188**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Spanish speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 8 – ICHL 188.

ICHL 190 Spanish X for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 189**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Spanish speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 9 – ICHL 189.

ICHL 191 Spanish XI for Hospitality and Tourism Industry**4 (4-0-8)****Prerequisite(s): ICHL 190**

Further knowledge of the grammar and of essential vocabulary in order to lead the students to an intermediate level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. Students must be able to communicate with Spanish speakers in the tourism and hospitality industry and to give more precise tourism information about Thailand. Continuation of level 10 – ICHL 190.

ICHM 101 Introduction to Philosophy**4 (4-0-8)****Prerequisites: -**

Fundamental philosophical methods and leading philosophical ideas concerning the notions of reality ('metaphysics'), knowledge ('epistemology'), consciousness ('philosophy of mind') and freedom ('action theory' / 'ethics'); reading of paradigmatic texts, both traditional and contemporary, and analysis as well as comparison of philosophical arguments; discussion of modern scientific research results in relationship to topics traditionally considered philosophical.

ICHM 103 Introduction to Logic**4 (4-0-8)****Prerequisites: -**

Introduction to methods of symbolic deductive logic (natural deduction, transformation tasks and logical analysis with regard to English) and to basic concepts characterizing modern logical theories; propositional logic; syllogistic reasoning and basic predicate logic.

ICHM 105 Music Appreciation**4 (4-0-8)****Prerequisites: -**

Introduction to distinctive features of Western classical music with paradigmatic examples; an elementary outline of music history, musical styles and idioms; exploration of musical form and structure as an essential but dynamic constituent of aesthetic expression; analysis and interpretation of basic musical patterns for the development of musical awareness and listening skills.

ICHM 106 Moral and Ethical Studies**4 (4-0-8)****Prerequisites: -**

Introduction to diverse ethical theories and paradigms (Virtue Ethics, Utilitarianism, Deontology, Naturalism, Intuitionism) in both historic and systematic terms. Outline of metaethics and formal ethics, multicultural approaches to ethics as well as psychological moral constraints (Situationism). Discussion of ethical reasoning with regard to contemporary ethical issues (human and animal rights, sexuality, environmental pollution, abortion, death penalty and euthanasia).

ICHM 107 Introduction to Asian Philosophy**4 (4-0-8)****Prerequisites: -**

Main aspects of Asian philosophy, covering the key philosophical ideas in India, starting from the Indian philosophy during the Rgvedic period, Buddhist philosophy and other main Hindu philosophical ideas developed during and after the Buddha's lifetime.

ICHM 140 Elementary Art Theory**4 (4-0-8)****Prerequisites: -**

Art theory in both analytical and historical terms including the relationship between art and technology; exploration of major concepts in Aesthetics and Semiotics and analysis of diverse art forms as well as individual art pieces.

ICHM 141 Art Appreciation I**4 (4-0-8)****Prerequisites: -**

Visual and historic elements of art; study of the most important works of art from the classical periods in art history such as ancient Greece and Rome, through the 16th century Renaissance and early Baroque periods.

ICHM 142 Art Appreciation II**4 (4-0-8)****Prerequisites: -**

Art from the 18th century through to the 20th century; reading from selected texts to understand the overall cultural and intellectual context for the modern and post-modern periods in art and architecture.

ICHM 143 Introduction to Photography**4 (2-4-6)****Prerequisites: -**

Basic skills and aesthetic principles of photography, how the camera works, types of cameras and film, techniques in taking pictures, specialized forms of photography, developing film, the aesthetics of picture taking.

ICHM 144 Intermediate Photography**4 (4-0-8)****Prerequisites: -**

Technical aspects of digital photography and digital darkroom technique; an advanced study of communicative uses of the aesthetic tools of photography; exposure to a variety of photographic artists with an emphasis on contemporary art; different approaches to the artistic process.

ICHM 202 Intermediate Logic**4 (4-0-8)****Prerequisites: -**

Monadic and polyadic first-order Predicate Logic in formal deduction and both natural language translation and argumentation; introduction to basic elements of logical semantics, metalogical concepts and aspects of non-classical Logic.

ICHM 205 Politics and Ethics**4 (4-0-8)****Prerequisites: -**

Ideas of political philosophy based on some classical text and contemporary approaches. Focusing on general questions of ethics through the lens of justice. Discussion of ethical questions regarding how persons ought to be governed/or if they ought to be governed at all (the justification of the authority of the state), the relationship of freedom and autonomy, and exploring the nature of a fair state, a good ruler and a just international order. Concepts learned will be tested in light of current political, ecological and economic issues.

ICHM 206 Ethics and Technology**4 (4-0-8)****Prerequisites: -**

Traditional and non-traditional ethical theories and their application to issues in modern technology topics.

ICHM 212 The Enlightenment in European Literature**4 (4-0-8)****Prerequisites: -**

The 18th century formative period in Europe through literary texts; political justice, religious tolerance, freedom of expression, individual freedom, the role of women in society and the perception of non-Western cultures in order to understand the meaning of the Enlightenment and of Immanuel Kant's principal motto of enlightenment, 'Sapere aude!', 'Dare to know!'. The literature selected ranges from classical drama to satirical, adventurous and amorous novels.

ICHM 213 Elements of Knowledge Representation**4 (4-0-8)****Prerequisites: -**

Knowledge representation from a logical, semiotic and philosophical perspective with focus on systematic conceptual accounts of the world (ontology) and non-monotonic (common sense) reasoning; presentation of selected tools and basic frameworks discussed in AI related research into rational agents without specifically targeting programming and efficient computing.

ICHM 218 Film Studies	4 (4-0-8)
Prerequisites: -	
Picture track and sound track components of a movie and of the principles behind their organization in order to develop student analytic skills and capacity to watch films from a new and enriching point of view; examples chosen from films made in the United States, Europe and Asia.	
ICHM 223 Thai Arts	4 (4-0-8)
Prerequisites: -	
Thai art forms including painting, sculpture, and architecture found in Thailand from pre-historic to modern periods; influence of other cultures on Thai arts.	
ICHM 225 The Western Classical Ideal	4 (4-0-8)
Prerequisites: -	
The 5th century Athens in the famous classical age of ancient Greece which witnessed the rise of Western style democracy, arts, science, philosophy, and literature; history of the period as well as its important architectural and artistic remains; readings from Plato, Aeschylus, and Aristophanes; ancient Greek mythology sciences and philosophies that came to characterize what is known as "the Age of the Greek Enlightenment".	
ICHM 241 Introduction to Drawing	4 (2-4-6)
Prerequisites: -	
Different aspects of drawing, observation and analysis of structure, form, proportion and contours, gaining a deeper understanding of visual perceptions; the development and practice of basic skills of realistic pencil drawing.	
ICHM 242 Intermediate Drawing	4 (2-4-6)
Prerequisites: -	
Application and practice of drawing skills with models with more complex structure and shading, new techniques of drawing and new media/drawing tools, practicing to develop more sensitivity to the visual (with finer details), knowing one's own personal artistic preferences and developing some personal style in drawing.	
ICHT 200 Business Communication	4 (4-0-8)
Prerequisites: Level IV in English	
Learning and problem solving approach to developing the level of English communication skills needed in the Tourism and Hospitality Industry under cross-cultural environments.	
ICHT 212 Principles of Accounting	4 (4-0-8)
Prerequisites: ICNS 101	
Business transactions and financial statements, evolution of accounting, recording and classifying financial transactions, preparation of financial statements, characteristics of various types of accounts, accounting principles, the usefulness and limitations of accounting information.	
ICHT 213 Corporate Finance	4 (4-0-8)
Prerequisites: ICHT 212	
Introduction to the concepts of corporate finance, cash management; the investment decisions; cash control during the various stages of operations; dividend policy and financial planning; feasibility studies and financial ratios analysis.	
ICHT 214 Business Economics	4 (4-0-8)
Prerequisites: ICSS 114	
Principles of economics, microeconomics, applied economic concepts; assessing the socio-economic behavior of economic agents comprising consumers, businesses, government and its agencies, particularly their business choices and decision making; demand, supply, elasticity, costing, pricing and investment.	

- ICHT 221 Fundamental Marketing** 4 (4-0-8)
Prerequisites: 36 GE Credits
 Principles of business management, developing market strategy in business marketing and business customers, and real life business examples and case studies to demonstrate business marketing theories in practice.
- ICHT 232 Introduction to Hospitality and Tourism Industry** 4 (4-0-8)
Prerequisites: 36 GE Credits
 An introduction to the tourism and hospitality industry; impacts that the industry has on the economy, culture and environment; exploring career opportunities and having the opportunity to build the skills essential to managerial success.
- ICHT 301 Management and Organization Behavior** 4 (4-0-8)
Prerequisites: 36 GE Credits
 The Competing Values Framework to management, creating and sustaining commitment and cohesion, establishing and maintaining stability and continuity, improving productivity and enhancing competitiveness, promoting change and encouraging adaptability, and integration and the road to mastery.
- ICHT 311 Human Resources Management and Development** 4 (4-0-8)
Prerequisites: ICHT 232
 An overview and survey of human resources management and personnel administration in the hospitality industry; recruitment and selection, staffing, labor relations, training and development of human resources, performance management and remuneration management and ethics management in human resource field.
- ICHT 331 Business Law** 4 (4-0-8)
Prerequisites: ICHT 232
 An overview of Thai laws related to tourism and hospitality industry, including the legal principles of personality, juristic act and contract, specific provisions concerning sale, hire of property, hire of work, hire of services and labour law, deposit and special rules for innkeeper, insurance, setting up and management of basic forms of business organizations for tourism and hospitality industry, specific legislations concerning the operation of hotel, place of entertainment, travel agency and tourist guide businesses.
- ICHT 371 Sustainable Development for Hospitality and Tourism Industry** 4 (3-2-7)
Prerequisites: ICHT 232
 Concepts of sustainable development in the hospitality and tourism industry; the range of hospitality and tourism developments designed to maintain environmental, social and economic well being of natural, built, and cultural resources; the inherent stability of socio-environmental systems in order that certain parallels may be drawn and guiding principles applied to the management of hospitality and tourism based projects.
- ICHT 391 Hospitality Management: Internship I** 12 (0-36-12)
Prerequisites: 80 credits and ICHT 232
 A one-trimester internship where students gain hands-on experience at the MUIC Training Center, also known as Salaya Pavilion Hotel, in consultation with an assigned advisor.
- ICHT 401 Strategic Planning and Management** 4 (4-0-8)
Prerequisites: ICHT 301 or ICIH 321
 Fundamental concepts of strategic management: internal and external analysis, strategy identification and evaluation, the relationship of strategy and organization, competitor analysis, corporate strategy and corporate social responsibility in order to reach firm's higher efficiency and gain the competitive position in the market.

- ICHT 490 Hospitality and Tourism Research Methodology** 4 (4-0-8)
Prerequisites: 140 Credits
 An introduction to research process and design, data collection, hypothesis testing, and reporting; featuring econometrics and other quantitative applications in business research; research on a topic related to the tourism and/or hospitality industry.
- ICHT 491 Hospitality Management: Internship II** 12 (0-36-12)
Prerequisites: ICHT 391
 A one-trimester continuation of the first internship (ICHT 391) where students gain hands-on experience in the tourism industry in consultation with an assigned advisor.
- ICID 100 Freshman Seminar** 0 (1-0-0)
Prerequisites: -
 Compulsory for all freshmen; time management skills, study plan, adjustment to college's life, and teachers' expectation.
- ICIH 321 Marketing and Sales for Hospitality Industry** 4 (4-0-8)
Prerequisites: ICHT 221, ICHT 232
 Market and sales orientation concepts and processes for gaining competitive advantages in the hospitality industry. Emphasis is placed upon identifying key environmental issues and formulating a competitive marketing and sales plan. It also demonstrates that the dimensions of marketing and sales evolved in accordance with time.
- ICIH 322 Consumer Behavior in Hospitality Industry** 4 (4-0-8)
Prerequisites: ICHT 232
 Factors that interact and influence the decision-making process of consumers to consume hospitality services from both conventional and post-modern perspectives, and to look into varieties of theories and phenomenon, particularly those of post-modern era that affect the intention of consumers to consume.
- ICIH 341 Information Technology in Hospitality Industry** 4 (4-0-8)
Prerequisites: ICHT 232
 The use of information systems in the hospitality industry; the use of computers to facilitate both the flow and management of information in the industry, the flow and capture of information related to providing tourism and hospitality services; constant changes in information technology and their impact on the channels of distribution; the interdependence and cross-linking of the industry's systems along with the emergence of the Internet as another channel of information flow.
- ICIH 351 International Service Quality Management** 4 (4-0-8)
Prerequisites: ICHT 232
 Delivering quality service to clients, training the travel industry's human resource component, the theories and the importance of quality, value of the customer and service quality, quality management process, its impact on organizations and the significance of service quality to tourism and hospitality concepts, together with the mechanism of quality management approach to provide service excellence through several advancements in quality such as benchmarking and total quality management.
- ICIH 361 Ethics in Hospitality Operation** 4 (4-0-8)
Prerequisites: ICHT 232
 Ethical foundation in business; fundamental theories of ethics; various ethical concepts and dilemmas in service industry for analysis and learning; essential process for self-evaluation and methods to test and apply the theories in their own working life.

ICIH 402 Entrepreneurship in Hospitality Business**4 (4-0-8)****Prerequisites: ICHT 232, ICHT 301**

Tourism Systems Model, Destination Life Cycle Model, Types of Travel Intermediaries for Hospitality Business, Factors Influencing Hospitality Growth, Business Plan for Hospitality, Blue Ocean Strategy, Creative Development for Hospitality Business, Travel Distribution Channel, Information Technology for Hospitality Business.

ICIH 403 Revenue Management in Hospitality Industry**4 (4-0-8)****Prerequisites: ICHT 232 and ICIH 321**

The concepts of revenue management for understanding the process of hospitality revenue management, effective revenue management planning; Demand Forecasting, Dynamic Value-Based Pricing, Network Revenue Management, Strategic revenue management; and the application of knowledge to solve the case studies in hospitality industry.

ICIH 411 Culinary Management**4 (3-2-7)****Prerequisites: ICHT 232**

Planning and management food and beverage production in quantity food settings; various methods of food preparation ingredients and culinary terminology; reading and evaluating menus; developing recipe conversion and costing skills; examining different production schemes and product flow; the use and care of equipment, service techniques, procurement management, and cost control.

ICIH 412 Front Office Management**4 (4-0-8)****Prerequisites: ICHT 232**

Understanding of front office operations and management in a hotel; presenting a systematic approach to front office procedures by detailing the flow of business through a hotel from the reservations process to check-out and account settlement; examining the various elements of effective front office management with paying particular attention to the planning and evaluation of front office operations to human resources management; studying front office procedures and management within the context of the overall operation of a hotel.

ICIH 413 Housekeeping Management**4 (4-0-8)****Prerequisites: ICHT 232**

Management of housekeeping duty within own establishment. Supervision and training of staff. Scheduling. Use of different cleaning agent. Safety within the work environment. Housekeeping technology and legendary quality service standards.

ICIH 414 Food and Beverage Management**4 (4-0-8)****Prerequisites: ICHT 232**

Decisions in food and beverage operations. Topics include increasing profits by maximizing service, efficiency and productivity; product knowledge to satisfy the food quality and nutritional demands of guests; meeting legal, safety and sanitation requirements; and building business through effective marketing.

ICIH 415 Lodging Property Management**4 (4-0-8)****Prerequisites: ICHT 232**

Organizational structures: management and operations of hotels and resorts, and their various departments; emphasize on management concepts and the decision making.

ICIH 421 Event Management**4 (3-2-7)****Prerequisites: ICHT 232**

Planning, organizing and managing event activities and the event environment, the industry's stakeholders, event infrastructure, marketing, human resources, contingency planning, legal issues, strategic management, and research, analysis and evaluation.

- ICIH 422 Sport Event Management** 4 (4-0-8)
Prerequisites: ICHT 232
 Evaluating the planning, concept, project development and implementation of Sport Event and sport tourism, include basic understanding and principles of Mega-Sport Event market, the promotion and marketing, human resources development, financial management, strategic planning for the industry.
- ICIH 423 Introduction to MICE Industry** 4 (4-0-8)
Prerequisites: ICHT 232
 Basic concepts and theories of MICE and their integration into practical application; looking into the nature of those activities that are related to MICE, resources required for carrying out MICE; the relationship between hospitality and tourism industry and the MICE sector.
- ICIH 424 Incentive and Convention Management** 4 (4-0-8)
Prerequisites: ICHT 232
 Understanding of incentive and convention management, hosting and co-ordination of familiarization visits, planning and taking sales promotional trips, participating in trade shows, and organizing convention promotion. In addition, this course covers marketing support, such as publication of sales aids and promotional materials, various audio-visual promotional aids, and other support materials.
- ICIH 425 Exhibition and Exposition Management** 4 (4-0-8)
Prerequisites: ICHT 232
 Exhibition and exposition business, a new channel for destination planning and promotion, focus on the major components of exhibition and exposition, the market, products and services, program development, market research with a highlight on CRM, public relations, business strategy development, venue management, intercultural human resource management, cost controls, and impacts assessment, exhibition and exposition logistics, stand construction, and service partner management are included.
- ICIH 431 Tourism Planning and Development** 4 (4-0-8)
Prerequisites: ICHT 232
 An introduction to tourism planning and development; investigating impacts of tourism on economic, socio-cultural, and physical environments; exploring issues concerning host-visitor relationship, environmental analysis and audit, sustainable tourism.
- ICIH 432 Airline Business Management** 4 (4-0-8)
Prerequisites: ICHT 232
 Airline organizations, airline regulations, airline routing, airline cost and revenue, aircraft structure, operations and marketing aspects, low cost airline management. The impacts of airline alliance and consolidation, the e-commerce revolution and sustainable airline development.
- ICIH 433 Tour Package Management** 4 (4-0-8)
Prerequisites: ICHT 232
 Roles and responsibilities of tour operators, types of major suppliers in the tourism industry, tour package planning and development, destination research, designing itineraries; quoting the selling prices of tour packages, tour executions, and post-tour services
- ICIH 434 Destination Marketing and Management** 4 (4-0-8)
Prerequisites: ICHT 232
 Framework for Destination Planning and Marketing, Environment and Resource Analysis, Target Marketing and Destination Branding Strategy, Destination Marketing Mix Strategy, Creative Destination Product Development, Strategies in Managing Destination Resources, and Interpretation for Destination Resources.

