

# Sell

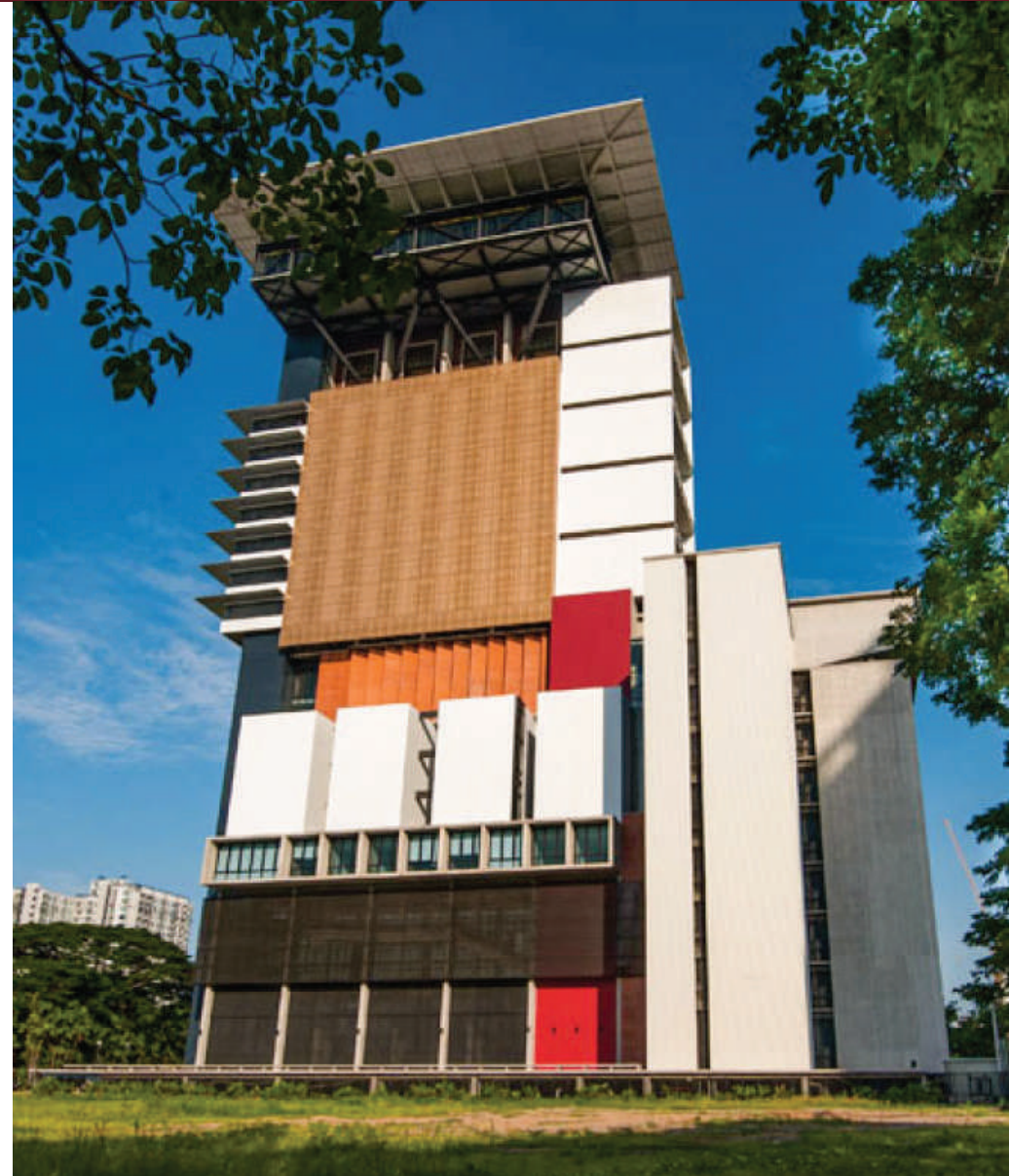
CHULALONGKORN  
SCHOOL OF INTEGRATED INNOVATION

BACHELOR OF ARTS AND SCIENCE IN  
INTEGRATED INNOVATION (Int.Program)

