

# Computer Science

## **ICBI 325 Special Topics in Bioinformatics and Molecular Genetics**

**4**

### **Prerequisites:** ICBI 211

Exploration of specific topics in bioinformatics and molecular genetics and/or a specific sub discipline in bioinformatics; class/group discussion on peer-review articles

## **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

## **ICCS 100 Computer Fundamentals and Concepts**

**4**

### **Prerequisites:** -

A broad overview of the following topics: computers and their operations; algorithms and problem solving; computer arithmetic and number systems; computer hardware and software components; physical and network access to devices and their data

## **ICCS 101 Introduction to Computer Programming**

**4**

### **Prerequisites:** -

Roles of algorithms in problem solving; concepts of data types, including integers, floating-point numbers, and strings; statements and expressions; simple input/output; conditionals and control-flow; iteration, including loops and recursion; functions; basic collections, including resizable arrays and dictionaries; classes and mechanics of object-oriented programming

## **ICCS 121 System Skills and Low-level Programming**

**4**

### **Prerequisites:** ICCS 100; ICCS 101

Linux environment, including toolchain and scripting; version control e.g. Git; law and licenses; low-level programming in C: syntax, semantics, and primitives; data types: array, functions, null-terminated strings, and pointers; preprocessor and build tools; dynamic memory allocation; bit-level representations of data, including two's complement, alignment, and non-integral data representation; machine-level programming, including x86 assembly, memory model, and basic machine architecture

## **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

## **ICCS 204 Data Structures and Object-Oriented Programming**

**4**

### **Prerequisites:** ICCS 101 or ICPY 221

### **Corequisites:** ICCS 206

Principles of object-oriented design and problem solving; objects and classes; encapsulation, abstraction, and information hiding; inheritance and polymorphism; unit testing; abstract data types and data structures, including stacks, queues, linked lists, hash tables, ordered dictionaries, binary search trees, priority queues, and heaps; upper bound efficiency analysis using big-O; elements of Java programming; the use of an integrated development environment

## **ICCS 205 Numerical Computation**

**4**

### **Prerequisites:** ICCS 101; ICMA 213

Taylor's theorem; roots of equations; interpolation; numerical integration and derivative; solutions to systems of equations; Monte Carlo simulation; optimization

**ICCS 206 Discrete Mathematics**

**4**

**Prerequisites: ICMA 106**

Mathematical statements and logical deduction; proves and proof techniques including direct, contradiction, contrapositive, induction, and invariants; summation, asymptotics, and recurrences; counting: combinations, permutations, and basic counting techniques; discrete probability: finite probability space, events, conditional probability, independence, random variables, expectation, variance, covariance, discrete distributions; graphs: tree, tree traversal, undirected graphs, directed graphs, weighted graphs, Euler's tours, isomorphisms, spanning trees

**ICCS 225 Database Foundations**

**4**

**Prerequisites: ICCS 121; ICCS 204**

Database design and ER models; relational models; relational algebra; concepts and syntax of SQL; storage and indexing; transactions; joins; distributed databases and replication; NoSQL; performance optimization

**ICCS 227 Principles of Computer Systems and Architecture**

**4**

**Prerequisites: ICCS 121**

Memory systems and memory management, including caches and virtual memory; exceptional control flows, including exceptions and processes, signals, and non-local jumps; networking and network programming, including socket API and principles behind the networking subsystem; processor architectures and implications to programmers: principles of pipelining and implementation, performance optimization; system-level I/O; concurrent programming, synchronization, and system-level parallel programming

**ICCS 271 Interaction Design**

**4**

**Prerequisites: ICCS 204**

Requirement analyses, including non-functional and functional requirements; data gathering; software design and prototyping; principles of good design; the software life cycle; software-development methodologies; quality assurance; cost modeling in software projects

