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; the data analysis		

ICMA 101	Precalculus	0
Prerequisites: Placement test Functions and graphs; polynomial functions; rational functions; exponential functions; logarithmic functions; trigonometry; unit circle; trigonometric identities; complex numbers		

ICME 101	Foundation English: Communication Skills	0
Prerequisites: Placement test A remedial course preparing students to use communicative and academic English at a level suitable for entering the English Studies I: The Writer's Toolkit course		

General Education Courses
English Communication

ICGC 104	English Studies I: The Writer's Toolkit	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 105	English Studies II: The Writer's Voice	4
Prerequisites: Placement Writing Test or ICGC 104 English Studies I: The Writer's Toolkit 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 106	English Studies III: Public Speaking	4

Prerequisites: ICGC 105 English Studies II: The Writer's Voice

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 the Writer's Toolkit (English Studies I) and the Writer's Voice (English Studies II) to create and deliver speeches to a professional standard

ICGC 221	English Studies IV: The World of English - Global Realities	2

Prerequisites: ICGC 106 English Studies III: Public Speaking

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 222	English Studies IV: The World of English - Literary Analysis	2

Prerequisites: ICGC 106 English Studies III: Public Speaking

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; utilising scaffolding of strategies for students to understand the function of a variety of literary forms

ICGC 223	English Studies IV: The World of English - Creative Writing	2

Prerequisites: ICGC 106 English Studies III: Public Speaking

An examination of fiction, poetry, drama, and media production through readings, speeches, and films; comparisons of writing in different genres; creation of a work of publishable quality by means of the consideration of audience and genre

ICGC 224	English Studies IV: The World of English - Advanced Oral Communication	2

Prerequisites: ICGC 106 English Studies III: Public Speaking

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 226	English Studies IV: The World of English - Literature Into Film	2

Prerequisites: ICGC 106 English Studies III: Public Speaking

An examination of the technical aspects of translating literature into film; an exploration of the interplay between literature and films through an analysis of literary works in their film versions; an exploration of the challenges merging both mediums

ICGC 228	English Studies IV: The World of English - Language and Culture	2

Prerequisites: ICGC 106 English Studies III: Public Speaking

An examination of the interplay between language and culture; a critical exploration of the global spread of the English language with a focus on the English culture coming out of the Global South

ICGC 230	English Studies IV: The World of English - First and Second Language Acquisition	2

Prerequisites: ICGC 106 English Studies III: Public Speaking

An exploration of 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 and applications of theories

ICGC 231	English Studies IV: The World of English - Poetr	2

Prerequisites: ICGC 106 English Studies III: Public Speaking

An in-depth study of poetry, including metrics, forms, themes, ethnic voices, throughout history; an evaluation of poetry from different genres through discussions, workshops and research

ICGC 232	English Studies IV: The World of English - The Short Story and the Novel	2

Prerequisites: ICGC 106 English Studies III: Public Speaking

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 233	English Studies IV: The World of English - Drama	2

Prerequisites: ICGC 106 English Studies III: Public Speaking

An exploration of ways to understand and appreciate drama by reading, watching, and analyzing theatrical performances; fundamentals of theatrical production and stage performance

ICGC 234	English Studies IV: The World of English - Literary Non-fiction	2

Prerequisites: ICGC 106 English Studies III: Public Speaking

An exploration of literary 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 235	English Studies IV: The World of English - Writing for Research	2
Prerequisites: ICGC 106 English Studies III: Public Speaking 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		

MU Literacy

ICGB 101	Project Management for Impacts	2
Prerequisites: None Develop self-awareness as a MAHIDOL person; application of the university's motto, philosophy, and core values to benefit the community; the application of the Project Management Bodies of Knowledge (PMBOK) and skills; the management of social service projects; Social impact assessments aligning with Sustainable Development Goals (SDGs) and other frameworks		

ICGB 108	Event for Good	2
Prerequisites: None Develop self-awareness as a MAHIDOL person; application of the university's motto, philosophy, and core values to benefit the community; exploration of various methods and strategies for organizing events that drive positive impact for communities; organizing an event focusing on community engagement, fundraising, or others with a focus on social outcomes or community-focused objective		

ICGN 139	Scientific Inquiry and the Community	2
Prerequisites: None Develop self-awareness as a MAHIDOL person; application of the university's motto, philosophy, and core values to benefit the community; applying process of science discovery to authentic issues in the local community through observation or experiment; collaborate with peers in findings; summarizing and reporting to local stakeholders		

ICGS 169	Learning by Doing	2
Prerequisites: None		

Develop self-awareness as a MAHIDOL person; application of the university's motto, philosophy, and core values to benefit the community; social work, ethical principles and values in social work, roles and settings in social work practice, collaborative approaches in social work, SDGs and their interconnectedness, analyzing global challenges addressed by the SDGs, partnerships with local communities for SDG initiatives

ICGS 171	Digital Campaign for Gender Issues	2

Prerequisites: None

Develop self-awareness as a MAHIDOL person; application of the university's motto, philosophy, and core values to benefit the community; gender inequalities and gender-based violence in society; gender activistism & technologies; working with local communities to raise awareness of gender violence and abuse; use of social media to condemn violent acts; raising awareness of human rights & equality; organizing collaborative work and discovering creative solution to gender issues; use of social media to offer solutions to the needs of the community

ICGS 172	Service Learning - Making Change	4

Prerequisites: None

Develop self-awareness as a MAHIDOL person; application of the university's motto, philosophy, and core values to benefit the community; exploring the nature of change and resistance in human society and across several disciplines such as philosophy, psychology, political science, sociology, and business; reviewing case studies about how change is initiated, implemented, resisted, and achieved; challenging students through projects to identify a need for change, and to devise a plan and implement it

ICGS 173	Service Learning - Campaigning for a Cause	4

Prerequisites: None

Develop self-awareness as a MAHIDOL person; application of the university's motto, philosophy, and core values to benefit the community; research, analyse, evaluate, present and produce media campaigns for selected community / Non-Governmental Organizations / Charitable Organization(s)

ICGS 175	Social Innovation and Sustainability	2

Prerequisites: None

Develop self-awareness as a MAHIDOL person; application of the university's motto, philosophy, and core values to benefit the community; exploring social innovation and sustainability principles, focusing on sustainable ecosystems, ethical decision-making, effective communication, and collaboration. Engaging in project-based learning to address global challenges, promoting responsible citizenship and leadership skills. Applying the 4Cs of 21st-century education: Critical

thinking, Communication, Collaboration, and Creativity. Analyzing ethical theories and frameworks, such as utilitarianism and deontological ethics, for moral decision-making. Utilizing communication theories and models, like the Shannon-Weaver model and Monroe's Motivated Sequence, for clear and persuasive communication. Highlighting team dynamics and conflict resolution for effective collaboration. Encouraging creative problem-solving aligned with the Sustainable Development Goals (SDGs). Preparing purposeful presentations and working as cohesive team members for sustainable development