# BAScii

# Course Handbook

*Semester 1 Academic Year 2021*



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**Prepared by Office of Academic Affairs  
Chulalongkorn School of Integrated Innovation**

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## **Disclaimer**

**The courses and the list of instructors in this coursebook are subject to change without prior notice in compliance with the policies of the Chulalongkorn University and the Ministry of Higher Education regulation**

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# Year 1 Mandatory Courses



### **Course Type** Core

### **Course Description**

Fundamental knowledge entrepreneurship and startup to create value for business and society. Entrepreneurial process of opportunity identification for founder to startup and scale up. Effects of entrepreneurial attitude, orientation and characteristics on types of startup. Dynamics of founding team formation. Resources optimization, bricolage and lean concept.

### **Course Outcomes**

To enable students to explain the meaning, key concepts, and main ideas of entrepreneurship, analyze entrepreneurship-related problems and situations, list business plan components, write and present business plans, and practice operating their own business or corporate intrapreneurship

**Class Capacity** 101 students

**Student Level** Year 1

### **Career Opportunities**

Entrepreneur, Corporate Innovator, Entrepreneurial Manager

### **Course Instructor**

#### **Dr. Pietro Borsano**

**Education:** MBA with merit, ESCP Europe, Dr.iur.hons, University of Turin, Innovative Teaching Scholar Program, Stanford University, and Entrepreneurship Leadership Program, Babson College

**Expertise:** Entrepreneurship, Digital Transformation, Innovation Management, Management Consulting

**Guest lectures** by Entrepreneurship Professors from Stanford University and Babson College and sharing session by entrepreneurs



### **Course Type** Core

### **Course Description**

This Accounting and Finance course provides students with applied knowledge and specialized skills that will enable learners to understand the basic principles of Accounting and Finance and apply them into real entrepreneurship and innovation case studies. During the first stage, students will be introduced to the key concepts of financial accounting and expand their knowledge in managerial accounting and financial analysis and projections. During the second stage, students will be introduced some risk management, governance and venture management concepts, with some case studies.

### **Course Outcomes**

To enable students to understand financial and managerial accounting, financial management, analyze entrepreneurial finance and understand the application and implementation of corporate governance and risk management

**Class Capacity** 101 students

**Student Level** Year 1

### **Career Opportunities**

Financial Analyst, Venture Capital Analyst, Incubator/Accelerator Analyst, Private Equity Analyst, Risk Management Analyst

### **Course Instructors**

Prof. Jack Poon

Prof. Lapman Lee

Prof. David Yu

Prof. Andrew Stotz

Assoc. Prof. Kriengkrai Boonlert-U-Thai

Dr. Nadharatch Ounlert

Dr. Kwanrat Suanpong

Dr. Alessandro Di Lullo

### **Course Coordinator**

**Dr. Pietro Borsano**

**Education:** MBA with merit, ESCP Europe, Dr.iur.hons, University of Turin, Innovative Teaching Scholar Program, Stanford University, and Entrepreneurship Leadership Program, Babson College

**Expertise:** Entrepreneurship, Digital Transformation, Innovation Management, Management Consulting





# 5602102

## MATHEMATICS FOR APPLIED DIGITAL INTELLIGENCE

**Course Type** Core

### Course Description

This course introduces students to mathematical principles, touching upon linear algebra, calculus and statistics. At the end of the course, students should be able to work with vectors and matrices, perform univariate differentiation and integration, and have an understanding of random variables, distributions, and summary statistics.

### Course Outcomes

To enable students to have fundamental knowledge of higher mathematics in relation to applied digital intelligence

**Class Capacity** 101 students

**Student Level** Year 1

### Career Opportunities

Data Scientist

### Course Instructor

**Dr. Chris Dixon**

**Education:** PhD, Chemical Engineering, Newcastle University, UK, M.Eng, Chemical Engineering, Newcastle University, UK.

**Expertise:** Machine Learning, Chemical Engineering



# 5603101

## PROJECT SEED I

### **Course Type** Core

### **Course Description**

Students have the opportunity to conduct an independent research project with guidance from their faculty advisor which must be approved to make sure it meets academic, health and safety criteria. The advisor and the student develop a learning plan for the semester and regular meetings take place to discuss the student's project. Students are expected to hand in written work on a regular basis. Students may not repeat the same course number for credit either in the same or in a different semester.