**ICCS 302 Human Computer Interaction and Visualization**

**4**

**Prerequisites: ICCS 271**

Design and evaluation of information systems and interfaces; user-centered design methods and skills; developing requirements through personas and scenarios; sketching, rapid prototyping and iterations; evaluation techniques: heuristics, cognitive walkthrough, user testing; usability and accessibility; visual design using principles of human perception and cognition; structured design and evaluation of visualizations; web-based interactive visualizations

**ICCS 303 Competitive Programming**

**4**

**Prerequisites: ICCS 204**

Introduction to competitive programming; differences from non-competitive programming; getting started with online contests; teamwork and contest strategies; problem solving paradigms including complete search, divide and conquer, greedy and dynamic programming; graph problems; data structure problems; string algorithms; computational geometry algorithms; search heuristics; ad-hoc problems

**ICCS 309 Scientific Research and Presentations**

**4**

**Prerequisites: ICCS 161; Junior standing**

Scientific methods of discovery; developing a hypothesis, testing and interpreting of the results; proper format for presenting papers in public and in a scientific forum; practical sessions and participation in scientific seminars

**ICCS 311 Functional and Parallel Programming**

**4**

**Prerequisites: ICCS 204**

Functional evaluation and operational semantics; recursive functions, cost analysis, and proofs by induction; datatypes, pattern-matching, and structural recursion/induction; higher-order functions and currying; laziness

and streams; cost semantics and parallel cost models such as work and span; theoretical efficiency and basic scheduling; parallelism, including parallel decomposition, tree parallelism, and vector parallelism; shared-memory parallel programming, including OpenMP, fork/join parallelism; standard parallel primitives and algorithms, including prefix scan, map, reduce, and sorting

**ICCS 312 Algorithms and Tractability****4****Prerequisites: ICCS 204; ICMA 213**

Asymptotic analysis (big-O, big-Omega, big-Theta, little-o, little-omega); recurrences; algorithmic strategies, including divide and conquer, greedy, inductive design, and dynamic programming; probabilistic analysis and randomized algorithms; graphs and graph algorithms, including traversal, minimum-spanning tree, shortest paths, network flow; amortized analysis; reduction, tractability, and basic complexity classes; NP-completeness, classic NP-complete problems, and techniques for coping with hard problems

**ICCS 315 Applied Algorithms****4****Prerequisites: ICCS 312**

Selection of topics from the following: hashing in various contexts, including Bloom filters, load balancing, document similarity, and data streaming; dimensionality reduction and nearest-neighbor searching; locality-sensitive algorithms; string algorithms; coding and error correction; and current research in the relevant areas

**ICCS 320 Computer Networks****4****Prerequisites: ICCS 227**

Network architecture, layering, and protocols; networked applications; socket programming; reliable data delivery, including flow control; routing and forwarding; local Area Networks; resource Allocation, including congestion control, CDN; mobility; network security

**ICCS 322 Operating Systems Design and Implementation****4****Prerequisites: ICCS 227**

Roles and importance of operating systems; overall structure of an operating systems; concept of process and process management; threads; synchronization and mechanisms; CPU scheduling; deadlock; virtual memory and memory management; protection and access control; security and threats

**ICCS 323 IoT Electronics****4****Prerequisites: ICCS 121; ICPY 102**

Electronic Components; circuit design and analysis; analog circuit; microcontroller programming; networking and data communication; IoT architecture and middleware; cloud-based computing

**ICCS 340 Web Application Development****4****Prerequisites: ICCS 204**

Protocols for web-based application; HTML; DOM; CSS; JavaScript; authentication; authorization; single-page application development; multi-pages application development; client-side validation; server-side validation; MVC and related design patterns; web services; micro services; deployment; security issues

**ICCS 361 Data Mining****4****Prerequisites: ICCS 161; ICCS 204**

Overview of data mining and its applications; software stack for data mining; acquiring data from web-scraping and data APIs; structured, semi-structured, unstructured data; data cleansing and manipulation; dimensionality reduction; exploratory data analysis and visualization; large-scale data platforms including HDFS; machine learning algorithms for large data sets; recommendation systems; natural language processing and its applications