ICGS 176	Sustainable Cooking	2

Prerequisites: None

Develop self-awareness as a MAHIDOL person; application of the university's motto, philosophy, and core values to benefit the community; student-led community projects promoting importance of sustainability in the food system; sustainable food choices and cooking; fundamental science in cooking; collaborative work to identify sustainable issues in culinary food production; students design creative solutions aligning with needs of the community; promote sustainable cooking and food consumption

ICGS 177	Social Innovation: Empowering Sustainable Communities	2

Prerequisites: None

Develop self-awareness as a MAHIDOL person; application of the university's motto, philosophy, and core values to benefit the community; exploring the dynamics of social change through innovation, based on frameworks like Asset-Based Community Development and the Social Capital theory, focusing on ethical decision-making, human rights, and community empowerment. Engaging with local communities to co-create sustainable solutions using Participatory Action Research, fostering responsible citizenship and ethical leadership. Integrating critical thinking and communication to address social challenges, promoting collaboration and creativity in line with the Sustainable Development Goals (SDGs)

ICGT 107	Innovation: Inside Out	2

Prerequisites: None

Develop self-awareness as a MAHIDOL person; application of the university's motto, philosophy, and core values to benefit the community; community-based projects course incorporating fundamentals of design thinking; empathy-building techniques; user-centered problem statements formulation; innovative solutions, design thinking tools; concept-to-prototype

Health Literacy

ICGH 136	Sound & Soul: A Journey of Music, Emotion, and Well-being	2

Prerequisites: None

Discovering how music can guide emotional states, fostering relaxation, motivation, and creativity; exploring how music interacts with our emotions and sound's power in emotional expression and regulation; extending to the cultural influences that shape our perceptions of beauty in music as well as discussing techniques for incorporating music into our lives to cultivate emotional well-being and navigating different genres and styles for a richer experience of ourselves and our environment

ICGH 143	Flowers and Fragrances for Health	2

Prerequisites: None

Introduction to the scientific and cultural aspects of floral fragrances for health benefits; exploring sustainable perfume industry and traditional essential oil extraction for medicinal purposes; significance of flowers in human society; floral composition, floral aesthetics, aromatherapy and how these relate to human mental and physical health

ICGN 135	Personal Health and Well being	2

Prerequisites: None

Understanding the health as a continuous process and can be changed at any time depending on the choices we make; exploring the current challenges facing young people of today; evaluating on how they affect health and healthful behavior; what individuals can do to navigate these challenges to arrive at their goals for the future

ICGP 101	American Flag Football	1

Prerequisites: None

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: None

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: None

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: None

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: None

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: None

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: None

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: None

A course stressing meditation postures, techniques, movement, and breathing to achieve positive mental state

ICGP 109	Selected Topics in Sports	1

Prerequisites: None

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: None

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: None

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: None

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: None

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: None

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

ICGP 115	Tennis	1

Prerequisites: None

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: None

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

ICGP 118	Health and Wellness	2

Prerequisites: None

Wellness design for a lifelong healthy lifestyles; basic principles of achieving physical, emotional, intellectual, environmental, social and spiritual well being

ICGP 119	Mindful Food and Well-being	2

Prerequisites: None

Explore food and culinary trends, food choices, and the concept of mindful food and eating; fundamental relationships between food and well-being; food products and services for consumers in various demographics; food products and food service features that emphasise the concept of mindful food and eating

ICGP 120	Mind and Body: Navigating the Interplay of Brain, Behavior, and Well-being	2

Prerequisites: None

The relationship between psychology and health; the influence of psychological factors on physical well-being; Exploration of how brain, thoughts, emotions, and behaviours impact overall health outcomes; Current knowledge in sleep, gut-brain connection on health and well-being; The integration of theory, research, and practical applications of psychological principles to promote health and wellness

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

Prerequisites: None

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 126	Introduction to Psychology	4

Prerequisites: None

Human behaviour and mental functioning; the nervous system; consciousness; sensation and perception; psychogenetic, life-span development; thinking, memory, language, conditioning and learning, motivation, personality, and stress

ICGS 155	Pathway to Purpose: Life Design and Self-Exploration	4

Prerequisites: None

Assessment of personal strengths, weaknesses, and areas for improvement; individual values, beliefs, and life goals; goal setting; self-awareness and emotional intelligence; life design

ICGS 164	Positive Psychology	2

Prerequisites: None

A practical introduction to the study of human flourishing and well-being; help students thrive using Positive Psychology principles including the PERMA model of well-being; develop a greater

understanding of positive emotions, engagement and flow, positive relationships, meaning and achievement; individual application of research findings via well-being project

ICGS 178	Unmasking Human Behaviour: Exploring Psychological Truths about Behaviour	2

Prerequisites: None

Introduction to the psychological principles and the importance of evidence-based thinking; Examination of current research on memory, perception, personality, mental illness, stereotype, prejudice, and social behaviour to debunk common myths and misconceptions about human behaviour

ICGS 179	Health and Society	2

Prerequisites: None

Exploring the concept of health across the historical periods; history of disease and origins of medicine; epidemics in the ancient societies; social welfare and the state; contemporary epidemics and the impact on society, state, and people, WHO and the role in the promotion of health

ICLL 100	Self Development	2

Prerequisites: None

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

Science & Environment Literacy

ICGH 131	Unraveling the Anthropocene: A Philosophical Critique of Earth's Shifts and Humanity's Roles	2

Prerequisites: None

Exploring the Anthropocene through the lens of philosophy of science and technology, scrutinizing the profound transformations on our planet and within societies; analyzing scientific advancements and technological innovations' roles in propelling this epochal shift, delving into the intricate interplay between human agency and environmental consequences; challenging conventional paradigms of development and progress through critical analysis, interrogating underlying assumptions that led to this critical juncture

ICGH 142	Fantasy Literature's Environmental Message	2

Prerequisites: None

An overview of the science of ecology; fiction analysis; an overview of the fantasy fiction subgenre; close reading of fantasy novels and short stories to recognize ecological realities and environmental messages; applying through personal reflection, through activities that promote the health of the environment, and through creative work

ICGH 144	A Candle in the Dark: How to Tell Fact from Fiction	2

Prerequisites: None

Rationalism and the scientific method; scientific awareness for decision-making; science vs. pseudoscience; supernaturalism and creationism; charlatanism and quackery; magical thinking and superstitions; conspiracy theories and fake news; fact-checking and logical fallacies