### **Course Outcomes**

To enable students to develop critical thinking and innovation through project seed development

### **Class Capacity** 101 students

### **Student Level** Year 1

### **Career Opportunities**

Innovation Entrepreneur

### **Course Instructor**

#### **Dr. Ronnakorn Vaiyavuth**

**Education:** PhD, Innovation Management, Telecom Ecole de Management, France, M.Eng, Energy Planning and Policy, University of Technology, Australia

**Expertise:** Energy Planning and Policy, Innovation, Entrepreneurship Management





# 0201173

## RETHINKING JUSTICE FOR INNOVATORS

**Course Type** BASCcii Gen-Ed

### Course Description

This course introduces the concept of social justice through six contexts: inequality, gender, corporate governance, environment, corruption and culture, and technology. This course also focuses on learning by experiencing. Using design thinking as a tool, students will get to rethink the concept of justice by applying what they learnt in class to the situation on the ground. Through project-based learning, students will get to interact with the relevant stakeholders to better understand their needs and be able to rethink the concept of justice in the 21st century.

### Course Outcomes

To enable students to understand the holistic definition of justice in different contexts, be aware of their own role in relation to ongoing social justice issues, and foster empathy as a mindset and skill in approaching social justice issues

### Career Opportunities

Social Innovator

**Class Capacity** 101 students

**Student Level** Year 1



**Course Instructor**  
**Mr. Paricha Duangtaweesub**

**Education:** MS, Design Impact, MS, Chemical Engineering, Stanford University, USA, BS, Chemical Engineering, UCLA

**Expertise:** Human-Centered Design and Innovation



**Course Instructor**  
**Ms. Kanravee Kittayarak**

**Education:** LLM, University of Cambridge, UK. LLM, Corporate Governance and Practice, Stanford University, USA, LLB, Chulalongkorn University

**Expertise:** Innovation and Collaboration in Criminal Justice Sector

**Course Type** BAScii Gen-Ed

### Course Description

Practical working communication for innovation projects, drawing, diagramming, writing, and speaking; communication materials and presentation design; content writing and storytelling; pitch types and practices.

### Course Outcomes

To enable students to develop better communication and writing skills with confidence and innovation

**Class Capacity** 101 students

**Student Level** Year 1

### Career Opportunities

Storyteller

### Course Instructor

**Dr. Lisa Kenney**

**Education:** PhD, Decision Science, University of Calgary, Canada, MPA, MID, University of Washington, USA

**Expertise:** Smart Mobility Technologies, Policies, Data Management



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# Year 2 Mandatory Courses



**Course Type** Core

### Course Description

Fundamental concepts of value chain and value creation in business processes, with a focus on transformational leadership and change management. Reconfiguration and inventing change in core business process. Managing change and transformation of strategic initiatives in collaboration with various functions and teams. End-to-end transformation across business, technology, process, and people.

### Course Outcomes

To enable students to explain the meaning, key concepts, and main ideas of entrepreneurship, analyze entrepreneurship-related problems and situations, list business plan components, write and present business plans, and practice operating their own business or corporate intrapreneurship

**Class Capacity** 175 students  
**Student Level** Year 2 and 3

### Career Opportunities

Management Consultant, Corporate Innovator, Product Owner, Digital Transformation Specialist

### Course Instructor Dr. Pietro Borsano

**with contributions from** Industry 4.0 strategists (Jean F. Laugier, Karoon Nijnananant, Charn Saralertsophon, Sasin leadership professors (Larry S. Persons) and industry leaders from McKinsey, PwC, C.P.Group, Banpu, SAP, Digital Healthcare, etc.)