**ICCS 370 Software System Construction****4****Prerequisites: ICCS 204**

Modern development tools, including development environments, build tools, test automation, debugger; profiling and performance tuning; software verification; software testing; UML diagrams; design patterns; system architectures; entity design and conceptual modeling; source code refactoring

<b>ICCS 371 Scalable Systems</b>	<b>4</b>
<b>Prerequisites:</b> ICCS 311; ICCS 370	
Challenges in constructing scalable distributed systems; system models and architectural patterns; networking and operating system support; RPC and middleware; binding and naming; synchronization; naming and directory services; distributed transaction processing; data replication; scalable databases	
 <b>ICCS 372 Software Engineering</b>	<b>4</b>
<b>Prerequisites:</b> ICCS 370	
Requirements analysis, including non-functional and functional requirements; data gathering; design and prototyping; principles of good design; the software life cycle; software-development methodologies; quality assurance; cost modeling in software projects	
 <b>ICCS 380 Cooperative Education Seminar</b>	<b>2</b>
<b>Prerequisites:</b> Completed at least 96 credits	
Concepts, processes, rules and regulations for cooperative education; management of organization; guidelines for applying academic knowledge and professional skills to accomplish tasks in the organization; workplace code of conducts; professional communication skills; office automation, note taking, reporting, presentation, aptitude and attitude in workplace	
 <b>ICCS 381 Cooperative Education I</b>	<b>8</b>
<b>Prerequisites:</b> ICCS 380	
Concepts of cooperative education, processes and steps, rules and regulations, fundamental knowledge and techniques in pursuing a career; workplace selection, application letter writing, job interview, knowledge for practical experience in workplace, qualifications, administrative system: health and safety, five keys to a Total Quality Environment, corporate culture, training and workshop on developing personality for working society, techniques of writing reports and making presentations, communication skill development, techniques in building self-confidence, problems or obstructions and approaches in solving problems during the job training	
 <b>ICCS 382 Cooperative Education II</b>	<b>8</b>
<b>Prerequisites:</b> ICCS 381	
Continuation of working as an actual employee from previous trimester under guidance of course coordinator and supervisors; writing cooperative education reports and giving presentations	
 <b>ICCS 404 Computer Graphics and Augmented Reality</b>	<b>4</b>
<b>Prerequisites:</b> ICCS 204; ICMA 223	
Representation and manipulation of graphical data; two-dimensional and three-dimensional transformations; curves; surfaces; projection; illumination and shading models; raster and vector graphic I/O devices; augmented reality technologies; basic object and location tracking; representation of augmented reality content	
 <b>ICCS 407 Senior Project I</b>	<b>6</b>
<b>Prerequisites:</b> ICCS 309; Completed at least 96 credits	
Initiation of a research or development project in computer science or related fields under the supervision of an advisor; conducting preliminary research into the problem to identify a proper scope and research questions; delivery of a written report and an oral presentation of the senior project proposal	
 <b>ICCS 408 Senior Project II</b>	<b>6</b>
<b>Prerequisites:</b> ICCS 407	
Completion of the design and measurements of the research/development project proposed in the prerequisite course under supervision of the advisor; delivery of a written report and an oral presentation of the progress in this term	
 <b>ICCS 409 Senior Project III</b>	<b>6</b>
<b>Prerequisites:</b> ICCS 408	

Conducting an actual investigation/experiment that has been designed in the prerequisite course; analyzing gathered data to address the proposed research thesis; delivery of a written report and an oral presentation of the work in all three senior project courses as a whole

**ICCS 412 Topics in Theory I**

**4**

**Prerequisites: ICCS 312**

Topic(s) from areas of theoretical computer science, including data structures, algorithms, and complexity theory, chosen according to current research and industrial trends

**ICCS 413 Topics in Theory II**

**4**

**Prerequisites: ICCS 312**

Topic(s) from areas of theoretical computer science, including data structures, algorithms, and complexity theory, chosen according to current research and industrial trends

