Course Description of Computer Engineering Program

Foundation Courses

ICMA 100   Foundation Mathematics   0
Prerequisites: Placement test
Expressions and equations; linear functions; polynomials and nonlinear functions; radical and rational functions; data analysis

ICME 100   English Resource Skills   0
Prerequisites: Placement test
A remedial course preparing students to read and write academic English at a level suitable for entering the Intermediate English Communication I

General Education Courses
English Communication

ICGC 101   Academic Writing and Research I   4
Prerequisites: Placement Writing Test
An introduction to the academic writing process through the development of the writer's voice through sentencing, structure, and rhetorical devices; 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 Academic Writing and Research I
The integration of skills in academic research and writing to analyze and create persuasive compositions; techniques to identify strengths and weaknesses in argument; 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; introduction and application of techniques to inform/persuade audiences; 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; emphasis on the development of a writer's voice through sentencing, structure, and rhetorical devices; strategies for using and integrating researched sources are introduced by way of explaining theories; concepts and writing conventions

ICGC 112   Academic Writing and Research II (Advanced)   4
Prerequisites: ICGC 111 Academic Writing and Research I (Advanced)
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; utilization of advanced strategies to exploit secondary research and argumentation; 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 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
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 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
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 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
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 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
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, presentations, and occasional speeches; the development of students' abilities to express themselves confidently in a variety of academic and professional environments through impromptu and prepared speeches

ICGC 206   Literature Into Film   4
Prerequisites: ICGC 103 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
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 208   Language and Culture   4
Prerequisites: ICGC 103 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
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 a research paper on the topic

ICGC 210   First and Second Language Acquisition   4
Prerequisites: ICGC 103 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
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 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
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 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
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 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
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

ICGC 214   Literary Non-fiction   4
Prerequisites: ICGC 103 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
Exploration of creative nonfiction, a flourishing genre of writing a step away from academic work; reading of compelling, informative, and insightful but also entertaining, imaginative, and risky nonfiction work; overview of various techniques utilized within this field of writing and media; analysis and response to a variety of texts

ICGC 215   Writing for Research   4
Prerequisites: ICGC 103 Public Speaking or ICGC 112 Academic Writing and Research II (Advanced)
A student-centric approach to developing research writing skills; an overview of the conventions of the world of research with an emphasis on academic honesty and academic style; use of sample papers to provide students with models to prepare effective abstracts, literature reviews, research paper outlines and short academic articles

Life Appreciation

ICGH 113   Moving Pictures: A History of Film   4
Prerequisites: -
An investigation of European, American and Asian film as art, philosophy, social commentary, propaganda, self-expression, well-being and social harmony; a focus not only on techniques, style and technological advances but on interpretation, comparison and criticism

ICGH 117   Drawing as Creative Expression   4
Prerequisites: -
Develop creativity and cognitive learning; utilize visual communication, design and art principles; experience multiple tools, techniques, medium, experimental mark making; research, analysis, observation, gesture, principles and elements of design and composition; examine, analyze, observe and reinterpret the human figure, plant and still life forms; research, interpret, evaluate, analyses contemporary artists; personal evaluation; personal expression

ICGH 118   Photography Visualizing in the Digital Age   4
Prerequisites: -
Basic skills and aesthetic principles of photography, how the camera works, types of cameras and digital image capture, techniques in taking pictures, in camera editing, specialized forms of photography, simple editing adjustments, the aesthetics of picture taking

ICGH 119   Listen! Soundscapes, Well-Being and Musical Soul Searching   4
Prerequisites: -
An examination of sound and music as sources of pleasure, aesthetic experience, well-being as well as stress; discussion of music's expressivity and the emotions it induces; cases studies linking music experience to aspects of perceptual training, personal development, public health and the appreciation of nature

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 108   Essentials of Culinary Science for Food Business   4
Prerequisites: -
Changes during preparation, heating, and storage of raw materials and of finished products, foodservice and commercial packaged food industries; chemical, sensory, and nutritional natures of food, food safety concepts, changing trends and interests, legal requirements of food establishment

ICGN 109   Food for Health   4
Prerequisites: -
Knowledge of general human nutritional requirements; the health benefits of various foods; quality and safety of the various types of food including processing; health and nutritional value

ICGN 110   Maker Workshop
Prerequisites: -
Mechanical design consideration, 3D drawing, safety in design; motion in 1 and 2 Dimension; sound and oscillation motion, mechanical properties of materials; basic electronics, circuit analysis, soldering; microcontroller, basic programming

ICGN 112   Stargazer   4
Prerequisites: -
Basic ideas of astronomy, astrophysics and cosmology; the progress of human understanding of the universe; the impact of scientific method on astronomical observation; the Earth & Moon; the Solar System; the lifecycle of stars; Black Holes; galaxies; and the current understandings about the origins and 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 115   Human Evolution, Diversity and Health   4
Prerequisites: -
Changing modern society; human ability; human body; human distinctiveness; human diversity; human evolution; human health; human origins; primate diversity; scientific advancements

ICGN 120   Chemistry of Cosmetics and Dietary Supplements   4
Prerequisites: -
Chemistry of cosmetic products; basic sciences behind common aesthetic medical procedures; basic biochemistry of human skins; basic functioning of vitamins, minerals, and specialty supplements

ICGN 124   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 125   Games and Learning   2
Prerequisites: -
History of games, combinatorial games, games of chance, game theory

ICGP 101   American Flag Football   1
Prerequisites: -
A ball based sport course emphasizing techniques, non-contact game play, including dodging, throwing, and catching and 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 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 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 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 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: -
External martial arts (striking) course emphasizing hard physical impact and exertion, muscular strength and tension, maximizing speed and power, through body coordination

ICGP 111   Self Defense (Grappling)   1
Prerequisites: -
Internal martial arts (grappling) course stressing timing, awareness, precision, and techniques, using body leverage for throws, 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 International Ballroom (Standard) and 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

ICGS 102   Business Sustainability and the Global Climate Change   4
Prerequisites: -
Study on 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 115   Sociology in the Modern World   4
Prerequisites: -
Sociology as a principle for understanding the modern world, life appreciation; 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, socialization process, family, social inequality, gender relations, racism, ageism, modern media, and social change; global social problems; evaluation of societies; influencing and improving life's quality

ICGS 125   American History, Popular Media and Modern Life   4
Prerequisites: -
Exploring modern American history through the lense of popular media and the state's power projection through hard and soft power; introducing the concept of life in the roaring twenties and the Great Depression, investigating available media sources during the war time from World War I, World War II, and the Cold war; understanding historical events impacting the American life including feminist and LGBT movement, the Vietnam War, African-American civil rights movement; discussing the importance modern digital media platforms and social media