**Education:** MBA with merit, ESCP Europe, Dr.iur.hons, University of Turin, Innovative Teaching Scholar Program, Stanford University, and Entrepreneurship Leadership Program, Babson College

**Expertise:** Entrepreneurship, Digital Transformation, Innovation Management, Management Consulting



# 5602201

## DATA STRUCTURE AND ALGORITHM

**Course Type** Core

### Course Description

Abstract Data Types; Linked Lists; Array; Trees; Queues; Stack; Sorting; Searching; Array-based Sequences; Recursion; Maps and Hash Tables; Search Trees; Graph and Graph Algorithms, String Matching

### Course Outcomes

To enable students to develop a fundamental understanding and deep knowledge on data structure and algorithm

**Class Capacity** 99 students

**Student Level** Year 2

### Career Opportunities

Data Scientist

### Course Instructor

**Dr. John Loewen**

**Education:** PhD, Computer Science, University of Eastern, Finland, MSc, Information Systems, Athabasca University, Canada

**Expertise:** Programming, Systems Engineering, Database Analysis and Design



**Course Type** Core

### Course Description

Cost of interaction; Usability concepts; Perception; Attention; Memory; Human Learning; Individual Differences; Human Mind in Usability Design; Quantitative Evaluation of User Experience; Data Analytics and User Experience; Customer Journey Map; Apply HCI and Usability Principles Through Web Design (HTML/CSS/JavaScript), introduction to Databases (database concepts, relational databases, simple DB design).

### Course Outcomes

To enable students to gain a fundamental understanding and deep knowledge on data analytics in relation to cognitive human factor and web design

**Class Capacity** 99 students  
**Student Level** Year 2

### Career Opportunities

Technology Innovator

### Course Instructor

**Dr. John Loewen**

**Education:** PhD, Computer Science, University of Eastern, Finland, MSc, Information Systems, Athabasca University, Canada

**Expertise:** Programming, Systems Engineering, Database Analysis and Design





# 5603201

## DESIGN-BUILD PROJECT I

**Course Type** Core

### Course Description

The journey of crafting a promising startup has reached to almost the end of the underworld tunnel. Project Seed 3 subject emphasizes the creation of Minimal Viable Product (MVP) which is one step closer to the production stage or commercialization stage. Students will be introduced to various tools that use to develop MVP as well as several techniques that are implemented by various successful startups to obtain reasonable number of tractions. The journey will also touch base on how to develop a proper company, including company registration process and vesting technique.

### Course Outcomes

To enable students to develop useful and practical tools and knowledge on building a startup from scratch

**Class Capacity** 99 students

**Student Level** Year 2

### Career Opportunities

Innovation Entrepreneur

### Course Instructor

**Dr. Ronnakorn Vaiyavuth**

**Education:** PhD, Innovation Management, Telecom Ecole de Management, France, M.Eng, Energy Planning and Policy, University of Technology, Australia

**Expertise:** Energy Planning and Policy, Innovation, Entrepreneurship Management



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# Year 3 Mandatory Courses



**Course Type** Core

### Course Description

Fundamental concepts of value chain and value creation in business processes, with a focus on transformational leadership and change management. Reconfiguration and inventing change in core business process. Managing change and transformation of strategic initiatives in collaboration with various functions and teams. End-to-end transformation across business, technology, process, and people.

### Course Outcomes

To enable students to explain the meaning, key concepts, and main ideas of entrepreneurship, analyze entrepreneurship-related problems and situations, list business plan components, write and present business plans, and practice operating their own business or corporate intrapreneurship

**Class Capacity** 175 students  
**Student Level** Year 2 and 3

### Career Opportunities

Management Consultant, Corporate Innovator, Product Owner, Digital Transformation Specialist

### Course Instructor

**Dr. Pietro Borsano**

**with contributions from** Industry 4.0 strategists (Jean F. Laugier, Karoon Nijnanant, Charn Saralertsophon, Sasin leadership professors (Larry S. Persons) and industry leaders from McKinsey, PwC, C.P.Group, Banpu, SAP, Digital Healthcare, etc.)