ICGN 105	Ecology, Ecosystems and Socio-Economics in Southeast Asia	4

Prerequisites: None

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 107	The Chemistry of Everyday Life	4

Prerequisites: None

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 108	Essentials of Culinary Science for Food Business	4

Prerequisites: None

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 111	Physics for CEO	4

Prerequisites: None

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 113	Plants, People and Poisons	4

Prerequisites: None

The plant world; the way plants grow and reproduce; modern technologies used for improving agricultural methods; the basics of plant biology; the distinctions among major groups of plants; the social implications of plant use and abuse

ICGN 114	The Scientific Approach and Society	4

Prerequisites: None

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 115	Human Evolution, Diversity and Health	4

Prerequisites: None

Changing modern society; human ability; human body; human distinctiveness; human diversity; human evolution; human health; human origins; primate diversity; scientific advancements

ICGN 116	Understanding and Visualizing Data	4

Prerequisites: None

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 119	Computer Essentials	4

Prerequisites: None

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 123	The Earth's Dynamic Structure	4

Prerequisites: None

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 124	Climate Change and Human Society	4

Prerequisites: None

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 126	Plant Society	2

Prerequisites: None

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

ICGN 127	Practical Mathematics	2

Prerequisites: None

Fibonacci numbers and the golden ratio, voting and election, data interpretation, probability, cryptography, financial mathematics

ICGN 128	Climate Emergency, Biodiversity Crisis, and Humanity at Risk	2

Prerequisites: None

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

ICGN 129	Programming for Problem Solving	4

Prerequisites: None

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: None

Classical cryptography; cryptosystems; the shift cipher, the substitution cipher, the Hill cipher, the permutation cipher, the stream ciphers; the RSA encryption; cryptanalysis

ICGN 134	Introduction to Artificial Intelligence	2

Prerequisites: None

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

ICGN 136	Creator Workshop	2

Prerequisites: None

Sustainable energy usage and responsible production, Design thinking and problem-solving with 3D designing and fabrication, Finite Element Analysis, Community engagement via I-fix-it project to restore broken appliances obtained from communities

ICGN 137	Star Wanderer	2

Prerequisites: None

Basic ideas of sky observations since the ancient time of humanity; motion of the sky; cycles of the Sun and Moon; development of tools used in sky observations; the progress of human understanding of the universe; the impact of the scientific method on astronomical observation; the Earth & Moon; the Solar System; the lifecycle of stars; the Milky way; modern sky survey

ICGN 138	Cosmetics Chemistry	2

Prerequisites: None

Chemistry of cosmetics products; basic science behind cosmetics and aesthetic medical procedures; basic biochemistry of human skins; basic function of aesthetic medical equipment such as HIFU, IPL, Lasers, and RF

ICGN 140	Food Energy for Health	2

Prerequisites: None

Basic chemistry and functions of energy yielding nutrients; Understand food labels and portion sizes. Estimate daily energy from food; Balance energy intake and expenditure

ICGN 141	Life in the Sea	2

Prerequisites: None

Fundamental structures and functions of marine and freshwater life; cell to underwater ecosystem levels of organization; underwater life processes for energy, nutrients, reproduction, growth and development; evolution and biodiversity of underwater life; marine and freshwater biomes; current health and environmental issues under SDG 14 life in the sea; field trip included

ICGN 142	Energy and the Environment	2

Prerequisites: None

Various forms of energy and their conversion processes, fossil fuels and renewable energy sources, Environmental consequences associated with each energy source, Energy efficiency and conservation, Future energy technologies

ICGN 143	Gaia: Life on Earth	2

Prerequisites: None

Fundamental structures and functions of life; cell to biosphere levels of organization; life processes for energy, nutrients, reproduction, growth and development, evolution and biodiversity; service learning and field trip opportunities to participate in mitigating current environmental, health or development issues through life science-based solutions

ICGT 101	Technology-Enhanced Learning: Harnessing AI & Digital Tools for Academic Success	2

Prerequisites: None

AI principles and educational impacts, Technology-enhanced creative learning methods, Ethical use and bias awareness in AI applications, Educational technology tool exploration, AI-driven content analysis techniques, AI tool selection and evaluation, Critical assessment of AI-generated materials, Learning personalization with technology

ICGT 102	Digital Document Management	2

Prerequisites: None

Demonstrate formatting and applying consistent styles in a variety of online platforms; preparing and including digital content; construct file management systems for organizing, storing, and searching materials through metadata; Integrating data from spreadsheets, database to create reports

ICGT 103	Computational Thinking	2

Prerequisites: None

Solving problems in a systematic manner; breaking down a problem into a manageable size; extracting the most important elements of the problem; identifying recurring behaviors in the problem; developing solutions; articulating solutions in a way that is simple yet accurate enough for a computer or even a human to follow

ICGT 104	Tell a Great Story with Data	2

Prerequisites: None

Influence decision with compelling narratives constructed from data; the power of storytelling; determining the purpose; understanding the audience; planning plotlines; creating narrative structures; developing the data story; ethical considerations in data storytelling

ICGT 105	No-Code Application Development	2

Prerequisites: None

Creating software applications without needing to write code; common features of no-code platforms; strategies for choosing no-code platforms; basics of user-friendly interface design, workflow logic, and data storage; using templates and plugins to simplify the development, testing and revising applications; online resources and support communities for further learning outside the classroom

ICGT 106	Data and Spreadsheets	2

Prerequisites: None

Demonstrating proficiency in using lists, function, formulas, filters; importing and transforming socio-economic and/or science-related data from the internet or other databases; providing information to other programs through embedded or link objects; illustrating findings through charts, map charts, conditional formatting, and sparklines

ICLL 102	Skills for a Digital World	2

Prerequisites: None

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

Intercultural & Global Awareness Literacy

ICGH 107	Contemporary Art and Visual Culture	4

Prerequisites: None

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: None

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: None

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 Language and Applications	4

Prerequisites: None

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 116	World Cinemas	4

Prerequisites: None

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 117	Drawing as Creative Expression	4

Prerequisites: None

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: None

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 120	Thai and ASEAN Cinema	4

Prerequisites: None

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 124	Life Drawing and Anatomy	4

Prerequisites: None

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 128	Internet Celebrity, Culture and the Media	4

Prerequisites: None

An examination of the Internet Celebrity phenomenon and the emerging online culture; focusing on the circulation of social media texts and images associated with the Internet Celebrity; i.e. bloggers, influencers, content creators, the construction of their practices, self-branding techniques, emphasizing on the discourse of labour, the impacts, the influences of cultural trends, and the ethical issues; encouraging students to draw on an online creative work in contemporary media culture

