

Chemistry

ICBI 101 Biology	4
Prerequisites: - Properties of life, classification, and scientific process; chemistry of life; cells and metabolism; genetics; mechanisms of evolution	
ICBI 102 Integrated laboratory in Biological Sciences I	2
Prerequisites: - Cell structure and function; tissue; cell division; ecology; movement of molecules; respiration and photosynthesis	
ICBI 103 Biology II	4
Prerequisite: - Diversity of life; plant forms and functions; animal forms and functions; ecology and behavior	
ICBI 211 Genetics and Molecular Biology I	4
Prerequisite: ICBI 101 An introductory course to genetics and molecular biology that focuses on genes/chromosome as inheritable elements; processes of mitosis and meiosis; DNA mutations; Mendelian genetics and central dogma	
ICBI 380 Introduction to Systems Biology and Bioinformatics	4
Prerequisite: ICBI 211, ICMA 252 or ICCS 161 An introduction to computational and mathematical modeling of complex interaction within biological systems; biological databases; information archiving and retrieval and tools for molecular sequence analysis	
ICCH 210 General Chemistry I	4
Prerequisites: - Concepts of general chemistry; matters, atoms, compounds, reactions, gases, thermodynamics, electrons in atoms, periodic table, chemical bonding; intermolecular forces, and spontaneous changes	
ICCH 211 General Chemistry II	4
Prerequisites: ICCH 210 Comprehensive general concepts and principles of chemistry; solutions, equilibria, acids and bases, solubility, electrochemistry, chemical kinetics, chemistry of main-group and transition elements, coordination compound, nuclear chemistry and selected topics in chemistry	
ICCH 221 Organic Chemistry I	4
Prerequisites: ICCH 211 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
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

Prerequisites: ICCH 210

or

Corequisites: ICCH 210

Laboratory practicals for general chemistry: measurements; stoichiometry; solids, liquids and solutions; gases; thermochemistry; equilibrium; acids and bases; electrochemistry; kinetics

ICCH 309 Scientific Research and Presentations

4

Prerequisites: ICCH 222 or lecturer permission

Literature search and review, research design and ethics, data collection and analyses, scientific writing, oral and poster presentation; critical scientific review

ICCH 311 Analytical Chemistry

4

Prerequisites: ICCH 211

Separation techniques and concepts of modern analytical methods essential for quantitative and qualitative characterization; treatment of the analytical data; principles and applications of chemical equilibria; electrochemical methods; separation methods; practical exercises involving the use of spectroscopic analytical equipment

ICCH 316 Modern Methods of Analysis

4

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; the atomic absorption and emission spectroscopy; practical exercises involving the use of spectroscopic analytical equipment

ICCH 321 Organic Spectroscopy

4

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

Prerequisites: ICCH 222 or lecturer permission

Advanced 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

Prerequisites: ICCH 224 and ICCH 311 or lecturer permission

Laboratory practicals for physical chemistry and related analytical chemistry: thermodynamics laws and enthalpy; kinetics and rate laws; molecular spectroscopy; atomic absorption spectrometry; infrared spectrometry; UV-vis spectrometry; gas chromatography-mass spectrometry; titration; electrochemistry

ICCH 333 Physical Chemistry I

4

Prerequisites: ICCH 211 and ICMA 213

Concepts of classical physical chemistry; behavior of gases; The first, second and third laws of thermodynamics; chemical equilibria; phases and solutions; phase equilibria; the rate of chemical reactions

ICCH 334 Physical Chemistry II

4

Prerequisites: ICCH 211 and ICMA 213

Concepts of classical and non-classical physical chemistry; the quantum theory and spectroscopy; statistical thermodynamics

ICCH 336 Computational Chemistry

4

Prerequisites: ICCH 211 or lecturer permission

An introduction to molecular modeling methods to study geometries, properties and reaction of compounds; molecular mechanics, semi-empirical and ab-initio methods and density functional theory	
ICCH 337 Applied Computational Methods and Cheminformatics	4
Prerequisites: ICCH 336 or ICCH 381 or lecturer permission	
Uses of computer for chemistry-related calculations; installation and uses of computational software for chemistry applications, selection of appropriate software and methodology for chemical system investigation, basic application of programming language(s) to chemistry related problems	
ICCH 371 Biochemistry I	4
Prerequisites: ICBI 101, ICCH 221 or lecturer permission	
Biomolecules, structure, conformation, and function of proteins and DNA, controls and processes of metabolism at cellular and molecular levels	
ICCH 372 Biochemistry II	4
Prerequisites: ICCH 371 or lecturer permission	
Biosynthesis of macromolecular precursors; storage, transmission and expression of genes; molecular physiological processes	
ICCH 373 Biochemistry Laboratory	2
Prerequisites: ICCH 371, ICCH 224 or co-requisites: 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
Prerequisites: ICCH 211 and ICMA 213	
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
Prerequisites: ICCH 222 and ICCH 224 or lecturer permission	
Supplementary organic laboratory practicals for those interested in developing more and advanced organic laboratory techniques through running more advanced organic reactions; Grignard synthesis; Friedel-Crafts; Diazonium salts; Diels-Alder and the spectroscopic analysis	
ICCH 391 Material Science	4
Prerequisites: ICCH 211	
Fundamental concepts of material science and engineering; structure, energetics, and bonding	
ICCH 393 Dermatology	4
Prerequisites: ICCH 371 or lecturer permission	
An introduction to science of human skin; cellular structure and function, clinical conditions	
ICCH 394 Colloid and Emulsion chemistry	4
Prerequisites: ICCH 333 or lecturer permission	
A variety of topics in surface science, emulsions, foams, aerosols, surfactants, self-assembly, micelles and vesicles	
ICCH 395 Cosmetic Science	4
Prerequisites: ICCH 222 or lecturer permission	
Scientific principles in cosmetic science; the definition of cosmetics, product formulation, vehicles of cosmetic products, functions of active ingredients, laboratory practice and/or field study related to the topics	
ICCH 396 Pharmaceutical Science	4