**Education:** MBA with merit, ESCP Europe, Dr.iur.hons, University of Turin, Innovative Teaching Scholar Program, Stanford University, and Entrepreneurship Leadership Program, Babson College

**Expertise:** Entrepreneurship, Digital Transformation, Innovation Management, Management Consulting



# 5602301

## APPLIED ARTIFICIAL INTELLIGENCE

### Course Type Core

### Course Description

Overview of AI, game playing and tree search, decision tree, Boolean logic, fuzzy set and fuzzy logic, concepts of neural classification and clustering, meta-heuristic algorithms

### Course Outcomes

To enable students to learn the skills and applications of AI algorithms

### Career Opportunities

Technology Innovator, Data Scientist

**Class Capacity** 76 students

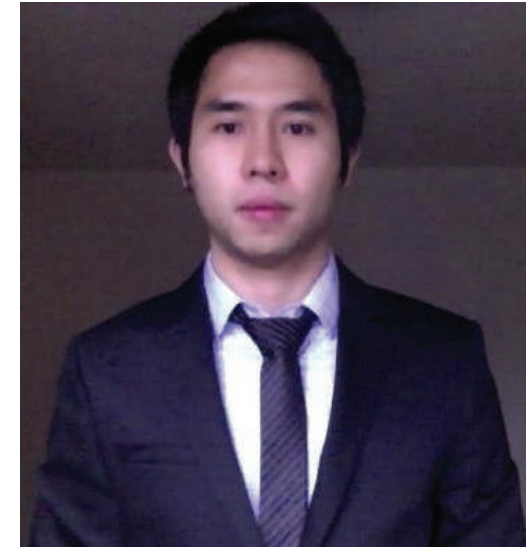
**Student Level** Year 3



**Course Instructor**  
**Dr. Chidchanok Lursinsap**

**Education:** PhD, Computer Science, University of Illinois, Urbana-Champaign, USA, MS, Computer Science, University of Illinois, Urbana-Champaign, USA, B.Eng. (Honors), Computer Engineering, Chulalongkorn University

**Expertise:** Bioinformatics and Computational Biology, Neural Networks and Machine Intelligence



**Course Instructor**  
**Dr. Warodom Khamphanchai**

**Education:** PhD, Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, USA, ME, Energy, Asian Institute of Technology (AIT)

**Expertise:** Full Stack Python Developer, Machine Learning, AI

### **Course Type** Core

### **Course Description**

After the minimal viable product (MVP) for each team is developed from the previous courses (Design Build 1 and 2) in the 2nd year. This course focuses on process, technique, framework and rationale behind finalising a MVP before developing a real product. Hands-on experiences including one-on-one mentorship with professionals are the key elements for this course. The minimum expected outcome for this course in this semester is the final MVP.

### **Course Outcomes**

To enable students to hone critical thinking skills and innovation on the process of a streamlined production of a physical solution in relation to a project of their choice

**Class Capacity** 76 students

**Student Level** Year 3

### **Career Opportunities**

Innovation Entrepreneur

### **Course Instructor**

**Dr. Ronnakorn Vaiyavuth**

**Education:** PhD, Innovation Management, Telecom Ecole de Management, France, M.Eng, Energy Planning and Policy, University of Technology, Australia

**Expertise:** Energy Planning and Policy, Innovation, Entrepreneurship Management



# 5600190

## NUMERICAL METHODS FOR INNOVATORS

**Course Type** BAScii Gen-Ed

### Course Description

This course introduces students to numerical analyses using MATLAB and Mathematica. At the end of the course, students should be able to solve systems of linear equations, approximate functions, find the roots of equations, perform numerical integration and differentiation, and apply the Monte Carlo simulation effectively.

### Course Outcomes

To enable students to gain a mathematical and theoretical foundation in numerical methods and numerical analysis

**Class Capacity** 76 students

**Student Level** Year 3

### Career Opportunities

Data Scientist

### Course Instructor

**Dr. Chris Dixon**

**Education:** PhD, Chemical Engineering, Newcastle University, UK, M.Eng, Chemical Engineering, Newcastle University, UK.

**Expertise:** Machine Learning, Chemical Engineering





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# **BAScii Gen-Ed Courses**



**Course Type** BAScii Gen-Ed

### Course Description

In a contemporary world greatly influenced by innovative technologies, it is critical for both innovators and firms to strategically manage their intellectual assets such as corporate data, users' data, technological know-hows, trademarks, industrial designs, inventions, and contractual agreements. The course aims to achieve a thorough understanding on theory and practice of intellectual property (IP) and Data Security Management. It covers key concepts, various strategies, and their strengths and weaknesses in IP and data security management. In addition, by critically reviewing various actual cases, students will learn practical knowledge that can be applied in real life. Lastly, through group project activities, the course offers an opportunity for students to draft and present IP management plans for products and services of their own.