ICGH 130	The Logic Lab: Crafting Coherent Arguments	2

Prerequisites: None

Introducing comprehensively formal and symbolic logic, by focusing primarily on categorical logic and truth functions, fundamental principles of logical reasoning with the goal of gaining a solid understanding of analyzing basic arguments, translating propositions, and evaluating truth-values

ICGH 132	The Rise and Fall of Ancient Athens	2

Prerequisites: None

Inquiring into the historical, philosophical and social circumstances involving the establishment, rapid growth, and eventual demise of the city state of Athens in the Archaic and Classical Periods of Ancient Greece

ICGH 135	The Horror Film	2

Prerequisites: None

Investigating the horror film as one of the earliest and most notable cinematic genres, by considering its historical development with examples from both Western and International cinema and by examining the most iconic themes of horror across the ages

ICGH 137	Apocalypse Now, or Never, or Maybe?	2

Prerequisites: None

Pondering the changes of the past two hundred years, especially when it comes to life expectancy, health, and standards of living, and examining in this light the evidence we have for thinking that we are living on the brink of disaster; considering the psychological dimension to our dissatisfactions; discussing the major demographical changes we are currently undergoing; exploring questions around resource shortages, and food supplies; reflecting on our energy needs and realistic ways of meeting them, as well as the uses, dangers, and fears around artificial materials like plastics; exploring the complex questions we face around global warming

ICGH 139	Spirituality, Sustainability, Ecosystems	2

Prerequisites: None

Spirituality's Sustainability Implications for Ecosystems: Bio-diversity, eco-justice, environmental ethics, environmental justice, faiths, spirituality, religious diversity, social equity, social justice, ecosystems, ecosystemic balance, (non-)anthropocentrism

ICGH 141	SPQR—Glimpses of Rome	2

Prerequisites: None

Imagining Rome as it came to be in its "golden age" under the emperors Trajan and Hadrian; reflecting on slavery in Rome, the meaning of bread and games, charioteers and gladiators; contemplating the ways of traditional Roman religion; returning to the founding of the city, to understand how it all began; surveying the end of Roman monarchy and the conflicts between the social classes (Secession of the Plebs); examining Rome's wars with invading Gauls and with the Carthaginians; reviewing the Roman constitution in its heyday, as described by Polybius; tracing the descent into social turmoil and civil war from the Gracchi brothers to the permanent dictatorship of Julius Caesar; sketching out the transition to the principate under Augustus and the Roman imperial period

ICGH 145	Essentials to Photography, Skills and Practices	2

Prerequisites: None

An introduction to major genres of photography including documentary, art, journalism, portraiture, still life, fashion, and landscape; exploring the ethics of publishing photography on the World Wide Web, emphasizing creative collaboration, problem-solving in engaging with real-world issues and

communities, utilising the photographic abilities and visual storytelling narratives to contribute positively to society and promoting sustainable practices and social change

ICGH 146	Acting for Self-Discovery and Empathizing with Others	2

Prerequisites: None

Exploring basic acting principles; leading to self-discovery, and empathy with others; studying breathing, body, voice, movement, mind; understanding strength, weakness, fear in oneself; approaching cognitive empathy, emotional empathy, compassion, sympathy through role play, scenework so as to understand others who are different; fostering authentic connection with self, relationships with others , and how to live in the world of various identities and beings

ICGH 147	Myth and the Masks of the Divine	2

Prerequisites: None

Delving into the ancient Greek mythology as it has come down to us through Hesiod and Homer, and by many more recent retellings, as well as the Nordic tradition codified in the Eddas; reflecting upon the meaning and relevance of such tales about gods and heroes through classic commentaries by Thomas Carlisle, James George Frazer, Joseph Campbell, and other more recent thinkers

ICGH 148	Quest for Global Justice: A Philosophical Inquiry	2

Prerequisites: None

Embarking on a philosophical journey, delving into the question: Is global justice possible? Engaging in critical analysis with an eye on case studies by examining the structural barriers and systemic inequalities that hinder the realization of global justice; through the lens of political theory and moral philosophy, confronting pressing questions about power dynamics, distribution of resources, and cultural diversity

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: None 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 164	Thai Writing for Specific Purposes in Workplace *for native Thai students	2

Prerequisites: None

Thai writing for specific workplace purposes: blend of theoretical insights and practical exercises; composing emails, reports, proposals, and business documents; proficiency in clear, coherent, precise Thai communication

ICGL 171	Diversities in Multilingual Societies	2

Prerequisites: None

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

ICGL 172	Chinese Influence in Thai Society	2

Prerequisites: None

Cultural Exchange, Cultural Awareness; Overview of Chinese Ethinicity and community in Thailand: Exploring the historical, cultural, economic, and political dimensions of Chinese influence in

Thailand; Examining Chinese immigration waves have shaped Thai identity, language, cuisine, and religious practices

ICGL 173	Introduction to Japanese Societies	2

Prerequisites: None

Japanese societies; Cultural diversities; Ethnic minorities; Gender gaps; Descriminations against minorities; Gender role expectations; Aging populations; Japanese universities; Japanese school systems; Working in Japan; Workig with Japanese people; Living in Japan; Punctuality

ICGL 174	From Siesta to Fiesta: Introduction to Spanish and Latin American Culture	2

Prerequisites: None

Introduction to Hispanic cultures: Spain, Mexico, Central America, South America, Caribbean; main cultural features; magic and colors of lands and people; cultural varieties; Spanish and indigenous languages; cultural legacy

ICGL 201	Pre-Intermediate German I	4

Prerequisites: Placement Test or ICGL 103 Elementary German III

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: Placement Test or ICGL 201 Pre-Intermediate German I

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: Placement Test or ICGL 202 Pre-Intermediate German II

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: Placement Test or ICGL 113 Elementary Japanese III

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: Placement Test or ICGL 211 Pre-Intermediate Japanese I

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: Placement Test or ICGL 212 Pre-Intermediate Japanese II

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: Placement Test or ICGL 123 Elementary French III

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: Placement Test or ICGL 221 Pre-Intermediate French I

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: Placement Test or ICGL 222 Pre-Intermediate French II

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: Placement Test or ICGL 133 Elementary Chinese III

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: Placement Test or ICGL 231 Pre-Intermediate Chinese I

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: Placement Test or ICGL 232 Pre-Intermediate Chinese II

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: Placement Test or ICGL 143 Elementary Spanish III

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: Placement Test or ICGL 241 Pre-Intermediate Spanish I

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: Placement Test or ICGL 242 Pre-Intermediate Spanish II

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 125	Games and Learning	2

Prerequisites: None

History of games, combinatorial games, games of chance, game theory

ICGS 112	Geography of Human Activities	4

Prerequisites: None

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 128	Global Gastronomy and Cuisines	4