**ICCS 418 Computer System Security**

**4**

**Prerequisites: ICCS 227**

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 423 Topics in Systems I**

**4**

**Prerequisites: ICCS 227**

Topic(s) from areas of systems in computer science chosen according to current research and industrial trends

**ICCS 424 Topics in Systems II**

**4**

**Prerequisites: ICCS 227**

Topic(s) from areas of systems in computer science chosen according to current research and industrial trends

**ICCS 444 E-Commerce**

**4**

**Prerequisites: ICCS 271; ICCS 370**

History of e-commerce, real and virtual networks, supply-side versus demand-side scale economies, business models, domain names, content management systems, merchant systems, system design and sizing, enterprise integration, payment mechanisms, personalisation and internationalisation, search engine interaction, driving and analysing traffic; dynamic pricing models, logs and audit, collaborative filtering and affinity marketing brand value, funding Internet ventures

**ICCS 448 Mobile Application Programming**

**4**

**Prerequisites: ICCS 271; ICCS 370**

Mobile application platforms; cross-platform framework; native application development; single-view and multi-view application development; database for mobile application, local files and media; connecting to web-services: JSON, XML; working with sensors and GPS; UI design for multiple screen sizes; publishing mobile application

**ICCS 461 Machine Learning**

**4**

**Prerequisites: ICCS 161; ICCS 205**

Probability and maximum likelihood estimate; k-nearest neighbor methods; decision tree and basic information theory; regressions; ensemble learning algorithms including bagging, boosting and random forest; support vector machines; perceptron and neural networks; deep learning; unsupervised learning; semi-supervised learning; PAC learning and VC dimension

**ICCS 463 Topics in Machine Learning I**

**4**

**Prerequisites: ICCS 161; ICCS 205**

Topic(s) from areas of Machine Learning chosen according to current research and industrial trends

<b>ICCS 464 Topics in Machine Learning II</b>	<b>4</b>
<b>Prerequisites:</b> ICCS 161; ICCS 205	
Topic(s) from areas of Machine Learning chosen according to current research and industrial trends	
<b>ICCS 471 Topics in Software Technology I</b>	<b>4</b>
<b>Prerequisites:</b> ICCS 271	
Topic(s) from areas of Software Technology chosen according to current research and industrial trends	
<b>ICCS 472 Topics in Software Technology II</b>	<b>4</b>
<b>Prerequisites:</b> ICCS 271	
Topic(s) from areas of Software Technology chosen according to current research and industrial trends	
<b>ICCS 491 Topics in Computer Science I</b>	<b>4</b>
<b>Prerequisites:</b> -	
Topic(s) from areas of computer science chosen according to current research and industrial trends	
<b>ICCS 492 Topics in Computer Science II</b>	<b>4</b>
<b>Prerequisites:</b> -	
Topic(s) from areas of computer science chosen according to current research and industrial trends	
<b>ICCS 493 Topics in Computer Science III</b>	<b>4</b>
<b>Prerequisites:</b> -	
Topic(s) from areas of computer science chosen according to current research and industrial trends	
<b>ICCS 494 Topics in Computer Science IV</b>	<b>4</b>
<b>Prerequisites:</b> -	
Topic(s) from areas of computer science chosen according to current research and industrial trends	
<b>ICCS 495 Topics in Computer Science V</b>	<b>4</b>
<b>Prerequisites:</b> -	
Topic(s) from areas of computer science chosen according to current research and industrial trends	
<b>ICMA 106 Calculus I</b>	<b>4</b>
<b>Prerequisites:</b> 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.	
<b>ICMA 151 Statistics for Science I</b>	<b>4</b>
<b>Prerequisite:</b> Placement test or ICMA 100	
Statistical ideas and concepts; probability, conditional probability; distribution functions; expected value; estimators, good estimators; hypothesis testing	
<b>ICMA 213 Calculus II</b>	<b>4</b>
<b>Prerequisites:</b> 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.	
<b>ICMA 214 Ordinary Differential Equations</b>	<b>4</b>
<b>Prerequisites:</b> ICMA 106	