ICGS 126   Introduction to Psychology   4
Prerequisites: -
Human behaviour and mental functioning; the nervous system; consciousness; sensation and perception; psychogenetics, life-span development; thinking, memory, language, conditioning and learning, motivation, personality, and stress

ICGS 127   Positive Psychology   4
Prerequisites: -
Concepts of success; societies emphasis on financial wealth and the accumulation of material things versus the importance of having a loving family, developing rewarding relationships with friends and colleagues; career achievement and the respect of others; regularly feeling positive emotions, developing morally and spiritually, engaging in worthwhile activities; staying physically fit; success as a multi-faceted and intensely personal concept; the exploration of well-being from the field of positive psychology; developing understanding of what comprises a successful life with an emphasis on greater self-expression and overall well-being

ICGS 128   Global Gastronomy and Cuisines   4
Prerequisites: -
Understanding the interconnection between gastronomy, culture, society, and local and global food systems; highlighting the global food production and consumption trends; examining diverse cultures through the food and food preparation; emphasis on multicultural context in cooking practices; understanding the current trend in various healthy diets and cuisines

ICGS 129   Tea Studies   2
Prerequisites: -
What is tea, main tea varieties, main tea types, climatic conditions for sustainable growth of tea, important tea growing countries and regions, tea processing, tea and health, tea tasting and evaluation, tea utensils and preparation, tea and food pairing

ICLL 100   Self Development   2
Prerequisites: -
Life skills for 21st century workplace through learning or training activities in various topics including creativity, growth mindset, leadership, and emotional intelligence or other selected personal development activities approved by the academic advisor and Curriculum Administrative Committee

Global Citizenship

ICGH 116   World Cinemas   4
Prerequisites: -
An introduction, practice and an application of languages to critical thinking and analysis of key world cinema texts; principal critical methods and theoretical debates of film theory; theoretical perspectives including structuralism, semiology, Marxism, feminism, psychoanalysis, post-structuralism, and cultural studies; questions of narrative and narration, realism, formalism, modernism, postmodernism, postcolonialism, gender, sexuality, and ideology

ICGH 120   Thai and ASEAN Cinema   4
Prerequisites: -
An introduction, practice and an application of languages to critical thinking and analysis of Thai and ASEAN film texts; examine key film languages and textual examples, including narrative theories; genre, film theories; an analysis of key film texts; the development of skills in research, writing and analytical thinking

ICGH 121   The End of the World? Development and Environment   4
Prerequisites: -
An integrated and system oriented view on applied ethics with an eye on development, the environment and technology; emphasis on the intersection between the central notions of justice, nature and technology, particularly under consideration of sustainability; critical analysis of current states of affairs in terms of diverse political traditions, the history of colonialism and the dialectic between globalization and segregation; examples and cases studies include issues of public health, education, food technology, global institutionalization, energy management, the international monetary system, trade, labor migration, and violations of human rights

ICGH 122   Introduction to Asian Philosophy   4
Prerequisites: -
A differentiation between the main schools of Asian philosophy, including Buddhism, Hinduism, Confucianism, Taoism, Jainism, among others; summaries of foundational concepts and themes; the influences of these philosophies on the beliefs and cultures as well as the politics, economics and legal frameworks around the world

ICGH 123   Faiths, Ecological Justice, and the Tropical Rainforests   2
Prerequisites: -
Biological diversity; ecological justice; environmentally ethical actions; environmental justice; faiths; indigenous peoples; impacts; interconnection; interdependence; religions; religious diversity; social equity; social justice; threats; tropical rainforests

ICGL 101   Elementary German I   4
Prerequisites: Placement test
Greetings, introducing oneself or others, German alphabet and phonemes, personal information, numbers from 1 – 100 and price quotations, expressing wishes, telling the time and making appointments, 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 Elementary German I
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 Elementary German II
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

ICGL 111   Elementary Japanese I   4
Prerequisites: Placement test
Hiragana and Katakana characters; fundamentals of 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); description of Japan; designing 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 Elementary Japanese I
Kanji characters (approximately 50); fundamentals of 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; designing written products in the target language; expressing simply points of view, describing people and daily life activities; comparing cultures

ICGL 113   Elementary Japanese III   4
Prerequisites: Placement test or ICGL 112 Elementary Japanese II
Kanji characters (approximately 50); fundamentals of basic Japanese grammar concepts (verb conjugation (masu-form, te-form, nai-form, and dictionary form), and related sentence patterns; polite style of speech, and plain style of speech, particles); scaffolding of basic vocabulary; basic communication about various topics; designing written products in the target language; expressing points of view, describing people and various activities; comparing cultures

ICGL 121   Elementary French I   4
Prerequisites: Placement test
Fundamentals of basic French grammar (pronouns, present tense conjugation, gender/number, adjectives, prepositions); scaffolding of basic vocabulary; basic communication about personal topics (self and others); identifying and describing French speaking countries; designing 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 Elementary French I
Fundamentals of basic French grammar (present and future tense, adjective gender, place & agreement, more complex prepositions, more complex questions); scaffolding of simple vocabulary; simple communication about daily life topics (in France and in their country); designing 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 Elementary French II
Fundamentals of more complex French grammar (present and future tense, adjective gender, place & 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); designing written products in the target language; expressing point of view, describing people and daily life activities; comparing cultures

ICGL 131   Elementary Chinese I   4
Prerequisites: Placement test
The Chinese phonetic system (Pinyin); the Chinese basic writing system (Stroke order); Chinese characters (approximately 100); fundamentals of basic Chinese grammar (interrogative pronouns, the的 particle, yes/no questions with 吗, demonstrative pronouns, classifiers, adverbs 也, 都); scaffolding of basic vocabulary; basic communication about personal topics (self and others); describing China; designing written products in the target language; expressing existence, preferences and agreement; comparing cultures

ICGL 132   Elementary Chinese II   4
Prerequisites: Placement test or ICGL 131 Elementary Chinese I
The Chinese phonetic system (Pinyin); the Chinese writing system; Chinese characters (approximately 100); fundamental Chinese grammar concepts (interrogative pronouns, classifiers, the "的" particle, "的" phrases, adverbials, continuous action sentence structures and reduplication of verbs); scaffolding of basic vocabulary; basic communication about daily life topics; designing written products in the target language; expressing simply points of view, describing people and daily life activities; comparing cultures

ICGL 133   Elementary Chinese III   4
Prerequisites: Placement test or ICGL 132 Elementary Chinese II
The Chinese phonetics (Pinyin); Chinese characters (approximately 150) ; Fundamentals of basic Chinese grammar concepts (interrogative pronouns, modal verbs, complex sentences, the modal particle "le" (了), complements of state, complements of result, complements of duration); scaffolding of basic vocabulary; basic communication about various topics; designing written products in the target language; expressing points of view; telling directions; describing oneself and other people's abilities; comparing cultures