**Class Capacity** 40 students

**Student Level** Year 2 and 3

### Course Outcomes

To enable students to apply theory and knowledge of intellectual property and data security management of intellectual assets

### Career Opportunities

Social Innovator

### Course Instructor

**Dr. Yon Jung Choi**

**Education:** PhD, Public Policy, George Mason University, Virginia, MPP, George Mason University, Virginia, MBA, Seoul School of Integrated Sciences and Technology, Korea

**Expertise:** Governance, Public Policy, Social Innovation



# 5600161

## STAKEHOLDER ENGAGEMENT FOR INNOVATORS

**Course Type** BAScii Gen-Ed

### Course Description

Learn how to communicate with and manage partners, customers, and users in the business sector, government, NGOs, community organizations, and the general public. The course introduces methods such as online platforms, text messaging, pop-up events, and other strategies to help get input and feedback from stakeholders. Students will learn how psychology influences decisions about design and marketing, customer and user behaviour.

### Course Outcomes

To enable students to gain a fundamental understanding of stakeholder engagement for innovation and behavioral science insights, and apply the knowledge in the form of real-world stakeholder engagement plan

**Class Capacity** 40 students

**Student Level** Year 2 and 3

### Career Opportunities

Social Innovator

### Course Instructor

**Dr. Lisa Kenney**

**Education:** PhD, Decision Science, University of Calgary, Canada, MPA, MID, University of Washington, USA

**Expertise:** Smart Mobility Technologies, Policies, Data Management





# Specialization Courses



**Course Type** Specialization

### Course Description

Many dimensions of sustainability and their relationship to economic growth, and the use of national, multinational, and international political and economic mechanisms, including environmental and economic incentives to further sustainable development are introduced. The inter-relationship of global, economic, financial changes, employment, and working conditions; the environment in the context of globalization, technology, trade, and employment; and the importance of networks and organizational learning are examined. Mechanisms for resolving the apparent conflicts between development, environment, and employment are explored.

### Course Outcomes

To enable students to develop critical thinking and knowledge of sustainability and sustainable development in relation to economic growth, environment, and employment

**Class Capacity** 40 students

**Student Level** Year 2 and 3

### Career Opportunities

Social Transformer

### Course Instructor

**Dr. Ronnakorn Vaiyavuth**

**Education:** PhD, Innovation Management, Telecom Ecole de Management, France, M.Eng, Energy Planning and Policy, University of Technology, Australia

**Expertise:** Energy Planning and Policy, Innovation, Entrepreneurship Management



**Course Type** Specialization

### Course Description

Learn about the role of social enterprises in smart cities projects. Learn how to identify opportunities, how to work with government and community stakeholders, do market analysis, fund your idea, and create a business plan.

### Course Outcomes

To enable students to put into practice their knowledge of social enterprises for smart cities in the form of applications and business plans

### Career Opportunities

Social Innovator

**Class Capacity** 40 students

**Student Level** Year 2 and 3



**Course Instructor**  
**Prof. Agachai Sumalee**

**Education:** PhD, Transport Economics and Operations Research, University of Leeds, UK, MSc, Transportation Planning and Engineering, University of Leeds, UK

**Expertise:** Smart City, Engineering, Transport Studies



**Course Instructor**  
**Dr. Lisa Kenney**

**Education:** PhD, Decision Science, University of Calgary, Canada, MPA, MID, University of Washington, USA

**Expertise:** Smart Mobility Technologies, Policies, Data Management



**Course Type** Specialization

### Course Description

This course covers theories and practices associated with economic, environmental, and social transformation for sustainability, with a particular focus on business perspectives. It offers an overview of historical, political, social backgrounds, key concepts and theories regarding corporate approaches to sustainability, different business examples in various related industries in order for students to achieve both an in-depth knowledge and critical understanding of sustainability with varying angles. With this knowledge and understanding, students will also have opportunities to discuss multiple issues related to the course topic through group seminars, and to analyze real-life corporate sustainability projects in different fields and industries through a case-study analysis as a group project.