ICIH 435 Principles of Tour Guiding	4 (3-2-7)
Prerequisites: ICHT 232	
Principles of tour guiding namely etiquette, personalities, roles and responsibilities, understanding tourist behaviours, managing the unexpected, principles of interpretation for heritage attractions, essential knowledge of cultural heritage in Thailand, especially during Ayutthaya period to Bangkok modernity, including field work held at outstanding tourist attractions in Bangkok.	
ICIS 220 Computer Programming	4 (4-0-8)
Prerequisite: -	
Introduction to a computer programming language, elementary concepts covering problem solving and algorithm development, programming standards, variable types, control structures, loops and arrays.	
ICIS 221 Computer and Information Systems Fundamentals	4 (4-0-8)
Prerequisite: -	
Introduction to the major features of computer systems, the architecture of the central processing unit (CPU), secondary storage, I/O devices, databases, networking, electronic commerce, the programming process and systems analysis.	
ICIS 222 Social and Professional Issues in Computing	4 (4-0-8)
Prerequisite: -	
History of computing, social context, analytical tools and professional ethics, software risks, intellectual property, and privacy and civil liberties.	
ICIS 350 Computer Graphics	4 (4-0-8)
Prerequisite: -	
Fundamental concepts in creating graphical images on the computer; application of ideas from art, mathematics, and information technology to create images; use of software tools to create graphical images, applications, and solve problems.	
ICIS 360 Management Information Systems	4 (4-0-8)
Prerequisite: -	
Study of the relationship between information systems and organizations, how computers and information systems are integral to modern organizations from managerial and business point of views, Enterprise Resource Planning (ERP), Supply Chain Management (SCM), and Customer Relationship Management (CRM).	
ICIS 361 Database Systems	4 (4-0-8)
Prerequisite: -	
Logical organization of databases, the entity-relationship model, relational database concepts, data design, modeling and normalization; the use of Structured Query Language (SQL) to define, manipulate and test the database.	
ICIS 362 Data Mining and Business Intelligence	4 (4-0-8)
Prerequisite: -	
Concepts, algorithms, techniques, systems, and processes of data mining; roles, issues, benefits, and challenges of data mining in business applications; statistical methods and tools in business intelligence with emphasis on real-world applications.	
ICIS 370 Web Programming	4 (4-0-8)
Prerequisite: ICIS 220	
The use of internet-based programming language in the development of e-commerce applications, advanced HTML usage, PHP programming; accessing MySQL database, handling Apache server with VBScript.	

- ICIS 371 Computer Networking** 4 (4-0-8)
Prerequisite: ICIS 221
 Architecture and components of computer communications networks, protocol concepts and standards, OSI Reference Model, network/protocol architecture examples: Internet, Intranets, Extranets, and local area networks.
- ICIS 385 Information Technology Economics** 4 (4-0-8)
Prerequisite: -
 Economics of information systems and information technology; estimation, budgeting, budget management, cost accounting, value assessment, and accountability of information systems and information technology.
- ICIS 387 Information Systems Security** 4 (4-0-8)
Prerequisite: -
 Examination of potential security risks in today intensive information organizations; introduction to viruses, security reviews, encryption, authentication, firewalls, and disaster recovery plans.
- ICIS 390 Data Structures and Algorithms** 4 (4-0-8)
Prerequisite: ICIS 370
 Design and analysis of fundamental data structures and algorithms; linked lists, queues, stacks, hash tables, binary trees, heaps, basic graph algorithms, algorithmic strategies, computing and distributed algorithms, algorithmic complexity, and basic computability theory.
- ICIS 482 Systems Analysis and Design** 4 (4-0-8)
Prerequisite: ICIS 360, ICIS 361
 Systems analysis and design methodologies; technologies useful for developing quality and cost effective software; engineering of programming systems products; current problems in software development, time management, cost estimation models, growth dynamics, software reliability models, and models of program testing.
- ICIS 490 Business Computer Project** 4 (4-0-8)
Prerequisite: ICIS 360, ICIS 361
 The use of acquired cumulative knowledge and further self-study to investigate the needs and to analyze and design business information systems.
- ICLC 211 Pre-intermediate Chinese I** 4 (4-0-8)
Prerequisites: ICML 133
 Read and summarize passages, write letters, relate travel experience, describe one's appearance, the preposition "ba". (The preposition "ba" and its object which together function as an adverbial clause in sentences with verbs being the predicate.), express the continuation of an act, complement of direction, describe the degree level of state of things as they change over time, Chinese culture on weddings.
- ICLC 212 Pre-intermediate Chinese II** 4 (4-0-8)
Prerequisites: ICLC 211
 Express one's feelings. i.e. sadness, happiness, anger, pain, etc., relate someone's experience and evaluate behavior, the preposition "ba" (continued), express passive meaning by using the prepositions "bei", "jiao", "rang", complement of potentiality (I), reduplication of numeral-quantifier compounds, Chinese culture and custom on how to decorate a house.
- ICLC 213 Pre-intermediate Chinese III** 4 (4-0-8)
Prerequisites: ICLC 212
 Make and decline invitations and requests, to express agreements and disagreements, express one's wishes, and indicate the result of an act using complements of direction, the flexible use of interrogative pronouns, rhetorical questions to express affirmation or negation, complement of potentiality (II), Chinese idioms and proverbs.

ICLF 211 Pre-intermediate French I 4 (4-0-8)

Prerequisites: ICML 123

To talk about friends; to describe someone; to look for a job; to apply for a job; to give advice; to talk about professional activities and professional experiences; to report speeches (1); relative pronouns : qui, que, à qui; Imparfait and passé composé tenses; subjunctive mood to express necessity.

ICLF 212 Pre-intermediate French II 4 (4-0-8)

Prerequisites: ICLF 211

To talk about a country; to understand tourist information and to make a reservation. To talk about one's living environment; to justify a choice; to talk about a movie; relative pronouns : où, dont ; Pronouns en & y; Gerundive form. Past tenses review : imparfait / passé composé / plus-queparfait; passive voice (1).

ICLF 213 Pre-intermediate French III 4 (4-0-8)

Prerequisites: ICLF 212

To express wishes; to make a suggestion; to talk about a project; to talk about a book or an article; to express aims, causes and consequences; to express agreements and disagreements; to talk about changes in life; to express a regret; subjunctive mood to express wishes; conditional mood to make a suggestion; reported speeches and time accordance; past conditional to express past hypothesis and regret.

ICLG 211 Pre-intermediate German I 4 (4-0-8)

Prerequisites: ICML 103

Clothing and accessory, appearance, shopping for clothes and accessory family members, families in present and past, statistics, festivities and culture, dates, presents; comparative forms of adjectives, modal verbs past tense, dependent clauses (cause and condition), personal pronouns, accusative and dative case.

ICLG 212 Pre-intermediate German II 4 (4-0-8)

Prerequisites: ICLG 211

Housing II, furniture and equipment II, school and education, school system in Germany, future plans, appearance II, fashion and life style, description of persons; dependent clauses II, future tense, declination of adjectives.

ICLG 213 Pre-intermediate German III 4 (4-0-8)

Prerequisites: ICLG 212

Travel, weather and seasons, public transport; free time, learn to know people abroad, clubs, work and job search, job advertisement and application; impersonal verbs, modal verbs III, relative clauses, indefinite pronouns, phrasal verbs, dependent clauses (concessive).

ICLJ 211 Pre-intermediate Japanese I 4 (4-0-8)

Prerequisites: ICML 113

50 Kanji characters; expressing opinions, impressions, and expectations; reporting or quoting others' statements; describing and explaining people and things in details; giving directions; describing kind actions of other people using appropriate verbs; stating decisions, judgments, etc. based on the suppositions; asking for explanations, and explaining one's situations or reasons; asking for advices and instructions; expressing what one can or cannot do using potential verbs.

ICLJ 212 Pre-intermediate Japanese II 4 (4-0-8)

Prerequisites: ICLJ 211

50 Kanji characters; explaining state of things; describing necessary things to do in advance as preparations for the future; expressing own intentions, plans, and schedule; expressing own guess and inference; asking someone to take a message or conveying a message; stating standards or norms, when one explains the manner of doing a certain action or work; explaining a condition in which a certain action is performed; stating everyday habitual actions.

ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
Prerequisites: ICLJ 212	
50 Kanji characters; expressing judgments under certain conditions; stating a purpose or an aim; describing changes in human ability and conditions; describing an action performed by a third person, or an action when one feels annoyed or troubled, using passive verbs; expressing something with the most important information emphasized; describing natural phenomena, happenings, and events, together with their causes; clearly telling what speakers consider as questions, by using a question with an interrogative as a component of a sentence; using appropriate expressions for giving and receiving of things and actions, depending on the relationship between the giver and the receiver, in terms of social status; telling usage, evaluation, necessary time, expense, etc.	
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
Prerequisites: ICML 143	
Habits; pronominal verbs; porque/para; house; furniture and parts of the house; appearance; family, irregular verbs in present tense; present progressive.	
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
Prerequisites: ICLS 211	
Leisure activities; intentions and projects; pain, discomfort and symptoms; parts of the body; vocabulary of food; ir a+ infinitive; present perfect; differences between ser and estar; personal pronouns for objects; verb gustar.	
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
Prerequisites: ICLS 212	
Past habits, customs and circumstances, past and present action, advice, instructions (imperative), future; situations and actions, conditions, hypotheses, past experience; verb tense imperfect; verb tense indefinido; verb tense present perfect; contrast of past tenses.	
ICMA 102 Principles of Mathematics	4 (4-0-8)
Prerequisites: Placement Test or ICNS 100	
Functions, limits, continuity, derivatives, techniques of differentiation and application, antiderivatives, definite integrals and area.	
ICMA 106 Calculus I	4 (4-0-8)
Prerequisites: Placement Test or ICNS 100	
A brief review of trigonometry; limits and continuity; differentiation and its techniques; derivatives of algebraic and trigonometric functions; graph sketching; applications of the derivatives; antiderivative and integration; area under a curve and between two curves.	
ICMA 200 Principles and Mathematical Concepts	4 (4-0-8)
Prerequisites:	
Symbolic logic, proof techniques, sets, relations, functions, the real numbers, introduction to number theory.	
ICMA 211 General Mathematics I	4 (4-0-8)
Prerequisites: ICNS 102	
Techniques of integration, improper integrals, applications of integration, analytical geometry, infinite series, polar coordinates, parametric equations, vectors in the plane.	
ICMA 212 General Mathematics II	4 (4-0-8)
Prerequisites: ICMA 211	
Three-dimensional space; rectangular, spherical and cylindrical coordinates; functions of several variables; partial derivatives; multiple integrals; vector calculus; line and surface integrals of vector functions; Green's theorem; the divergence theorem; Stoke's theorem.	

- ICMA 213 Calculus II** 4 (4-0-8)
Prerequisites: ICMA 106
 Derivatives of logarithmic and exponential functions; techniques of integration; improper integrals and indeterminate forms; applications of the derivative and integration; infinite series; functions of several variables; limits and continuity; partial derivatives.
- ICMA 214 Ordinary Differential Equations** 4 (4-0-8)
Prerequisites: ICMA 106
 Prerequisites: ICNS 102 (For Computer Science Students)
 Introduction to ordinary differential equations, linear first order equations, nonlinear first order equations, applications of first order equations, second order linear equations, applications of second order linear equation, higher order linear equations.
- ICMA 215 Calculus** 4 (4-0-8)
Prerequisites: (For Computer Engineering Students Only) ICNS 102
 Derivatives of logarithmic and exponential functions; techniques of integration; improper integrals and indeterminate forms; applications of the derivative and integration; infinite series; functions of several variables; limits and continuity; partial derivatives.
- ICMA 219 Calculus of Several Variables** 4 (4-0-8)
Prerequisites:
 Vectors, three-dimensional space, cylindrical and spherical coordinates, functions of several variables, partial derivatives, calculus of vector-valued functions, multiple integrals, line and surface integrals of vector-valued functions, Green's theorem, the divergence theorem, and Stokes' theorem.
- ICMA 222 Introduction to Mathematical Software** 4 (3-2-7)
Prerequisites:
 Introduction to the use of several software packages which are useful to Mathematics students. Software for symbolic computing, software for numerical computing, and software for mathematical documents, introduction to spreadsheets.
- ICMA 231 Theory of Interest** 4 (4-0-8)
Prerequisites:
 Simple interest; compound interest; effective rate of interest; effective rate of discount; annuities; amortization schedule and sinking fund; yield rates; bonds and other securities; installment loans.
- ICMA 242 Discrete Mathematics** 4 (4-0-8)
Prerequisites:
 Basic logic, set theory, relations, functions, integers, counting technique, algorithms, method of proof, Boolean algebra, topics from graph theory, tree, modeling computation.
- ICMA 313 Number Theory** 4 (4-0-8)
Prerequisites:
 Divisibility, primes and their distribution, congruence, Fermat's theorem, Euler's generalization of Fermat's theorem, primitive roots and indices, quadratic reciprocity, quadratic congruence, perfect numbers.
- ICMA 316 Introduction to Graph Theory** 4 (4-0-8)
Prerequisites:
 Graphs and subgraphs, isomorphic graphs, graph and matrices, connectivity, Eulerian and Hamiltonian circuits, planarity, Euler's Formula, digraphs, graph colorings problems and chromatic polynomial, trees, shortest path minimal spanning tree, Ramsey number.

ICMA 319 Introduction to Combinatorial Mathematics	4 (4-0-8)
Prerequisites:	
Counting principles, inclusion-exclusion principle, recurrence relations, partitions and generating functions, Stirling's approximation, permutations and groups, graphs, counting patterns, Polya's Theorem.	
ICMA 321 Linear Algebra	4 (4-0-8)
Prerequisites:	
Matrices, determinant, linear equations, system of linear equations, vector spaces, linear transformations, eigenvalues and eigenvectors, inner product spaces.	
ICMA 322 Advanced Calculus	4 (4-0-8)
Prerequisites:	
Real and complex number systems; functions; continuity; convergence; differentiation; integration.	
ICMA 323 Partial Differential Equations	4 (4-0-8)
Prerequisites:	
Heat equation, method of separation of variables, Fourier series, wave equation, Laplace's equation.	
ICMA 324 Real Analysis	4 (4-0-8)
Prerequisites: ICMA 322	
Infinite series, sequence and series of functions, power series, fourier series.	
ICMA 331 Special Functions	4 (4-0-8)
Prerequisites: ICMA 214	
Orthogonal polynomials, gamma functions, beta functions, hypergeometric functions, Legendre functions, spherical harmonics in p dimensions, Bessel functions.	
ICMA 333 Boundary Value Problems	4 (4-0-8)
Prerequisites: ICMA 323	
Sturm-Liouville eigenvalue problems, nonhomogeneous problems, Green's function and generalized Green's function.	
ICMA 335 Complex Variables	4 (4-0-8)
Prerequisites:	
Complex numbers, analytic functions; Cauchy-Riemann equations; conformality; Cauchy's Theorems, maximum modulus principle, Liouville's Theorem, Residue Theorem and evaluation of real integrals, principle of arguments, Rouché's Theorem.	
ICMA 337 Numerical Methods	4 (3-2-7)
Prerequisites: ICCS 100 and ICCS 101	
Introduction to the use of computers to solve scientific problems, numerical solution of nonlinear equations, linear algebra systems, the interpolation and approximation of functions, differentiation and integration, and differential equations.	
ICMA 341 Fluid Dynamics	4 (4-0-8)
Prerequisites: ICMA 214	
Review of fluid mechanics, including one dimensional flow, two dimensional motion, Eulerian methods and momentum, the pressure equation, general equations of motions, irrotational motion, viscous fluid, stream functions, complex potential, method of images, and basic singularities.	

ICMA 344 Time Series Analysis**4 (4-0-8)****Prerequisites: ICSC 303**

Basic principles of representing time series in both the time and frequency domains; Box and Jenkins technique of fitting data to autoregressive moving average models in the time domain; model construction; evaluation and forecasting; analysis of time domain and digital filtering; methods of estimating and interpreting the spectrum.

ICMA 346 Optimization**4 (4-0-8)****Prerequisites: ICMA 337**

Introduction to the theory and algorithms of linear and nonlinear programming, linear programming, simplex method, duality theory and sensitivity analysis, large-scale linear programming, unconstrained nonlinear optimization, constrained optimization problems.

ICMA 348 Numerical Methods for Partial Differential Equations**4 (4-0-8)****Prerequisites: ICMA 323 and ICMA 337**

Forming and solving elliptic difference equations, relaxation, conjugate gradient and multigrid solution algorithms, discrete maximum principles and error estimates, explicit and implicit difference schemes for parabolic equations and systems, stability of difference schemes, parabolic free boundary problems, Stefan problems, Stochastic algorithms, first-order hyperbolic equations and systems in one space variable.

ICMA 350 Probability**4 (4-0-8)****Prerequisites: ICMA 219**

Sample spaces; basic axioms of probability; conditional probability and independence. Random variables, expectation and moment-generating functions. Discrete and continuous distributions. Multidimensional distributions and transformations. Central limit theorem. Sampling distribution theory.

ICMA 352 Experimental Design**4 (4-0-8)****Prerequisites: ICSC 303**

Basic principles of experimental design; completely randomized design; randomized block design; Latin square design; factorial experiments; confounding; split-plot experiment.

ICMA 353 Actuarial Mathematics I**4 (4-0-8)****Prerequisites:**

Stochastic approach to life insurance models using the life table and mathematics of finance; calculation of net premiums and reserves for life insurance; types of annuity products.

ICMA 354 Actuarial Mathematics II**4 (4-0-8)****Prerequisites: ICMA 353**

Survival probability; joint life probabilities; last survivor and compound status functions; premiums; life insurance for other status; annuities; annuities paid after death.

ICMA 355 Introduction to Operation Research**4 (4-0-8)****Prerequisites:**

Introduction to quantitative analysis, formulation of linear optimization, algebraic and geometric models, simplex method, sensitivity testing, duality, optimization in network, network algorithm.

ICMA 356 Decision Analysis**4 (4-0-8)****Prerequisites: ICSC 303**

Decision models; expected monetary values; decision flow diagrams; probability assessment; optimization techniques; perfect information; opportunity losses; uncertain payoffs; biased measurements; utility theory; judgmental probability; normal form of analysis; economics of sampling; risk sharing.

ICMA 360 Sampling Techniques	4 (4-0-8)
Prerequisites: ICSC 303	
Survey methods and planning a survey; elements of random sampling; choices of sampling units; estimation of sample size; techniques of sampling such as simple random, unequal probability, stratified, systematic, cluster, two-stage sampling and miscellaneous survey techniques. Errors and non-response.	
ICMA 393 Special Topics in Applied Mathematics I	4 (4-0-8)
Prerequisites:	
Topics of current interest.	
ICMA 395 Special Topics in Applied Mathematics II	4 (4-0-8)
Prerequisites:	
Topics of current interest.	
ICMA 423 Set Theory	4 (4-0-8)
Prerequisites:	
Historical introduction, classes and sets, functions, relations, partially orders classes, axiom of choice and related principle, natural numbers, finite and infinite sets, arithmetic of cardinal numbers, arithmetic of ordinal numbers.	
ICMA 424 Abstract Algebra	4 (4-0-8)
Prerequisites:	
Partitions and equivalence relations, binary operations, groups, subgroups, permutations, cyclic groups, isomorphism, direct products, cosets, normal subgroups, factor groups, homomorphism, rings, fields, integral domains.	
ICMA 425 Introduction to Topology	4 (4-0-8)
Prerequisites:	
Topological spaces, closed sets, open sets, homeomorphisms, continuous functions, metric topology, connected spaces, compact spaces, countability axioms, separation axioms, normal spaces, Urysohn lemma, Urysohn metrization theorem.	
ICMA 432 Multivariate Analysis	4 (4-0-8)
Prerequisites: ICSC 303	
Multivariate normal distribution; multiple and partial correlation; Wishart distribution; Hotelling's T distribution; multivariate analysis of variance; discriminant analysis; factor analysis.	
ICMA 434 Introduction to Fourier Analysis	4 (4-0-8)
Prerequisites: ICMA 322 and ICMA 335	
Fourier coefficients and Fourier series, L2 spaces, convolution and the delta function, Fourier transforms.	
ICMA 435 Regression Analysis	4 (4-0-8)
Prerequisites: ICSC 303	
Simple and multiple regression, diagnostics, model selection, models with categorical variables.	
ICMA 441 Viscous Fluid	4 (4-0-8)
Prerequisites: ICMA 214	
Couette and Poiseuille Flow, Navier-Stokes Equation, Small Reynolds number flows, Flow in Convergent and Divergent Channels, Boundary Layer Analysis, Flow Along a Flat Plate; Displacement Thickness; Curved Walls and Separation; Instability of Vortex Motion.	