ICGL 141   Elementary Spanish I   4
Prerequisites: Placement test
Fundamentals of basic Spanish grammar (pronouns, present tense conjugation, gender/number, adjectives, prepositions); scaffolding of basic vocabulary; basic communication about personal topics (self and others); identifying and describing Spanish speaking countries; designing 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 Elementary Spanish I
Fundamentals of 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); identifying and describing Spanish speaking countries; designing written products in the target language; expressing existence, preferences and agreement; talking about daily habits

ICGL 143   Elementary Spanish III   4
Prerequisites: Placement test or ICGL 142 Elementary Spanish II
Towns, quarters and cities; directions; past experiences; 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

ICGL 160   Introduction to Thai Language and Culture   4
Prerequisites: -
Fundamental vocabularies and structures for various communicative situations in everyday use and introduce basic aspects of Thai culture

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 Elementary Thai I
Listening and speaking skills on the following topics: one's schedule, making appointments, favorite leisure activities, ordering food, drinks and desserts with special requests, presentation of one's plan for activities during school break, continuation of Elementary Thai I in reading and writing skills, consonant clusters, tone marks, words with special spelling rules, reading short paragraphs

ICGL 163   Elementary Thai III   4
Prerequisites: Placement test or ICGL 162 Elementary Thai II
Listening and speaking skills on the following topics: going to see the doctor, looking for a house for rent, seasons, travel and festivals

ICGL 170   Diversities in Multilingual Societies   2
Prerequisites: -
Multilingual societies; cultural diversities; cross-cultural communication; Chinese-, German-, French-, Japanese, and Spanish-speaking cultures; Chinese-, German-, French-, Japanese, and Spanish languages; cultural conflicts; cultural gaps; cultural shocks; cultural discoveries; cultural awareness; cultural harmonies; foreign visitors to Thailand; working with Thai people

ICGL 201   Pre-intermediate German I   4
Prerequisites: ICGL 103 Elementary German III or Placement Test
Clothing and accessory, appearance, shopping for clothes and accessory family members, present and past families, statistics, festivities and culture, dates, presents; comparative forms of adjectives, modal verbs past tense, dependent clauses (cause and condition), personal pronouns, accusative and dative cases

ICGL 202   Pre-intermediate German II   4
Prerequisites: ICGL 201 Pre-Intermediate German I or Placement Test
Media usage and Internet-shopping, advertisement, expressing surprise, meeting someone for the first time, country and city life, cultural capitals in Europe; direct and indirect questions, adjective without article, relative clause and pronoun, modal verb in simple past, sub-clause with als

ICGL 203   Pre-intermediate German III   4
Prerequisites: ICGL 202 Pre-Intermediate German II or Placement Test
Professional biographies, job announcements, festivities and customs, emotions, movie synopsis, products and inventions; reasons with weil and denn, nominalization, preposition with dative, sub-clause with wenn and um zu, passive voice

ICGL 211   Pre-intermediate Japanese I   4
Prerequisites: ICGL 113 Elementary Japanese III or Placement Test
Kanji characters (approximately 50); fundamentals of basic Japanese grammar concepts (verb conjugation (masu-form, te-form, nai-form, and dictionary form), and related sentence patterns; polite style of speech, and plain style of speech, particles); scaffolding of basic vocabulary; basic communication about various topics; design of written products in the target language; expressing points of view, describing people and various activities; comparing cultures

ICGL 212   Pre-intermediate Japanese II   4
Prerequisites: ICGL 211 Pre-Intermediate Japanese I or Placement Test
50 Kanji characters; explaining the state of things; describing necessary things to do in advance as preparations for the future; expressing own intentions, plans, and schedule; expressing own guess and inference; asking someone to take a message or conveying a message; stating standards or norms, when one explains the manner of doing a certain action or work; explaining a condition in which a certain action is performed; stating everyday habitual actions

ICGL 213   Pre-intermediate Japanese III   4
Prerequisites: ICGL 212 Pre-Intermediate Japanese II or Placement Test
50 Kanji characters; expressing judgments under certain conditions; stating a purpose or an aim; describing changes in human ability and conditions; describing an action performed by a third person, or an action when one feels annoyed or troubled, using passive verbs; expressing something with the most important information emphasized; describing natural phenomena, happenings, and events, together with their causes; clearly telling what speakers consider as questions, by using a question with an interrogative as a component of a sentence; using appropriate expressions for giving and receiving of things and actions, depending on the relationship between the giver and the receiver, in terms of social status; telling usage, evaluation, necessary time, expense, etc.

ICGL 221   Pre-intermediate French I   4
Prerequisites: ICGL 123 Elementary French III or Placement Test
Developing further knowledge of French grammar at the pre-intermediate level (present, past and future, more complex interrogative sentence, negative sentence, comparative and pronouns); scaffolding of more complex vocabulary; more complex and longer communication about personal needs, solving simple problems; interacting in predictable context topics in French; designing written products in the target language; expressing points of view, giving simple advices and interacting in daily life activities; comparing cultures

ICGL 222   Pre-intermediate French II   4
Prerequisites: ICGL 221 Pre-Intermediate French I or Placement Test
Extending further knowledge of French grammar at the pre-intermediate level (hypotheses and conditions, future, conditional, pronouns, direct and indirect speech, imperative and gerundive); scaffolding of more complex vocabulary; longer communication about solving problems and expressing feelings; commenting on attitudes and justifying actions in predictable context topics in French; comparing cultures

ICGL 223   Pre-intermediate French III   4
Prerequisites: ICGL 222 Pre-Intermediate French II or Placement Test
Developing further knowledge of French grammar at the pre-intermediate level (comparative, complex interrogative sentence, gerundive, subjunctive present in regular and irregular forms, passive voice); scaffolding of more complex vocabulary; longer communication about personal feelings, wishes and hopes; complaining and talking about difficulties, suggesting solutions; comparing cultures

ICGL 231   Pre-intermediate Chinese I   4
Prerequisites: ICGL 133 Elementary Chinese III or Placement Test
Chinese characters (approximately 300); identifying pre-intermediate level Chinese grammar concepts (complements of duration, expressing approximate numbers, comparative sentences, complements of quantity, exclamatory sentences); developing listening, speaking, reading and writing skills through an integrated approach; communication about various topics; comparing two cities in various aspects; comparing the seasons in China and Thailand; activities and festivals in each season; organizing a trip