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 216 Calculus IIIA**

**2**

**Prerequisite: ICMA 213**

Vector, dot product, cross product, parametric equations, plane, surface in 3D, arclength, partial derivative, tangent plane

**ICMA 217 Calculus IIIB**

**2**

**Prerequisite: ICMA 213**

Lagrange multipliers, double integrals, triple integrals, line integrals, Green's theorem, surface integrals

**ICMA 223 Linear Algebra A**

**2**

**Prerequisite: -**

Linear equations, system of linear equations, matrices, Euclidean spaces, traces, determinants

**ICMA 224 Linear Algebra B**

**2**

**Prerequisite: -**

General vector spaces, linear transformations, eigenvalues and eigenvectors, Inner product spaces

**ICMA 322 Advanced Calculus**

**4**

**Prerequisites: -**

Real and complex number systems; functions; continuity; convergence; differentiation; integration

**ICMA 346 Optimization**

**4**

**Prerequisites: ICMA 338 or ICCS 205**

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 350 Probability**

**4**

**Prerequisites: ICMA 216 and ICMA 217**

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 424 Abstract Algebra**

**4**

**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

**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 492 Electronics**

**4**

**Prerequisites: ICPY 102**

Microcontroller and programming, a circuit design and analysis, electrical Components, networking, and analog Circuit



**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 sentencing, 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 sentencing, 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

<b>ICGC 208 Language and Culture</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 <b>ICGC 209 The Story of English</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 <b>ICGC 210 First and Second Language Acquisition</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 <b>ICGC 211 Topics in Comparative Literature A: Poetry</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 <b>ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 <b>ICGC 213 Topics in Comparative Literature C: Drama</b>	<b>4</b>
<b>Prerequisites:</b> 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	
<b>Natural Science</b>	
• Scientific and Environmental Literacy	
 <b>ICGN 101 Decision Mathematics</b>	<b>4</b>
<b>Prerequisites:</b> -	
Graphs and networks; linear programming; transportation problems; game theory	
 <b>ICGN 102 Essential Mathematics</b>	<b>4</b>
<b>Prerequisites:</b> Placement test	
Real numbers, algebraic expressions, percentages, ratio, proportion; linear functions; the systems of linear equations	
 <b>ICGN 103 Essential Statistics</b>	<b>4</b>
<b>Prerequisites:</b> ICGN 102	
Statistical ideas and concepts; probability and conditional probability; distribution functions; expected value; estimators; hypothesis testing; a linear regression analysis	

<b>ICGN 104 Mathematics and Its Contemporary Applications</b>	<b>4</b>
<b>Prerequisites:</b> Placement test or ICMA 100	
A review of algebra, logarithmic and exponential functions, matrix algebra, differential calculus, integral calculus	
<b>ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGN 106 Climate Change and Human Society</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGN 107 The Chemistry of Everyday Life</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGN 108 Essentials of Culinary Science for Food Business</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGN 109 Food for Health</b>	<b>4</b>
<b>Prerequisites:</b> -	
Human nutritional requirements; health benefits of various foods; quality and safety of foods; food additives; food production and preservation; health and nutritional value	
<b>ICGN 110 Maker Workshop</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGN 111 Physics for CEO</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGN 112 Stargazer</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	

<b>ICGN 113 Plants, People and Poisons</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGN 114 The Scientific Approach and Society</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGN 115 Human Evolution, Diversity and Health</b>	<b>4</b>
<b>Prerequisites:</b> -	
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"> <li>• <b>ICT and Digital Literacy</b></li> </ul>	
<b>ICGN 116 Understanding and Visualizing Data</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGN 117 Technology behind E-Business and Digital Strategies</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGN 118 Everyday Connectivity</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGN 119 Computer Essentials</b>	<b>4</b>
<b>Prerequisites:</b> -	
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

<ul style="list-style-type: none"> <li>• <b>Logical and Ethical Literacy</b></li> </ul>	
<b>ICGH 101 Biotechnology: from Science to Business</b>	<b>4</b>