ICMA 444 Research Project in Applied Mathematics	6 (6-0-12)
Prerequisites:	
Small research project in Mathematics or related fields under the supervision of an advisor.	
ICMA 445 Seminar in Applied Mathematics	2 (2-0-4)
Prerequisites:	
Student presentations and discussions of research; review of topics.	
ICMA 450 Introduction to Mathematical Modeling	4 (4-0-8)
Prerequisites: ICMA 214, ICMA 321 and ICMA 337	
Concepts of mathematical modeling. modeling methods, understand the problem, choosing variables, making assumptions, solving the equations, interpreting the solution and validating the model. improving the Model. Classic models such as Predator-prey Interaction, numerical methods for Mathematical Models.	
ICMA 484 Special Topics in Applied Mathematics III	4 (4-0-8)
Prerequisites:	
Topics of current interest.	
ICMA 485 Special Topics in Applied Mathematics IV	4 (4-0-8)
Prerequisites:	
Topics of current interest.	
ICMB 203 Microeconomics	4 (4-0-8)
Prerequisite: None	
Introduction to microeconomics principles, pricing theory, economic scarcity, consumer behavior, production costs, market structure, utility analysis, and distribution of income.	
ICMB 204 Macroeconomics	4 (4-0-8)
Prerequisites: -	
Introduction to macroeconomics principle, theories of output, consumption, inflation, unemployment, fiscal and monetary policy, international monetary system.	
ICMB 211 Fundamental Financial Accounting	4 (4-0-8)
Prerequisites: -	
Business transactions and financial statements. evolution of accounting, recording and classifying financial transactions, the preparation of financial statements, characteristics of various types of accounts, the accounting principles, and the usefulness and limitations of accounting information.	
ICMB 212 Managerial Accounting	4 (4-0-8)
Prerequisite: ICMB 211	
Cost accounting and the role of managerial accounting in planning, organizing, controlling functions, and decision support.	
ICMB 221 Principles of Marketing	4 (4-0-8)
Prerequisites: -	
General knowledge of marketing, introduction of marketing planning, consumer behavior, marketing research, target market selection, positioning strategy and marketing mix elements, product strategy, channel of distribution, pricing strategy, promotional activities.	

- ICMB 231 Business Communication** 4 (4-0-8)
Prerequisite: None
 Written and oral communication in formal and informal business settings, basic understanding of communication processes in the business environment, practical experiences gained through business writing assignments and presentations, professional development topics such as career planning, networking, job searching, resume preparation, and job application and interviewing are discussed.
- ICMB 234 Management and Organizational Behavior** 4 (4-0-8)
Prerequisite: None
 A study of the role of manager in an organization, an emphasis on understanding the behavioral and administrative theories and concepts needed to succeed in contemporary organizations. Topics include motivation, leadership, managing teams, teamwork, and human resources management.
- ICMB 282 Computer Software Usage Skills** 4 (4-0-8)
Prerequisite: None
 Basic computer literacy use of application program as business communication and analysis tools (database management systems, spreadsheets, and presentation graphics) with an emphasis on applications in major business functions such as accounting, finance, marketing, production, and human resources.
- ICMB 341 Business Law** 4 (4-0-8)
Prerequisite: None
 Business law, government regulations, elements of contract, partnership and company law, employment law, revenue law.
- ICMB 351 International Business Management** 4 (4-0-8)
Prerequisite: ICMB 234
 International business operations, organization structure, finance and accounting systems, taxation system, marketing strategy, cultural differences, global trade, capital markets and economic growth, the impact of regional trading blocs, corporate global competitiveness, and global strategies.
- ICMB 363 Management Science** 4 (4-0-8)
Prerequisite: None
 Application of quantitative analysis techniques using computers to solve business problems. Linear programming, network models, decision analysis, and simulation.
- ICMB 364 Operations Management** 4 (4-0-8)
Prerequisite: ICMB 234
 Issues facing manufacturing and service firms. Forecasting, product/process design, inventory and supply chain management, project management, and quality management.
- ICMB 371 Business Finance** 4 (4-0-8)
Prerequisites: ICMB 211
Prerequisites: (For Computer Science Students Only) ICNS 102 and ICMB 211
 An introduction to the principles of financial management, the role of finance within the firm, the firm and its objectives, time value of money, valuation of financial assets, capital budgeting techniques, risk and return, costs of capital, estimation and forecasting of cash flows, project evaluation, and other financial management tools.
- ICMB 431 Strategic Management** 4 (4-0-8)
Prerequisite: ICMB 351
 The fundamental elements of organizational management strategy, the process and frameworks of strategic management, the internal and external environment, the mission of the organization, organizational objectives and policies, and business strategy.

ICMB 432 Business Ethics	4 (4-0-8)
Prerequisite: ICMB 351	
An understanding, analysis of ethical concepts, and the implications of ethics in business decisions under different social and other business-related environments, an application of ethical principles to ethical issues within the organization and the external environment.	
ICMB 481 Special Topics in Business (1)	4 (4-0-8)
Prerequisite: Juniors	
A study of contemporary issues, industry trends, theories, and best practices in business in response to the changing business environment.	
ICMB 482 Special Topics in Business (2)	4 (4-0-8)
Prerequisite: Juniors	
A study of contemporary issues, industry trends, theories, and best practices in business in response to the changing business environment.	
ICMB 483 Special Topics in Business (3)	4 (4-0-8)
Prerequisite: Juniors	
A study of contemporary issues, industry trends, theories, and best practices in business in response to the changing business environment.	
ICMB 484 Special Topics in Business (4)	4 (4-0-8)
Prerequisite: Juniors	
A study of contemporary issues, industry trends, theories, and best practices in business in response to the changing business environment.	
ICMB 485 Special Topics in Business (5)	4 (4-0-8)
Prerequisite: Juniors	
A study of contemporary issues, industry trends, theories, and best practices in business in response to the changing business environment.	
ICMB 491 Practical Business Training – On Campus	8 (0-24-8)
Prerequisite: Juniors	
Serving an internship at MUIC's training facility, learning the day to day operations of the business, and emphasizing on the importance of planning, organizing, leading, and controlling.	
ICMB 492 Practical Business Training – Off Campus	12 (0-36-12)
Prerequisite: Seniors	
Serving an internship at a company outside MUIC, placements arranged according to major.	
ICMB 494 Business Plan for Entrepreneur	8 (4-12-12)
Prerequisite: Juniors	
Developing a comprehensive and effective business plan that can be adapted for a small business and community based project.	
ICMB 495 Business Practices	8 (4-12-12)
Prerequisite: Juniors	
Business consulting practices with real business cases under a supervision of an advisor.	
ICME 100 English Resources Skills	0 (4-0-0)
Prerequisites: Placement test	
A remedial course that prepares students to read and write academic English at a level suitable for entry to Intermediate English Communication I.	

- ICMF 372 Financial Management** **4 (4-0-8)**
Prerequisite: ICMB 371
 Financial policies affecting decision making in financial management, the differences in the need for finance in terms of the operational characteristics of particular industries, long-term financial planning, net working capital management, asset pricing theory, efficient market hypothesis, capital structure, and dividend policy.
- ICMF 375 Multinational Corporate Finance** **4 (4-0-8)**
Prerequisite: ICMB 371
 Characteristics and roles of international financial markets, foreign exchange markets, financial cross border trade, currency risk and portfolio diversification, introduction to derivative markets and international monetary systems affecting the management of multinational business corporations.
- ICMF 377 Money and Capital Markets** **4 (4-0-8)**
Prerequisite: ICMB 371
 Overview of institutions, financial products, and processes by which capital is directed from savers to borrowers, fundamental of organization and structure of markets, money market instruments, derivative markets, equity markets, debt markets, and foreign exchange markets.
- ICMF 378 Banking and Financial Institution Management** **4 (4-0-8)**
Prerequisite: ICMB 371
 Examine the practices, procedures, techniques and tools to operate and manage commercial, investment, and saving banks or financial institutions, analyzing bank performance, managing noninterest income and expenses, managing interest risk, liquidity plan of banking, evaluating commercial and consumer loans, global banking activities.
- ICMF 379 Investment Analysis and Portfolio Management** **4 (4-0-8)**
Prerequisite: ICMF 372
 Introduction of developments in investment theory, valuation principles and practices, stock, bond and derivatives analysis, specification and evaluation of asset management, quantitative and qualitative aspects of risk and return associated with investment decisions, and fundamental, technical, and random-walk approaches to valuation.
- ICMF 478 Risk Management** **4 (4-0-8)**
Prerequisite: ICMF 372
 Introduction to the management of financial risks, market risk, credit risk, operational risk, implementation of risk management techniques, the value at risk, the reduced-form approach, and the structural approach used by corporate and financial institutions in the identification, assessment, and monitoring of risk.
- ICMF 480 Cases and Financial Modeling** **4 (4-0-8)**
Prerequisite: ICMF 372
 Employing of Microsoft Excel, Visual Basic and other software packages in application of several topics of financial management to cases analysis, the modeling of asset valuation, capital budgeting, cash management, cash flow analysis, and application of the Monte Carlo simulation.
- ICMF 481 Financial Derivatives** **4 (4-0-8)**
Prerequisite: ICMF 372
 Introductions of mechanics of future, option, and swap markets, determination of forward, future and option prices, emphasizing on the technical and mathematical tools including binomial trees, wiener processes and the Black-Sholes-Merton model, implementing of trading strategies involving, forward, future, option, and swaps.

ICMI 352 Legal issues in International Business Prerequisite: ICMB 341 An examination of regulations and legal aspects of international business, written contracts, cultural attitudes and incentives, documents of foreign investment, antitrust law, foreign layoffs, disclosure requirements, and protection of copyrights, patents and trademarks.	4 (4-0-8)
ICMI 359 Strategic Human Resource Management Prerequisite: ICMB 234 Human resource environment and trends, the acquisition and preparation of international human resources, the assessment and development of international human resources, compensation of international human resources, multicultural topics relating to human resource management.	4 (4-0-8)
ICMI 361 Global Leadership Development Prerequisite: ICMB 234 Current models and approaches for managerial behavior at the global level, developing managerial and leadership skills, and strategic planning and policy development.	4 (4-0-8)
ICMI 454 International Logistics Management Prerequisite: ICMB 351 The nature of international problems associated with the supply, distribution, and sourcing of products, the operational support of market development in foreign countries, international sourcing and the management of supply and distribution activities.	4 (4-0-8)
ICMI 456 Export-Import Management Prerequisite: ICMB 351 The basics of exporting and importing management, an introduction to the intricacies of how export and import deals function, procedures and documentation, identifying an international trade opportunity and bringing the opportunity to fruition.	4 (4-0-8)
ICMI 457 International Business Negotiations Prerequisite: ICMB 351 An exploration of negotiation concepts developed in a number of academic fields, including psychology, law, finance, and communication; exposition to experience in real negotiations; development of individual abilities to negotiate through a series of individual and class exercises and negotiation simulations; realization of one's own negotiating preferences and the consequences of the choices made; ability to accept and offer feedback on negotiation behavior demonstrated and observed.	4 (4-0-8)
ICMK 314 Marketing Research Prerequisite: ICMB 221 Introduction of marketing research and its role in marketing decisions, qualitative and quantitative research procedures, tools, analyses, and result presentations.	4 (4-0-8)
ICMK 316 Consumer Behavior Prerequisite: ICMB 221 Theories of consumer behavioral analysis, consumer decision-making process, consumer psychological processes, social and cultural dimension in the consumer purchasing process and their impact on marketing decision.	4 (4-0-8)
ICMK 319 New Product Management Prerequisite: ICMB 221 Process of bringing new products and services to market within the strategic context, including technique for idea generation, development of product and service to meet consumer needs, testing feasibility of idea, strategies in developing and positioning products and product lines throughout the product life cycle, new product and service introduction, improvements, and deletion strategy.	4 (4-0-8)

- ICMK 322 Brand Management** 4 (4-0-8)
Prerequisite: ICMB 221
 Brand management and strategy in creating, leveraging, and preserving brand equity, the use of qualitative and quantitative methods in evaluating brand equity, brand strategy at different stages of the product life cycle, development of brand positioning, managing total brand experience and brand relevancy.
- ICMK 323 Integrated Marketing Communications** 4 (4-0-8)
Prerequisite: ICMB 221
 The nature and purpose of integrated marketing communications, specifically addresses communication process, target audience selection, communication objective, budgeting, creative strategy, and media strategy.
- ICMK 328 Marketing Channel Management** 4 (4-0-8)
Prerequisite: ICMB 221
 Management of the firm's distribution systems, role of channel members, the impact of marketing channel decisions on marketing strategy, channel design and management, and an overview of supply chain management.
- ICMK 420 Business-to-Business Marketing** 4 (4-0-8)
Prerequisite: ICMB 221
 Understanding of the nature of organization buyers and its buying behavior, business buyer segmentation, supply chain management, customer relationship management, pricing, and product development.
- ICMK 424 Global Marketing Strategy** 4 (4-0-8)
Prerequisite: ICMB 221
 Management of international marketing strategy, frameworks for developing international marketing strategy, sources of sustainable competitive advantage, international market source analysis, market entry strategy, and integration of marketing strategy with other functional strategies.
- ICMK 429 Pricing Strategy and Tactics** 4 (4-0-8)
Prerequisite: ICMB 221
 An integrative approach to understand and evaluate the firm's pricing strategy and tactics, drawing upon several disciplines such as marketing, economics, management, and psychology. Fundamental of business pricing strategy and tactics in theoretical and applied context, the dynamic of pricing and the influence of price on customer value, as well as the firm's profits, and the competitors' responses to the firm's pricing strategy.
- ICML 101 Elementary German I** 4 (4-0-8)
Prerequisites: -
 Greetings, introduce oneself or others, German alphabet and phonemes, personal information, numbers from 1 – 100 and price quotations, express wishes, tell the time and make appointments, quality of items, shop in a supermarket, measurements; verb forms, pronouns, sentence structure, gender of nouns, accusative case and plural forms, negation.
- ICML 102 Elementary German II** 4 (4-0-8)
Prerequisites: ICML 101
 Order and pay for meals in a restaurant, preferences of food and drinks, giving and asking for directions, reading a map, preferences of work conditions, job advertisements; essay writing, yes/no questions, imperative forms, compound verbs, preposition with dative case, modal verbs I, German sentence bracket.

- ICML 103 Elementary German III** **4 (4-0-8)**
Prerequisites: ICML 102
 Health advice and problems, healthy and unhealthy life styles, housing I, advertisement for apartments, furniture and equipment I, events and accidents, travel reports, curriculum vitae (CV); possessive articles in nominative, accusative and dative case, perfect tense, connectors, modal verbs II.
- ICML 111 Elementary Japanese I** **4 (4-0-8)**
Prerequisites: -
 Hiragana and Katakana characters; greeting and introducing oneself; pointing at things and asking about them; asking places of various things; asking about products and their prices; telling time and days of the week; describing simple daily activities; expressing actions using vehicles; inviting a person to do things together; Number 0-1,000,000.
- ICML 112 Elementary Japanese II** **4 (4-0-8)**
Prerequisites: ICML 111
 40 Kanji characters; asking what things are called in Japanese; describing the action of giving and receiving things between people; describing situations and feelings using adjectives; expressing what one likes/dislikes and is good/poor at; describing reasons and causes; describing the existence of things, people and animals; expressing the quantity of various things; expressing feelings and impressions about the past events and experiences; expressing what one wants and wants to do.
- ICML 113 Elementary Japanese III** **4 (4-0-8)**
Prerequisites: ICML 112
 40 Kanji characters, giving instructions and offerings; describing what one is doing; asking permissions and understanding prohibited actions; describing family and work; giving simple description and explanation about people, things and places; making confirmation on what one has to and does not have to do; describing hobbies; describing the changes of things and situations; making conversation with friends using plain style of speech.
- ICML 121 Elementary French I** **4 (4-0-8)**
Prerequisites: -
 Numbers from 0 to 69; how to introduce yourself; greet other people; gender of nouns; plural of nouns; articles (definite, indefinite); qualifying adjective; present tense forms of verbs: tell and understand phone numbers; tell dates.
- ICML 122 Elementary French II** **4 (4-0-8)**
Prerequisites: ICML 121
 Talk about a trip schedule; tell and ask for the date and the time; check in in a hotel; enquire about hotel facilities; purchase a train ticket; understand and give directions ; count from 100 to 1000 ; interrogative forms (3) (Questions with est-ce que, qu' est-ce que, que, quoi, combien de...); present tense forms of the -er, -ir, -re -oir, negative form.
- ICML 123 Elementary French III** **4 (4-0-8)**
Prerequisites: ICML 122
 Book a table and order a meal at a restaurant; tell what you like and what you don't like; order traveller's cheques and ask for exchange rates, open a bank account; buy gifts; ask for and understand directions; imperative mood; future tense; buy clothes; telling quantities; partitive article, passé composé built with avoir; 'Going to' future tense: aller + infinitive; present tense conjugations patterns (recapitulation); complex negative patterns.

ICML 131 Elementary Chinese I**4 (4-0-8)****Prerequisites: -**

Chinese phonetics (Pinyin), Chinese strokes and stroke order rules, greet people and inquire about someone's personal information (name, nationality place of study, address, telephone numbers), construct question sentences using basic questions words, place orders at restaurant, inquire about prices of things, numbers from 0-10,000, measure words, write 200 Chinese characters.

ICML 132 Elementary Chinese II**4 (4-0-8)****Prerequisites: ICML 131**

Introduce oneself and one's family, inquire about someone's daily activities and hobbies, enquire about an amount of something using 几 or 多少, tell time and date, tell directions, interrogative form: 还是, 呢, reduplication of verbs, write 200 Chinese characters.

ICML 133 Elementary Chinese III**4 (4-0-8)****Prerequisites: ICML 132**

Modal verbs, complement of state, modal particle “了”, complement of result and complement of duration, complex sentences and comparative sentences, write 200 Chinese characters.

ICML 141 Elementary Spanish I**4 (4-0-8)****Prerequisites: -**

Basic personal information; conjugate verbs (present tense); verbs ser, tener and llamarse; gender; alphabet; count from 0 to 100; places and countries; express existence; verbs talk about location; verbs hay and estar; prepositions a, con de, por and para.

ICML 142 Elementary Spanish II**4 (4-0-8)****Prerequisites: ICML 141**

Objects, colors, and clothes, preference, interests and appearance, habits and express frequency, tell the time, in a restaurant; information about food; conjugation in present of some irregular verbs; verb gustar; articles el, la, los, las; count from 100; pronominal verbs.

ICML 143 Elementary Spanish III**4 (4-0-8)****Prerequisites: ICML 142**

Towns, quarters and cities; directions; past experience; present perfect tense, past tense indefinido; verbs ser, estar and hay; vocabulary of places; time markers for past tense; verbs empezar a+ infinitive; verbs ir / irse.