Prerequisites: None

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 131	Introduction to International Studies	4

Prerequisites: None

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: None

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: None

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 civilization; Ancient Italy; arts in Florence and Venice; Modern Italy history; Italian food; the World of Fashion in modern Italy; Italian film; Italian music

ICGS 137	Witchcraft and Gender Representation	4

Prerequisites: None

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 143	Introduction to Air Transport and Tourism	4

Prerequisites: None

Basic overview and knowledge of air transport, travel and tourism and the interconnections amongst these elements; the history of air transportation, both airlines and airports; the role of air transport for today's travellers and tourists; relationship between airport and airline, airport business model, airline business model, the nature of air travellers, the nature of demands, air transport journey and experience, passengers/tourist decision makings on air travel, current global issues (e.g., economic, environmental and ethics) of the air transport and tourism

ICGS 156	Fashion and Society	2

Prerequisites: None

What is fashion, History of fashion since the 20th Century, Fashion reflects its temporal and spatial context, fashion and culture, sub-cultural fashion (street fashion), Fashion and Art development, Fashion as an art form, Fashion and business, Fast fashion, Fashion victims

ICGS 157	Asian Religious Traditions	2

Prerequisites: None

Overview of major religious traditions in Asia, including Hinduism, Buddhism, Sikhism, Taoism, Confucianism, and Shintoism; Historical evolution of Asian religious traditions; Significance of rituals, symbols, and sacred texts; Key philosophical and ethical concepts such as karma, dharma, nirvana, and the Tao

ICGS 159	The Self and Modern Media	2

Prerequisites: None

A sociological approach to understanding the disintegration of old social structures and reintegration based on contemporary technology and social media; the new non-geographical communities and the lack of norms; development of a global culture; the role of media and advertising in the new global culture; the generational theory of culture and constructionist theory or reality; the new global self

ICGS 161	Skills in Dealing with People Across Cultures	2

Prerequisites: None

Development of skills in dealing with people across cultures through a psychological approach, covering identity formation and conflict, values and communication across culture, culture and tourism, work motivation, and culture in educational institutions

ICGS 162	Arts, Culture and Tourism Development	2

Prerequisites: None

Artistic categories and roles of arts in soceity, community arts activities and events - processes and outcomes, arts-led urban regeneration, current trends in cultural tourism, online travel platform, creative tourism and designing visitor experiences

ICGS 165	Tea Studies	2

Prerequisites: None

What is tea, main tea varieties, main tea types, climatic condition for sustainable growth of tea, important tea growing countries and regions, tea processing, tea and health, tea evaluation, tea utensils and preparation, tea and food paring

ICGS 167	Coffee Studies	2

Prerequisites: None

Coffee, an introduction; The journey of Coffee - a journey of love, tears, sweats and blood; Three waves of coffee; Terroir of coffee; Main and sub-varieties of coffee; The world of coffee; Coffee drinking culture, coffee cupping; From harvesting to shipment; From roasting to brewing; Coffee and health; Ethical and environmental issues

ICGS 168	Faith a Lifestyle	2

Prerequisites: None

Faith, spirituality, and interaction in the modern world, spirituality and its economy, spirituality and faith marketing, modern forms of spirituality, spirituality, pop culture, and the soft power

ICGS 180	Cafe Story and Slow food	2

Prerequisites: None

Café concept: historically integral coffeehouse in café culture and social/economic position; slow food in sustainability business concept, specialty food and beverage evolution, new business trends

ICGS 181	Cuisine and Culture	2

Prerequisites: None

Exploration of how food shapes and is shaped by culture, Food as a cultural symbol, Historical evolution of culinary practices, Spices in cultural identity and economy, Food in celebrations and rituals, Festival foods around the world, Food Ethics and Sustainability, The phenomenon of culinary fusion and its impact on traditional cuisines, The Language of Food, Religious and cultural influences on dietary practices, The Art of Dining Ethiquette, Food in Literature and Film, The Future of Food, Culinary Tourism

ICGS 182	Humor Horizons	2

Prerequisites: None
Introduction to Cultural Humor; Language and Wordplay; Stereotypes and Satire; Historical Perspectives; Regional Comedy Traditions; Social Commentary Jokes; Comedy in Film and TV; Cross-Cultural Comedy Challenges; Humor and Identity; Humor in Business; The Future of Cultural Humor

Civic Literacy

ICGH 126	Behavioral Ethics: Why Good People Do Bad Things	2
Prerequisites: None		
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		

ICGH 129	Searching for Meaning	2
Prerequisites: None		
Starting from Socrates' quest for wisdom as described in the Apology, and the difficulties he encountered as a consequence, leading up to his trial and death sentence; connecting the Apology to Plato's Allegory of the Cave, and the dialectical method of ascent towards the truth; wondering whether Marcus Aurelius may qualify as a philosopher-kind, and exploring the connections with Stoicism as taught by Epictetus; reflecting on Montaigne's contemplations of death; connecting such ancient models to strains of thought in Thoreau and Emerson, Schopenhauer and Nietzsche, Freud and William James, Albert Camus and Viktor Frankl		

ICGH 133	Socrates, His Predecessors and Successors	2
Prerequisites: None		
Surveying the major philosophical movements in Ancient Greece, including the Presocratics, Socrates, Plato and Aristotle, and the various Hellenistic schools, by focusing on themes related to knowledge, truth, art, psychology, justice and the good life, and considering their relevance to life today		

ICGH 134	Digital Media Literacy: Skills for 21st Century Learning	2
Prerequisites: None		
Integration of media literacy, media production, and media ethics; accessing, analyzing, evaluating, questioning, and producing media texts; social, cultural, and political implications of media;		

representations in media; media as political economy; media aesthetics; media and influence; audiences negotiating meaning

ICGH 138	The Philosophies of Asia	2

Prerequisites: None

Exploring the major schools in Asian Philosophy, including Buddhism, Hinduism, Confucianism, Taoism, Jainism, among others, through a survey of foundational concepts and themes and an analysis of the implications that they have on ethics and culture as well as contemporary political, economic and legal frameworks

ICGH 140	Ethics and Evolution	2

Prerequisites: None

Scrutinizing the relationship between the theory of natural selection and ethics, through an examination of the implications of Darwinian evolution on the status of moral claims, the significance of our evolutionary history on moral theory and practice, and the relevance of these intersections on the development of morally justifiable policies and individual decision-making

ICGH 149	Law, Technology, and Society	2

Prerequisites: None

Foundations of the relationship between law, technology, and societal values, how laws evolve with technological innovation, the ethical considerations at play, and the role of law in shaping and responding to societal changes. Current and emerging issues in technology law, including intellectual property, privacy, cybersecurity, and regulation of AI