Prerequisites: ICCH 222 or lecturer permission

Applications of chemical principles to the study and evaluation of pharmaceutical systems; pharmaceutical stability, pharmacokinetics, drug delivery systems, molecular and cellular pharmaceuticals

ICCH 425 Current Topics in Organic Chemistry I 4

Prerequisites: ICCH 322 or lecturer permission

The frontier in organic chemistry; reaction or synthesis or mechanism topics

ICCH 426 Current Topics in Organic Chemistry II 4

Prerequisites: ICCH 322 or lecturer permission

The frontier in organic chemistry; bioorganic chemistry, natural products or macromolecules

ICCH 427 Current Topics in Applied Chemistry I 4

Prerequisites: ICCH 222 or lecturer permission.

The frontier in applied chemistry; industrial chemistry or nuclear chemistry

ICCH 428 Current Topics in Applied Chemistry II 4

Prerequisites: ICCH 222 or lecturer permission

The frontier in applied chemistry; environment chemistry or medicinal chemistry

ICCH 429 Current Topics in Physical Chemistry 4

Prerequisites: ICCH 334 or lecturer permission

The frontier in physical, computational and theoretical chemistry topics

ICCH 430 Current Topics in Inorganic Chemistry 4

Prerequisites: ICCH 442 or lecturer permission

The frontier in inorganic chemistry topics

ICCH 433 Current Topics in Biochemistry 4

Prerequisites: ICCH 372 or lecturer permission

The frontier in biochemistry or biophysics topics

ICCH 441 Inorganic Chemistry I 4

Prerequisites: ICCH 222 or lecturer permission

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

Prerequisites: ICCH 441 or lecturer permission

Advanced 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 445 Integrated Laboratory Techniques in Chemistry III 2

Prerequisites: ICCH 329 or lecturer permission

Laboratory practicals covering inorganic chemistry and related analytical chemistry techniques: inorganic complex formation; inorganic compound synthesis and characterization; organometallic chemistry; inorganic spectroscopy; titration; gravimetric quantification; liquid chromatography, gas chromatography, chromatography techniques

ICCH 446 Chemical Unknown Detective 2

Prerequisites: ICCH 445 or lecturer permission

Selected techniques of substance identification and substance quantification; case studies or field study and laboratory practice

ICCH 454 Seminar in Chemistry	2
Prerequisites: Seniors or lecturer permission	
Current topics of interest in the frontier of chemical research discussed with an emphasis on searching chemical database for research papers for in-class discussion	
ICCH 455 Senior Project in Chemistry	6
Prerequisites: Seniors or lecturer permission	
A 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	
ICCS 161 Introduction to Data Science	4
Prerequisites: ICMA 151	
An overview of data science; software stack for data scientists; acquiring data from online sources; data cleansing and simple manipulation; exploratory data analysis and visualization; statistical inference and modeling; basic machine learning algorithms; classification and its applications; clustering and its applications; a brief introduction to natural language processing; data science and ethical issues	
ICMA 106 Calculus I	4
Prerequisites: Placement test or ICMA 100	
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 curves.	
ICMA 151 Statistics for Science I	4
Prerequisite: Placement test or ICMA 100	
Statistical ideas and concepts; probability, conditional probability; distribution functions; expected value; estimators, good estimators; hypothesis testing	
ICMA 213 Calculus II	4
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.	
ICPY 101 Physics I	4
Prerequisites: -	
Measurement, units and dimensions; vectors; linear motion; Newton's laws of motion; rotational motion; energy, momentum, static equilibrium, fluid mechanics	
ICPY 102 Physics II	4
Prerequisites: ICPY 101	
Oscillations and wave; light and sound; Thermodynamics; electricity and magnetism; Modern Physics	
ICPY 105 Integrated Laboratory in Physics I	2
Prerequisites: ICPY 101	
Lab practice on measurement and uncertainty, propagation of errors, and data analysis for Newton's laws of motion; refraction and diffraction; heat transfer	
ICPY 496 Biophysics	4
Prerequisites: ICBI 101	
An introduction to biophysics, physical methods in the study of biological systems, including molecular and cellular biology, mathematical modeling of biological phenomena; applications of physics to biology; instruments in biophysics	



Mahidol University

International College

Foundation Courses

(For all 618xxxx students, except ICCI, ICCU and ICMC students)

ICID 100 Freshman Seminar	0
Prerequisites: - Compulsory for all freshmen; time management skills, study plan, adjustment to college's life, and teachers' expectation	
ICMA 100 Foundation Mathematics	0
Prerequisites: Placement test Expressions and equations; linear functions; polynomials and nonlinear functions; radical and rational functions; the data analysis	
ICME 100 English Resource Skills	0
Prerequisites: Placement test A remedial course preparing students for reading and writing academic English at a level suitable for entering the Intermediate English Communication I	

General Education Courses

(For all 618xxxx students, except ICCI, ICCU and ICMC students)