ICML 160 Introduction to Thai Language and Culture**4 (4-0-8)****Prerequisites: -**

Vocabulary and structures for various communicative situations in everyday use and introduce basic aspects of Thai culture.

ICML 161 Elementary Thai I**4 (4-0-8)****Prerequisites: -**

Greeting and introducing oneself, talking about one's family, counting from 0 – 9,999, place names and locations, various types of transport, talking about price, sizes and colors, asking for bargain, telling the time (day time) and days of the weeks, Thai consonants, long vowels placed before, after, above, and below initial consonants and corresponding short vowels, reading short sentences.

ICML 162 Elementary Thai II Prerequisites: ICML 161 Telling the time (night time) and duration of time, making appointments, ordering food and drinks, making special requests when ordering food and drinks, telling the date, buying different types of tickets, departure and arrival time, the first six months of the year, different regions of Thailand, vowels placed around initial consonants, special vowels เ-็, เ-ย, etc., consonant clusters, “ห” followed by unpaired low consonants, tone marks, unwritten vowels, 20 words written with ไ- , special spelling rules and exceptions อย่า อยู่ อย่าง อยากร, writing short sentences and reading short paragraphs.	4 (4-0-8)
ICML 163 Elementary Thai III Prerequisites: ICML 162 Last six months of the year, making hotel reservations and checking in, symptoms of illness, different sections in a hospital, seasons and weather, Thai ways of life by the river, new year celebration in different cultures, reading text on life in a Thai house by the canal, visiting a temple, Thai new year, Chinese new year, and Christmas celebration in Thailand, writing short paragraphs.	4 (4-0-8)
ICML 171 Elementary Indonesian I Prerequisites: - Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level.	4 (4-0-8)
ICML 172 Elementary Indonesian II Prerequisites: ICML 171 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 1 – ICML 171.	4 (4-0-8)
ICML 173 Elementary Indonesian III Prerequisites: ICML 172 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 2 – ICML 172.	4 (4-0-8)
ICML 181 Elementary Burmese I Prerequisites: - Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level.	4 (4-0-8)
ICML 182 Elementary Burmese II Prerequisites: ICML 181 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 1 – ICML 181.	4 (4-0-8)
ICML 183 Elementary Burmese III Prerequisites: ICML 182 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 2 – ICML 182.	4 (4-0-8)
ICML 191 Elementary Cambodian I Prerequisites: - Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level.	4 (4-0-8)

ICML 192 Elementary Cambodian II Prerequisites: ICML 191 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 1 – ICML 191	4 (4-0-8)
ICML 193 Elementary Cambodian III Prerequisites: ICML 192 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 2 – ICML 192	4 (4-0-8)
ICNS 015 Refresher Mathematics Prerequisites: Placement test Real Numbers, Exponents and Radicals, Operations with real numbers and algebraic expressions, Factoring, Fractions, Linear and Quadratic equations, Linear Inequalities, Applications of Equations and Inequalities, Absolute Value, Functions and their graphs.	0 (4-0-0)
ICNS 100 Intensive Mathematics Prerequisites: Placement test or ICNS 015 Lines, linear functions, quadratic functions, systems of linear equations, nonlinear systems, exponential and logarithmic functions, exponential and logarithmic equations, matrices, matrix addition and scalar multiplication, matrix multiplication, matrix reduction, inverses of matrices, determinants, Cramer's rule.	0 (4-0-0)
ICNS 101 Introduction to Mathematics Prerequisites: Placement test or ICNS 100 Limit and continuity, introduction to differential and integral calculus with applications.	4 (4-0-8)
ICNS 102 Principles of Mathematics Prerequisites: Placement test or ICNS 100 Functions, limits, continuity, derivatives, techniques of differentiation and application, antiderivatives, definite integrals and area.	4 (4-0-8)
ICNS 103 Fundamental Mathematics Prerequisites: Placement test or ICNS 100 Limits and continuity, differentiation, curve sketching, applied maxima and minima, integration, area between curves, multivariable functions; partial differentiation.	4 (4-0-8)
ICNS 104 Fundamental Statistics Prerequisites: ICNS 103 Descriptive statistics, modern statistical methods as a basis for decision making in the face of uncertainty; probability theory; discrete and continuous distributions, sampling, hypothesis testing, estimation, simple linear regression analysis.	4 (4-0-8)
ICNS 105 Basic Mathematics Prerequisites: - Whole numbers, introduction to algebra, integers, rational numbers, decimals, operations with real numbers, solving equations, applying, inequalities, solving inequalities, powers and polynomials, factoring polynomials, rational expressions, ratio and proportion, percent, rectangular coordinate system, basic geometry, statistics and graphs, probability.	4 (4-0-8)

- ICNS 111 Fundamental Biology** 4 (4-0-8)
Prerequisites: -
Principles and methods of biology with a focus on aspects directly relevant to human life, society and the economy; chemical and cellular basis of life, including development and metabolism, the origin, evolution, diversity and interdependence of life, and areas of topical importance including genetic technology, medicine and environmental awareness.
- ICNS 112 Integrated Biology** 4 (4-0-8)
Prerequisites: -
Diversity and development of life; origin of life; cell; energy transformation; genetics; natural selection and evolution; ecology awareness.
- ICNS 114 The Science of the Human Body** 4 (4-0-8)
Prerequisites: -
Basic structure of a cell, the immune system, and several bodily systems; basic look into how several of the primary functions operate, such as tissue structure, endocrine system, respiration, digestion, reproduction, the nervous system, and the sense organs.
- ICNS 115 Hominid Evolution and Primate Society** 4 (4-0-8)
Prerequisites: -
The origins and evolution of the hominids, to natural selection, and to the study of non-human primate societies within the evolutionary framework; origins of human species, examining the origins of some of the more important physical and behavioral traits that distinguish humans from other non-human mammalian relatives; the biological and behavioral characteristics of human and nonhuman primates – both extinct and extant.
- ICNS 116 Mushrooms, Molds and Mankind** 4 (4-0-8)
Prerequisites: -
How fungi, people and societies interact; industrial applications of fungi using relevant scientific information and techniques; identification of various fungi, mostly mushrooms, will also be included.
- ICNS 117 Plants, People, and Society** 4 (4-0-8)
Prerequisites: -
How people and societies interact with the plant and fungal worlds; differences among cultures and the indigenous uses of medicinal, textile and food plants; the benefits, problems and social implications of their use.
- ICNS 121 Fundamental Chemistry** 4 (4-0-8)
Prerequisites: -
Enables students to understand basic reactions at the atomic and molecular level and their use in common processes such as in industry and manufacturing. Students will attain better understanding of how science in general and chemistry in particular helps us understand and develop our world and solve problems.
- ICNS 122 Principles of Chemistry** 4 (4-0-8)
Prerequisites: -
Atomic structure, chemical bonding, gases, solids and liquid solutions, stoichiometry, chemical equilibria, ionic equilibria, periodic properties of representative and transition elements.
- ICNS 131 Fundamental Physics** 4 (4-0-8)
Prerequisites: -
Basic concepts of physics that impact individuals and society on a daily basis: physical quantities, Newtonian mechanics and dynamics, energy and heat, electricity and magnetism, light and sound, and the electromagnetic spectrum.

ICNS 132 Principles of Physics**4 (4-0-8)****Prerequisites: -**

Measurement, units and dimensions; vectors; description of motion; Newton's Laws of Motion; work; kinetic energy, potential energy, conservation of energy; linear momentum and it's Law of the Conservation; equilibrium and elasticity; periodic motion; one dimensional wave motion; sound and hearing; hydrostatics; heat and thermal properties of mater; electricity and magnetism; geometrical optics; nuclear physics.

ICNS 133 Introduction to Astronomy**4 (3-2-7)****Prerequisites: -**

Basic ideas of astronomy, astrophysics and cosmology; the progress of human understanding of the universe; the impact of scientific method on astronomical observation; the Earth & the Moon; the Solar System; the lifecycle of stars; Black Holes; galaxies; and the current understandings about the origins and future of the universe.

ICNS 141 Computer Essentials**4 (3-2-7)****Prerequisites: -**

Skills and knowledge to interact and learn in a digital environment more effectively on a personal level; hands-on experience with commonly used software packages and operating systems, computer security.

ICNS 142 Introduction to Internet Technology**4 (3-2-7)****Prerequisites: -**

Characteristics and types of communication technologies commonly used on the Internet; Internet standards and technology; the uses of online services; basic HTML; basic scripting in JavaScript.

ICNS 143 Fundamental of Computer Science**4 (4-0-8)****Prerequisites: -**

History of computer science; algorithms in theory and practice; binary numbers, Boolean logic, and gates; an introduction to computer organization and system software, such as operating systems; basic networking concepts and information security; high-level language programming. Real world examples of computer science applications will be examined, such as using data structures to enable spellcheckers; artificial intelligence in search engines and navigation systems; and creating computer graphics for entertainment media.

ICNS 152 Southeast Asian Ecology**4 (3-2-7)****Prerequisites: -**

Overview of the ecological systems of Southeast Asia, and discusses the current impacts and potential threats to the ecosystems; the protected area system and its role in protecting intact ecosystems, in the conservation of biological diversity, in providing ecological services, and as a key component of eco-tourism; relationship between ecosystem protection and sustainable development, and the international conventions that relate to ecosystem protection; ecofriendly guidelines for developers and planners.

ICNS 153 Ecosystems and Natural Resources**4 (3-2-7)****Prerequisites: -**

Human impacts on ecosystems and natural resources; structure, function and diversity of global ecosystems, ecosystem valuation and management, and threats to ecosystem function including climate change, pollution and extinction; scientific approaches to investigation of the causes and potential solutions of threats to ecosystems are discussed. A day trip for direct observation and study of ecosystem function and management is required.

ICNS 154 Science, Technology and Environment**4 (4-0-8)****Prerequisites: -**

Progress of science and technology and its impact on humans and the environment; technology's ability to improve the quality of life; modification of natural systems to achieve human benefits; propagation of plants; ramification of food production; new energy sources; their effects on the environment, such as CFC in aerosol and ozone depletion, nuclear power plants, disposal and treatment of waste materials from industry, and environmental conservation.

ICNS 161 General Geology**4 (3-2-7)****Prerequisites: -**

Introducing fundamental concepts and applications of general geology at a beginning level. Basic concepts of physical geology, emphasizing surficial and deep earth processes, including rock formation, plate tectonics, weathering and erosion, formation of landscapes, and crustal deformation.

ICNS 171 The Scientific Approach and Society**4 (3-2-7)****Prerequisites: -**

An examination of the scientific method through the work and ideas of outstanding scientific thinkers, the process of scientific reasoning and theory building, the impact of science on society.

ICNS 211 The Science of Food**4 (3-2-7)****Prerequisites: -**

Most significant types of foods, their chemical, biochemical, physical properties and microbiological nature; overview of food production and distribution chain from raw material utilization, processing, preservation to finished products, storage and distribution.

ICNS 212 Essentials of the Food Industry**4 (4-0-8)****Prerequisites: -**

The basic concepts of basic and applied science that are fundamental to the food industry. Scientific perspectives on food production, from ingredient sourcing, product development and processing, through to waste management. Food marketing, food policy and environmental sustainability are also explored through case studies.

ICNS 255 Essentials of Marine Life**4 (3-2-7)****Prerequisites: -**

The natural history of marine organisms, exclusive of protozoa and insects. Types of environment in the ocean, with special reference to shallow tropical seas. The relation of biological distributions to the physical and chemical environment. The effects of environmental change. The application of ecological techniques to local problems. Field surveys with laboratory exercises are included.

ICNS 256 Sustainable Development**4 (4-0-8)****Prerequisites: -**

Sustainable development; guiding principles and approaches; 1972 Stockholm Earth Summit; 1992 Rio Earth Summit; Agenda 21; 2002 Johannesburg World Summit; outcomes of the summits; the role of UN agencies, NGOs, governments, businesses and individuals; industry and farming and the environment; population; poverty and inequality; food and agriculture; corporate social responsibility and the International Organization for Standardization.

ICNS 257 Environmental Issues: past, present and future**4 (4-0-8)****Prerequisites: -**

An in-depth study of environmental issues e.g. Exxon Valdez and other oil spills; Bhopal and other chemical leaks; Chernobyl and other radiation leaks; ozone depletion; global warming; loss of biodiversity; deforestation; genetic engineering and GMOs; water issues; urban issues; includes contemporary and likely future environmental issues.

ICPE 101 Physical Education: Badminton	1 (0-2-1)
Prerequisites: -	
History, value, rules and regulations of badminton; practicing individual and team playing skills.	
ICPE 102 Physical Education: Basketball	1 (0-2-1)
Prerequisites: -	
History, value, rules and regulations of basketball; practicing individual and team playing skills.	
ICPE 103 Physical Education: Golf	1 (0-2-1)
Prerequisites: -	
History, value, rules and regulations of golf; practicing the basics playing skills.	
ICPE 105 Physical Education: Swimming	1 (0-2-1)
Prerequisites: -	
Value, rules and regulations of swimming, with an emphasis on water safety; practicing various swimming strokes.	
ICPE 106 Physical Education: Tennis	1 (0-2-1)
Prerequisites: -	
History, value, rules and regulations of tennis; practice the basics of serving and hitting movements and other playing skills.	
ICPE 107 Physical Education: Volleyball	1 (0-2-1)
Prerequisites: -	
History, value, rules and regulations of volleyball; practicing individual and team playing skills.	
ICPE 109 Physical Education: Social Dance	1 (0-2-1)
Prerequisites: -	
History Values of social dance; practicing basic movements as well as figures and skills of ballroom dancing.	
ICPE 113 Physical Education: Modern Dance	1 (0-2-1)
Prerequisites: -	
Demonstration, discussion, and practice of international forms of modern dance; comparison of modern dance with classical ballet.	
ICPE 115 Self Defense	1 (0-2-1)
Prerequisites: -	
Non-violent self defense course, providing students with self confidence and skills in assault situations; practical exercises focus on skills needed in different conditions.	
ICPE 117 Physical Education: Mind and Body	1 (0-2-1)
Prerequisites: -	
History, value, rules and regulations of Yoga; practicing individual skills.	
ICPE 118 Physical Education: American Flag Football	1 (0-2-1)
Prerequisites: -	
A non-contact version of American football; basic fundamentals of running and jumping through an aerobic exercise; honing of hand-eye co-ordination, and building of locomotive skills, as well as developing a variety of strategies of attacking or defending against an opponent.	
ICPE 121 Physical Education: Soccer	1 (0-2-1)
Prerequisites: -	
Theory and practice of the game including individual and team participation.	

ICPE 123 Physical Education: Cycling	1 (0-2-1)
Prerequisites: -	
History, value, and regulations of cycling; practicing safe and efficient riding skills.	
ICPE 124 Selected Topics in Sports	1 (0-2-1)
Prerequisites: -	
History, value, rules and regulations of selected recreational and spectator sports.	
ICPY 132 Principles of Physics	4 (4-0-8)
Prerequisites:	
Measurement, units and dimensions; vectors; description of motion; Newton's Laws of Motion; work; kinetic energy, potential energy, conservation of energy; linear momentum and it's Law of the Conservation; equilibrium and elasticity; periodic motion; one dimensional wave motion; sound and hearing; hydrostatics; heat and thermal properties of mater; electricity and magnetism; geometrical optics; nuclear physics.	
ICPY 210 General Physics	4 (3-2-7)
Prerequisites:	
Principle of relativity and basic laws of physics; motion with arbitrary acceleration; Newton's Law of Gravity; Work Energy Theorem, conservative forces; system of particles; rotational motion; oscillations and resonance; mechanical waves, Fourier Analysis; thermodynamics; fluid dynamics; Electromagnetic Theory; electromagnetic waves; wave properties of light; photons, electrons and atoms; the wave nature of particles; quantum mechanics.	
ICPY 211 General Physics I	4 (4-0-8)
Prerequisites: ICPY 132 or ICNS 132	
Kinetic theory, heat, temperature, thermodynamics, oscillation, waves, electricity and magnetisms.	
ICPY 212 General Physics II	4 (4-0-8)
Prerequisites: ICPY 211	
Modern physics; special theory of relativity, quantum theory, the uncertainty principle, wave and particle duality; Schrodinger's equation, atomic and nuclear theories, nuclear instability and decay, Bohr's picture of atom.	
ICPY 221 Computer Programming for Physics	4 (4-0-8)
Prerequisites:	
Introduction to programming, computer components, programming language, principle of software development, input and output data, program and function, program control, array data type, pointer data type, structure data type, object data type, data file management, introduction to algorithm, advanced programming and mathematical packages.	
ICPY 321 Intermediate Mechanics	4 (4-0-8)
Prerequisites:	
Newton's laws, linear and rotational dynamics, Euler angles and rigid body dynamics, small oscillation.	
ICPY 322 Electricity and Magnetism	4 (4-0-8)
Prerequisites: ICPY 211	
The Coulomb force, electric fields and potential, Gauss' law, dielectrics, the Biot-Savary law, Ampere's law, magnetic field and magnetic induction, vector and scalar potential, Faraday's law.	
ICPY 323 Electrodynamics	4 (4-0-8)
Prerequisites: ICPY 211	
Maxwell's equation, wave equations, radiation fields, guided waves, cavity resonators, radiation from an oscillating dipole and a group of moving charges.	

ICPY 324 Wave and Optics	4 (4-0-8)
Prerequisites: ICPY 211	
Wave and vibration, mechanical and EM waves, reflection and refraction, lens, fiber optics, physical optics.	
ICPY 325 Advanced Optics	4 (4-0-8)
Prerequisites: ICPY 324	
Diffraction, Fresnel diffraction, basic concepts of Fourier optics, optical coherence, propagation of light in anisotropic media, nonlinear optics.	
ICPY 326 Special Topics in Optics	2 (2-0-4)
Prerequisites:	
Presentation and discussion on the optics topics which are in the current interests. Topics are issues that are in the current interests.	
ICPY 327 Laser and Applications	4 (4-0-8)
Prerequisites:	
Laser fundamentals, types of lasers, characteristics of laser beams, metrological and scientific applications, industrial applications, medical applications, military applications, optical information transmission and storage, and other applications.	
ICPY 331 Mathematical Methods in Physics I	4 (4-0-8)
Prerequisites:	
Special functions, Legendre functions, Hermite polynomials, Laguerre polynomials, Bessel functions.	
ICPY 332 Mathematical Methods in Physics II	4 (4-0-8)
Prerequisites: ICPY 331	
Complex variables, mappings, analytic functions, Cauchy's theorem, residue theory, conformal mapping.	
ICPY 333 Mathematical Methods in Physics III	4 (4-0-8)
Prerequisites: ICPY 331 and ICPY 332	
Numerical analysis; Error analysis, solution of nonlinear equation, interpolation and polynomial approximation, curve fitting, systems of linear equations, fast Fourier transform, numerical solution of differential equations, applications in research.	
ICPY 334 Numerical Methods in Physics	4 (4-0-8)
Prerequisites:	
Basic Fortran algorithms; application of Fortran algorithms and numerical methods in solving a variety of physics problems.	
ICPY 341 Integrated Laboratory in Physics I	2 (0-4-2)
Prerequisites:	
Laboratory practice on mechanics, heat, optic and electricity.	
ICPY 342 Integrated Laboratory in Physics II	2 (0-4-2)
Prerequisites:	
Laboratory practice on electricity and magnetism.	
ICPY 343 Integrated Laboratory in Physics III	2 (0-4-2)
Prerequisites:	
Laboratory practice on electrodynamics.	