**Class Capacity** 40 students

**Student Level** Year 2 and 3

### Course Outcomes

To enable students to gain an in-depth knowledge on sustainability, and apply the knowledge to real-life sustainability projects in various industries

### Career Opportunities

Social Innovator

### Course Instructor

**Dr. Yon Jung Choi**

**Education:** PhD, Public Policy, George Mason University, Virginia, MPP, George Mason University, Virginia, MBA, Seoul School of Integrated Sciences and Technology, Korea

**Expertise:** Governance, Public Policy, Social Innovation



**Course Type** Specialization

### Course Description

This course aims to increase the capability and artificial intelligence skill in Game Design and Development, for being in charge of protocol and reduced inequalities on productions line. Students in this course will use ARSA Framework and Photoshop as design and implementing tools. Weekly work-in progress (WIP) reinforces learning along the way and a final project collaboration together with real-world organization and MOU.

### Course Outcomes

To enable students to put into practice the principle of game development, game design, artificial intelligence for games, in the form of game prototypes and real-world collaboration

**Class Capacity** 40 students

**Student Level** Year 2 and 3

### Career Opportunities

Technology Innovator, Technopreneur, Tech Startup

### Course Instructor

**Assoc. Prof. Dr. Arsa Tangchitsomkit**

**Education:** PhD, Information Technology, King Mongkut's University of Technology North Bangkok, Thailand

**Expertise:** Computer Game Multimedia, AI, Computer Vision, Machine Learning, Deep Learning and Tech Startup



**Course Type** Specialization

### Course Description

Design, implementation and evaluation of secured system; Able to differentiate between secured and unsecured system; Techniques for achieving and assessing security in computer systems such as multi-user, distributed computer system, blockchain and APIs; physical security; biometrics; information flow models; cryptography; public-key and private-key concepts; authentication; security in electronic money and bitcoins; virus and malware; firewall; secure web browsers.

### Course Outcomes

To enable students to gain specialized knowledge and tools on increasing digital privacy and security

**Class Capacity** 40 students

**Student Level** Year 2 and 3

### Career Opportunities

Technology Innovator

### Course Instructor

**Mr. Panant Krairojananan**

**Education:** MTEL, University of Denver, USA

**Expertise:** Business Information Systems



# 5607301

## BIG DATA ANALYTICS

**Course Type** Specialization

### Course Description

This course introduces students to the principles and practices of data analytics, i.e. the application of data science and machine learning techniques to develop a suite of tools designed to help businesses mine data for information, analyze information for insights, and utilize insights for decision-making. The course provides the mathematical and theoretical foundation for understanding data science and machine learning models, the computer programming foundation for coding applications and building data analysis pipeline, and class projects simulating business use cases.

### Course Outcomes

To enable students to apply the principles of mathematical, statistical, and computational aspects of data analytics into practice

**Class Capacity** 40 students

**Student Level** Year 2 and 3

### Career Opportunities

Data Scientist, Technology Innovator

### Course Instructor

#### Dr. Poomjai Nacaskul

**Education:** PhD, Computational Intelligence and Operational Research, Imperial College London, UK, MS, Operations Research, Case Western Reserve University, Ohio

**Expertise:** Machine Learning, Data Science, Financial Engineering



### **Course Type** Specialization

### **Course Description**

This project-oriented course will consist of the specification, design, implementation, integration, and testing of an IoT and Embedded System. The topics that will be covered include Embedded Systems HW, Embedded Systems SW, interfacing, communications, control, design technology, and validation. It should help to motivate students to put more emphasis on education in embedded systems by integrating knowledge from many different areas. Students will work in groups of two to design, implement, and test a small Embedded System.