English Communication

ICGC 101 Academic Writing and Research I	4
Prerequisites: Placement Writing Test or ICME 100 An introduction to the academic writing process through the development of the writer's voice through sentencings, structure, and rhetorical devices; a focus on strategies for using and integrating researched sources; methods to compose well-structured essays based on themes relevant to the world today	
ICGC 102 Academic Writing and Research II	4
Prerequisites: ICGC 101 The integration of skills in academic research and writing to analyze and create persuasive compositions; techniques to identify strengths and weaknesses in argument; the development of students' knowledge and preconceptions of global issues through a progressive series of essays and journal assignments	
ICGC 103 Public Speaking	4
Prerequisites: ICGC 102 Academic Writing and Research II Fundamentals of key skills for confident and effective public speaking through a series of prepared and unprepared speeches; an introduction and application of techniques to inform/persuade audiences; the utilization of Academic Writing and Research I and II to create and deliver speeches to a professional standard	
ICGC 111 Academic Writing and Research I (Advanced)	4
Prerequisites: Placement Writing Test Theories and practical methods to enhance students' creative and descriptive abilities; an emphasis on the development of a writer's voice through sentencings, structure, and rhetorical devices; strategies for using and integrating researched sources introduced by means of explaining theories, concepts, and writing conventions	

ICGC 112 Academic Writing and Research II (Advanced)	4
Prerequisites: ICGC 111	
A focus on high levels of academic literacy and presentation skills in reading, writing, and public speaking for experts or near-expert users of English; the utilization of advanced strategies to exploit secondary research and argumentation; an application of advanced skills in critical thinking and rhetorical knowledge through class discussions and written and oral assignments	
ICGC 201 Global Realities	4
Prerequisites: ICGC 103 or ICGC 112	
An exploration and a critical analysis of key texts on poetry, literature, and legislative documents in order to understand the complexity and challenges of the world we live in; themes encouraging students to consider values, human rights and government; class discussions, journal writing, and presentation activities to demonstrate how students can contribute to the betterment of society	
ICGC 202 Literary Analysis	4
Prerequisites: ICGC 103 or ICGC 112	
A review of literary works from selected literary genres; an exploration of how literature informs our perceptions of the world by way of analytical and critical thinking; an analysis of short stories, poetry and drama; scaffolding of strategies for students to understand the function of a variety of literary forms	
ICGC 203 Creative Writing	4
Prerequisites: ICGC 103 or ICGC 112	
An examination of fictions, poetry, drama, and the media production through readings, speeches and films; comparisons of writing in different genres; a creation of the work of publishable quality by means of the consideration of audience and genre	
ICGC 204 Advanced Oral Communication	4
Prerequisites: ICGC 103 or ICGC 112	
Theories of persuasion, non-verbal techniques, and voice control for advanced presenters; strategies to develop high levels of voice control and expressions; activities including debates, stage, and sales strategies; the development of students' abilities to express themselves confidently in a variety of academic and professional environments through impromptu and prepared speeches	
ICGC 205 Linguistics	4
Prerequisites: ICGC 103 or ICGC 112	
An introduction to major features and components of the human languages; a focus on power and complexity of languages, its influence on interactions and its contributions to understanding; an exploration of definitions and applications of syntax, semantics, pragmatics, and other related topics	
ICGC 206 Literature Into Film	4
Prerequisites: ICGC 103 or ICGC 112	
An introduction to the technical aspects of translating literature into films; an exploration of the interplay between literature and films through an analysis of short stories, novels, and plays and their film versions; an exploration of the challenges merging both mediums	
ICGC 207 Diverse English Speaking Cultures	4
Prerequisites: ICGC 103 or ICGC 112	
An introduction to the study and appreciation of post-colonial literature; utilizing literature, music, and film to help students develop the ability to understand influences in new ways; an evaluation through a combination of mock trials, debates, plays, presentations, reading notes, and essays	

ICGC 208 Language and Culture	4
Prerequisites: ICGC 103 or ICGC 112	
An examination of the interplay between language and culture; having texts and class discussions to focus on the importance of understanding the link between culture and languages; a completion of research paper on the topic	
ICGC 209 The Story of English	4
Prerequisites: ICGC 103 or ICGC 112	
The development of English traced from its origins; the/a demonstration through texts, films, and media of the growth and spread of English; an introduction to methods of understanding a variety of linguistic progressions in the language	
ICGC 210 First and Second Language Acquisition	4
Prerequisites: ICGC 103 or ICGC 112	
An introduction to how children develop their first language; comparing and contrasting of the second language development; theories of language development from behaviorism to more recent cognitive and functional approaches; the implications of theories	
ICGC 211 Topics in Comparative Literature A: Poetry	4
Prerequisites: ICGC 103 or ICGC 112	
An in-depth study of poetry, including: metrics, forms, themes, ethnic voices, throughout history; an evaluation of poetry from different genres through a series of discussions, workshops and a term research paper	
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4
Prerequisites: ICGC 103 or ICGC 112	
A study of elements of fictions in short stories and novels through class workshops on characters, dialogue, plot and atmosphere; class discussions to analyze the effect of historical and social developments on selected themes	
ICGC 213 Topics in Comparative Literature C: Drama	4
Prerequisites: ICGC 103 or ICGC 112	
An exploration of ways to understand and appreciate drama by reading, watching, and analyzing theatrical performances; staging and enactment of a theatrical production; readings, essays, and theater workshop activities to prepare students for a final stage performance	