ICGL 232   Pre-intermediate Chinese II   4
Prerequisites: ICGL 231 Pre-intermediate Chinese I or Placement Test
Chinese characters (approximately 300); identifying pre-intermediate level Chinese grammar concepts (past experiences, complements of frequency, the structure of 是……的, reduplication of adjectives, S-P phrases, complements of result II, simple passive sentences); developing listening, speaking, reading and writing skills through an integrated approach communication about various topics; sports or entertainment; expressing unlucky stories; describing appearance and clothes; Chinese style weddings (1)

ICGL 233   Pre-intermediate Chinese III   4
Prerequisites: ICGL 232 Pre-intermediate Chinese II or Placement Test
Chinese characters (approximately 300); identifying pre-intermediate level Chinese grammar concepts (continuous actions or states, Chinese style weddings, Chinese construction quadrangles, existence emergence sentences,"把"sentence I, ,"把"sentence II, "被"sentence, adverb "又") ; developing listening, speaking, reading and writing skills through an integrated approach; communication about various topics; travelling by airplane; Beijing Opera performances; outdoor activities; reunions with old friends

ICGL 241   Pre-intermediate Spanish I   4
Prerequisites: ICGL 143 Elementary Spanish III or Placement Test
Habits; pronominal verbs; porque/para; furniture and parts of the house; appearance; family, irregular verbs in present tense; present progressive

ICGL 242   Pre-intermediate Spanish II   4
Prerequisites: ICGL 241 Pre-Intermediate Spanish I or Placement Test
Leisure activities; intentions and projects; pain, discomfort and symptoms; parts of the body; vocabulary of food; ir a+ infinitive; present perfect; differences between ser and estar; personal pronouns for objects; verb gustar

ICGL 243   Pre-intermediate Spanish III   4
Prerequisites: ICGL 242 Pre-Intermediate Spanish II or Placement Test
Past habits, customs and circumstances; past and present actions; advice, instructions (imperative); future situations and actions, conditions, hypotheses; past experience; imperfect verb tense; indefinido verb tense; present perfect verb tense; contrast of past tenses

ICGN 126   Plant Society   2
Prerequisites: -
People interacting with the plant and fungal worlds; differences among cultures and the indigenous uses of medicinal, textile and food plants; the benefits, problems and social implications of their use; hands-on experiences with techniques and methods used by field scientists

ICGS 106   Fashion and Society   4
Prerequisites: -
Design elements of fashion, fashion terminology, fashion reflecting its temporal and spatial context, fashion and the development of art, fashion is a cultural expression, fashion is creativity, fashion needs customers' approval and endorsements, fashion and consumer behaviour, fashion and consumerism, and ethical issues of fashion

ICGS 111   Exploring Religions   4
Prerequisites: -
Major religions in the world: Hinduism, Buddhism, Sikhism, Chinese religions, Shinto, Judaism, Christianity, and Islam; origins of the three religious groups, religions arising in India, religions of China and Japan, and the religions of the family of Abraham; similarities and differences; contemporary new religious developments and related issues; religious diversities present in the world

ICGS 112   Geography of Human Activities   4
Prerequisites: -
Global Learning Initiative class; a systematic study of patterns and processes of geography; understanding human perceptions of surroundings and alterations of the earth's surface; diversity of cultures, beliefs, and ways of life; establishing global unity and harmony; recognition of equality and respect between persons in diverse regional geographical settings; raising awareness of one's own humanity and human responsibilities; the interrelationship between humans and the spaces they create; human activity as interdisciplinary by nature; the physical and socially created environment people live in; human interactions shaping the human understanding of the environment; the utility of resources; phenomena on the earth's surface relating to human actions; concepts and geographical methodologies; examination of social organizations and environmental consequences; a broad dynamic domain reflecting such developments and issues as social bias, discrimination, and stereotyping in the contemporary world; associating a critical geographical perspective on the past, present and future achievement of the social world

ICGS 123   Tourism Concepts and Practices   4
Prerequisites: -
Exploring tourism as a geographical system approach and looking at the characteristics of tourism and the demand side first by examining driving forces shaping the strong growth of global tourism and Thailand tourism; the reasons for travelling and selecting a travel destination; examining the roles of tourism organisations both in the public and private sectors especially national tourism organisations, travel suppliers, and travel intermediaries; introducing the concept of community art event and creative tourism for promoting cultural diversity and social inclusion; and special interest tourism in Thailand

ICGS 130   Political Science   4
Prerequisites: -
The understanding of politics and political systems of the current world; interactions and connections of different ideas; systems of thought and conflict in contemporary society; analysis of political phenomenon; collecting information, organizing information, organizing in groups, analyzing information, presenting clearly and concisely on political phenomenon, state typology, political taxonomy, ideological persuasion, voting systems and outcomes

ICGS 131   Introduction to International Studies   4
Prerequisites: -
The field of international studies; interdisciplinary approaches; economic globalization; the Bretton Woods system and neoliberalism; political globalization; the United Nations system, the International Court of Justice, and Human Rights; cultural globalization; migration diaspora and transnationalism; the internet and global media; development; modernization and dependency; Global North and Global South; traditional and human security; food; health; energy; environment

ICGS 132   Career Preparation in a Globalized World   4
Prerequisites: -
Trends in national, regional and international job markets; self-assessment on career options; career plan creation; principles in business communication; job search process and tools; resume, cover letters; interview preparation and simulation; dimensions of culture

ICGS 133   Foundation of Mediterranean Cultures   4
Prerequisites: -
The Mediterranean as a source of Western culture; Egypt and the Fertile Crescent; Mohammed and the Muslim World; the Promised Land: Moses' Israel; Jesus and the birth of Christianity; Greek history and civilisation; Ancient Italy; arts in Florence and Venice; Modern Italy history; Italian food; the World of Fashion in modern Italy; Italian film; Italian music

Critical Thinking

ICGH 101   Biotechnology: from Science to Business   4
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 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 transistor

ICGH 106   The Greeks: Crucible of Civilization   4
Prerequisites: -
An introduction to 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

ICGH 107   Contemporary Art and Visual Culture   4
Prerequisites: -
Focusing on current issues in society as reflected in the new media utilized in art today; an analysis of images and group discussions regarding social and historical contexts of contemporary art; creative thinking skills; effects of globalization on the visual world; connections between global and local issues; an investigation of broader social and cultural matters such as ideology, gender, race, and ethnicity

ICGH 109   Creative Thinking Through Art and Design   4
Prerequisites: -
Combining hands-on studio experiences 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 to develop individual solutions to open-ended problems