ICPY 361 Quantum Mechanics I Prerequisites: ICPY 212 Quantum theory wave-particle duality, probability in quantum theory, the Schrodinger equation in one-dimensional and three-dimensional potentials, operator methods, matrix representation, hydrogen atom, spin and angular momentum.	4 (4-0-8)
ICPY 371 Thermal Physics Prerequisites: ICPY 211 The laws of thermodynamics, heat engines, entropy, axiomatic formulation of thermodynamics.	4 (4-0-8)
ICPY 421 Theoretical Physics Prerequisites: ICPY 361 Mathematical methods for theoretical physics, perturbation methods, quantum field theory, theory of relativity, statistical mechanics and non-linear systems.	4 (4-0-8)
ICPY 431 Surface Analysis Prerequisites: Introduction to surface analysis, surface characterization, instrumentation, applications in research and industry.	4 (4-0-8)
ICPY 436 Seminar in Physics Prerequisites: Each student is required to give a seminar on a physics topic of his/her interest.	2 (2-0-4)
ICPY 441 Senior Project in Physics Prerequisites: Teams of two students are to perform small physics projects of their own interests. The proposals have to be approved by the project supervisors. Students will learn the process of data analysis and report writing.	6 (0-12-6)
ICPY 451 Analytical Mechanics Prerequisites: ICPY 321 Noninertial reference systems, rigid bodies in three dimension, principle of least action, Lagrangian Mechanics, and Hamiltonin theory.	4 (4-0-8)
ICPY 452 Statistical Mechanics Prerequisites: ICPY 361 Statistical physics, distributions, Boltzmann 's factor, partition and grand partition functions, Ising's model, quantum statistics.	4 (4-0-8)
ICPY 453 Theory of Relativity Prerequisites: ICPY 211 The Michelson-Morley experiment, the Lorentz transformation, Einstein's special theory of relativity, relativistic mechanics, relativistic wave equations.	4 (4-0-8)
ICPY 461 Quantum Mechanics II Prerequisites: ICPY 361 Angular momentum, time-independent perturbation theory, the real-hydrogen atom, the two-particle system, Pauli principle, exclusion principle, time-dependent perturbation theory and scattering.	4 (4-0-8)
ICPY 462 Molecular Dynamics Prerequisites: Classical mechanics for molecular dynamics; Operators and numerical methods; ensembles and observables; force fields; inter- and intramolecular interactions; electronic and molecular dynamics; Monte Carlo Methods.	4 (4-0-8)

ICPY 471 Atomic and Molecular Physics**4 (4-0-8)****Prerequisites:**

One-electron atoms, Helium atom, multi-electron atoms, structure and spectra of molecules, atomic spectroscopy methods, excitations of atoms and molecules by photons and electrons.

ICPY 472 Solid State Physics**4 (4-0-8)****Prerequisites:**

Periodic structure and symmetries of crystals, diffraction, reciprocal lattice, chemical bonding, lattice dynamics, phonons, thermal properties, free electron gas, band theory, applications in metals and semi conduction materials.

ICPY 473 Nuclear and Particle Physics**4 (4-0-8)****Prerequisites: ICPY 212**

Nuclear structure, nuclear forces, radioactive decay, nuclear reaction, fission, fusion, nuclear detection and measurement, applications of radioactivity, fundamental particles and interactions, classification by quantum numbers, isospin concept, symmetries, conservation laws, quark model.

ICPY 474 Astrophysics**4 (4-0-8)****Prerequisites: ICCH 224**

Fundamental astronomical parameters, Orbit theory, Potential theory, Stellar kinetic theory, Stellar structure and evolution.

ICPY 475 Plasma Physics**4 (4-0-8)****Prerequisites:**

Saha's formula, elementary statistical interpretation, guiding center motion. Maxwell's equation approach, Vlasov equations, Magnetohydrodynamic equations.

ICPY 476 High Energy Physics**4 (4-0-8)****Prerequisites:**

Introduction to high energy physics, applications in research and industry.

ICPY 477 Special Topics in Nuclear Physics**2 (2-0-4)****Prerequisites:**

Presentation and discussion on the nuclear physics topics of current interests. Topics are varied from year to year.

ICPY 478 Advanced Topics in Solid State Physics**4 (4-0-8)****Prerequisites:**

This course is organized to give lecture and discussion on the recent advanced research in solid state physics.

ICPY 481 Nanomaterial Physics**4 (4-0-8)****Prerequisites:**

Introduction to nanotechnology, definition and development, effect of size, bottom up approach, self assemble, quantum mechanics and quantum nanostructure, nanomaterial, nanoparticle, nanotube, molecular mimic, molecular simulation, biomimetic, protein engineering, DNA structure as an information transfer, drug delivery system, nanoelectronics and quantum electronic devices, molecular electronics, light interaction and nanodevices, fabrication of nanodevices, equipment used in nanostructures, scanning tunneling microscope, atomic force microscope and surface analysis, future application.

ICPY 482 Special Topics in Nanomaterials**2 (2-0-4)****Prerequisites:**

Presentation and discussion on the nanomaterials topics of current interests. Topics are varied from year to year.

- ICPY 490 Computational Physics** 4 (4-0-8)
Prerequisites: ICPY 331 and ICPY 332
 Basic mathematical operations: scattering by a central potential. Ordinary differential equations: stability, order and chaos in two- dimensional motion. Boundary value and eigenvalue problems: stationary solutions of the one-dimensional Schroedinger equation. Special functions and Gaussian quadrature: Born and eikonal approximations to quantum scattering. Matrix operations: determining nuclear charge densities. Elliptic partial differential equations: elliptic equations in two dimensions. Parabolic partial differential equations: the time-dependent Schroedinger equation. Monte Carlo methods: the Ising model in two dimensions. Fast Fourier transform: diffraction, image processing.
- ICPY 492 Electronics** 4 (4-0-8)
Prerequisites:
 Introduction to electronics, operational amplifiers, inductance and transformers, capacitance, AC circuits, network analysis, semiconductors, digital electronics, flip-flops, medium scale integration, logic circuits, microcontrollers.
- ICPY 493 Geophysics** 4 (4-0-8)
Prerequisites:
 Introduction to geophysical techniques; seismic waves, seismic refraction interpretation; seismic reflection; acquisition, processing, waveform analysis and interpretation; earthquake seismology; characteristics of earthquakes, seismograms analysis, focal mechanism, travel-time curve for earthquakes.
- ICPY 495 Special Topics in Geophysics** 2 (2-0-4)
Prerequisites:
 Presentation and discussion on the geophysics topics of current interests. Topics are varied from year to year.
- ICPY 496 Biophysics** 4 (4-0-8)
Prerequisites:
 Introduction to biophysics, physical methods in the study of biological systems, including macromolecules, membranes, nerves, muscle, photosynthetic systems and visual systems, mathematical modeling of biological phenomena and applications of physics to biology and ecology.
- ICPY 497 Special Topics in Biophysics** 2 (2-0-4)
Prerequisites:
 Presentation and discussion on the biophysics topics of current interests. Topics are varied from year to year.
- ICSA 201 Geography of Southeast Asia** 4 (4-0-8)
Prerequisites: -
 The regional geography of Southeast Asia; its physical structure, climate; human settlement; population; tradition, colonies, economy during the colonial and modern periods.
- ICSA 202 Ecology of Southeast Asia** 4 (3-2-7)
Prerequisites: -
 An overview of the ecological systems of the region; selected issues, problems and areas are studied in greater detail.
- ICSA 203 The History of Southeast Asia up to 1800** 4 (4-0-8)
Prerequisites: -
 Historical migrations of various peoples into the region. The introduction and impact of Hindu and Buddhist religions and culture. The role of Indic political systems and of interstate warfare. The development of trade with China. The introduction of Islam and the establishment of Muslim sultanates. The arrival and impact of the first Western traders and missionaries.

- ICSA 206 Political Systems of Southeast Asia** 4 (4-0-8)
Prerequisites: -
 Southeast Asian nations and their political systems; constitutional concepts; government and administrative functioning; law making and enforcement.
- ICSA 207 Southeast Asian Archaeology** 4 (4-0-8)
Prerequisites: -
 Archaeology in Southeast Asia in comparative perspective. The earliest human presence in the region. Ecological adaptations. The origins of plant and animal domestication. The timing and impact of early metallurgy. The emergence of socio-political complexity. Language and ethnicity. Research Methodology and theories.
- ICSA 208 Modern History of Southeast Asia c. 1800-1948** 4 (4-0-8)
Prerequisites: -
 A concise history of the region from the beginning of the modern colonial period through to independence; independence, liberalism, nationalism, communism, democratization and globalization.
- ICSA 209 Contemporary History of Southeast Asia, 1948 to Present** 4 (4-0-8)
Prerequisites: -
 The history of the region since World War II. The impact of the Cold War and decolonialization processes. Power struggles amongst competing elites. Military authoritarianism and democratic experiments. The impact of globalization. Contemporary social trends and issues.
- ICSA 211 Economics of Southeast Asia** 4 (4-0-8)
Prerequisites: -
 The national and regional economies of Southeast Asia; agriculture; Industry, finance and the service sector; the role of government; development and economic change in the post-war period; regional and international economic relations; present economic trends.
- ICSA 212 Peasant Societies in Southeast Asia** 4 (4-0-8)
Prerequisites: -
 Peasant communities in the different countries of the region. Their social structures and patterns of life. Their contemporary problems and future prospects. Their role in the wider society.
- ICSA 213 Poverty and Rural Development in Southeast Asia** 4 (4-0-8)
Prerequisites: -
 The problems of poverty, especially in the agrarian sector; the successes and challenges of rural development and the consequences of change; comparison of the solutions and policies adopted in the various countries of the region.
- ICSA 231 Southeast Asian Arts I** 4 (4-0-8)
Prerequisites: -
 The arts and music of the various societies of the region and their development. Architecture, the fine arts, and folk traditions.
- ICSA 233 Dance & Theatre in Southeast Asia** 4 (4-0-8)
Prerequisites: -
 An introduction to the traditions of dance, theatre and puppet theatre in Southeast Asia. Their characteristic features, historical background and contemporary expressions.
- ICSA 234 Southeast Asian Cinema** 4 (4-0-8)
Prerequisites: -
 The history and development of cinema in post-colonial Southeast Asia. Historiography, nationalism and state ideologies in Southeast Asian movies. Censorship policies and legal issues. Themes and issues in contemporary Southeast Asian movies.

ICSA 251 Thai Arts (SAS Concentration)	4 (4-0-8)
Prerequisites: -	
The history, features, and cultural context of the major forms of Thai arts, specifically painting, sculpture, and architecture.	
ICSA 253 Thai Society and Culture	4 (4-0-8)
Prerequisites: -	
Traditional Thai culture, social structure and hierarchy; interpersonal relations; kreng jai; family; the role of Buddhism and animism; folk traditions (birth, life, marriage, death, etc.); the modern period; the impact of Chinese, Western and Japanese culture; business culture; the rural-urban division.	
ICSA 254 Introduction to Thai History	4 (4-0-8)
Prerequisites: -	
An overview of Thai history and culture, the history of Thailand, the Neolithic Period, Dvaravati, Srivijaya, Lanna, Sukhothai, Ayudhaya, Thonburi, and Ratanakosin.	
ICSA 255 Thai Economic History	4 (4-0-8)
Prerequisites: -	
Economic developments and social structures in Thailand since the Sukhothai period. The modern Thai economy.	
ICSA 311 International Politics in Southeast Asia	4 (4-0-8)
Prerequisites: -	
Southeast Asia in the context of global politics in the period since World War II. The impact of the Cold War and its ending. The international relations of the Southeast Asian states. ASEAN.	
ICSA 312 Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
Prerequisites: -	
Ethnicity in relationship to language, religion, 'race', and culture. Ethnic groups in Southeast Asia. Minorities and majorities in the various Southeast Asian states. Political and cultural issues. The development of national identity.	
ICSA 313 Economic History of Southeast Asia	4 (4-0-8)
Prerequisites: -	
The history of economic developments in the region since the early kingdoms to modern times. The traditional economies of highlanders and lowlanders and of feudal kingdoms. The emergence of trade entrepôts and the impact of Indian, Middle Eastern and Chinese traders. Colonial, export-oriented and state-controlled economies. Economic policies and economic globalization.	
ICSA 314 Economic Problems in Southeast Asia	4 (4-0-8)
Prerequisites: -	
A seminar-based study of contemporary economic problems in Southeast Asia.	
ICSA 315 Globalization in Southeast Asia	4 (4-0-8)
Prerequisites: -	
A 300-level seminar-format course. Producing and presenting a series of short research papers on the various social, economic and political impacts of globalization in the region over the last few decades.	
ICSA 316 Democratization in Southeast Asia	4 (4-0-8)
Prerequisites: -	
A 300-level seminar-format course. Producing and presenting and present a series of short research paper on contemporary political developments in the region.	

- ICSA 317 Political Systems of Southeast Asia I** 4 (4-0-8)
Prerequisites: -
 Authoritarianism in Southeast Asia. Socio-political hierarchy, legal authority and religious belief. Nation-building. State security and the centralization of authority.
- ICSA 318 Political Systems of Southeast Asia II** 4 (4-0-8)
Prerequisites: -
 Democratization in Southeast Asia. Citizenship and civil rights. Mechanisms of political representation and contestation.
- ICSA 321 Religion, Society and Politics in Mainland Southeast Asia** 4 (4-0-8)
Prerequisites: -
 The Mainland Southeast Asian religions. Animism, Hinduism, Buddhism and Confucianism in theory and practice. The relationship between the religious authorities and the secular powers. Political links and controversies. The role of religious teachings and communities in the wider society as in education, gender relations and the economy.
- ICSA 322 Religion, Society and Politics in Maritime Southeast Asia** 4 (4-0-8)
Prerequisites: -
 Religious life in maritime Southeast Asia. Traditional religions and indigenous cosmologies. A historical review of the spread and localization of world religions (Hinduism, Islam and Christianity) in the region. The growing importance of religious identities in the political arena of post-colonial maritime Southeast Asia.
- ICSA 329 Indigenous Peoples of Southeast Asia** 4 (4-0-8)
Prerequisites: -
 Ethnic and linguistic diversity in Southeast Asia. Livelihoods and modes of subsistence. Environmental and cultural adaptation. Traditional religions and cosmologies. Colonial tribal policies. Indigenous peoples and modern nation-states. Social, cultural and political movements among indigenous peoples.
- ICSA 331 Southeast Asian Arts II** 4 (4-0-8)
Prerequisites: -
 This course continues ICSA 231, and studies the traditional arts of the region in more depth. The contemporary state of the arts in Southeast Asia, and the impact of modern and Western influences.
- ICSA 333 Media and Politics in Southeast Asia** 4 (4-0-8)
Prerequisites: -
 The development of regional publishing and publications. Vernacular printing and Southeast Asian nationalisms. Press freedom and constraints. Broadcast news production and issue framing. Censorship and self-censorship.
- ICSA 334 Gender and Identity in Southeast Asia** 4 (4-0-8)
Prerequisites: -
 Traditional gender categories and identities. Mass nationalism and the standardization of gender types. The family as an evolving legal construct. Shifting understandings of acceptable sexual conduct. Public morality and the stigmatization of deviance.
- ICSA 411 Law and Society of Southeast Asia** 4 (4-0-8)
Prerequisites: -
 Traditional concepts of law and justice and their development through colonial and modern time.

- ICSA 412 Population Movements and Diasporas in Southeast Asia** 4 (4-0-8)
Prerequisites: -
 Refugees and internally displaced persons. Stateless persons. Domestic migration. Legal and illegal labor imports. Formal and informal labor exports. Trafficking. Diasporas both within and outside the region. Prevailing state policies and international agreements.
- ICSA 420 Contemporary Issues in Thailand** 4 (4-0-8)
Prerequisites: -
 An in-depth examination of contemporary Thai politics, economy and society. Demographics. National and regional politics. Buddhism, media issues, film, business and employment. Development issues. Democratization and civil society. National integration and ethnic minorities.
- ICSA 421 Contemporary Issues in Burma** 4 (4-0-8)
Prerequisites: -
 Contemporary issues in modern day Burma (Myanmar) ranging from religious cults to refugee issues, women's issues, film industry and the economy.
- ICSA 422 Contemporary Issues in Malaysia** 4 (4-0-8)
Prerequisites: -
 An in-depth examination of contemporary Malay politics, economy and society. Demographics, ethnicity, national and regional politics. Islam. Media issues. Business and labor. Development issues. Democratization and civil society.
- ICSA 423 Contemporary Issues in Indonesia** 4 (4-0-8)
Prerequisites: -
 An in-depth examination of contemporary Indonesian politics, economy and society. Demographics, ethnicity, national and regional politics. Islam. Media issues. Business and labor. Development issues. Democratization and civil society.
- ICSA 424 Contemporary Issues in Vietnam** 4 (4-0-8)
Prerequisites: -
 An in-depth examination of contemporary Vietnamese politics, economy and society. Demographics. Ethnicity. State security. Party politics. Business and labor. Development issues. Civil Society. Popular culture.
- ICSA 425 Contemporary Issues in the Philippines** 4 (4-0-8)
Prerequisites: -
 An in-depth examination of contemporary Philippine politics, economy and society. Demographics, ethnicity, party politics, business and labor, development issues, the evolution of civil society and popular culture.
- ICSA 426 Contemporary Issues in Cambodia** 4 (4-0-8)
Prerequisites: -
 An in-depth examination of contemporary Cambodian politics, economy and society. Demographics, ethnicity, religion, national and regional politics. Media issues. Development issues, Democratization and civil society. Post-conflict reconstruction and sustainable peace-building through justice and accountability.
- ICSA 431 Urban Anthropology of Southeast Asia** 4 (4-0-8)
Prerequisites: -
 The origin and development of Southeast Asian cities; Historical processes of urbanization and rural-urban migration. Demographic change: ethnicity, cultural pluralism and social stratification in urban space. Slums, poverty and crime.

ICSC 301 Data Collection and Laboratory Methods**4 (3-2-7)****Prerequisites:**

Data collection and testing of scientific hypotheses; a survey of techniques used to quantify information, including methods of measuring and sampling, and potential errors in data collection; laboratory techniques include planning and conducting experiments in the laboratory, developing skills in the laboratory, and controlling experimental, environmental variables.

ICSC 302 Scientific Research and Presentation**4 (4-0-8)****Prerequisites:**

Scientific method of discovery; developing a hypothesis and testing, interpretation of the results; proper format for presenting papers in public and in a scientific forum; practical sessions and participation in scientific seminars included.

ICSC 303 Statistics**4 (4-0-8)****Prerequisites: (For Applied Mathematics, Chemistry, Physics students) ICMA 106****Prerequisites: (For Computer Science Students Only) ICNS 102****Prerequisites: (For Food Science and Technology Students Only) ICNS 141****Prerequisites: (For Environmental Science Students) ICMA 102**

Statistical ideas and concepts, probability and conditional probability, distribution functions, expected value, estimators, good estimators and hypothesis testing.

ICSC 304 Computer for Research**4 (3-2-7)****Prerequisites: ICNS 141 Computer Essentials**

Basic knowledge of various platforms of operating systems (DOS, UNIX, WINDOWS), files and data management, basic programming, application packages for statistical analysis and scientific plots, literature search through the on-line library computer system.