Natural Science

- **Scientific and Environmental Literacy**

ICGN 101 Decision Mathematics	4
Prerequisites: -	
Graphs and networks; linear programming; transportation problems; game theory	
ICGN 102 Essential Mathematics	4
Prerequisites: Placement test	
Real numbers, algebraic expressions, percentages, ratio, proportion; linear functions; the systems of linear equations	
ICGN 103 Essential Statistics	4
Prerequisites: ICGN 102	
Statistical ideas and concepts; probability and conditional probability; distribution functions; expected value; estimators; hypothesis testing; a linear regression analysis	

ICGN 104 Mathematics and Its Contemporary Applications	4
Prerequisites: Placement test <i>or</i> ICMA 100	
A review of algebra, logarithmic and exponential functions, matrix algebra, differential calculus, integral calculus	
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4
Prerequisites: -	
Human impacts on Southeast Asian ecology; human impacts on Southeast Asian's biodiversity and natural resources; fundamental ecological and resource management principles; current sustainable development issues; sustainable development practices for Southeast Asia	
ICGN 106 Climate Change and Human Society	4
Prerequisites: -	
Human activities and the global climate; consequences for human society; consequences for the essential life support systems; perspectives on human health and diseases; adapting to global climate change; mitigating global climate change; an optional field visit included	
ICGN 107 The Chemistry of Everyday Life	4
Prerequisites: -	
The air we breathe; ozone hole; water quality; acid-base and everyday chemicals; energy and fuels; battery; portable electronics; pharmaceuticals from nature; polymer and plastics; nutrition and modern life; genetic engineering; forensics and the DNA technology	
ICGN 108 Essentials of Culinary Science for Food Business	4
Prerequisites: -	
Changes during the preparation, heating, and storage of raw materials and finished products, food service and commercial packaged food industries; chemical, sensory, and nutritional natures of food, food safety concepts, changing trends and interests, legal requirements of the food establishment	
ICGN 109 Food for Health	4
Prerequisites: -	
Human nutritional requirements; health benefits of various foods; quality and safety of foods; food additives; food production and preservation; health and nutritional value	
ICGN 110 Maker Workshop	4
Prerequisites: -	
A mechanical design consideration, 3D drawing, safety in design; motion in 1 and 2 dimension; the sound and the oscillation motion, mechanical properties of materials; basic electronics, a circuit analysis, soldering; microcontroller, basic programming	
ICGN 111 Physics for CEO	4
Prerequisites: -	
Basic concepts of physics impacting individuals and society on a daily basis: physical quantities, the Newtonian mechanics and dynamics, energy and heat, electricity and magnetism, light and sound, and the electromagnetic spectrum	
ICGN 112 Stargazer	4
Prerequisites: -	
Basic ideas of astronomy, astrophysics, and cosmology; the progress of human understanding of the universe; the impact of the scientific methods on the astronomical observation; the earth and the moon; the solar system; the lifecycle of stars; Black Holes; galaxies; and the current understandings about the origins and the future of the universe	

ICGN 113 Plants, People and Poisons	4
Prerequisites: -	
The plant world; the way plants grow and reproduce; modern technologies used for improving agricultural methods; the basics of plant biology; the distinctions among major groups of plants; the social implications of plant use and abuse	
ICGN 114 The Scientific Approach and Society	4
Prerequisites: -	
Scientific literacy; the process of science discovery; verification, its limitation, and the influence on various disciplines; human research and animal research ethics; the critical analysis of current scientific articles; life cycle of scientific knowledge; modeling in science	
ICGN 115 Human Evolution, Diversity and Health	4
Prerequisites: -	
The Hominid evolution; primate societies; the origins of human species; the Order Primates; human distinctiveness and diversity; the scientific advancements and the human body; the scientific advancements and the modern society	
<ul style="list-style-type: none"> • ICT and Digital Literacy 	
ICGN 116 Understanding and Visualizing Data	4
Prerequisites: -	
An introduction to data analytics; roles and examples of the data-driven decision making; technology landscape; data kinds and types; data sources and collection techniques; data storage and standard formats; data processing workflow; summary from data; different types of visualization; data visualization tools	
ICGN 117 Technology behind E-Business and Digital Strategies	4
Prerequisites: -	
Landscape of technologies in the digital enterprise and e-business; internet-based staples such as web hosting, domain-name acquisition, the social media, the payment systems; electronic business models and digital strategies; emerging trends in technology; legal and ethical issues	
ICGN 118 Everyday Connectivity	4
Prerequisites: -	
The Internet, computer networks, and the World Wide Web (W3) in daily life; troubleshooting small network problems; identifying threats and avoiding dangers online; finding credible information on the Web; online communication tools, such as the social media and email, for professional branding; the basic e-business concepts and tools; the e-payment systems	
ICGN 119 Computer Essentials	4
Prerequisites: -	
Digital literacy relating to computer literacy and information literacy; the computer hardware and its general functions; the operating systems; software packages and their daily use; computer security; the ethical use of the intellectual property	

Humanities

- **Logical and Ethical Literacy**

ICGH 101 Biotechnology: from Science to Business	4
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Prerequisites: -

Biotechnology, bioethics, and the law, biotechnology and the regulatory framework, genetic testing, patenting life, biobanks and modern genomics research; genetically modified organisms; human and animal testing, bioterrorism; biological weapons laws, bio-prospecting, pharmaceutical pricing; the future of the human beings and post-humanism