ICGH 110   Drawing as Visual Analysis   4
Prerequisites: -
Developing creativity and cognitive learning skills; utilizing visual communication, design and art principles; mark making; observation, analysis, record, representational plant and still life forms; practice, application, techniques for conventional pencil drawing tools: shape, form, perspective, lines, shading, value, negative space, texture, composition; observation; scientific illustration, realistic representational observation

ICGH 115   Cinematic Languages and Its Application   4
Prerequisites: -
An introduction, practice and an application of languages to critical thinking and analysis; examining key film languages and textual examples, including narrative theories; genre, film theories; an analysis of key film texts; the development of skills in research, writing and analytical thinking; applied knowledge to creative works; the presentation of original ideas and reflection on the craft approach

ICGH 124   Life Drawing and Anatomy   4
Prerequisites: -
An introduction, practice and application of observation drawing to record the human form; including key principles of composition, gesture and observation drawing techniques and design skills for static, gesture and motion poses; understanding record and identifying the anatomical make-up of the human form in muscles and skeletons; technical proficiency with suitable media for observation drawing; studio practice; hand-drawing from observations

ICGH 125   How Can We Know What Is Good? Moral Reasoning and Behavior   4
Prerequisites: -
A survey of philosophical, psychological and scientific contributions to the understanding of moral values and agency; hands-on construction, scrutiny and analysis of ethical argument regarding burning issues in applied ethics

ICGH 126   Behavioral Ethics: Why Good People Do Bad Things   2
Prerequisites: -
Foundations of behavioral ethics, assumptions of ethical decision making, process of ethical decision making, cognitive errors in ethical decision making: incrementalism, self-serving bias, tangible and abstract, loss aversion, framing, and overconfidence, social and organizational pressures in ethical decision making, situational factors in ethical decision making

ICGN 107   The Chemistry of Everyday Life   4
Prerequisites: -
Portable electronics; the air we breathe; radiation from the sun; climate change; energy from combustion; energy from alternative sources; water; polymers and plastics; nutrition; health and medicine; genes and life

ICGN 111   Physics for CEO   4
Prerequisites: -
Basic concepts of physics impacting individuals and society on a daily basis: physical quantities, Newtonian mechanics and dynamics, energy and heat, electricity and magnetism, light and sound, and the electromagnetic spectrum

ICGN 123   The Earth's Dynamic Structure   4
Prerequisites: -
Introducing fundamental concepts and applying general geology at the beginning level; basic concepts of physical geology, emphasizing on surficial and deep earth processes, including minerals; rocks and their formations, crustal deformation, plate tectonics; weathering and erosion, formation of landscapes, geological resources and environmental geology

ICGN 127   Practical Mathematics   2
Prerequisites: -
Fibonacci numbers and the golden ratio, voting and election, data interpretation, probability, cryptography, financial mathematics

ICGS 103   Economics in Modern Business   4
Prerequisites: -
Forces of demand and supply, elasticity, opportunity cost; market structures, pricing strategy, business enterprise, consumers behavior; Thai economy, world economy, globalization and technology, profit maximizing, firm and organization, government policies; business analysis and managerial decision-making, competitive advantage, dynamic business environment

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 interpretation of a range of primary sources dealing with the Thai past; an understanding of how history is written

ICGS 134   Is Democracy Good?   4
Prerequisites: -
Democracy as a political system and a 'normal' form of governance throughout the world, especially since the transitional Third Wave of democratization ending in the 1990's; democracy as a highly contested term; forms of governance; contestations in Thailand; arguments of Thai Style Democracy; defining democracy; different forms of democracy; local perception of democracy; critical debate on the merits of democracy; functionality; theoretical and in pragmatic situations; qualitative and quantitative analysis; democratic performance

ICGS 135   Entrepreneurial Accounting   4
Prerequisites: -
Fundamental accounting concepts; financial statements for small enterprises; financial statement analysis; cost-volume-profit analysis; management decision making; business taxation

Leadership

ICGN 114   The Scientific Approach and Society   4
Prerequisites: -
Scientific literacy; the process of science discovery; verification, its limitation, and the influence in various disciplines; human and animal research ethics; the critical analysis of current scientific articles; the life cycle of scientific knowledge; modeling in science

ICGN 128   Climate Emergency, Biodiversity Crisis, and Humanity at Risk   2
Prerequisites: -
Anthropogenic activities; biodiversity crisis; biodiversity loss; biological diversity; climate change; climate crisis; climate emergency; ecosystem functions; harmful and unsustainable practices; humanity at risk; mitigation and adaptation; threats, impacts and consequences

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, customer analysis, integrated marketing, funding, securing and managing capital, human capital management under the disruptive environment

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: identity formation and conflict; ethics and moral behavior; values and communication across cultures; culture and tourism; culture and work motivation; culture in educational institutions

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 136   Social and Health Issues in Thailand   4
Prerequisites: -
Social and health issues in Thailand; experiential learning approach; site visits to various government and non-governmental organizations; small groups work; identification of issues and characterize the factors affecting the issues; prioritization of the urgency of the issues and determination of the possible solutions; proposing action plans addressing the issues

ICGS 137   Witchcraft and Gender Representation   4
Prerequisites: -
The term "witch" used to suppress women: accusations of witchcraft to eliminate strong, assertive women; accusations of demonic or magic sources demeaning to women; European, American and African use of witch accusations to stifle women; other forms of oppression of women: the Chinese foot binding, the Indian Suttee, the African genital mutilation; the meaning of gender; gender vs sex; marginalization of women in patriarchal societies; women's rights in the contemporary world; differing concepts of women's rights; global and national enforcement of women's rights; organizations concerned with gender and women's issues: UN, ILO, etc; an application of gender rights to other genders like LGBTQ

ICGS 138   Business Event Essentials   4
Prerequisites: -
An introduction to business event industry, meetings, incentive travels, conventions, exhibitions; decision making criteria, special events, business event organization management, venue management, logistics for business event industry, stakeholders in business event industry and local community engagement, standards in business event industry, ethics for business event professionals

ICGS 139   Leadership and Change for a Global Society   4
Prerequisites: -
Concepts and practices for leadership development; developing leadership skills and challenges of change in a global society; the need, vision, initiation for change, teamwork and collaboration for the efficient management

ICLL 101   Professional Development   2
Prerequisites: -
Professional skills for 21st century workplace through learning or training activities in various topics including innovation management, start-up business, agile workplace or other selected professional development activities approved by the academic advisor and Curriculum Administrative Committee

Digital Literacy

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

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 118   Everyday Connectivity   4
Prerequisites: -
The Internet, computer networks, and the World Wide Web (W3) in the daily life and organizations; 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

ICGN 119   **Computer Essentials**   **4**
Prerequisites: -
Developing the digital literacy relating to the computer literacy and the 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