### **Course Outcomes**

To enable students to apply the knowledge learnt from IOT and embedded systems to solve real-world problems and design a practical embedded system

### **Career Opportunities**

Technology Innovator

**Class Capacity** 40 students

**Student Level** Year 2 and 3



**Course Instructor**  
**Dr. Mongkol Ekpanyapong**

**Education:** PhD, Electrical and Computer Engineering, Georgia Institute of Technology, Georgia

**Expertise:** Computer Architect



**Course Instructor**  
**Dr. Sarat Yoowattana**

**Education:** PhD, Microelectronics and Embedded Systems, Asian Institute of Technology, Thailand

**Expertise:** Hardware Engineering



**Course Type** Specialization

### Course Description

This course aims for students to learn two interacting components including Smart City concept and Urban development approach from theory to practice. The course includes: Introduction to the concept of smart city from the technology perspective, strategy and planning approach, urban policy formation, infrastructure required for sustainable city development, to social consequences of automation. The course also provides opportunities to students to apply knowledge to real-world cases.

### Course Outcomes

To enable students to gain a deeper understanding of smart city and urban development concepts and apply the knowledge to real-life examples of smart cities

**Class Capacity** 40 students

**Student Level** Year 2 and 3

### Career Opportunities

Social Innovator

### Course Instructor

**Prof. Agachai Sumalee**

**Education:** PhD, Transport Economics and Operations Research, University of Leeds, UK, MSc, Transportation Planning and Engineering, University of Leeds, UK

**Expertise:** Smart City, Engineering, Transport Studies



# 5604301

## FOOD AND DRUG TECHNOLOGY FOR WELLBEING

**Course Type** Specialization

### Course Description

Key knowledge and understanding in food and drug technology for wellbeing including nutrition and immunization, deterioration of food, food processing and preservations, food safety, food sanitation, food service, food packaging and labelling, food law and regulations, culinary art and science, sensory science, food and drug product research and development

### Course Outcomes

To enable students to develop knowledge and understanding in food and drug technology for wellbeing, as well as R&D process for new food products and innovation on the special topics (real cases) with industry partner

### Career Opportunities

Food Technologist, Food Business Analyst, Food Entrepreneur, Food Innovation Specialist, Food Product Manager

**Class Capacity** 40 students

**Student Level** Year 2 and 3

### Course Instructor

**Dr. Warinya Chemnasiri**

**Education:** Innovative Teaching Scholar Program, Stanford University, Ph.D., Nanomaterials and Sensors, University of Central Florida, USA, B.Eng., Nanoengineering, ISE, Chulalongkorn University

### Expertise:

R&D: New Product/Process Development, Nanotechnology: Material and Sensors, Inquiry-Based and Project-Based Teaching

### Guest Lectures by Professors from

- Food Tech, CU
- Immunology, NUS
- Pharmaceutical Tech, CU
- Finance & Marketing, CU
- Communication Design, CU
- Design & Architecture, CU
- Food R&D/ NPD of Yuzu Group
- Innovation and Product Design Chef
- Stanford d.school alumni





# 5604206

## HUMAN ANATOMY AND PHYSIOLOGY

**Course Type** Specialization

### Course Description

Human anatomy and physiology explain our body structures and functions, respectively. In other words, anatomy deals with macroscopic and microscopic structures of our organs (e.g., brain, heart, lung, intestine, etc.), while physiology describes how those organs work together. The body consists of a number of atoms and molecules to form levels of organization, i.e., organelle, cell, tissue, organ and integrated body systems. For example, the brain is a part of the neural system that controls several activities, e.g., thinking, movement, blood circulation, breathing, food digestion and absorption, etc. Both anatomy and physiology also provide foundations for physicians in diagnosis and treatment of diseases as well as for innovators or entrepreneurs in various businesses pertaining to medical device, artificial intelligence (AI)-brain interface, vaccine, stem cell, drug discovery and nutraceuticals. This course is also appropriate for students who want to build a health-tech, biomedical deep-tech or biopharma start-ups.

**Class Capacity** 40 students

**Student Level** Year 2 and 3

### Course Outcomes

To enable students to develop innovative ideas based on a fundamental understanding of human anatomy and physiology

### Career Opportunities

Innovation Entrepreneur in Health and Well-being field

### Course Instructor

**Dr. Narattaphol Charoenphandhu**

**Education:** MD, PhD (Physiology), Mahidol University, Thailand

**Expertise:** Calcium and Bone Physiology, Physiology and Biophysics, Calcium Metabolism, Calcium Product Development



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