**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

<b>ICGL 102 Elementary German II</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 <b>ICGL 103 Elementary German III</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 • Japanese	
<b>ICGL 111 Elementary Japanese I</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 <b>ICGL 112 Elementary Japanese II</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 <b>ICGL 113 Elementary Japanese III</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 • French	
<b>ICGL 121 Elementary French I</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 <b>ICGL 122 Elementary French II</b>	<b>4</b>
<b>Prerequisites:</b> 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 “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

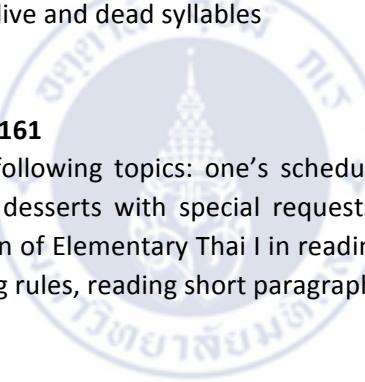
- **Spanish**

**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

<b>ICGL 143 Elementary Spanish III</b>	<b>4</b>
<b>Prerequisites:</b> 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	
<b>ICGL 160 Introduction to Thai Language and Culture</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGL 161 Elementary Thai I</b>	<b>4</b>
<b>Prerequisites:</b> 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	
<b>ICGL 162 Elementary Thai II</b>	<b>4</b>
<b>Prerequisites:</b> 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	
<b>ICGL 163 Elementary Thai III</b>	<b>4</b>
<b>Prerequisites:</b> 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	
 <b>Social Sciences</b>	
• Financial, Economic, Business and Entrepreneurial Literacy	
<b>ICGS 101 Accounting for Young Entrepreneurs</b>	<b>4</b>
<b>Prerequisites:</b> -	
Fundamental accounting concepts; the basic accounting process used in small enterprises; the preparation of financial statements; the break-even analysis; business taxation	
<b>ICGS 102 Business Sustainability and the Global Climate Change</b>	<b>4</b>
<b>Prerequisites:</b> -	
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	
<b>ICGS 103 Economics in Modern Business</b>	<b>4</b>
<b>Prerequisites:</b> -	

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

<b>ICGP 104 Body Fitness</b>	<b>1</b>
<b>Prerequisites:</b> -	
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	
<b>ICGP 105 Cycling</b>	<b>1</b>
<b>Prerequisites:</b> -	
A course designed on cycling instruction for safety, fitness, riding techniques, posture, communication, knowledge of the equipment and hazards, for recreational and commuter cycling	
<b>ICGP 106 Discover Dance</b>	<b>1</b>
<b>Prerequisites:</b> -	
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	
<b>ICGP 107 Golf</b>	<b>1</b>
<b>Prerequisites:</b> -	
A club based game course designed on developing correct grip, stance, posture, swing, and the knowledge of equipment, rules, regulations, and etiquette	
<b>ICGP 108 Mind and Body</b>	<b>1</b>
<b>Prerequisites:</b> -	
A course stressing meditation postures, techniques, movement, and breathing to achieve the positive mental state	
<b>ICGP 109 Selected Topics in Sports</b>	<b>1</b>
<b>Prerequisites:</b> -	
Learning concepts, rules and strategies through planned and structured movements by way of sport or activity to enhance a healthy lifestyle	
<b>ICGP 110 Self Defense (Striking)</b>	<b>1</b>
<b>Prerequisites:</b> -	
An external martial arts (striking) course emphasizing hard physical impact and exertion, muscular strength and tension, maximizing speed and power, through the body coordination	
<b>ICGP 111 Self Defense (Grappling)</b>	<b>1</b>
<b>Prerequisites:</b> -	
An internal martial arts (grappling) course stressing timing, awareness, precision, and techniques, using the body leverage for throwing, take downs, pins, and submissions	
<b>ICGP 112 Soccer</b>	<b>1</b>
<b>Prerequisites:</b> -	
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	
<b>ICGP 113 Social Dance</b>	<b>1</b>
<b>Prerequisites:</b> -	
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



**Mahidol University  
International College**