ICGN 129   **Programming for Problem Solving**   **4**
Prerequisites: -
Influence and impact of computer science on everyday life and society; the problem solving process in programming: abstraction, problem decomposition, algorithms; programming basic; privacy, ethical, and legal issues related to the software development

ICGN 130   **Cryptography: The Science of Making and Breaking Codes**   **2**
Prerequisites: -
Classical cryptography; cryptosystems; the shift cipher, the substitution cipher, the Hill cipher, the permutation cipher, the stream ciphers; the RSA encryption; cryptanalysis

ICGN 131   **Digital Search Literacy**   **2**
Prerequisites: -
The Information literacy relating to search term, the evaluation of the internet site and the quality of data; use of information; the ethical use of the intellectual property; the use of computer platforms; software, online services

ICGN 132   **Digital Security and Privacy**   **2**
Prerequisites: -
Privacy rights of data and safeguarding personal information by the protection organizations, anonymizing of data, computer security relating to computer platforms, network, internet and smart devices; password managements and shortcomings, authentication factors and technology

ICGN 133   **E-Business: Technology and Digital Strategies**   **4**
Prerequisites: -
The 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 134   **Introduction to Artificial Intelligence**   **2**
Prerequisites: -
The artificial intelligence terminology; machine learning types and techniques; guidelines for building the machine learning model; neural networks; an evaluation in the AI system; the real-world artificial intelligence; the future trends of the artificial intelligence; dangers and threats of the artificial intelligence

ICGS 140   Fake News, Censorship and the Politics of Truth   4
Prerequisites: -
Internet and hyper news flows; patterns of information consumption; knowledge of information authenticity; socio-political effects of 'fake news'; impacts and methods of data collection; censorship and contested 'digital space', fact-checking, source evaluation and trust-building online; social power of algorithms, quantification and profiling; citizens journalism and the traditional media

ICLL 102   Skills for a Digital World   2
Prerequisites: -
Twenty-first century skills for digital economy through learning or training activities in various topics including e-Commerce, Blockchain technology, and data science, or other selected activities approved by the academic advisor and Curriculum Administrative Committee

Major Courses
Core Courses

ICMA 106   Calculus I   4
Prerequisites: Placement test or ICMA 100 Foundation Mathematics
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 213   Calculus II   4
Prerequisites: ICMA 106 Calculus I
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 law of motion, rotational motion, energy, momentum, static equilibrium, fluid mechanics

ICPY 102   Physics II   4
Prerequisites: ICPY 101 Physics I
Oscillations and wave; light and sound; thermodynamics; electricity and magnetism; modern physics

EGCI 113   Fundamental Computer Programming   3
Prerequisites: -
Introduction to computer concepts, computer components, hardware and software, hardware and software interaction, and Electronic Data Processing (EDP) concepts; introduction to program design and implementation using a high-level language: types and expressions, iterative and conditional control statements, functions, Boolean logic, array

EGCI 201   Discrete Mathematics   4
Prerequisite:-
Basic set theory, mathematical reasoning, relations, functions, graphs, trees, an introduction to number theory

EGCI 211   Advanced Computer Programming   3
Prerequisite: EGCI 113 Fundamental Computer Programming
Programming techniques and concepts. Various techniques for Efficient Pointer; Structure; Sorting; Programming, Software-Bug Prevention, Debugging, Testing, and Source-Code and version control; Scope/Lifespan of variables

EGCI 230   Electric Circuit Analysis   4
Prerequisite: ICPY 102 Physics II
Circuit elements; Kirchhoff's laws; resistive circuits; node and mesh analysis; Thevenin and Norton theorems; Op-amp, inductor and capacitor, first–order and second order circuits; step responses; zero input and zero–state responses; DC transient and AC steady-state responses; elementary transfer functions; sinusoidal waveforms; phasor representations; impedance and admittance; sinusoidal steady-state analysis; complex power; frequency responses

EGCI 232   Engineering Electronics   4
Prerequisite: ICPY 102 Physics II
Introduction to solid-state electronics as circuit elements, including diodes, bipolar transistor, rectifier circuits, Zener diodes regulators, power supplies, power amplification, MOSFETs, applications in operational amplifiers in various feedback configurations

EGCI 305   Statistics for Research in Computer Engineering   4
Prerequisite: ICMA 213 Calculus II
The design of experiments; the collection and presentation of data; descriptive statistics; elementary probability and normal distributions; the estimation of parameters; hypothesis testing; the analysis of variance; regression and correlation; the analysis of frequencies and non-parametric methods

Required Courses

ICMA 223   Linear Algebra A   2
Prerequisites: -
Linear equations, system of linear equations, matrices, Euclidean spaces, traces, determinants

EGCI 202   Engineering Mathematics for Signal and Systems   4
Prerequisites: ICMA 106 Calculus I
The basic complex analysis, probability and random variables, mathematics for linear systems; superposition, convolution, Laplace transform, Fourier analysis; discrete time Fourier transform, Z-transform, ordinary differential equations

EGCI 213   Programming Paradigms   4
Prerequisite: EGCI 113 Fundamental Computer Programming
An introduction to programming paradigms and programming languages; fundamental programming concepts: data types, basic programming statements, functions, memory management; object-oriented programming, concurrent programming, event-driven programming

EGCI 221   Data Structures and Algorithms   4
Prerequisite: EGCI 211 Advanced Computer Programming
The analysis of algorithms; abstract data types; linear data structures: linked lists, stacks, queues; non-linear data structures: trees, hash tables, graphs; sorting and searching algorithms; recursion, divide-and-conquer algorithms, dynamic programming, greedy algorithms; an introduction to NP-completeness

EGCI 231   Digital Circuit Design   4
Co-requisite: EGCI 233 Digital Circuit Design Lab
The digital Circuit Design, Basic Gates, Boolean Algebra, Combination Logic Circuit Design (e.g. Decoder, Encoder, Multiplexer, and Comparator circuits), Logic Minimization, Number Systems, Binary Codes, Flip-Flops and register, Counter Circuits, Synchronous and Asynchronous Circuit Design, A/D and D/A converters, Memory Organization

EGCI 233   Digital Circuit Design Lab   1
Co-requisite: EGCI 231 Digital Circuit Design
An introduction to the Digital Systems Lab, Basic Gates' Operations; Boolean Algebra; the Design of Adder and the Subtractor Circuits, Encoder and Decoder Circuits; Multiplexer and Demultiplexer Circuits, the Design of Sequential Circuits

EGCI 252   System Programming   4
Prerequisite: EGCI 211 Advanced Computer Programming
System programming; fundamental process management; concurrency and communication; signals, thread, thread synchronization, semaphores, inter-process communication