ICGH 150	Global Perspectives on Free Expression in the Digital Age	2

Prerequisites: None

Delving into the intricate dimensions of free expression on a global scale, particularly in the digital realm, tracing the evolution of free speech and contemplating its philosophical foundations and historical context. Examining pivotal case studies and real-world examples, exploring the complexities of free expression, from its role in fostering democracy to its challenges in relation to the notion of Human Rights and navigating a contemporary culture of feeling 'offended'

ICGN 131	Digital Search Literacy	2

Prerequisites: None

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: None 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 144	Environmental Ethics	2
Prerequisites: None Foundations of Environmental Values, Anthropocentrism vs Ecocentrism, Deep Ecology, Eco-Feminism, Land Ethics, Energy Ethics, Wilderness vs Built Environments, Radical Environmentalism and its Societal, Economic and Policy Implications		

ICGN 145	Food Integrity and Food Fraud: When a Food Product Is Not What It Seems	2
Prerequisites: None Understand the food integrity matrix, recognise common types of fraudulence in food products, their factors and effects on public health and society, prevention, ethical responsibilities and roles of food business and consumers in the food system with food integrity		

ICGS 134	Is Democracy Good?	4
Prerequisites: None 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 136	Social and Health Issues in Thailand	4
Prerequisites: None 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 140	Fake News, Censorship and the Politics of Truth	4
Prerequisites: None		

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

ICGS 147	Women in Leadership	4

Prerequisites: None

Prominent female leaders around the world from the past to present; cross-cultural challenges female leaders encounter; heroines and women warriors in folklores and myths; the perception and sins of matriarchal societies; political roles and suffragette movements around the world; the Modern Girl and consumerism; women's rights movement, glass-ceiling and female career advancement, female attributes and leadership qualities

ICGS 158	Contemporary Issues in Thailand	2

Prerequisites: None

Prevailing ideological issues; contemporary political economy; legal affairs and the judicial system; religious institutions; provincial politics; land rights and other community movements, education and reform; environmental groups; media affairs

ICGS 160	Self and Society	2

Prerequisites: None

A sociological approach to understanding the nature of societies, cultures and institutions; the development of the self through the socialization process from Social Interactionist and Critical Theory perspectives; cultural norms and geographical influence on culture: social class and gender structures; the influence of individualism and non-conformity in society

ICGS 163	Popular Media and Conflicts	2

Prerequisites: None

The role of popular media during the war-time and conflicts; the evolution of media and its employment by the state; printed propaganda; the age of radio and its political agenda; newsreels during the wartime; televised wars and public opinions; the emergence of social movement caused by the popular media

ICGS 166	Power and Politics	2

Prerequisites: None

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. To collect information, organize information, organize in groups, analyze information, present clearly and concisely on political phenomenon, state typology, political taxonomy, ideological persuasion, voting systems and outcomes

ICGS 170	Civic Action in Thailand	2

Prerequisites: None

Local community organisations and institutions; effective social media and other promotional campaigns on behalf of independent social organisations; funding drives on behalf of independent social organisations; project planning and development

ICGS 183	Media and Community	2

Prerequisites: None

Application of media practices and techniques used as a means for empowerment and communication supporting community and social change; Application of assessment practices to support community goals and development; Application of project-based learning in a real community

Finance & Management Literacy

ICGB 102	Navigating the Market Landscape	2

Prerequisites: None

Exploration of the dynamic interplay between consumer behavior and firm strategy across industries, guided by the supply-demand framework; practical insights into market dynamics, tool navigation through diverse market landscapes (degree of competition, digital economy, sharing economy), and impact on key stakeholders

ICGB 103	Decoding Economic News	2

Prerequisites: None

Uncovering of economic news mysteries, deciphering of the big picture, and exploration of how economic forces shape our world through key macroeconomic indicators and the aggregate supply-aggregate demand framework; acquisition of practical skills for analyzing current economic events with clarity and insight, empowering navigation of global economic complexities with confidence

ICGB 104	Entrepreneurship in a Disruptive Environment	2

Prerequisites: None

Understand how entrepreneurs create new businesses, capture new markets, and enhance organizational effectiveness so the economy could benefit. Applying disruptive innovation due to new technologies and innovation to deal with the disruptive changes as the new generation entrepreneurs

ICGB 105	Personal Finance Literacy	2

Prerequisites: None

Personal finance literacy includes: financial planning process, life goals and financial goals, tax preparation, consumer credits, investment and retirement planning, investment fundamentals, its techniques and investment assets, making loan and debt decisions, life and property insurance, and estate planning

ICGB 106	The Business of Fashion	2

Prerequisites: None

The fashion world, categorisation of fashion, glossary of fashion, fashion trend interpretation, fashion and creativity, brand image, understanding customers: national culture influences the choice of fashion, understanding customers: motivations for buying fashion, total shopping experiences, extension of the fashion business, consumerism

ICGB 107	Tourism Management Perspectives	2

Prerequisites: None

Overview of the tourism industry and its significance, factors shapping the future of tourism and hospitality, opportunities and challenges of tourism development in Thailand, tourism supply chains, key stakeholders and their roles in the tourism ecosystems, and innovative and promising practices in sustainable tourism development

ICGB 109	Business Event Essentials	2

Prerequisites: None

Event as a global strategic and management tool; introduce different types of business events to achieve various objectives including Meetings, Incentive Travels, Conventions, Exhibitions and Special Events; Event strategies

ICGB 110	Management Styles of Effective Leaders	2

Prerequisites: None

Overview of management; evolution of Management theories and thoughts; changing environment of organizations, social responsibility, organizational culture and change

ICGB 111	Leadership in a Global Society	2

Prerequisites: None

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

ICGB 112	The Art of Pricing	2

Prerequisites: None

Rationales and conditions required for sellers to apply different prices to different groups, in order to maximize profits; benefits of first-, second-, and third-degree price discrimination; examples of the use of consumers' demographics and characteristics in buyers' classification; evaluation of certain complex pricing namely, bundling and versioning; which are invented by sellers as a means to price discriminate; assessment of pros and cons of algorithm pricing; the cost of profit-maximizing strategy particularly buyers' perception and fairness

ICGB 113	Crisis Management in Service Businesses	2

Prerequisites: None

Basics of crisis management, crisis preparedness and risk management, methods of analysis and prognosis, strategic measures of crisis management applied in service businesses, crisis planning and organizational measures applied in service businesses, crisis communication