ICGH 102 Famous Arguments and Thought Experiments in Philosophy 4

Prerequisites: -

An examination of the most striking argumentative moves in philosophy from Plato's Allegory of the Cave to Searle's Chinese Room and beyond; a transfer and an application of paradigmatic philosophical thinking to current open questions in politics and science

ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments 4

Prerequisites: -

Basic formal tools from sentential and predicate logic; logical structures of arguments used in the everyday contexts of life; an analysis of their strengths and weaknesses; common fallacies in reasoning, including reasoning involving determining probabilities; a construction of good arguments using the principles of informal reasoning

ICGH 104 Moral Reasoning: How can we know what is good? 4

Prerequisites: -

A survey of philosophical, psychological, and scientific contributions to the understanding of moral values; a hands-on construction and an analysis of ethical argument regarding burning issues in applied ethics

ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?! 4

Prerequisites: -

An examination of major technological and scientific innovations across the globe and their effects on human life and thought; a focus on agriculture, steel, the printing press, the mechanical clock, magnifying lenses, antibiotics, electricity, steam and combustion engines, and the transistor

ICGH 106 The Greeks: Crucible of Civilization 4

Prerequisites: -

An introduction to and an overview of the philosophy and thought of Ancient Greece and its influence on contemporary civilization; theories about knowledge, propaganda, truth, art, psychology, happiness, justice, and democracy

- **Arts and Media Literacy**

ICGH 107 Contemporary Art and Visual Culture 4

Prerequisites: -

Current issues in society; the new media in art today; an analysis of images; social and historical contexts of contemporary art; creative thinking; the effects of globalization on the visual world; an investigation of broader social and cultural matters; subject matters related to ideology, gender, race, and ethnicity

ICGH 108 Creative Drawing Expression 4

Prerequisites: -

Drawing in a variety of medium; drawing as creativity; re-presenting, expressing, texturizing, sublimating, juxtaposing, appropriateness, redefining, constructing, illustrating, and describing; drawing from life: human form; developing cognitive learning skills; utilizing visual communication, the design and art principles (experimentation, exploration, application, techniques for mark making, proportion, gesture, contour, action,

weight, line, value, texture, composition); researching, interpreting, evaluating, and analysing contemporary artists; personal evaluation; personal expression

ICGH 109 Creative Thinking Through Art and Design **4**

Prerequisites: -

Combining a hands-on studio experience with demonstrations, lectures and discussions; developing creativity and gaining confidence in communicating one's own unique vision; exploring a variety of art and design mediums; understanding the elements of the visual language; implementing the creative process and creative thinking; developing individual solutions to open-ended problems

ICGH 110 Drawing as Visual Analysis **4**

Prerequisites: -

Developing creativity and cognitive learning skills; utilizing visual communication, the/a design and art principles; mark making; observing, analyzing, recording, representing plant and still life forms; practicing and applying, and using techniques for conventional pencil drawing tools (shape, form, perspective, lines, shading, value, negative space, texture, composition); scientific illustration; a realistic representational observation

ICGH 111 Media Literacy: Skills for 21st Century Learning **4**

Prerequisites: -

An integration of the media literacy, the media production, and the media ethics; accessing, analyzing, evaluating, questioning, and producing media texts; social, cultural, and political implications of the media; representations in the media; the media as political economy; the media aesthetics; the media and influence; audiences negotiating meaning

ICGH 112 Photography **4**

Prerequisites: -

An integration of visual literacy, photography techniques, and ethics; analyzing, evaluating, and authoring photographs; visual aesthetics; visual storytelling and narrative building techniques; the decisive moment; influencing audiences; maximizing the audience engagement; the ethical publications and the dissemination of photographs

ICGH 113 Moving Pictures: A History of Film **4**

Prerequisites: -

An investigation of European, American, and Asian films as art, philosophy, social commentary, and propaganda; a focus not only on techniques, styles, and technological advances but on the interpretation, comparison, and criticism

ICGH 114 The Sound of Music: Form, Emotion, and Meaning **4**

Prerequisites: -

A survey of a musical expressions and an analysis of its communicative force in light of current research; examples from a wide range of musical styles with a focus on classical music

Foreign Languages

- **German**

ICGL 101 Elementary German I **4**

Prerequisites: Placement test

Greetings, introducing oneself or others; German alphabets and phonemes; personal information, numbers from 1 – 100 and price quotations; expressing wishes, telling the time and making appointments; the quality of items, measurements; verb forms, pronouns, sentence structure, gender of nouns, accusative case and plural forms, negation