EGCI 319   Internship In Computer Engineering   2
Prerequisite: Must complete 60 EGCI credits before register for this course
A minimum 156 hours practical training in an industrial factory or an organization with computer-related systems, computer control system, or systems using computer processing; the internship summary, including the report of the training outcome from the host organization; grading as either 'S' or 'U'

EGCI 321   Database Systems   4
Prerequisite: EGCI 221 Data Structures and Algorithms
The entity-relationship model, the relational data model; logical and physical database design, a query language, data dependencies and normalization; the transaction, the crash recovery, the concurrency control; the internet databases

EGCI 330   Microprocessor and Interfacing   4
Prerequisite: EGCI 231 Digital Circuit Design
Introduction to microprocessor, microprocessor architecture and instruction set, addressing modes, assembly language, memory interfacing, interrupts and direct memory access (DMA), interfacing with I/O devices, microprocessor's interfacing programming and applications

EGCI 332   Embedded Systems   4
Prerequisite : -
Embedded system designs and development processes; portable-battery operated embedded systems; high-level language programming for embedded system applications; real-time operating system; advanced peripheral interfacing; DAC and ADC converters; sensors and signal conditioners

EGCI 333   Computer Architecture   4
Prerequisite: EGCI 231 Digital Circuit Design
Computer components; design of logic circuits; working of and designing register level components used in computer systems; data representation in computer systems; clock signal; datapath design; design of control unit using microprogram (CISC architecture) and logic circuit (RISC architecture); work of computer of each architecture; performance enhancement; pipeline systems of computers; memory systems; principles and work of cache memory; input-output system design; fundamentals of serial and parallel communication; parallel processing architecture; fault tolerance

EGCI 340   Software Design   2
Prerequisite:
An introduction to software design paradigms; software design fundamentals; system and software requirements; software design tools, and computer aided for software design; business process modeling (BPM); user experience (UX) design; software architecture; Service-Oriented Architecture (SOA); microservices architecture; software project management

EGCI 341   Software Engineering   4
Prerequisite: EGCI 340 Software Design
Software life cycle; need and specification; large-scale software development; scheduling, developing, constructing, testing and maintenance of software system; object-oriented analysis and design; software reuse; documentation; management of software project; case studies of software system in the market

EGCI 351   Operating Systems   4
Prerequisite: EGCI 252 System Programming
Contemporary concepts of computer operating systems; Thread; CPU scheduling; definition and details of harmonizing cooperating process; system resources management; deadlock handling; main memory management and design; virtual memory management; auxiliary memory management; file systems; protection and security; introduction to distributed operating systems

EGCI 371　　　Computer Networks and Information Security　　　　　4
Prerequisite : -
An introduction to the data communication; the network architecture; local and wide area networks; wired and wireless networks; network protocols; network applications; network management; data communications; performance evaluation; data security and integrity; vulnerabilitie; secret and public key cryptography; message authentication codes; network and web security; authentication

EGCI 491　　　Computer Engineering Seminar　　　　　　　　　　1
Prerequisite: Must complete 60 EGCI credits before register for this course
Developing oral and written communication skills; preparing students for training and cooperative education; a computer engineering or cooperative education proposal project; project approval; further research and implementation in the Computer Engineering Project course

EGCI 492　　　Computer Engineering Project　　　　　　　　　　2
Prerequisite: EGCI 491 Computer Engineering Seminar
The computer engineering project supervised by the advisory committee; a complete project report and an oral examination

<u>**Elective Courses**</u>
<u>**Network and Security Specialization Courses**</u>

EGCI 432　　　Distributed Systems　　　　　　　　　　　　　　4
Prerequisite: EGCI 113 Fundamental Computer Programming
Naming, consistency, concurrency, and security; reviewing some of the current best practices in distributed computing models: peer-to-peer, grid computing, and distributed object model

EGCI 474　　　Internetworking Technologies I　　　　　　　　　4
Prerequisite: EGCI 371 Computer Networks and Information Security
Theoretical and practical aspects of routing, including internetworking models, internet protocol, and routing technologies; required laboratory work

EGCI 475　　　Internetworking Technologies II　　　　　　　　　4
Prerequisite:　EGCI 474 Internetworking Technologies I
Theoretical and practical aspects of advanced routing and switching technologies, including hierarchical network design model, layer 2 switching, internet protocol version 6, spanning tree concepts, inter-virtual local area network, wide area network technologies, network security, network services, and network troubleshooting; required laboratory work

EGCI 476　　　Cryptography and Computer Security　　　　　　　4
Prerequisite : EGCI 201 Discrete Mathematics
An introduction to basic theory and techniques in cryptography; symmetric and asymmetric encryption; cryptanalysis techniques. security in computer network; security threats and vulnerabilities; authentication mechanisms; identification schemes; security in operating system and application; firewall; the intrusion detection system

EGCI 477   Penetration Testing and Prevention   4
Prerequisite : EGCI 371 Computer Networks and Information Security
The process of penetration testing; collection and analysis of computer network vulnerabilities; tools for penetration testing; ethics of penetration testing processes; summarizing and reporting the result from the penetration testing; planning and designing of the prevention systems to protect the computer network form vulnerabilities

EGCI 478   Wireless Communication   4
Prerequisite : EGCI 371 Computer Networks and Information Security
Wireless transmission systems; wireless channel; coding techniques; error control; satellite; cellular networks; mobile internet protocols and management; multiple-access techniques; wireless protocols; wireless local area networks (WLANs); and wireless mesh networks

System and Signal Specialization Courses

EGCI 431   Internet of Things   4
Prerequisite : -
IoT architectures, communication technologies for IoT, technologies behind IoT, IoT platform; how they are integrated to form IoT systems

EGCI 451   Cloud Computing   4
Prerequisite : -
Fundamental concepts of cloud computing; fundamental principles of the cloud architecture, web applications development on cloud; web services on cloud, service models for cloud computing; virtualization technology for cloud computing, computing services, cloud computing services

EGCI 466   Big Data Processing   4
Prerequisite: -
Theories and techniques for managing big data, big data storage, the distribution system for big data, relationship analysis for big data, big data visualization, trends and applications for big data

EGCI 467   Natural Language and Speech Processing   4
Prerequisite: -
Algorithms for the processing of linguistic information, computational properties of natural languages. morphological, syntactic, and semantic processing from a linguistic and an algorithmic perspective, modern quantitative techniques in NLP: using large corpora, statistical models for acquisition, and the representative systems

EGCI 486   Image Processing   4
Prerequisite: Consent of instructor
The image processing system, an introduction to the digital image processing, the digital image fundamental, the image enhancement, the image transformation, the image restoration, color image processing, image compression, the morphological image processing, the image segmentation, the object recognition