ICSC 335 Statistics for Biological Science**4 (4-0-8)****Prerequisites: -**

Design of experiments, collection of data, presentation of data, descriptive statistics, elementary probability, normal distributions, estimation of parameters, hypothesis testing, analysis of variance, regression and correlation, analysis of frequencies, non-parametric methods, P-test and t-test analysis.

ICSO 201 Human Geography**4 (4-0-8)****Prerequisites: -**

Human way of life in relation with geographical space. Population growth and distribution. Patterns of livelihood. Agricultural and industrial locations. Disparities between rich and poor. The concept of "development." Human settlements. Communication. Regional cultural patterns. States, ethnicities, and global order.

ICSO 202 Major Social Institutions**4 (4-0-8)****Prerequisites: -**

Basic social institutions in comparative global perspective. Socialization. Marriage and the family. Education and knowledge. Religion and culture. Media and communication. Government and administration. Politics and power. Multi-institutional politics approaches in sociology.

ICSO 203 Global Change in the Late Twentieth Century**4 (4-0-8)****Prerequisites: -**

The global structures and transformations of the late twentieth century; the global economy; food supply; population; disease; environment, resources, and pollution; communications; geopolitics; national states, regional, and international organizations; minorities; the role of women; warfare and terrorism; migration and refugees; crime; culture.

- ICSO 204 Academic Methodologies for the Social Science** 4 (4-0-8)
Prerequisites: ICCM 105 Intermediate English Communication II
 The Social Sciences: scope, methodologies and techniques. Referencing: Oxford and Harvard styles. Data gathering. Printed and digital sources. Organizing data. Academic reading. Academic writing. paraphrasing; essays; book and article reviews.
- ICSO 205 Paradigms in the Social Science I** 4 (4-0-8)
Prerequisites: -
 A historical survey of the major paradigms in the Social Sciences (History, Political Science, Economics, Sociology, Anthropology, Geography, Psychology) up to the end of the nineteenth century.
- ICSO 206 Paradigms in the Social Science II** 4 (4-0-8)
Prerequisites: -
 A historical survey of the major paradigms in the Social Sciences (History, Political Science, Economics, Sociology, Anthropology, Geography, Psychology) during the twentieth century.
- ICSO 207 The History of the World Economy** 4 (4-0-8)
Prerequisites: -
 International trade up to c.1450. The creation of a world economy in the 16thC. The Commercial Revolution and the development of capitalism up to c.1800. The Industrial Revolution and its global impact. Technology and societal transformation. Changes in the nature of industrial production and business enterprise. The economic role of primary producers. World War I, the post-war boom, and the Great Depression. Classical economics and Keynesianism. Soviet and Fascist economic experiments. World War II. Economic development and technology since 1945. International trade and finance. Multi-nationals. Globalization.
- ICSO 210 World History A (c.1400 – 1763)** 4 (4-0-8)
Prerequisites: -
 Selected aspects of world history from c.1400 to c.1763, concentrating on the political and economic forces which brought the various societies of the world together and created the background for the modern world; the traditional civilizations of Asia, Europe and Africa; the gunpowder revolution; the overseas expansion of Western Europe; the development of a world economy; the emergence of Russia; absolutism and constitutionalism as forms of government; printing and the Scientific Revolution.
- ICSO 211 World History B (c.1763 - 1914)** 4 (4-0-8)
Prerequisites: -
 Selected aspects of world history from c.1763 to 1914; the Industrial Revolutions and the growth of the world economy; the American and French Revolutions; Latin American independence and development; political developments in Europe and the United States: representative government, the abolition of slavery, nationalism, socialism, women's rights; imperialism and responses to it; the emergence of Japan; wars and warfare; social, scientific, medical and technological developments.
- ICSO 212 World History C (c.1914 - 1945)** 4 (4-0-8)
Prerequisites: -
 A short introduction to selected aspects of world history during the early 20th century; the two world wars; the Russian Revolutions; the development of the Soviet Union; the League of Nations and international relations during the interwar period; the American Boom of the 1920s; the Great Crash and its global impact; the rise of Fascism and Nazism; regional developments in Latin America, Asia, Africa and Australasia.

ICSO 213 World History D (c.1945 -2000)**4 (4-0-8)****Prerequisites: -**

A short introduction to selected aspects of world history since World War II. The USA and the USSR as superpowers. The Cold War. The UN system. Decolonialization and the 'Third World'. Major regional powers. The Soviet collapse and its repercussions. Regional conflicts in the Middle East, South Asia, and the Balkans. Economic, technological and scientific developments. The great consumer boom. OPEC and oil prices. The World Bank and IMF. The EU and other economic regionalisms. World poverty. New political movements: Civil Rights, feminism, radical Islam. Ethnic conflicts and nationalism.

ICSO 231 Modern History of East Asia**4 (4-0-8)****Prerequisites: -**

History of China, Japan, and Korea since the mid-19th century; traditional political and economic structures; the impact of the West; Meiji Japan; nationalism; communism; wars; contemporary economic and political structures; the role of the East Asia Region in the world.

ICSO 232 Civilizations of East Asia**4 (4-0-8)****Prerequisites: -**

Cultural patterns and developments in China, Japan, and Korea; the nature of tradition, East Asian world views, Confucianism, Buddhism, Daoism, Shintoism; population migrations; craftsmanship and economic and scientific development; the high arts.

ICSO 233 Civilizations of East Asia II**4 (4-0-8)****Prerequisites: -**

An overview of East Asia from the 10th to the 19th century. From the Northern and Southern Sung to the Mongols. Changing patterns of overland and maritime trade. The Ming and Ching (Qing) dynasties. The shifting political order of pre-modern Korea up to the end of the Choson period. Developments in Japan through to the end of the Tokugawa Shogunate. Early European exploration and impact.

ICSO 234 The Indian Sub-Continent up to c.1500**4 (4-0-8)****Prerequisites: -**

The history and culture of the region; prehistory, the Indus Valley civilization, the settlement of the Indo-Aryans; empires and kingdoms; the Hindu traditions; the emergence of Buddhism and Jainism; the early impact of Islam; Indian influence in Southeast Asia.

ICSO 235 The Indian Sub-Continent since c.1500**4 (4-0-8)****Prerequisites: -**

The rise and fall of the Mughal Empire. Hindus, Muslims, and Sikhs; the rise of European influence; the British raj; social and economic transformations; movements of religious reform and protest; the independence movement; economic and political developments since 1947.

ICSO 237 Australasia Since 1770**4 (4-0-8)****Prerequisites: -**

The geography of Australasia. The history of the Australasian region since the coming of the Europeans. The settlement of Australia and New Zealand. Relations with the indigenous populations. Political and economic developments from the colonial period to the present day. New Guinea. The smaller island nations and territories of the Pacific. The impact of World War II and of war in Indochina. International relations both within and beyond the region.

ICSO 238 Africa Since 1800**4 (4-0-8)****Prerequisites: -**

The geography of Africa; pre-colonial states and societies; the impact of European colonialism; social and economic transformations; the emergence and development of independence movements; political and economic developments since independence; international relations within and beyond the region; cultural change: the relationships between the indigenous, Islamic, and Western traditions.

ICSO 239 The Middle East Since 1800**4 (4-0-8)****Prerequisites: -**

The geography of the Middle East; Iran, the Ottoman Empire, and North Africa in the nineteenth century; the European impact; the rise of nationalism; political and economic developments since World War I; the founding of Israel and its consequences; the politics of petroleum; international relations within and beyond the region; religious movements and cultural change since 1800; contemporary states.

ICSO 241 Latin America since 1800**4 (4-0-8)****Prerequisites: -**

The geography of Latin America and the Caribbean. Spanish and Portuguese colonial societies. Revolution and independence. Subsequent political and economic developments in Mexico, Central and South America. Relations with Europe and the United States. The impact of the Cold War and the Cuban Revolution. Social and political movements. The contemporary scene. The Caribbean from the colonial period through to the present day.

ICSO 243 North America c. 1763-1900**4 (4-0-8)****Prerequisites: -**

The geography of North America. The colonial situation under the British and French. The American Revolution and subsequent political developments. Territorial expansion. Slavery and the U.S. Civil War. Reconstruction and the South. Industrialization and its consequences. Immigration. The international role of the United States. The political and economic development of Canada.

ICSO 244 The United States and Canada Since 1900**4 (4-0-8)****Prerequisites: -**

A history of North America since 1900; the impact of World War I, economic and political developments in the United States and Canada during the interwar years; social change, international relations; World War II and the Cold War, the Vietnam War; American society and politics since 1945; race relations; the Quebec independence movement and the future of Canada; the contemporary scene.

ICSO 246 Europe Since 1945**4 (4-0-8)****Prerequisites: -**

A political and economic history of Europe since 1945. The devastation of World War II. Marshall Aid and economic recovery. The impact of the Cold War. The early development of the European Economic Community. The foreign policies of Britain, France, and Germany. The loss of empire. Internal political, social and economic developments in the major European countries. Immigration. The situation in Eastern Europe. The collapse of communism and its consequences. The European Union. The contemporary situation and future prospects.

ICSO 247 The European Union: Development, Institutions, and Politics**4 (4-0-8)****Prerequisites: -**

The development of the European Union since the end of World War II; its political institutions and legal system, the economic aspects of integration, present policies and politics; future prospects.

ICSO 250 European Classical Heritage**4 (4-0-8)****Prerequisites: -**

A survey of the political, religious-mythological, political-legal and legacies of Greece and Rome from c. 600 BCE-1450 CE., The rise of democracy in Athens, Republican Rome and its transition to Empire, the legacy of Roman law, the ancient Greek myths, early Christianity in Rome, the literature of the Greeks and Romans and the important elements of sculpture, painting and architecture that made decisive contributions to later European culture.

ICSO 252 Early Modern Europe, c.1450-c.1700**4 (4-0-8)****Prerequisites: -**

An outline of the political, economic, and cultural development of Europe, c.1450-c.1700. The Reformation. Other religious developments. Political systems and theories. Warfare. Early overseas exploration and colonialism. The Scientific Revolution. Developments in art, music and literature.

ICSO 253 The European Ancient Regime and Revolution, c.1700-c.1830**4 (4-0-8)****Prerequisites: -**

An outline of the political, economic, and cultural development of Europe, c.1700-c.1830. Absolutism and constitutionalism. The Enlightenment. Science, technology and industrialism. The French Revolution and its impact. Napoleon. Early 19th century political movements. Warfare. Overseas exploration and colonialism. Religious developments. Developments in art, music and literature.

ICSO 254 European Society and Culture c. 1830-1945**4 (4-0-8)****Prerequisites: -**

An outline of the political, economic, and cultural development of Europe, c.1830-1945. Nineteenth century nationalism and political movements. Industrialization and the economy. Warfare. Overseas exploration and colonialism. Religious developments. Developments in science, technology, art, music, and literature.

ICSO 255 Medieval and Renaissance Europe**4 (4-0-8)****Prerequisites: -**

An outline of the political, economic, and cultural development of Europe up to c.1450. The geography of the European continent. The legacy of Greece and Rome. The medieval heritage. The Renaissance.

ICSO 256 The European Renaissance: Culture and Context**4 (4-0-8)****Prerequisites: -**

Intellectual change during the Renaissance period. The printing revolution. Education and humanism. Philosophical, artistic, and cultural changes. Social, political and economic contexts. The Scientific Revolution.

ICSO 259 Russia and the Soviet Union up to 1825**4 (4-0-8)****Prerequisites: -**

The land, geography and climate of Russia. Prehistoric Russia. The Kievan Period. Mongol Rule. The rise of Muscovy. The early Romanovs. Peter I and the building of Petrograd. Westernization and modernization. Relations with the West.

ICSO 260 Russia and Soviet Union since 1825**4 (4-0-8)****Prerequisites: -**

Society, political institutions, and economic developments from 1825 up to World War I. The 1905 Revolution. World War I and the Revolutions of 1917. The Bolshevik victory and the Civil War. Stalinism. The Great Patriotic War. The Cold War and international relations. Khrushchev and the end of Stalinism. The age of Brezhnev. Social and economic developments. The end of the USSR.

ICSO 261 Economic Geography**4 (4-0-8)****Prerequisites: -**

The basic concepts of economic geography. Physical and demographic conditions of economic activities. Spatial location in relation to agriculture, industry and other forms of economic activities. Core and periphery. Historical changes in the world economy. Economic globalization in geographical perspectives.

ICSO 262 Global Resources**4 (4-0-8)****Prerequisites: -**

The availability, distribution, and uses of the world's resources: food, water, land, soil, minerals, energy, fisheries, etc; resource depletion and optimal usage; public policies, international agreements and business needs as related to the production, distribution and exchange of resources; relevant technological and scientific developments; future prospects.

ICSO 263 Population and Migration in the Modern World**4 (4-0-8)****Prerequisites: -**

The basic principles of demography. Population increase and its social impact. Urbanization. The history of international migration. International agreements and conventions on travel, and the treatment of foreign nationals and workers. Contemporary issues in immigration policy worldwide. Illegal foreign workers. Refugees.

ICSO 264 The World Economy Since 1945**4 (4-0-8)****Prerequisites: -**

The world economy in 1945; economic growth in North America, Western Europe, and Japan; the impact of technology; the Bretton Woods system; changes in international trade and finance; multinationals; the situation in the Soviet Union and its successor states; the questions of development and dependence in the 'Third World'; international competitiveness; protectionism and free trade; OPEC and other producer organizations; regional trade organizations.

ICSO 271 International Relations**4 (4-0-8)****Prerequisites: -**

The principles and practice of international relations, with particular reference to the modern world; the bases of international power and interstate competition; inequalities among states, including domination and colonialism; war and conflict resolution among great powers; the role of trade, defence policies, and control over scarce resources; the involvement of non-state players, including international organizations and special interest groups; international issues concerning the treatment of minority groups, human rights, the use of the environment, international crime, and terrorism.

ICSO 272 Comparative Political Systems**4 (4-0-8)****Prerequisites: -**

Various forms of political systems, both in theory, principle, and practice; political systems in stateless societies, traditional kingdoms and empires, absolutist states, democracies, and modern "authoritarian" and militaristic states; various forms of representation, party-political systems, elections, and decision-making; the working of the executive, legislative, and judicial aspects of government and their interrelationships.

ICSO 273 World Politics and World Order**4 (4-0-8)****Prerequisites: -**

The historical development of a world political society and the structures of international diplomacy. War and peace-making between the Great Powers. The Concert of Europe. The League of Nations, the United Nations, and the Cold War. International agreements, treaties, and organizations. The principles of international law. The contemporary situation.

ICSO 274 International Organizations**4 (4-0-8)****Prerequisites: -**

The development of international organizations since the 19th century; their nature, function, and purpose; contemporary global and regional international organizations (the United Nations, ILO, WTO, and the IMF; the EU, ASEAN, NAFTA, APEC, etc.); their effectiveness and future.

ICSO 275 Democracy as a Political System**4 (4-0-8)****Prerequisites: -**

Historical developments; the principles, practices, and processes of democracy; essential elements; criticisms, strengths, and weaknesses; alternative systems; social and cultural prerequisites for democracy; possible future developments.

ICSO 276 History of War**4 (4-0-8)****Prerequisites: -**

The history of warfare since antiquity, but with particular reference to the modern period; the development of armed forces; innovations in weaponry, tactics and strategy; social and economic costs of warfare; combat and combatants; provisioning and planning; the use of reporting and propaganda in support of warfare; the industrialization of war and the rise of the military-industrial complex; types of warfare in the contemporary world.

ICSO 280 Gender Issues in the Modern World**4 (4-0-8)****Prerequisites: -**

Traditional roles of men and women in various world societies. Sociological and psychological theories relating to gender roles. Historical development of feminist thought and women's movements. Contemporary women's issues worldwide. Contemporary men's issues worldwide.

ICSO 281 The Social Impact of Science and Technology on Society**4 (4-0-8)****Prerequisites: -**

The social impact of science and technology up to c. 1900; the early 20th century: transportation, the technology of warfare, the 'new physics' of Einstein and Bohr; developments since World War II: computers, satellite communications, the Internet, genetic engineering, and medical advances.

ICSO 282 Global Media and Social Change**4 (4-0-8)****Prerequisites: -**

The development of the media as a global socializing force; the creation of a global market place; the information age; the power of the media in society and politics; the new global media culture.

ICSO 283 International Cultural Studies**4 (4-0-8)****Prerequisites: -**

Culture in the modern world; the study of symbol; how culture is defined and created; modernity, post-modernity, and technoculture; dominant and minority cultural forms; gender, sexuality and ethnicity; globalism and post-colonialism; the culture of everyday life.

ICSO 284 History of Disease and Medicine**4 (4-0-8)****Prerequisites: -**

Historical changes in the incidence and types of disease. The development of medicine.

ICSO 285 Drugs and Society**4 (4-0-8)****Prerequisites: -**

The social environment and correlates of drug addiction; the drug industry and crime; international repercussions; governmental and medical policies towards drug use and their effectiveness.

ICSO 301 Research Methods in the Social Sciences**4 (4-0-8)****Prerequisites: -**

An introduction to the scientific method and its use in social science research; examination of research methods, data collection, survey techniques, and hypothesis formation and testing.

- ICSO 302 Historiography** 4 (4-0-8)
Prerequisites: -
 A survey of approaches to the writing of history from ancient times to the present; historical methodology and analysis and related theoretical concerns; the nature and use of sources; contemporary issues and debates in historiography.
- ICSO 303 Modern Social Theory** 4 (4-0-8)
Prerequisites: -
 An introduction to the major contemporary theoretical approaches in the social sciences, particularly in sociology, anthropology and cultural studies; key concepts, issues and debates; different views of the social world; practical implications and applications in social research methodology.
- ICSO 309 Political Movements** 4 (4-0-8)
Prerequisites: -
 Political movements and the ideas that inspired them. Paradigm shifts in political systems. The Enlightenment. Liberalism. Neo-liberalism. Conservatism. Neo-conservatism. Fascism. Democracy. Anarchism. Constructivism. Liberation theology. Labor movements. Civil Rights. Peace and antiwar movements. People power. Non-violent civil disobedience.
- ICSO 310 Labor Movements** 4 (4-0-8)
Prerequisites: -
 The development of organized labour following the Industrial Revolution. Social changes induced by industrialism. Factory conditions and reform. The early labour movement. The consolidation of trade unionism in Britain. Labour and union movements in Continental Europe. Labour movements in the USA and the British Dominions up to World War I. Labour movements worldwide from 1914 to the present day. Issues of trade union organization, power and influence in the modern world.
- ICSO 332 Human Rights** 4 (4-0-8)
Prerequisites: -
 The concept of human rights in philosophical, historical, and legal perspective; human rights in contemporary international law; international conventions and the United Nations; individual rights; war crimes; the protection of minorities; economic, and cultural rights.
- ICSO 341 Society, Politics, and Economics in Contemporary East Asia** 4 (4-0-8)
Prerequisites: -
 An overview of the contemporary East Asian scene; the Japanese economic crisis and its political fallout; the rapid rise of China and the struggle with Taiwan; North and South Korea; the Asian economic crisis; political uncertainties in Southeast Asia; the human rights situation; religious movements; separatism; the Tibet problem.
- ICSO 342 Society, Politics, and Economics in Contemporary South Asia** 4 (4-0-8)
Prerequisites: -
 An overview of the contemporary scene in South Asia; military government in Pakistan; Indian democracy; political Hinduism; ethnic struggle in Sri Lanka; Islamic fundamentalism in Pakistan and Bangladesh; the Indian technological revolution; human rights problems.
- ICSO 343 Society, Politics, and Economics in Contemporary Australasia** 4 (4-0-8)
Prerequisites: -
 The contemporary Australasian region. The rise in status of the Pacific Rim. Nationalism and republicanism. Ethnic relations. Economic and social developments in Australia, New Zealand, New Guinea, and the Pacific island nations.