ICGL 102 Elementary German II	4
Prerequisites: Placement test or ICGL 101	
Ordering and paying 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	
ICGL 103 Elementary German III	4
Prerequisites: Placement test or ICGL 102	
Health advice and problems, healthy and unhealthy lifestyles, events, and accidents, travel reports, curriculum vitae (CV); possessive articles in nominative, accusative and dative case, perfect tense, connectors, modal verbs II	
<ul style="list-style-type: none"> • Japanese 	
ICGL 111 Elementary Japanese I	4
Prerequisites: Placement test	
The Hiragana and Katakana characters; fundamentals of the basic Japanese grammar (noun-ending sentences, particles, demonstratives, verb-ending sentences, non-past and past tenses); scaffolding of basic vocabulary; basic communication about personal topics (self and others); the description of Japan; the design of written products in the target language; expressing existence, preferences, and agreement; comparing cultures	
ICGL 112 Elementary Japanese II	4
Prerequisites: Placement test or ICGL 111	
The Kanji characters (approximately 50); fundamentals of the basic Japanese grammar concepts (particles, verbs of giving and receiving, na-adjective-ending sentences, i-adjectives-ending sentences, non-past and past tenses, and classifiers); scaffolding of basic vocabulary; basic communication about daily life topics; the design of written products in the target language; expressing simple points of view, describing people and daily life activities; comparing cultures	
ICGL 113 Elementary Japanese III	4
Prerequisites: Placement test or ICGL 112	
The Kanji characters (approximately 50); fundamentals of the basic Japanese grammar concepts (verb conjugation (masu-form, te-form, nai-form, and dictionary form), and related sentence patterns; the polite style of speech, and the plain style of speech, particles); scaffolding of basic vocabulary; basic communication about various topics; the design of written products in the target language; expressing points of view, describing people and various activities; comparing cultures	
<ul style="list-style-type: none"> • French 	
ICGL 121 Elementary French I	4
Prerequisites: Placement test	
Fundamentals of the basic French grammar (pronouns, present tense conjugation, gender/number, adjectives, prepositions); scaffolding of basic vocabulary; basic communication about personal topics (self and others); an identification and a description of French speaking countries; the design of written products in the target language; expressing existence, preferences and agreement; comparing cultures	
ICGL 122 Elementary French II	4
Prerequisites: Placement test or ICGL 121	
Fundamentals of the simple French grammar (present and future tense, adjective gender, place and agreement, more complex prepositions, more complex questions); scaffolding of simple vocabulary; simple communication about daily life topics (in France and in their country); the design of written products in the target language; expressing simply point of view, describing people and daily life activities; comparing cultures	

ICGL 123 Elementary French III**4****Prerequisites: Placement test or ICGL 122**

Fundamentals of the more complex French grammar (present and future tense, adjective gender, place and agreement, more complex prepositions, questions and past tense notions); scaffolding of more complex vocabulary; longer communication about daily life topics (in France and in their country); the design of written products in the target language; expressing point of view, describing people and daily life activities; comparing cultures

- **Chinese**

ICGL 131 Elementary Chinese I**4****Prerequisites: Placement test**

The Chinese phonetic system (Pinyin), the Chinese basic writing system (Stroke order), the Chinese characters (approximately 100) and fundamentals of the basic Chinese grammar (interrogative pronouns, particle 的“de”, Yes/No questions with 吗“ma”, demonstrative pronouns, classifiers, adverb “ye”也, “dou”都); scaffolding of basic vocabulary; basic communication about personal topics (self and others); the description of China; the design of written product in the target language; expressing existence, preferences and agreement; comparing cultures

ICGL 132 Elementary Chinese II**4****Prerequisites: Placement test or ICGL 131**

The Chinese phonetic system (Pinyin), the Chinese writing system, the Chinese characters (approximately 100); fundamental Chinese grammar concepts (interrogative pronouns, classifiers, “de” particles, “de” phrase, adverbials, the continuation of an act sentence structures and the reduplication of verbs); scaffolding of basic vocabulary; basic communication about daily life topics; the design of written products in the target language; expressing simple points of view, describing people and daily life activities; comparing cultures

ICGL 133 Elementary Chinese III**4****Prerequisites: Placement test or ICGL 132**

The Chinese phonetics (Pinyin); The Chinese characters (approximately 150); Fundamentals of the basic Chinese grammar concepts (interrogative pronouns, modal verbs, complex sentence, modal particle “le” (了), complement of state, complement of result, complement of duration); scaffolding of basic vocabulary; basic communication about various topics; the design of written products in the target language; expressing points of view, telling direction, describing oneself and other people’s abilities; comparing cultures

- **Spanish**

ICGL 141 Elementary Spanish I**4****Prerequisites: Placement test**

Fundamentals of the basic Spanish grammar (pronouns, present tense conjugation, gender/number, adjectives, prepositions); scaffolding of basic vocabulary; basic communication about personal topics (self and others); an identification and a description of Spanish speaking countries; the design of written products in the target language; expressing existence, preferences and agreement; comparing cultures

ICGL 142 Elementary Spanish II**4****Prerequisites: Placement test or ICGL 141**

Fundamentals of the basic Spanish grammar (pronouns, present tense conjugation, reflexive verbs, gender/number, adjectives, prepositions); scaffolding of basic vocabulary; basic communication about personal topics (self and others); an identification and a description of Spanish speaking countries; the design of written products in the TL; expressing existence, preferences and agreement; talking about daily habits

ICGL 143 Elementary Spanish III 4
Prerequisites: Placement test *or* ICGL 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

- **Thai**

ICGL 160 Introduction to Thai Language and Culture 4
Prerequisites: -
A communication in basic situations such as introducing oneself, asking for and giving directions, ordering food and drinks, asking for prices and bargaining at the same time, understanding selected topics of Thai culture in daily life

ICGL 161 Elementary Thai I 4
Prerequisites: Placement test
Listening and speaking skills on the following topics: introducing oneself, one's friend and family, basic food and drink ordering, places, directions, transportation, buying tickets, clothing items, colours, and sizes; bargaining, counting and using classifiers; reading and writing Thai consonants; vowels placed after, before, above, and below the consonants; Thai numbers; live and dead syllables

ICGL 162 Elementary Thai II 4
Prerequisites: Placement test *or* ICGL 161
Listening and speaking skills on the following topics: one's schedule, making appointments, favourite leisure activities, ordering food, drinks, and desserts with special requests; presentation of one's plan for activities during the school break; a continuation of Elementary Thai I in reading and writing skills; the consonant clusters, tone marks, words with special spelling rules, reading short paragraphs