EGCI 487   Computer Vision   4
Prerequisite: -
An introduction to programming for computer vision; fundamentals of the computer vision, 3D geometrical transformations; the stereo imaging, the perspective camera, the camera calibration, the camera imaging model, the image registration, the wavelet transform, the 3D modeling; image segmentation, feature detection and matching, the face recognition, the object recognition, the content-aware image resizing

Intelligent System and Robotic Sciences Elective Courses

EGCI 331   Introduction to IC Design   4
Prerequisite: EGCI 231 Digital Circuit Design
The N MOS and C MOS integrated circuit technologies; properties of N MOS and C MOS circuits; calculation of parameters in circuits, static and dynamic MOS circuits; system design; circuit drawing and testing; computer arithmetic; performance evaluation; synthesis of digital circuits from HDL models; modeling and simulation; fault models and testing the use of CAD tools in circuit design

EGCI 406   Mechatronics   4
Prerequisite: -
Microcontroller; digital input/output; switches and LEDs; analog input/output; PWM signal; switching devices; relays; motors; H-bridge; serial communication; power supply; sensors; PCB design; feedback control

EGCI 407   Human-Robot Interaction (HRI)   4
Prerequisite: -
The fundamentals of robotics business; a physical humanoid robot component; robot functionality; natural social interaction partners for human users; Human-Robot Interaction (HRI); the use of companion robots in different business application domains; development lifecycle of a robotics application

EGCI 425   Data Mining   4
Prerequisite: -
Knowledge discovery in databases; data preparation, data visualization, and data transformation; clustering, association analysis, classification and ensemble classification; metrics and evaluation; data warehouse, online analytical processing (OLAP); effects of data mining, current technology and trend, applications of data mining

EGCI 461   Artificial Intelligence   4
Prerequisite: EGCI 221 Data Structures and Algorithms
The foundations of artificial intelligence, solving problems by searching, knowledge representation, the first-order logic, the inference in the first-order logic; planning, the probabilistic reasoning systems; an introduction to Prolog, the natural language processing; the genetic algorithm, and machine learning techniques

EGCI 463　　　Pattern Recognition　　　　　　　　　　　　　　　　　4
Prerequisite: ICMA 213 Calculus II
Preprocessing for data recognition: features extraction, classification or linear techniques for recognition; Parametric and nonparametric techniques, Bayesian classifiers, methods, neural networks, hybrid method, learning techniques; Applications in pattern recognition

Linguistic Software and Theory Elective Courses

EGCI 301　　　Computer Graphics　　　　　　　　　　　　　　　　　4
Prerequisite: EGCI 113 Fundamental Computer Programming
Principles of the computer graphics, graphics systems and models, graphics programming, graphic devices and their controls; color model, geometric objects and transformations, viewing, shading, clipping, and the hidden-surface removal

EGCI 404　　　Theory of Computation　　　　　　　　　　　　　　　　4
Prerequisite: EGCI 201 Discrete Mathematics
An introduction to the structure of languages and the characteristic of languages: formal languages, regular languages and non-regular languages, the context-free grammar and context-free languages; describing the characteristic of state machines used to check the membership of languages: finite state machines, transducers, state transition machines, non-deterministic finite state machines, push-down state machines, Turing machines; the advanced theory of computation: Kleene's Theorem, recursively enumerable languages, decision problems

EGCI 427　　　Web Programming　　　　　　　　　　　　　　　　　4
Prerequisite: -
Semi-structured data models for the Web (such as XML, etc.), the semi-structured data management, associated query languages and query systems for Web data, query processing and optimization over semi-structured data as well as over multiple distributed sources; data integration over the Web, warehousing of Web data; mappings from relational and object-oriented database servers to web data; discussions on some novel data-intensive applications on the Web such as electronic commerce, digital libraries, and distance education relating to web database issues

EGCI 428　　　Mobile Device Programming　　　　　　　　　　　　　　4
Prerequisite: -
Fundamental of the mobile device programming; concept of mobile device technology; basic mobile device programming; user-interface design; database connection; remote sensors controlling; mobile web services; developing a prototype for the mobile device application for with notification services

EGCI 429   Web Application Architecture   4
Prerequisite: -
Fundamental concepts of web application development from a managerial perspective; extensible Markup Language (XML) and Hypertext Markup Language (HTML) technology; fundamental principles of architecture, process, and elements of web applications; Web services application development; mobile applications such as geographical information system and social networks

EGCI 494   Fundamental of Digital Forensics   4
Prerequisite : -
An introduction to basic of digital forensics; the data collection and investigation from operating system such as Windows and Unix; the computer files system storage; collecting and analyzing the network traffic; data analysis and validation; digital forensic tools

Advanced Topics

EGCI 381   Introduction to Quantum Computing   4
Prerequisite: -
A brief history of quantum computing and quantum technologies; mathematics for quantum theory; quantum bits (qubits); qubits superposition; entanglement; qubits manipulation; basic quantum and quantum-inspired algorithms; quantum logic gates; and quantum programming

EGCI 382 - 389 Special Topics in Computer Engineering (…)   4
Prerequisite: -
Selected topics in current computer engineering technologies, which could be offered by the department or propose to be offered by other departments; the title of the topic indicated in the parenthesis part of the course title

EGCI 394 - 399 Special Topics in Computer Engineering (…)   4
Prerequisite: -
Special topics in current computer engineering technologies, which could be offered by the department or propose to be offered by other departments; the title of the topic indicated in the parenthesis part of the course title

Field Work Elective Course

EGCI 493   Cooperative Education   8
Prerequisite: EGCI 319 Internship In Computer Engineering
Integrating and adapting all classroom knowledge into the real practice in corporate environments, gaining working experiences and teamwork experiences under a supervision of mentors from the companies and advisors from the department, in order to prepare the students from transition from school to work after graduation; grading as either 'S' or 'U'

EGCI 495   Regional Study Experience   1
Prerequisite: Must complete 50 EGCI credits before register for this course
Visiting local or international companies in the fields related to computer and engineering technology in order to gain experience and adjust attitude from a perspective of a student into working experience perspective in order to prepare the students from transition from school and to make a preparation to work after graduation; grading as either 'S' or 'U'

EGCI 496   International Study Experience   2
Prerequisite: Must complete 50 EGCI credits before register for this course
Visiting international companies or educational institutes aboard in the field related to computer and engineering technology; providing opportunity for students to broaden educational and cultural experience aboard; expanding their knowledge both theoretically and perceptive capacity; prepare for working in international companies or continuing their study; ; grading as either 'S' or 'U'