- ICSO 344 Society, Politics, and Economics in Contemporary Africa** 4 (4-0-8)
Prerequisites: -
 The contemporary situation in Africa; successful and unsuccessful states; economic development and stagnation; poverty, hunger and AIDS; corruption and leadership problems; ethnic relations; civil and international wars; post-apartheid South Africa; intra-African relations.
- ICSO 345 Society, Politics, and Economics in the Contemporary Middle East** 4 (4-0-8)
Prerequisites: -
 The contemporary scene in the Middle East; the Arab-Israeli struggle, regional powers, the status of Palestine; Islamic governments in Afghanistan, Iran and Sudan; the struggle between the Religious Realm and the state; Westernization in Lebanon and Turkey; the problem of Cyprus; future prospects.
- ICSO 346 Society, Politics, and Economics in Contemporary Latin America and the Caribbean** 4 (4-0-8)
Prerequisites: -
 The contemporary situation of Latin America and the Caribbean; the rise of democracy; the international drug trade and its social impact; economic development and its consequences to society; the persistence of poverty; popular political and religious movements; inter-American and international relations.
- ICSO 347 Society, Politics, and Economics in Contemporary North America** 4 (4-0-8)
Prerequisites: -
 Contemporary Canada and the United States; economic prosperity and challenges; national political developments, social problems; North America and the world; US – Canadian relations; the formation of NAFTA; the new role of NATO, the US role as the sole remaining superpower.
- ICSO 348 Society, Politics, and Economics in Contemporary Europe** 4 (4-0-8)
Prerequisites: -
 The current situation in Europe; economic developments and trend; the growth and strength of the EU; relations between Eastern and Western Europe; ethnicity, separatism and conflict in Western Europe and the Balkans; Cyprus and the relationship between Greece and Turkey; immigration; the Pope and Catholicism.
- ICSO 349 Society, Politics, and Economics in Contemporary Russia and the Former Soviet Republics** 4 (4-0-8)
Prerequisites: -
 The end of the USSR. Eastern Europe and the fall of the Party structure. The Commonwealth of Independent States. Boris Yeltzin and the breakup of the USSR. The new Russia. The economy. Foreign relations. Culture.
- ICSO 350 Contemporary China and the Chinese World** 4 (4-0-8)
Prerequisites: -
 Contemporary politics, economy, society and culture in the People's Republic of China, Hong Kong and Taiwan; international relations in a Chinese perspective.
- ICSO 352 Society, Politics, and Economics in Contemporary Japan** 4 (4-0-8)
Prerequisites: -
 Japan since World War II. Economy, Political and cultural development. International relations. Women and minorities.
- ICSO 353 Society, Politics, and Economics in the Two Koreas** 4 (4-0-8)
Prerequisites: -
 The two Koreas since World War II. Economy, Political and cultural development. International relations.

- ICSO 354 Japan and Southeast Asia** 4 (4-0-8)
Prerequisites: -
 An examination of the historical relations between Japan and Southeast Asia up until the present day. Japan's present movement in Southeast Asia.
- ICSO 355 Religion in the Americas** 4 (4-0-8)
Prerequisites: -
 Religions and religious developments in the Americas from pre-colonial times to the present day.
- ICSO 360 Patterns and Consequences of Development** 4 (4-0-8)
Prerequisites: -
 Concepts of political and economic development; policies, structures and patterns of change; production and investment priorities; the consequences of economic transformation in poor countries; contrasting results in Asia, Africa, and Latin America; urbanization and urban-rural relations; social and economic stratification; problems and challenges relating to commerce, travel and the communication revolutions.
- ICSO 364 Slavery and Human Trafficking** 4 (4-0-8)
Prerequisites: -
 The history of slavery and human trafficking. Their occurrence in the modern world. Case studies. Common themes. Possible solutions.
- ICSO 365 Genocide and Ethnic Cleansing** 4 (4-0-8)
Prerequisites: -
 The occurrence of genocide and ethnic cleansing in the modern world. Case studies. Common themes. Possible solutions.
- ICSO 366 Indigenous Cultures in the Modern World** 4 (4-0-8)
Prerequisites: -
 Small-scale and tribal societies in the modern world; the impact of incorporation into modern states; cultural change, resistance and survival.
- ICSO 367 Environmental Issues in Social Context** 4 (4-0-8)
Prerequisites: -
 A historical review of the human impact on the environment; major contemporary environmental issues; economic development, state policies and business practices in relationship to the environment; environmentalism as a social and political movement; relations with business and government: tensions, and the possibilities of conflict and cooperation.
- ICSO 368 Environmental Sociology** 4 (4-0-8)
Prerequisites: -
 Environmental sociology and environmental problems. Conservative, managerial and radical paradigms. The sociology of consumption.
- ICSO 369 NGOs and Political and Business Contexts** 4 (4-0-8)
Prerequisites: -
 The history and development of Non-Governmental Organizations at the national and international levels; the identification of social issues: slavery, women's and minority rights, civilians and the injured in wartime, refugees, civil rights, environmental issues, global political and economic movements; the relation of NGOs with the state and international organizations; the politics, organization and finance of NGOs; NGOs in relationship with business.

ICSO 370 Diplomacy and Negotiation**4 (4-0-8)****Prerequisites: -**

The uses of diplomacy and negotiation in resolving political and commercial disputes. Role and status of diplomats and negotiators. The question of political versus commercial issues. State-to-state relations, business-to-state relations, international business-state relations. Conflict generation and diplomatic model solutions.

ICSO 371 Foreign Policy of the Major Powers since 1945**4 (4-0-8)****Prerequisites: -**

The foreign policy of the United States, the Soviet Union, and China since 1945; objectives and realities; relations between these powers; the foreign policy role played by the Western European powers, Japan and India.

ICSO 373 Conflict Resolution**4 (4-0-8)****Prerequisites: -**

Origins and methods of conflict resolution. Typologies and historical trends of conflict and violence. Conflict prevention and containment. Negotiation and international agreements. Cessation of hostilities and durable standards for the implementation of conflict settlements. Terrorism, justice, and the rule of law. Modern warfare dynamics and ways to counter internecine conflict cycles.

ICSO 374 Revolution, Terrorism and the Modern State**4 (4-0-8)****Prerequisites: -**

A brief historical survey of revolution and terrorism; theories of revolution and terrorism; a critical examination of political theory regarding the rights and wrongs of revolt and terrorism; the relationship of the modern state to revolution and terrorism.

ICSO 376 War, the Military, Society and the State**4 (4-0-8)****Prerequisites: -**

The impact of war upon society and the state; social and political consequences of war; the mobilization of society in times of war; the status of human rights and freedom in times and places of war; politics and war; patterns of military organization; the possible social and political role of the military.

ICSO 377 Devolution, Privatization, and the State**4 (4-0-8)****Prerequisites: -**

A critical examination of the factors leading to devolution and decentralization in government; the popularity of local autonomy and regionalism in politics; the parallel trend of de-regulation and privatization in business; re-defining the role of national and central governments and their responsibilities to citizens.

ICSO 378 International Law and the State**4 (4-0-8)****Prerequisites: -**

The nature, development, and current status of international law; the legal personality of states and other entities under international law; recognition; territory; jurisdiction and immunity; treaties; state responsibilities; the settlement of disputes and the use of force; laws of the sea, air and space; environmental law; human rights; international legal institutions; enforcement of international law.

ICSO 381 Ethnicity, Society and the State**4 (4-0-8)****Prerequisites: -**

The concept of ethnicity; ethnic labelling and identity; the concept of race; minority groups, wider society, and the state; acceptance, prejudice and discrimination; economic, political, and sociocultural aspects of ethnicity; ethnic conflicts; ethnic cleansing and genocide.

ICSO 382 Religion, Society and the State	4 (4-0-8)
Prerequisites: -	
Religion and society; types of religious organizations and movements and their social role and impact. Secularization and counter-secularization. Religion, politics, and the state. Case studies of the contemporary role of religion in selected societies.	
ICSO 383 International Crime and Law Enforcement	4 (4-0-8)
Prerequisites: -	
The rise of international crime; smuggling; sea and air piracy; trade in human cargoes; the international drug trade; cultural property; human rights and crimes against humanity; INTERPOL and the means and problems of enforcement; extradition, immunity and asylum under International law; transnational pursuit.	
ICSO 384 Migration, Diasporas and Culture	4 (4-0-8)
Prerequisites: -	
The cultural impact of the movement of peoples. Reasons and contexts of migration historically. The preservation and transformations of traditional cultures and identities in alien land. Enclave communities and host societies. Generational differences in culture amongst migrants. The image of homeland.	
ICSO 390 Tourism: Developments and Cultural Change	4 (4-0-8)
Prerequisites: -	
The role of tourism in economic development; the impact of tourism upon traditional culture and the effects of tourism upon the patterns of cultural change: destruction, preservation, and construction; the role of traditional culture in attracting tourists.	
ICSO 396 Special Topics in History I	2 (2-0-4)
Prerequisites: -	
World War I: An account and analysis of its origins, course and outcomes.	
ICSO 397 Special Topics in History II	2 (2-0-4)
Prerequisites: -	
World War I: An account and analysis of its origins, course and outcomes.	
ICSO 398 Special Topics in Social Science I	2 (2-0-4)
Prerequisites: -	
The Life and Thought of Alexis de Tocqueville.	
ICSO 399 Special Topics in Social Science II	2 (2-0-4)
Prerequisites: -	
The Life and Thought of Alexis de Tocqueville.	
ICSO 401 Independent Study in the Social Sciences	4 (4-0-8)
Prerequisites: ICSO 301, ICSO 402	
Independent work under the supervision of an instructor. The student will be required to produce a quality paper on an approved topic or issue of interest.	
ICSO 402 Research Seminar (Social Sciences)	4 (4-0-8)
Prerequisites: ICSO 301	
Seminar discussion of selected topics in the Social Sciences; prepare and present seminar papers.	

- ICSP 250 History and Systems of Psychology** 4 (4-0-8)
Prerequisites: 1. Proven competency in English (e.g. Grade B in ICCM 105 or equivalent)
 2. Students should have some background knowledge about Psychology such as having taken ICSS 112.
 The historical development of psychology. Philosophical perspectives. The social and political implications of psychological perspectives.
- ICSS 112 Introduction to Psychology** 4 (4-0-8)
Prerequisites: -
 Human behaviour and mental functioning. The nervous system, consciousness, psychoactive drugs, sensation and perception, psychogenetics, life-span development, thinking, memory, language, conditioning and learning, motivation, personality, and stress.
- ICSS 113 Introduction to Sociology** 4 (4-0-8)
Prerequisites: -
 Humans as social beings; socialization and the sense of self; social action and interaction; social patterns and groups; culture; deviance; sociology as science; statistics and correlations; social stratification; and gender.
- ICSS 114 Introduction to Economics** 4 (4-0-8)
Prerequisites: -
 Basic principles of economics; economic valuation, scarcity, and the price mechanism; factors determining the supply of and demand for goods; factors affecting competitive markets; and international trade.
- ICSS 115 Introduction to Physical Anthropology** 4 (4-0-8)
Prerequisites: -
 The origin of human beings and special features of human race, distinctiveness, and present situation of the human species. Darwinian Theory, human evolution and cultural development, human diversity, population, and diseases.
- ICSS 116 Introduction to Political Science** 4 (4-0-8)
Prerequisites: -
 Introduction to political science and the political systems. Forms of government, the evolution of the state, political authority, the nature of citizenship, and the relationship between states in the modern world.
- ICSS 117 Introduction to Social Anthropology** 4 (4-0-8)
Prerequisites: -
 An introduction to selected aspects of social anthropology; forms of society; family and kinship; ethnicity and identity; economic and political relationships; consumption and exchange; rites of passage and the life cycle; rituals, meanings, and cultural performances.
- ICSS 118 Introduction to Mass Communications** 4 (4-0-8)
Prerequisites: -
 An introduction to mass communication and the mass media; the development, scope and functions of the mass media; basic mass communication theories; the role and significance of the media in relationship to the individual and society.
- ICSS 119 Introduction to International Studies** 4 (4-0-8)
Prerequisites: -
 The Inter-State System and the rise of the nation-state paradigm as a basis for articulating foreign policy and conducting diplomacy; post-WW II institutions and mechanisms for organizing international relations; colonialism, anti-colonialist movements and the decolonization process; the global economy and economic development agendas; the Cold War and its legacy; the rise of non-state actors; global media and transitional information flows; contemporary debates.

- ICSS 121 Southeast Asian Studies** 4 (4-0-8)
Prerequisites: -
 A general study of the Southeast Asian region: its distinctive features, geography, societies and cultures, economics, and history; the development of "Southeast Asian Studies" curriculum; an introduction to other courses on the region.
- ICSS 133 Introduction to European History** 4 (4-0-8)
Prerequisites: -
 An overview of the major developments in European history up to 1945, the geography of the European continent, the legacies of Greece and Rome, the Dark Ages, the Mediaeval Period, the Renaissance and the Reformation, the Scientific Revolution and the Enlightenment, the Industrial Revolutions and the economic transformation, Nationalism and the European wars of the 19th and 20th centuries.
- ICSS 135 Introduction to Human Geography** 4 (4-0-8)
Prerequisites: -
 Human way of life in relation with geographical space. Population growth and distribution. Patterns of livelihood. Agricultural and industrial locations. Disparities between rich and poor. The concept of "development". Human settlements. Communication. Regional cultural patterns. States, ethnicities, and global order.
- ICSS 136 Religious Experience and Traditions** 4 (4-0-8)
Prerequisites: -
 The academic study of religions. Religious phenomena. The religious traditions of East and West. Contemporary religious developments and the modern world.
- ICSS 137 Introduction to Archaeology** 4 (4-0-8)
Prerequisites: -
 History, development. The development of ancient civilizations. Contemporary archaeology. Discussions of important archaeological sites in Southeast Asia.
- ICSS 139 Tourism Geography** 4 (4-0-8)
Prerequisites: -
 Geography and the importance of place; world regions: physical, political, economic, and cultural characteristics; the development of international tourism; geographical patterns of tourism and the tourism features of selected world regions.
- ICSS 202 Social Institutions** 4 (4-0-8)
Prerequisites: -
 Basic social institutions in comparative global perspective. Socialization. Marriage and the family. Education and knowledge. Religion and culture. Media and communication. Government and administration. Politics and power. Multi-institutional politics approaches in sociology.
- ICSS 203 Globalization and the Modern World** 4 (4-0-8)
Prerequisites: -
 The global structures and transformations of the late twentieth century; the global economy; food supply; population; diseases; environment, resources, and pollution; communications; geopolitics; national-states, regional, and international organizations; minorities; the role of women; warfare and terrorism; migration and refugees; crime; culture.

ICSS 204 World History A (c. 1400-1763)**4 (4-0-8)****Prerequisites: -**

Selected aspects of world history from c.1400 to c.1763, concentrating on the political and economic forces which brought the various societies of the world together and created the background for the modern world; the traditional civilizations of Asia, Europe and Africa; the gunpowder revolution; the overseas expansion of Western Europe; the development of a world economy; the emergence of Russia; absolutism and constitutionalism as forms of government; printing and the Scientific Revolution.

ICSS 205 World History B (c. 1763-1914)**4 (4-0-8)****Prerequisites: -**

Selected aspects of world history from c.1763 to 1914; the Industrial Revolutions and the growth of the world economy; the American and French Revolutions; Latin American independence and development; political developments in Europe and the United States: representative government, the abolition of slavery, nationalism, socialism, women's rights; imperialism and responses to it; the emergence of Japan; wars and warfare; social, scientific, medical and technological developments.

ICSS 206 World History C (c. 1914-1945)**4 (4-0-8)****Prerequisites: -**

A short introduction to selected aspects of world history during the early 20th century; the two world wars; the Russian Revolutions; the development of the Soviet Union; the League of Nations and international relations during the interwar period; the American Boom of the 1920s; the Great Crash and its global impact; the rise of Fascism and Nazism; regional developments in Latin America, Asia, Africa and Australasia.

ICSS 207 World History D (c. 1945-2000)**4 (4-0-8)****Prerequisites: -**

A short introduction to selected aspects of world history since World War II. The USA and the USSR as superpowers. The Cold War. The UN system. Decolonization and the 'Third World'. Major regional powers. The Soviet collapse and its repercussions. Regional conflicts in the Middle East, South Asia, and the Balkans. Economic, technological and scientific developments. The great consumer boom. OPEC and oil prices. The World Bank and IMF. The EU and other economic regionalisms. World poverty. New political movements: Civil Rights, feminism, radical Islam. Ethnic conflicts and nationalism.

ICSS 211 Regional Geography of Southeast Asia**4 (4-0-8)****Prerequisites: -**

The regional geography of Southeast Asia; its physical structure, climate; human settlement; population; tradition, colonies, economy during the colonial and modern periods.

ICSS 212 History of Southeast Asia in the Modern Period**4 (4-0-8)****Prerequisites: -**

An overall history of the region from the beginning of the modern colonial period through to independence; general themes such as independence, liberation, nationalism, communism, democratization and globalization.

ICSS 213 Southeast Asian Political Systems**4 (4-0-8)****Prerequisites: -**

Southeast Asian nations and their political systems; constitutional concepts; government and administrative functioning; law making and enforcement.

ICSS 214 Southeast Asian Women**4 (4-0-8)****Prerequisites: -**

The roles of women in the various societies of the region; social problems that pertain to women, such as divorce, abandonment, abuse, prostitution problems and legal and political participation; global perceptions of Southeast Asian women; discussions of outstanding contemporary women in the region.

