

**Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students**

**(2021-22, Term 1)**

**Institution: The Chinese University of Hong Kong**

| Course Code | Course Title                                     | Units | Keyword Syllabus or<br>Brief Subject Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Pre-requisites<br>(if any)                                       | Result Grade | Medium of<br>Instruction | Remarks, if any                                         |
|-------------|--------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------|--------------------------|---------------------------------------------------------|
| ACCT7110    | Issues in Financial Accounting                   | 3     | Current research topics in financial accounting. These include accounting information and capital market behaviour, the economic consequences of both mandatory and voluntarily public announcements made by firms, effects of agency costs and debt covenants on the behaviour of firms' reporting choices, fundamental analysis of accounting data, compensation schemes and financial reporting.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | —                                                                | A-F          | English                  | Quota for visiting students: 5                          |
| ANTH6010    | Seminars in Anthropological Theory               | 3     | This course introduces research postgraduate students to major theories and debates that have inspired the development of (sociocultural) anthropology. The course serves as a foundation for understanding both the history of anthropological thought and the wealth of contemporary analyses of cultural phenomena. Over the course of the semester, we will discuss a range of theoretical propositions concerning such topics as evolution, culture, structure, subjectivity, agency, social change, power, discourse, representation, and globalization. We will selectively explore some of the most prominent theories, writings, and concepts by interrogating them on three levels: (1) their explanatory power for understanding human behavior and the social world; (2) the social and historical circumstances in which they were produced; and (3) their application and value in ongoing anthropological debates, including your research. The readings in this syllabus will serve as (re)entry points into a larger body of work produced by key scholars of anthropology. We will begin by reading the works of the discipline's foundational figures in Europe and North America in the 19th–early 20th centuries as well as their less-known contemporaries whose work gained recognition in the second half of the 20th century. Then we will examine more recent theoretical developments to understand where the discipline is going. <a href="https://www.arts.cuhk.edu.hk/~ant/programmes/postgraduate/mphil/mphil-programme-curriculum-course-schedule-and-syllabi/">https://www.arts.cuhk.edu.hk/~ant/programmes/postgraduate/mphil/mphil-programme-curriculum-course-schedule-and-syllabi/</a> | —                                                                | A-F          | English                  | Subject to teacher's approval on individual application |
| BASA6001    | Research Methodology in Behavioural Studies      | 3     | This course is divided into two main parts. The first part is focused on the application of the philosophy of science to behavioral research in business. Basic concepts such as Explanation, scientific laws, and theory are introduced and discussed. The second part provides an introduction to the various stages of scientific research which include research design, measurement scale and development, sampling design, Data collection and statistical analysis. Even though mathematical proofs and statistical derivations will be reduced to a minimum, having the knowledge of basic statistics and matrix manipulations will be helpful.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | —                                                                | A-F          | English                  | —                                                       |
| BMEG5610    | Research Methods in Biomedical Engineering       | 3     | This course presents research methods in biomedical engineering, and primarily aims at preparing postgraduate students for basic research or employment in the clinic and biomedical industries. Students will learn relevant concepts and tools for analyzing data arising from quantitative and qualitative research in molecular, physiological, and clinical systems. This course focuses on developing students' ability to analyze research data and critique the scientific literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | —                                                                | A-F          | English                  | Quota for visiting students: 5                          |
| CHEM5642    | Supramolecular Chemistry                         | 2     | This course provides an overview of fundamental concepts and essential applications of supramolecular chemistry. This course covers two parts. The first part focuses on the fundamental concepts, including a brief history of supramolecular chemistry, characterization of supramolecular systems, noncovalent interactions and ion binding, templated synthesis and self-assembly as well as inclusion complexes. The second part focuses on the application of supramolecular chemistry, discussing selected supramolecular systems and introducing important examples of applying supramolecular chemistry in materials sciences and biology.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Having taken at least one undergraduate organic chemistry course | A-F          | English                  | —                                                       |
| CHES6002    | Critical Cultural History of China: Modern China | 3     | This course will focus on the emergence of two modern Chinas, that of the gentry and that of the people: 1) the re-emergence of Confucianism as "this culture of ours", eventually leading to the creation of lineage China in the 16th century; 2) the emergence of "popular culture", which includes a popular, increasingly state-supported pantheon of local gods, local festivals built around these gods, and popular literature (from the bianwen of the Tang to the xiaoshuo of the Ming). Particular attention will be paid to the parallel transformations of the economy and of the legal system in Ming-Qing China.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | —                                                                | A-F          | English                  | Quota for visiting students: 2                          |
| CHLL6251    | Special Topics in Classical Chinese Texts I      | 3     | Critical study of topics that pertain to compilation, transcription, transmission, commentaries, and annotations of ancient Chinese texts. Students are required to conduct research on a chosen topic under guidance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | —                                                                | A-F          | Putonghua & Cantonese    | Quota for visiting students: 10                         |
| CHLL6451    | Special Topics in Modern Chinese Literature I    | 3     | Critical study of issues, other than genres and authors, in modern Chinese literature. Topics may focus on research methodologies, literary thoughts, literary schools, regional literature, comparative literature, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | —                                                                | A-F          | Putonghua & Cantonese    | Quota for visiting students: 10                         |

Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students

(2021-22, Term 1)

Institution: The Chinese University of Hong Kong

| Course Code | Course Title                                       | Units | Keyword Syllabus or<br>Brief Subject Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Pre-requisites<br>(if any)                                                                               | Result Grade | Medium of<br>Instruction | Remarks, if any                  |
|-------------|----------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------|--------------------------|----------------------------------|
| CSCI5120    | Advanced Topics in Database Systems                | 3     | This course will introduce to students advanced topics in database systems including advanced data structures, concurrency control, deadlock resolutions, recovery schemes, distributed database systems, multimedia database indexing techniques, data mining, data on the web and network data analysis.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Pre-requisite: CSCI3170                                                                                  | A-F          | English                  | Exclusion: CSCI5705 and SEEM5010 |
| CSCI5350    | Advanced Topics on Game Theory in Computer Science | 3     | This course starts with a review of the basic concepts in game theory, including pure strategy and mixed strategy Nash equilibrium. It then discusses some specific types of games, such as zero-sum games and Bayesian games, and introduces other types of equilibriums including correlated equilibrium and evolutionary equilibrium. Rationalisability and the relation between knowledge and equilibrium will also be discussed. After a review of subgame perfect equilibrium and sequential equilibrium, bargaining games, implementation theory, perfect Bayesian equilibrium and trembling hand perfect equilibrium will be discussed. Finally, the relationship between the core, the stable sets, and the Shapley value in coalitional games will be discussed.                                                                                                                                                                                                          | Pre-requisites: CSCI2110 or ENGG2440<br>or ESTR2004, ENGG2040 or<br>ENGG2430 or ESTR2002 and<br>CSCI4220 | A-F          | English                  | Exclusion: CMSC5728              |
| CSCI5550    | Advanced File and Storage Systems                  | 3     | This course aims to introduce important systems-level research topics in the design and implementation of practical file and storage systems. Topics include: (i) storage device organization (e.g., disk drives, disk arrays, RAID, solid state drives), (ii) file system design (e.g., log-structured file systems, distributed file systems), (iii) data availability (e.g., erasure coding techniques, data integrity protection), (iv) data consistency (e.g., journaling techniques), (v) data compression (e.g., deduplication), (vi) benchmarking (e.g., I/O metrics, benchmarking tools), etc. Depending on the current research trends, the course also discusses the latest applied storage topics, especially related to scalable and dependable big data management.                                                                                                                                                                                                   | Pre-requisites: CSCI3150 or ESTR3102                                                                     | A-F          | English                  | —                                |
| CSCI5640    | Natural Language Processing                        | 3     | Natural language processing (NLP) is a crucial part of artificial intelligence (AI), which aims to endow computers with the ability to process human language. This course gives an overview of modern deep learning techniques for natural language processing. The course starts with basic linguistic concepts in NLP and moves from shallow bag-of-words representations to richer structural embeddings, which is the foundation for the successful use of deep learning in NLP. Then the course will guide you through three fundamental tasks of NLP: language modeling (LM), natural language understanding (NLU), and natural language generation (NLG), followed by some recent advances such as BERT and adversarial learning. Along the way we will introduce cutting-edge computational models together with insights from a linguistic perspective.                                                                                                                   | —                                                                                                        | A-F          | English                  | —                                |
| CSCI5650    | Graph Neural Networks                              | 3     | Graph is a fundamental data structure with a wide range of applications. This course covers advanced topics in graph neural networks (GNN) that include, but are not limited to: introductory algorithms and analyses for graph mining, graph-based semi-supervised learning, graph embedding techniques, graph convolution networks, graph attention networks, graph encoder-decoder, graph transformer, knowledge graphs and translation models, application of graph algorithms, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | —                                                                                                        | A-F          | English                  | —                                |
| CULS6100    | The Sexual Body in Arts and Media                  | 3     | This course will analyze different modes of visualization within artforms, movies and social media in how they define contemporary genders and sexualities. We will focus on theories of sexuality and gender alongside those of media representations and contemporary art forms while highlighting topics such as pornographic expansionism and its cultural effects, indie and corporate LGBTQ media, social media wars and intimacies, censorship paradigms and online activism. Students will be encouraged to respond to theories and audio-visual examples while partaking in debates about these topics. They will also carry out one assignment throughout the semester while learning how to apply ethnographic research methods to analyze media representations about sex cultures. In this assignment, they will focus on one media environment/platform and a sexual culture of their choice to examine how culture is being redefined and visualized by media users. | —                                                                                                        | A-F          | English                  | —                                |
| DSME5001    | Microeconomic Theory                               | 3     | This course is on advanced microeconomic theory. Topics include individual decision theory (consumer theory, production theory, choice under uncertainty), game theory (static and dynamic games under complete and incomplete information), and equilibrium and market failure (general equilibrium, principal-agent problems, economics of information, auctions, bargaining, and market design).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | —                                                                                                        | A-F          | English                  | —                                |

Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students

(2021-22, Term 1)

Institution: The Chinese University of Hong Kong

| Course Code | Course Title                                                | Units | Keyword Syllabus or<br>Brief Subject Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Pre-requisites<br>(if any)                                                                | Result Grade | Medium of<br>Instruction | Remarks, if any                                          |
|-------------|-------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------|--------------------------|----------------------------------------------------------|
| EASC5110    | Applied Geophysics                                          | 3     | This course introduces concepts, principles, and applications of geophysical methods in environmental and engineering studies. It offers an overall survey of various geophysical methods for exploring the shallow subsurface. It provides the technical foundation needed to understand the use and limitations of gravity, seismic, ground penetrating radar, and electromagnetic methods. Demonstration of commonly used methods will be provided in the field along with tutorials of preliminary data analysis techniques. Technical papers published in leading applied geophysics journals will be discussed in reading groups.                                                                                                                                                                                                                                                                                                         | –                                                                                         | A-F          | English                  | Subject to teacher’s approval on individual application. |
| EASC5120    | Petrology                                                   | 3     | Petrology is an essential subfield of Earth System Science because the rock record is the foundation for interpreting Earth history and internal processes. Petrologic concepts help us understand the Earth system, with connections to related fields such as geochemistry, geophysics, mineralogy, structural geology and geodynamics. This course broadly surveys the formation, distribution, chemical composition, mineral associations, and internal texture and structures in rocks of the earth’s crust and upper mantle, and establishes it relation to global tectonic environments. Class lectures are supplemented by lab exercise, demonstrations and tutorials (e.g. study of rock hand specimens, understand phase rule, use of optical microscope etc.).                                                                                                                                                                       | –                                                                                         | A-F          | English                  | Subject to teacher’s approval on individual application. |
| EASC5210    | Land-Atmosphere Interactions and Boundary-Layer Meteorology | 3     | This course introduces the physical, chemical and biological processes governing the exchange of energy, momentum, water and other chemical materials between the atmosphere and land surface, including a formal introduction into boundary-layer meteorology. Topics covered include the basic equations and concepts of heat, momentum and mass conservation and transfer at the land-atmosphere interface; soil physics and hydrometeorology; temperature, humidity and wind distribution in the atmospheric boundary layer; theories and observations of turbulence; stability and boundary-layer dynamics; biometeorology and ecophysiology of land plants; canopy and ecosystem exchange; and land use change and urbanization. Applications to weather phenomena, air pollution, forestry, agriculture and ecosystem management will be emphasized throughout.                                                                          | –                                                                                         | A-F          | English                  | Subject to teacher’s approval on individual application. |
| ECON5440    | International Trade                                         | 3     | Please visit: <a href="https://www.econ.cuhk.edu.hk/econ/en-gb/programs/curriculum/course-offered/postg">https://www.econ.cuhk.edu.hk/econ/en-gb/programs/curriculum/course-offered/postg</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Graduate Microeconomics                                                                   | A-F          | English                  | –                                                        |
| ELEG5301    | Photonic Integrated Circuits                                | 3     | The course covers the design of planar optical waveguides and introduce numerical methods such as Fourier transform beam Propagation Method, and Finite Difference Time Domain methods. We shall introduce the principles and design methodology of passive integrated optic functional elements (Multimode Interferometer, directional couplers, waveguide grating couplers, microring resonators, arrayed waveguide gratings), and the use of subwavelength gratings in engineering different optical properties. We shall also introduce pulse propagation in dispersive and nonlinear media and nonlinear optical effects in waveguides. Examples of waveguide based photonic devices covered in the course include waveguide photodetectors, laser diodes and optical modulators.                                                                                                                                                          | Vector calculus, semiconductor physics, Fourier transforms, Introductory electromagnetism | A-F          | English                  | –                                                        |
| ENGE5010    | Theoretical Linguistics                                     | 3     | This course provides a broad introduction to general linguistics and the fundamental properties of human language shared by all language systems. It includes a survey of phonological, morphological, syntactic, and semantic structures of language, thus enabling students to investigate established theoretical premise for the linguistic description of natural languages and describe general grammatical properties of language universals in the light of the theory established. This course also equips students with some analytical tools and techniques for linguistic analysis and provides practice in using these scientific ways to discover the organizing principles underlying a language.                                                                                                                                                                                                                                | –                                                                                         | A-F          | English                  | Subject to approval by the division head                 |
| ENGE5210    | Advanced Studies in Literature                              | 3     | This course surveys key texts from the western literary canon in order both to introduce you to the concept of literary canonization and to interrogate its lasting significance to contemporary writing. In the first instance, our concern is to recognize the chronology (and with it, the genealogy) of western writing. This will demonstrate to you the various evolutions of literary writing, as writers of different generations concern themselves with very different aspects of writing – from how best to tell a (moral) story, to questioning the very capacity of language to capture our experience of the world. From this, you will begin to recognize the way in which the western literary canon can serve as an important spine to your future work in literary studies. It will certainly allow you to understand the broad context of any work that you will subsequently read, and because of this enrich your reading. | –                                                                                         | A-F          | English                  | Subject to approval by the division head                 |

**Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students**

**(2021-22, Term 1)**

**Institution: The Chinese University of Hong Kong**

| Course Code | Course Title                                                    | Units | Keyword Syllabus or<br>Brief Subject Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Pre-requisites<br>(if any) | Result Grade | Medium of<br>Instruction | Remarks, if any                          |
|-------------|-----------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------|--------------------------|------------------------------------------|
| ENGE5250    | Children's Literature                                           | 3     | This course provides an in-depth study of developments in children’s literature through an examination of some essential, central texts as well as recent books for children. The uses of fantasy and the educational aspects of books for children will be discussed, along with notions of childhood and the nature of children. Through close reading, students will be able to engage in critical techniques applicable to most literature, for the best texts for children satisfy sensitive adult readers too.                                                                                                                                                                                                                                                 | —                          | A-F          | English                  | Subject to approval by the division head |
| ENGE5330    | Modernist Literature                                            | 3     | In this course, we will examine various modernist fiction, essays and poetry in order to understand not only the formal and innovative aspects of modernism, but also some of the historical and material conditions which propelled the literary movement of modernism into being in the first place. We will consider such wide-ranging historical issues as imperialism, modernity, war, and female emancipation, and see how these helped shape both the form and content of modernist literature. The course will involve extremely close reading of the texts, with the goals to re-introduce students to terminology useful in literary analysis, and to teach methods to analyze and understand the formal and technical complexities of literary modernism. | —                          | A-F          | English                  | Subject to approval by the division head |
| ENGE5540    | Research Methods in Applied Linguistics                         | 3     | This course introduces students to major research methods in applied linguistics (e.g. qualitative, quantitative, mixed-method) and guide students through the basics of preparing their research proposals. Major topics of the course include the identification of research problems; the formulation of research questions; a critical review of relevant research literature; and the selection of appropriate research methods.                                                                                                                                                                                                                                                                                                                                | —                          | A-F          | English                  | Subject to approval by the division head |
| ENGE5550    | English for Specific Purposes                                   | 3     | This course will introduce students to the field of teaching English for Specific Purposes (ESP) by exploring the primary context for ESP teaching and research (academic institutions of higher education, the workplace, and professional institutions and organizations). The course will examine the main issues and concepts related to the field in terms of their historical and discipline-specific relevance. Topics include the concepts of learner needs, target situation analysis, authenticity, discourse community, genres, and specialist knowledge. The course will equip students with a better understanding of how to design language programmes to suit the needs of a specific group of learners.                                              | —                          | A-F          | English                  | Subject to approval by the division head |
| ENGE5600A   | Special Topics in Applied English Linguistics                   | 3     | This course provides an opportunity for students to be exposed to some current developments in certain area of applied linguistic research in English. The topics vary according to the research expertise of the staff or the visiting academics.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | —                          | A-F          | English                  | Subject to approval by the division head |