ICGB 114	Cultural Strategies for Success: Unveiling Eastern Business Dynamics	2

Prerequisites: None

Introduce theories (change theories, cultural theories) and frameworks governing Eastern societies in the context of business; Eastern cultural practices and behaviors shaping strategies in competitive markets; Complexities of Asia's diverse business environment; Comparative analysis of strategies and behaviors

ICGB 115	Money: Deciphering Currencies of Value	2

Prerequisites: None

Navigating the intricate realm where money transcends tangible forms, from paper bills to digital transactions; unveiling the essence and construction of value inherent in these mediums, exploring their societal significance and evolving role in contemporary economies

ICGB 116	Managing Self and Working with Others	2

Prerequisites: None

Personal goal setting, personality models and profiling, self awareness and management, social awareness and interaction, techniques in working with others through the lens of diversity, equity, and inclusion, conflict resolution, people management, personal development plan

ICGH 101	Biotechnology: from Science to Business	4

Prerequisites: None

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

ICGS 102	Business Sustainability and the Global Climate Change	4

Prerequisites: None

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 135	Entrepreneurial Accounting	4

Prerequisites: None

Fundamental accounting concepts; financial statements for small enterprises; financial statement analysis; cost-volume-profit analysis; management decision making; business taxation

ICGS 153	Social Media Management for Service Sector	2

Prerequisites: None

Introduction to digital business transformation in service sector, social consumers and social communities, social media landscape and ecosystem; social media strategy for service sector; digital tools for social media management; social commerce; social media analytical tools and measurement

ICGS 174	The Art of Leadership in Practice: Inspiration	2

Prerequisites: None

Virtue ethics and practical philosophy; driving change through personal development and action directives; managing ethical leadership goals and challenges; climbing Mount Impossible and the power to change the world; what is and what can be in the context of SDGs; finding inspiration and inspiring others; inspirational leaders in History and fiction

ICGS 184	Healthy Habits, Happy Shoppers: Exploring Health Literacy in Consumer Decisions	2

Prerequisites: None

Exploration of the impact of health literacy on shopping behavior; coverage of health literacy principles, consumer psychology, and marketing's role; learning through stimulus case studies to promote informed consumer choices

ICLL 101	Professional Development	2
Prerequisites: None 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		

Specific Courses
Core Courses

EGCI 113	Fundamental Computer Programming	3
Prerequisites: None 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
Prerequisites: EGCI 113 Fundamental Computer Programming Basic set theory, mathematical reasoning, relations, functions, graphs, trees, an introduction to number theory		

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

EGCI 230	Electric Circuit Analysis	4
Prerequisites: ICPY 102 Physics II Circuit elements; Kirchhoff's laws; resistive circuits; node and mesh analysis; Thevenin and Norton theorems; 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; power factor		

EGCI 232	Engineering Electronics	4
Prerequisites: EGCI 230 Electric Circuit Analysis 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

Prerequisites: ICMA 213 Calculus II

Descriptive statistics; the collection and presentation of data; elementary probability and normal distributions; the estimation of parameters; hypothesis testing; the analysis of variance; regression and correlation; design of experiments; the analysis of variance

ICMA 106	Calculus I	4

Prerequisites: Placement test or ICMA 101 Precalculus

Limits and continuity; differentiation and its techniques; derivatives of algebraic, logarithmic, exponential, 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

Techniques of integration; improper integrals; indeterminate forms; applications of integration; sequences and series; power series; Taylor and Maclaurin series

ICPY 101	Physics I	4

Prerequisites: None

Measurement, units and dimensions; vectors, linear motion, Newton's laws of motion; kinetic and potential energy, rotational motion, linear and angular momentum; static equilibrium; fluid mechanics

ICPY 102	Physics II	4

Prerequisites: ICPY 101 Physics I

Thermodynamics; electricity and magnetism; optics; nuclear and atomic physics

Major Required Courses

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

Prerequisites: EGCI 113 Fundamental Computer Programming

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

Prerequisites: EGCI 113 Fundamental Computer Programming and EGCI 201 Discrete Mathematic

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

EGCI 231	Digital Circuit Design	4

Prerequisites: EGCI 113 Fundamental Computer Programming

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

Prerequisites: EGCI 113 Fundamental Computer Programming

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

Prerequisites: EGCI 211 Advanced Computer Programming
System programming; low-level file input and output; process and thread management, process and thread concurrency, process and thread communication including signals, pipes, message queues, shared memory, mapped memory, semaphores

EGCI 321	Database Systems	4

Prerequisites: EGCI 211 Advanced Computer Programming

The entity-relationship model, the relational data model; logical and physical database design; data dependencies and normalization; data query language; the transaction, the crash recovery, the concurrency control, database security; NoSQL

EGCI 330	Microprocessor and Interfacing	4

Prerequisites: 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

Prerequisites: EGCI 330 Microprocessor and Interfacing
Embedded system designs and development processes; high-level language programming for embedded system applications; real-time operating system; DAC and ADC converters; sensors and signal conditioners; internet of things

EGCI 333	Computer Architecture	4

Prerequisites: 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

Prerequisites: EGCI 211 Advanced Computer Programming
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) and user interface design

EGCI 341	Software Engineering	4

Prerequisites: 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; software architecture; microservices architecture; software project management; software cost estimation; case studies of software system in the market

EGCI 351	Operating Systems	4

Prerequisites: 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

Prerequisites: EGCI 221 Data Structures and Algorithms

An introduction to the data communication; OSI and TCP/IP model; the network architecture; wired and wireless networks; routing protocols, network protocols and applications; data security and integrity; network security devices; network and web security

EGCI 419	Computer Engineering Internship	8

Prerequisites: Must complete 60 EGCI credits before register for this course

Comprehensive, hands-on training experience over a full trimester or minimum 12 weeks in an industrial company or organization utilizing computer-related systems, computer control systems, or computer-based processing, emphasizing both technical proficiency and the development of essential communication and collaboration skills, engaging in real-world projects, contributing to the organization; working in teams; and writing an internship summary including the report of training outcomes

EGCI 491	Computer Engineering Seminar	1

Prerequisites: EGCI 305 Statistics for Research in Computer Engineering

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

Prerequisites: EGCI 491 Computer Engineering Seminar

The computer engineering project supervised by the advisory committee; a complete project report and an oral examination

ICMA 240	Linear Algebra I	4
Prerequisites: Placement test or ICMA 101 Precalculus Systems of linear equations, matrix algebra, determinants, vector spaces, linear transformations, eigenvalues and eigenvectors, diagonalization, applications		