- ICSS 215 Southeast Asian Religious and Cultural Traditions** 4 (4-0-8)
Prerequisites: -
 Theravadan Buddhism, Islam, and Christianity in Southeast Asia. The traditional Vietnamese religious synthesis. Religions and the impact of colonialism, nationalism, secularizing ideologies, and economic modernization. Contemporary religious developments.
- ICSS 216 Introduction to the Economics of Southeast Asia** 4 (4-0-8)
Prerequisites: -
 The national and regional economies of Southeast Asia; agriculture; Industry, finance and the service sector; the role of government; development and economic change in the post-war period; regional and international economic relations; present economic trends.
- ICSS 221 Thai Society and Culture** 4 (4-0-8)
Prerequisites: -
 Traditional Thai culture, social structure and hierarchy; interpersonal relations; kreng jai; family; the role of Buddhism and animism; folk traditions (birth, life, marriage, death, etc.); the modern period; the impact of Chinese, Western and Japanese culture; business culture; the rural-urban division.
- ICSS 222 Thai History** 4 (4-0-8)
Prerequisites: -
 An overview of Thai history and culture, the history of Thailand, the Neolithic Period, Dvaravati, Srivijaya, Lanna, Sukhothai, Ayudhaya, Thonburi, and Ratanakosin.
- ICSS 231 History of East Asia in the Modern Age** 4 (4-0-8)
Prerequisites: -
 History of China, Japan, and Korea since the mid-19th century; traditional political and economic structures; the impact of the West; Meiji Japan; nationalism; communism; wars; contemporary economic and political structures; the role of the East Asia Region in the world.
- ICSS 232 Introduction to the Civilizations of East Asia I** 4 (4-0-8)
Prerequisites: -
 Cultural patterns and developments in China, Japan, and Korea; the nature of tradition, East Asian world views, Confucianism, Buddhism, Daoism, Shintoism; population migrations; craftsmanship and economic and scientific development; the high arts.
- ICSS 233 Introduction to the Civilizations of East Asia II** 4 (4-0-8)
Prerequisites: -
 An overview of East Asia from the 10th to the 19th century. From the Northern and Southern Sung to the Mongols. Changing patterns of overland and maritime trade. The Ming and Ching (Qing) dynasties. The shifting political order of pre-modern Korea up to the end of the Choson period. Developments in Japan through to the end of the Tokugawa Shogunate. Early European exploration and impact.
- ICSS 234 The History and Culture of South Asia up to c.1500** 4 (4-0-8)
Prerequisites: -
 The history and culture of the region; prehistory, the Indus Valley civilization, the settlement of the Indo-Aryans; empires and kingdoms; the Hindu traditions; the emergence of Buddhism and Jainism; the early impact of Islam; Indian influence in Southeast Asia.
- ICSS 235 The History and Culture of South Asia since c.1500** 4 (4-0-8)
Prerequisites: -
 The rise and fall of the Mughal Empire. Hindus, Muslims, and Sikhs; the rise of European influence; the British raj; social and economic transformations; movements of religious reform and protest; the independence movement; economic and political developments since 1947.

ICSS 237 Introduction to Australasian History since 1770**4 (4-0-8)****Prerequisites: -**

The geography of Australasia. The history of the Australasian region since the coming of the Europeans. The settlement of Australia and New Zealand. Relations with the indigenous populations. Political and economic developments from the colonial period to the present day. New Guinea. The smaller island nations and territories of the Pacific. The impact of World War II and of war in Indochina. International relations both within and beyond the region.

ICSS 238 Africa since 1800**4 (4-0-8)****Prerequisites: -**

The geography of Africa; pre-colonial states and societies; the impact of European colonialism; social and economic transformations; the emergence and development of independence movements; political and economic developments since independence; international relations within and beyond the region; cultural change: the relationships between the indigenous, Islamic, and Western traditions.

ICSS 239 The Middle East Since 1800**4 (4-0-8)****Prerequisites: -**

The geography of the Middle East; Iran, the Ottoman Empire, and North Africa in the nineteenth century; the European impact; the rise of Nationalism; political and economic developments since World War I; the founding of Israel and its consequences; the politics of petroleum; international relations within and beyond the region; religious movements and cultural change since 1800; contemporary states.

ICSS 241 Latin America since 1800**4 (4-0-8)****Prerequisites: -**

The geography of Latin America and the Caribbean. Spanish and Portuguese colonial societies. Revolution and independence. Subsequent political and economic developments in Mexico, Central and South America. Relations with Europe and the United States. The impact of the Cold War and the Cuban Revolution. Social and political movements. The contemporary scene. The Caribbean from the colonial period through to the present day.

ICSS 243 North America History c. 1763-1900**4 (4-0-8)****Prerequisites: -**

The geography of North America. The colonial situation under the British and French. The American Revolution and subsequent political developments. Territorial expansion. Slavery and the U.S. Civil War. Reconstruction and the South. Industrialization and its consequences. Immigration. The international role of the United States. The political and economic development of Canada.

ICSS 244 North America History since 1900**4 (4-0-8)****Prerequisites: -**

A history of North America since 1900; the impact of World War I, economic and political developments in the United States and Canada during the interwar years; social change, international relations; World War II and the Cold War, the Vietnam War; American society and politics since 1945; race relations; the Quebec independence movement and the future of Canada; the contemporary scene.

ICSS 246 Europe History since 1945**4 (4-0-8)****Prerequisites: -**

A political and economic history of Europe since 1945. The devastation of World War II. Marshall Aid and economic recovery. The impact of the Cold War. The early development of the European Economic Community. The foreign policies of Britain, France, and Germany. The loss of empire. Internal political, social and economic developments in the major European countries. Immigration. The situation in Eastern Europe. The collapse of communism and its consequences. The European Union. The contemporary situation and future prospects.

ICSS 247 The European Union**4 (4-0-8)****Prerequisites: -**

The development of the European Union since the end of World War II; its political institutions and legal system, the economic aspects of integration, present policies and politics; future prospects.

ICSS 250 Introduction to History and Systems of Psychology**4 (4-0-8)****Prerequisites: 1. Proven competency in English (e.g. Grade B in ICCM 105 or equivalent)**

2. Students should have some background knowledge about Psychology such as having taken ICSS 112.

The historical development of psychology. Philosophical perspectives. The social and political implications of psychological perspectives.

ICSS 251 Developmental Psychology I**4 (4-0-8)****Prerequisites: -**

The life-span perspective of individual human development from conception through infancy and childhood to adolescence; processes of physical, cognitive, and psychological growth, including language and social development; child abuse and childhood psychopathology.

ICSS 252 Developmental Psychology II**4 (4-0-8)****Prerequisites: -**

An introduction to the life-span perspective of individual human development from adolescence through adulthood to old age. The processes of physical, cognitive, and psychological growth and change, including sexuality, adult relationships, social development, and issues related to aging.

ICSS 253 Social Psychology**4 (4-0-8)****Prerequisites: -**

Social cognition and social perception. Attribution. Attitudes. Socialization, self-esteem and the self-concept. Social behaviour. Interpersonal attraction. Conformity and obedience. Aggression. Altruism. Group processes. Collective decision making. Leadership.

ICSS 254 Psychological Approaches to Personality**4 (4-0-8)****Prerequisites: -**

Diverse views of human nature. The analysis of personality. Basic qualities and dispositions. Characteristic ways of behaving. Theoretical approaches to human personality. Trait theory. The determinants of behaviour. Psychodynamic and cognitive approaches.

ICSS 255 Abnormal Psychology**4 (4-0-8)****Prerequisites: -**

The definition, assessment, and classification of abnormal behaviour. Historical approaches to the understanding and treatment of abnormal behaviour. Psychotherapies and biological treatments.

ICSS 256 Introduction to Industrial and Organizational Psychology**4 (4-0-8)****Prerequisites: -**

Work-related attitudes. Social influences at work. Job satisfaction. Work groups. Matching workers with jobs.

ICSS 257 Introduction to Educational Psychology**4 (4-0-8)****Prerequisites: -**

An introduction to the study of human learning in the educational context. Motivation. Learning mechanisms. Knowledge and intelligence. Measurement and evaluation. Teaching processes.

ICSS 258 Introduction to Cross-Cultural Psychology**4 (4-0-8)****Prerequisites: -**

The role of culture in the study of behaviour. Psycho-social development, social behaviour, personality and cognition in cross-cultural perspective. Theoretical and methodological issues.

ICSS 259 Russia and the Soviet Union up to 1825**4 (4-0-8)****Prerequisites: -**

The land, geography and climate of Russia. Prehistoric Russia. The Kievan Period. Mongol Rule. The rise of Muscovy. The early Romanovs. Peter I and the building of Petrograd. Westernization and modernization. Relations with the West.

ICSS 260 Russia and the Soviet Union Since 1825**4 (4-0-8)****Prerequisites: -**

Society, political institutions, and economic developments from 1825 up to World War I. The 1905 Revolution. World War I and the Revolutions of 1917. The Bolshevik victory and the Civil War. Stalinism. The Great Patriotic War. The Cold War and international relations. Khrushchev and the end of Stalinism. The age of Brezhnev. Social and economic developments. The end of the USSR.

ICSS 271 An Introduction to International Relations**4 (4-0-8)****Prerequisites: -**

The principles and practice of international relations, with particular reference to the modern world; the bases of international power and interstate competition; inequalities among states, including domination and colonialism; war and conflict resolution among great powers; the role of trade, defence policies, and control over scarce resources; the involvement of non-state players, including international organizations and special interest groups; international issues concerning the treatment of minority groups, human rights, the use of the environment, international crime, and terrorism.

ICSS 272 An Introduction to Comparative Political Systems**4 (4-0-8)****Prerequisites: -**

Various forms of political systems, both in theory, principle, and practice; political systems in stateless societies, traditional kingdoms and empires, absolutist states, democracies, and modern "authoritarian" and militaristic states; various forms of representation, party-political systems, elections, and decision-making; the working of the executive, legislative, and judicial aspects of government and their interrelationships.

ICSS 303 The Early History of Southeast Asia**4 (4-0-8)****Prerequisites: -**

Historical migrations of various peoples into the region. The introduction and impact of Hindu and Buddhist religions and culture. The role of Indic political systems and of interstate warfare. The development of trade with China. The introduction of Islam and the establishment of Muslim sultanates. The arrival and impact of the first Western traders and missionaries.

ICSS 307 A Historical Introduction to the World Economy**4 (4-0-8)****Prerequisites: -**

International trade up to c.1450. The creation of a world economy in the 16thC. The Commercial Revolution and the development of capitalism up to c.1800. The Industrial Revolution and its global impact. Technology and societal transformation. Changes in the nature of industrial production and business enterprise. The economic role of primary producers. World War I, the post-war boom, and the Great Depression. Classical economics and Keynesianism. Soviet and Fascist economic experiments. World War II. Economic development and technology since 1945. International trade and finance. Multi-nationals. Globalization.

ICSS 311 Introduction to International Politics in Southeast Asia**4 (4-0-8)****Prerequisites: -**

Southeast Asia in the context of global politics in the period since World War II. The impact of the Cold War and its ending. The international relations of the Southeast Asian states. ASEAN.

ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
Prerequisites: -	
Ethnicity in relationship to language, religion, 'race', and culture. Ethnic groups in Southeast Asia. Minorities and majorities in the various Southeast Asian states. Political and cultural issues. The development of national identity.	
ICSS 315 Thai Economic History	4 (4-0-8)
Prerequisites: -	
Economic developments and social structures in Thailand since the Sukhothai period. The modern Thai economy.	
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
Prerequisites: -	
The problems of poverty, especially in the agrarian sector; the successes and challenges of rural development and the consequences of change; comparison of the solutions and policies adopted in the various countries of the region.	
ICSS 332 Introduction to Human Rights	4 (4-0-8)
Prerequisites: -	
The concept of human rights in philosophical, historical, and legal perspective; human rights in contemporary international law; international conventions and the United Nations; individual rights; war crimes; the protection of minorities; economic, and cultural rights.	
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
Prerequisites: -	
A seminar-based study of contemporary economic problems in Southeast Asia.	
ICSS 335 SEA Arts I	4 (4-0-8)
Prerequisites: -	
The arts and music of the various societies of the region and their development. Architecture, the fine arts, and folk traditions.	
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
Prerequisites: -	
An introduction to the traditions of dance, theatre and puppet theatre in Southeast Asia. Their characteristic features, historical background and contemporary expressions.	
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
Prerequisites: -	
The psychological and anthropological understanding of prosocial and antisocial behaviours. Altruism and helping. Aggression and violence. Theoretical approaches and debates.	
ICSS 355 Drug Use and Behavior	4 (4-0-8)
Prerequisites: -	
The psychology of drug use and addiction. Types of psychoactive drugs, their use, and neurological impact.	
ICSS 361 Economic Geography	4 (4-0-8)
Prerequisites: -	
The basic concepts of economic geography. Physical and demographic conditions of economic activities. Spatial location in relation to agriculture, industry and other forms of economic activities. Core and periphery. Historical changes in the world economy. Economic globalization in geographical perspectives.	

ICSS 362 Introduction to Global Resources	4 (4-0-8)
Prerequisites: -	
The availability, distribution, and uses of the world's resources: food, water, land, soil, minerals, energy, fisheries, etc; resource depletion and optimal usage; public policies, international agreements and business needs as related to the production, distribution and exchange of resources; relevant technological and scientific developments; future prospects.	
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
Prerequisites: -	
The basic principles of demography. Population increase and its social impact. Urbanization. The history of international migration. International agreements and conventions on travel, and the treatment of foreign nationals and workers. Contemporary issues in immigration policy worldwide. Illegal foreign workers. Refugees.	
ICSS 374 Introduction to International Organization	4 (4-0-8)
Prerequisites: -	
The development of international organizations since the 19th century; their nature, function, and purpose; contemporary global and regional international organizations (the United Nations, ILO, WTO, and the IMF; the EU, ASEAN, NAFTA, APEC, etc.); their effectiveness and future.	
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
Prerequisites: -	
Historical developments; the principles, practices, and processes of democracy; essential elements; criticisms, strengths, and weaknesses; alternative systems; social and cultural prerequisites for democracy; possible future developments.	
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)
Prerequisites: -	
The development of the media as a global socializing force; the creation of a global market place; the information age; the power of the media in society and politics; the new global media culture.	
ICTP 101 Introduction to Television	4 (4-0-8)
Prerequisites: -	
Introduction to basic principles of TV production: use of a single camera, lighting, sound, electronic news gathering, post-production equipment, and broadcasting system.	
ICTP 102 Television Production Techniques	4 (4-0-8)
Prerequisites: -	
Introduction to multi-camera production for basic Television programs (i.e. Talk Shows and Demonstration programs).	
ICTP 111 Television Production Studio I	4 (0-8-4)
Prerequisites: -	
Application and practice in TV production for the construction of "the shot" and the elements thereof.	
ICTP 112 Television Production Studio II	4 (0-8-4)
Prerequisites: -	
Application and practice in TV production for the construction of a brief narrative employing shots and sequences.	
ICTP 201 Television Scriptwriting	4 (4-0-8)
Prerequisites: ICEM 112	
Introduction to TV scriptwriting: from conception to final script; study of script structure and practice writing various short program formats such as demonstration, news, feature, and variety shows.	

ICTP 202 Television Directing and Production Procedures	4 (0-8-4)
Prerequisites: ICTP 102	
Application and practice in TV production procedures for in-studio and on-location shooting with an emphasis on directing.	
ICTP 203 Television Genre Studies	4 (4-0-8)
Prerequisites: -	
Genre studies in film and television, theoretical and historical contexts, specific case studies, ranging from melodrama and horror to westerns and science fiction.	
ICTP 204 Television Pre-Production	4 (4-0-8)
Prerequisites: -	
Stages in pre-production: research, development of a viable concept for a production proposal, production planning, production management, and production assignments.	
ICTP 211 Television Production Studio III	4 (0-8-4)
Prerequisites: -	
Application and practice in TV production for on-location shooting with an emphasis on directing.	
ICTP 212 Television Production Studio IV	4 (0-8-4)
Prerequisites: -	
Application and practice in TV production for in-studio shooting with an emphasis on directing.	
ICTP 301 Television Drama	4 (4-0-8)
Prerequisites: -	
Artistic and technical approaches to TV drama, including blocking and acting for multi-camera shooting, camera angles and movements, shot planning, outside rehearsal, master cut and insert shooting, and continuity.	
ICTP 302 Television Post-Production	4 (0-8-4)
Prerequisites: ICTP 102	
Introduction to the artistic and technical principles of video and audio editing: the manipulation of images using non-linear editing; the addition of sound to complement the images; special effects.	
ICTP 303 Television Marketing, Sales, and Business Development	4 (4-0-8)
Prerequisites: -	
Introduction to TV program marketing and sales: applying marketing concepts to a TV program; budgeting considerations; identifying and understanding target markets; sales and presentation tools and techniques.	
ICTP 304 Television Production Design	4 (0-8-4)
Prerequisites: -	
Introduction to creating and developing a cohesive and coherent TV production, including overall style and consistency as well as the design of props and scenery.	
ICTP 305 Television Documentary Production	4 (4-0-8)
Prerequisites: ICTP 102	
A historical perspective of the documentary format; aesthetics and authorship; documentary theory; presentation styles and ethical considerations; production procedures.	
ICTP 306 Professional Internship in Television Production	4 (0-12-4)
Prerequisites: -	
Supervised internship in the field through placement in television companies. At the end of the internship, a seminar will summarize the main concepts in "Television Production" within a context of Mass Communication.	

ICTP 311 Television Production Studio V	4 (0-8-4)
Prerequisites: -	
Application and practice in the procedures for in-studio and on-location production of segments and scenes for a TV drama.	
ICTP 312 Television Production Studio VI	4 (0-8-4)
Prerequisites: -	
Application and practice in the procedures for in-studio and on-location production of an original product for TV, including dramas, documentaries, news and game shows, as well as comedies.	
ICTP 321 Television Series Scriptwriting	4 (0-8-4)
Prerequisites: -	
Introduction to the principles of dramatic storytelling: drama theory, plot structure, character design; character and plot development; dramatic elements.	
ICTP 322 News and Current Affairs Programs	4 (0-8-4)
Prerequisites: -	
Process of news and current affairs program production: principles of news editing; news production team and management; nature of various types of news and current affairs program; presentation formats.	
ICTP 323 International Field Study in Television Production	4 (0-12-4)
Prerequisites: ICTP 312	
Introduction to the management styles of international media corporations; international artistic and business trends, and international media markets; foreign broadcasting regulations and legal considerations; innovations and technology, a seminar will be conducted in order to consolidate ideas and practices.	
ICTP 324 Wardrobe for Television and Film	4 (0-8-4)
Prerequisites: -	
Introduction to the artistic and technical principles of wardrobe design, from the interpretation of the script to the completion of the wardrobe.	
ICTP 325 Special Effects Make-up for Television and Film	4 (0-8-4)
Prerequisites: -	
Introduction to special effects make-up; developing and creating an imaginative character with unique features; creating realistic injuries and marks.	
ICTP 326 Selected Topics in Television Production	4 (0-8-4)
Prerequisites: -	
Selected topics including specific television genres, styles analysis, culture and television, global television and media, television criticism and theory, technological developments, detailed investigation of new or emerging trends in television, etc.; special subjects determined by student interest and available instructor or visiting faculty.	
ICTP 327 Independent Study in Television Production	4 (0-8-4)
Prerequisites: -	
A directed independent study tailored to fit individual interests in a specific area of TV production.	
ICTP 328 3D Production for Television	4 (0-8-4)
Prerequisites: -	
Fundamental technical and conceptual skills to work in 3D production will be introduced. Students will be exposed to actual 3D pre and post production.	

ICTP 329 Television Criticism**4 (4-0-8)****Prerequisites: -**

Introduction to the role and function of the TV critic; core principles of TV criticism including TV theories and approaches; social and political implications of film.

ICTP 401 Seminar in Television Production Senior Project and Ethics**4 (4-0-8)****Prerequisites: ICTP 312**

Integration of the knowledge, skills, and techniques acquired throughout the course of study in developing a TV program proposal and planning the production of the final project, including legal and ethical considerations.

ICTP 402 Television Production Senior Project I**4 (0-12-4)****Prerequisites: ICTP 401**

Production of an approved final project.

ICTP 403 Television Production Senior Project II**4 (0-12-4)****Prerequisites: ICTP 402**

Post-production of the approved project including editing, post-production, and screening. Completion of Final Project Book.



GENERAL CATALOG

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Mahidol University International College

999 Phutthamonthon 4 Road, Salaya, Nakhonpathom, Thailand 73170

Tel: 02 441 5090

www.muic.mahidol.ac.th