ICGL 163 Elementary Thai III 4
Prerequisites: Placement test *or* ICGL 162
Communication of the four skills on the following topics: booking or renting accommodation, symptoms of illness and visiting a doctor; selected holidays and festivals; a presentation of a selected province in Thailand; a continuation of Elementary Thai II in reading and writing skills, writing short paragraphs and reading long passages on selected topics

International College

Social Sciences

- **Financial, Economic, Business and Entrepreneurial Literacy**

ICGS 101 Accounting for Young Entrepreneurs 4
Prerequisites: -
Fundamental accounting concepts; the basic accounting process used in small enterprises; the preparation of financial statements; the break-even analysis; business taxation

ICGS 102 Business Sustainability and the Global Climate Change 4
Prerequisites: -
A study of the role of business in the society; the basic concept of sustainability; global governance; sustainable development; social inequalities and social inclusion; environment sustainability; climate change; climate change mitigation; climate change adaptation; green marketing; business sustainability

ICGS 103 Economics in Modern Business 4
Prerequisites: -

Forces of demand and supply, elasticity, opportunity cost, market structures, pricing strategy, business enterprise, consumers' behavior; the Thai economy, the world economy, globalization and technological, profit maximizing, firm and organization, government policies, a business analysis and managerial decision-making, competitive advantage; the social media economy, innovation-based economy, digital sharing economy, aging society and dynamic business environment

ICGS 104 Essentials of Entrepreneurship 4

Prerequisites: -

Creating new businesses, capturing new markets, enhancing organizational effectiveness; entrepreneurship theories and frameworks, practices of promoting and managing start-ups; the life-cycle of an entrepreneurial venture; concept implementation, entrepreneurial pathway; the customer analysis, integrated marketing, funding, securing and managing capital, the human capital management under the disruptive environment

ICGS 105 Personal Financial Management 4

Prerequisites: -

Personal finance and investment; financial goals and planning process; financial statements and budgets; tax preparation; cash and savings management; investment planning; investing in stocks and mutual funds; making automobile and housing decisions; life insurance; protecting the property; retirement planning

ICGS 106 Fashion and Society 4

Prerequisites: -

The design elements of fashion, fashion terminology, fashion reflecting its temporal and spatial context, fashion and the development of art; fashion as a cultural expression, fashion as creativity; fashion requiring customers' approval and endorsements, fashion and consumer behaviour, fashion and consumerism, and ethical issues of fashion

ICGS 107 MICE 101 4

Prerequisites: -

An introduction to MICE industry; meetings; incentive travels; convention; exhibitions; decision-making criteria; special events; MICE event management; the venue management; logistics for MICE industry; service providers in MICE industry; standards in MICE industry; ethics for MICE

ICGS 108 Money Matters 4

Prerequisites: -

Financial issues related to money, rational choices, income and success; managing personal finances; markets and their functions; challenges in hard economic times; financial responsibility and basic money management skills

- **Global and Multicultural Literacy**

ICGS 109 American History, Film and Modern Life 4

Prerequisites: -

The history of modern America from the post reconstruction to the present; a survey history of the American political economy, society and international relations available in the modern media such as arts, film; influential thinking and writing; television channels and the social media; the state's power projection through hard and soft power; the American Innovative Industrialists; the Progressive Reformers; World War I; the Roaring Twenties; the Great Depression; Isolationism in the interwar years; Women's Suffrage; World War II; the Cold War; the Vietnam War; Racial Tensions; the Bush, Obama, Trump administrations and the future U.S. foreign policy

ICGS 110 Development and Conflicts 4

Prerequisites: -

Concepts of political and economic development; policies; production, and investment priorities; the consequences of economic transformation in poor countries; developmental failure since the 1980s; four development traps, including the conflict trap; the natural resource trap; the bad governance trap; and being landlocked with bad neighbours; solutions of how countries can achieve positive changes; the environmental and social development; the appropriateness and sustainability of the existing conventional development and growth trajectory

ICGS 111 Exploring Religions

4

Prerequisites: -

Major religions in the world, Hinduism, Buddhism, Sikhism, Chinese religions, Shinto, Judaism, Christianity, and Islam; the origins of the three religious groups, religions arising in India, China, and Japan, and of the family of Abraham; contemporary new religious developments; religious diversities present in the world

ICGS 112 Geography of Human Activities

4

Prerequisites: -

The interrelationship between humans and the spaces they create; human activities as interdisciplinary by nature; the physical and socially instructed environment people live in; human interactions shaping the human understanding of the environment; the utility of resources; the phenomena on the earth's surface related to human actions; concepts and geographical methodologies used to examine social organizations and environmental consequences

ICGS 113 Perspectives on the Thai Past

4

Prerequisites: -

The origins of the Thai people in pre-historic times to the late twentieth century; an alternative view incorporating the different regions and various ethnic groups making up present-day Thailand; key issues in Thai history; an analysis of the classics of Thai historiography; an evaluation and an interpretation of a range of primary sources dealing with the Thai past; understanding of how history is written