Major Elective Courses

Track 1: Cybersecurity		
EGCI 470	Reverse Engineering	4
Prerequisites: EGCI 371 Computer Networks and Information Security Introduction to software reverse engineering; Process of software reverse engineering, Using of software reverse engineering tools; Software vulnerability analysis; Software architecture; Software reverse engineering protection; Software reverse engineering protection bypassing		
EGCI 471	Blockchain	4
Prerequisites: EGCI 371 Computer Networks and Information Security Introduces the structure, components and working principles of blockchain, the development of technology based on blockchain systems, the use of tools to develop applications on blockchain systems, guidelines for analyzing the weaknesses of smart contracts on blockchain systems, and the development of smart contracts on blockchain systems safely		
EGCI 476	Cryptography and Computer Security	4
Prerequisites: 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
Prerequisites: 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 494	Fundamental of Digital Forensics	4

Prerequisites: EGCI 371 Computer Networks and Information Security

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; digital forensic techniques and tools; collecting and analyzing the network traffic; cyber-attack analysis and investigation

Track 2: Artificial Intelligence		
EGCI 425	Data Mining	4

Prerequisites: EGCI 305 Statistics for Research in Computer Engineering

Knowledge discovery in databases and data warehouses; data preparation, data visualization, and data transformation; classification and ensembled classification, clustering; metrics and evaluation; effects of data mining, current technology and trend, applications of data mining

EGCI 461	Artificial Intelligence	4

Prerequisites: 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; the probabilistic reasoning systems; an introduction to Prolog, the natural language processing; machine learning techniques; model evaluation; deep learning

EGCI 463	Pattern Recognition	4

Prerequisites: 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

EGCI 466	Big Data Processing	4

Prerequisites: EGCI 113 Fundamental Computer Programming

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

Prerequisites: EGCI 202 Engineering Mathematics for Signal and System

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

Prerequisites: EGCI 113 Fundamental Computer Programming
Introduction to image processing, image fundamentals, image enhancement in the spatial domain, color image processing, image segmentation, morphological image processing, feature extraction and matching, image classification with machine learning and deep learning

EGCI 487	Computer Vision	4

Prerequisites: EGCI 113 Fundamental Computer Programming
Introduction to computer vision, fundamentals of computer vision, edge detection, shape analysis, texture, object description, deep learning in computer vision, semantic segmentation, instance segmentation, motion and video analysis, object detection, and object tracking in video

Track 3: Digital System		
EGCI 406	Mechatronics	4

Prerequisites: EGCI 332 Embedded Systems
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

Prerequisites: EGCI 340 Software Design
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 427	Web Programming	4

Prerequisites: EGCI 213 Programming Paradigms
Web application development; HTML; responsive web design; css; javascript; JSON; model-view-controller (MVC) development pattern; frontend development; backend development; full-stack framework; application interface (API) and web services; json web tokens (JWT); code deployment; virtualization

EGCI 428	Mobile Device Programming	4

Prerequisites: EGCI 213 Programming Paradigms

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

Prerequisites: EGCI 341 Software Engineering

Fundamental concepts of web application development from a managerial perspective; markup language technology; fundamental principles of architecture, process, development and elements of web applications; web services application development; mobile web services

EGCI 451	Cloud Computing	4

Prerequisites: EGCI 113 Fundamental Computer Programming

Fundamental concepts of cloud computing; Fundamental principles of 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 452	System Engineering	4

Prerequisites: EGCI 113 Fundamental Computer Programming

Introduction to Systems Engineering, Systems Thinking and Analysis, Requirements Engineering, System Architecture, System Design and Optimization, Risk Management, Verification and Validation, Project Management in Systems Engineering, System Integration, Emerging Trends in Systems Engineering, Ethical and Professional Considerations, Case Studies and Real-World Applications

EGCI 453	Open Source Software Engineering	4

Prerequisites: EGCI 113 Fundamental Computer Programming

Introduction to Open Source, Version Control Systems, Open Source Development Methodologies, Collaborative Coding, Open Source Licensing, Toolchain for Open Source Development, Community Engagement, Installation and Deployment Best Practices, Security in Open Source Development, Practical Projects

EGCI 466	Big Data Processing	4

Prerequisites: EGCI 113 Fundamental Computer Programming

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 471	Blockchain	4

Prerequisites: EGCI 371 Computer Networks and Information Security
Introduces the structure, components and working principles of blockchain, the development of technology based on blockchain systems, the use of tools to develop applications on blockchain systems, guidelines for analyzing the weaknesses of smart contracts on blockchain systems, and the development of smart contracts on blockchain systems safely

EGCI 474	Internetworking Technologies I	4

Prerequisites: EGCI 113 Fundamental Computer Programming
Theoretical and practical aspects of routing and switching; including IP address design and assignment, virtual local area network (VLAN), inter VLAN routing, network redundancy, network availability and reliability, network security, wireless local area network (WLAN) and routing protocols; required laboratory work

EGCI 475	Internetworking Technologies II	4

Prerequisites: EGCI 474 Internetworking Technologies I
Theoretical and practical aspects of advanced routing and switching technologies; including open shortest path first (OSPF) routing protocol, network design, network management, network troubleshooting, network security, access control list, network address translation, port address translation, virtual private network, internet protocol security, WAN technologies, quality of service, network virtualization and network automation; required laboratory work

EGCI 478	Wireless Communication	4

Prerequisites: 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

EGCI 488	Metaverse	4

Prerequisites: EGCI 113 Fundamental Computer Programming
Introduction to metaverse, color theory, programming for creating two-dimensional objects, designing and creating a two-dimensional game, programming for creating threedimensional objects, texture properties and elements, lighting and cameras, lighting and shading, designing and creating

a metaverse, avatar and object control, and managing the user system in the metaverse		

Elective Courses for Study Experience (no track)

EGCI 495	Regional Study Experience	1

Prerequisites: Must complete 30 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

Prerequisites: Must complete 40 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'

Advanced Topics

EGCI 382	Special Topics in Computer Engineering (Course Title I)	4

Prerequisites: None

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 383	Special Topics in Computer Engineering (Course Title II)	4

Prerequisites: None

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 384	Special Topics in Computer Engineering (Course Title III)	4

Prerequisites: None

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 385	Special Topics in Computer Engineering (Course Title IV)	4

Prerequisites: None
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 386	Special Topics in Computer Engineering (Course Title V)	4

Prerequisites: None
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	Special Topics in Computer Engineering (Course Title VI)	4

Prerequisites: None
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

EGCI 395	Special Topics in Computer Engineering (Course Title VII)	4

Prerequisites: None
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

EGCI 396	Special Topics in Computer Engineering (Course Title VIII)	4

Prerequisites: None
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

EGCI 397	Special Topics in Computer Engineering (Course Title IX)	4

Prerequisites: None

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

EGCI 398	Special Topics in Computer Engineering (Course Title X)	4

Prerequisites: None

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