ICGS 114 Power, Money and Behavior of Powerful States

4

Prerequisites: -

Understanding the motives behind the inter-state relations; the increase of power, wealth and international prestige; tools states use to achieve objectives and the challenges of decision-making; foreign policies of the great power states having permanent seats and veto power on the UN Security Council; middle-power states including economically and politically advanced countries; critical issues such as nuclear weapons in North Korea; the war in Afghanistan; democratization or terrorism in failing states; and world trade; patterns and trends of foreign policy making of powerful states during the last century individually and in comparison with other states; case studies illustrating the policy decision-making to meet the contemporary international challenges

ICGS 115 Sociology in the Modern World

4

Prerequisites: -

Sociology as a field of study explaining social, political, and economic phenomena; social interactions and social organizations; sociological perspectives; methodologies and sociological insights; topics relevant to the modern world including culture, social groups, socialization process, deviance, family, religion, social inequality, gender, economic, politics, the media, and social change

ICGS 116 Power and Politics

4

Prerequisites: -

The understanding of the politics and the political systems of the current world; interactions and connections of different ideas; systems of thought and conflict in contemporary society; an analysis of political phenomenon

ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination

4

Prerequisites: -

An analysis of psychological theories; psychological approaches to stereotypes, discrimination and prejudice; the emotional, behavioral and cognitive implications; the impact on our behavior and society; debiasing and metacognition

ICGS 118 Skills in Dealing with People Across Cultures 4

Prerequisites: -

The development of skills in dealing with people across cultures, covering topics such as: communication across cultures; parenting in different cultures; understanding consumers from different cultural backgrounds; emotions and motivation across cultures as well as approaches to deal with cultural diversity at work

ICGS 119 World Politics 4

Prerequisites: -

Different disciplinary perspectives on world politics; historical, geographical, anthropological, economic, and political approaches; specific regions in the world politics

ICGS 120 Global Awareness 4

Prerequisites: -

The state of the world: key facts and trends of geography, economy, society, politics and the environment; global relationships: key economic, political, and environmental relations and trends; Thailand in the world: how Thailand impacts the world, and vice versa

- **Psychological Literacy**

ICGS 121 Abnormal Colleagues: how do I make this work? 4

Prerequisites: -

The stigma of psychological issues; the fear of the workplace gossips and job security; an avoidance of getting treatment and counseling; a recognition of various disorders and devising strategies to effectively communicate and work with people; improving the workplace productivity and relationships

ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist? 4

Prerequisites: -

An examination of the science behind the 'mind control' and its implementation in the current society; an investigation of real and possible counter-strategies; a detailed psychological and socio-economic analysis of subtle oppressions of human autonomy in institutional, social, political, and economic practices

Physical Education

ICGP 101 American Flag Football 1

Prerequisites: -

A ball based sport course emphasizing techniques; non-contact game play, including dodging, throwing, and catching and the development of teamwork management, communication, and terminology

ICGP 102 Badminton 1

Prerequisites: -

A racket based sport course stressing technique, strategies, grip, serving, positioning and movement; game play in both singles and doubles

ICGP 103 Basketball 1

Prerequisites: -

A ball based sport course emphasizing attentiveness, dribbling, passing, shooting, rebounding, ball control, game play, and the development of game strategies

ICGP 104 Body Fitness	1
Prerequisites: - A comprehensive course in one or more exercise techniques: strength/resistance, cardio, plyometric, stretching, high-intensity interval training, and calisthenics; to maintain health and wellness	
ICGP 105 Cycling	1
Prerequisites: - A course designed on cycling instruction for safety, fitness, riding techniques, posture, communication, knowledge of the equipment and hazards, for recreational and commuter cycling	
ICGP 106 Discover Dance	1
Prerequisites: - A dance based course of current forms and techniques in one or more categories: African/Jazz, Worldwide Dances/Latin Dances, Professional Performance Dance, Modern Dance, Hip-hop/Funk	
ICGP 107 Golf	1
Prerequisites: - A club based game course designed on developing correct grip, stance, posture, swing, and the knowledge of equipment, rules, regulations, and etiquette	
ICGP 108 Mind and Body	1
Prerequisites: - A course stressing meditation postures, techniques, movement, and breathing to achieve the positive mental state	
ICGP 109 Selected Topics in Sports	1
Prerequisites: - Learning concepts, rules and strategies through planned and structured movements by way of sport or activity to enhance a healthy lifestyle	
ICGP 110 Self Defense (Striking)	1
Prerequisites: - An external martial arts (striking) course emphasizing hard physical impact and exertion, muscular strength and tension, maximizing speed and power, through the body coordination	
ICGP 111 Self Defense (Grappling)	1
Prerequisites: - An internal martial arts (grappling) course stressing timing, awareness, precision, and techniques, using the body leverage for throwing, take downs, pins, and submissions	
ICGP 112 Soccer	1
Prerequisites: - A ball based sport course stressing alertness, ball control, including dribbling, passing, trapping, shooting, ball movement, game play, and development of strategies through drills and competitive play	
ICGP 113 Social Dance	1
Prerequisites: - A dance based social sport or activity course of choreographed movements, styles and regulations from the International Ballroom (Standard) and the International Latin dances	

ICGP 114 Swimming**1****Prerequisites: -**

A water based sport course stressing swimming techniques, breathing, and knowledge of buoyancy, propulsion, and water safety

ICGP 115 Tennis**1****Prerequisites: -**

A racket based sport course of techniques, strategy, grip, serve, game play, ball tracking, timing, shot control, through drills, live ball hitting sessions, and competition

ICGP 116 Volleyball**1****Prerequisites: -**

A ball sport course emphasizing passing, setting, serving, developing strategies, positions, game play, teamwork management, and communication



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