| ENGE5630    | Cognitive Linguistics and Its Applications in Language Teaching | 3     | This course provides an overview of the discipline of cognitive linguistics and its application in second language teaching. Cognitive linguists understand the language that we encounter every day as input from which we draw inferences about form-meaning relationships, typical patterns, and schemata. The course addresses core concepts in this area of study including: prototype, perspective, categorization, image schema, figure and ground, metaphor, metonymy, entrenchment, embodied cognition, gesture, construction grammar, attention and salience, and contingency learning. The course discusses how cognitive linguists design pedagogical methods and stimulate learners to explore the deeper meanings of grammatical forms.                | —                          | A-F          | English                  | Subject to approval by the division head |
| ENGE5710    | Critical Approaches in Literary Studies                         | 3     | The course aims at providing the students with an orientation of critical and interpretive approaches required of graduate studies in literature in a cross-cultural context. Various literary and critical paradigms from Western and Chinese traditions will be reviewed with a discussion of the basic issues in interpretation theory and criticism. The course will also focus on the implications of recent orientations in social sciences and philosophy for literary studies. Students will be required to identify their own research interests and pursue textbased case studies on problems or topics in criticism and interpretive theory that are involved in the interdisciplinary studies of literature.                                             | —                          | A-F          | English                  | Subject to approval by the division head |
| ENGG5103    | Techniques for Data Mining                                      | 3     | Data mining provides useful tools for the analysis, understanding and extraction of useful information from huge databases. These techniques are used in business, finance, medicine and engineering. This course will introduce the techniques used in data mining. Topics will include clustering, classification, estimation, forecasting, statistical analysis and visualization tools.                                                                                                                                                                                                                                                                                                                                                                          | —                          | A-F          | English                  | Exclusion: CMSC5724                      |

Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students

(2021-22, Term 1)

Institution: The Chinese University of Hong Kong

| Course Code | Course Title                                      | Units | Keyword Syllabus or<br>Brief Subject Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Pre-requisites<br>(if any)                                                 | Result Grade | Medium of<br>Instruction | Remarks, if any                 |
|-------------|---------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------|--------------------------|---------------------------------|
| ENGG5105    | Computer and Network Security                     | 3     | This course aims to introduce important topics in computer and network security from an applied perspective. Topics include: (i) applied cryptography (e.g., cryptographic primitives, programming with OpenSSL), (ii) network security (e.g., unauthorized accesses, large-scale network attacks, firewall & intrusion detection systems), (iii) web security (e.g., HTTP session management and web attacks), and (iv) system security (e.g., buffer overflow, passwords, file system security). The course also discusses latest applied security topics depending on the current research trends.                                                                                                                                                                                                                                                   | Pre-requisites: CSCI3150 or ESTR3102, and CSCI4430 or CENG4430 or IERG3310 | A-F          | English                  | Exclusion: CMSC5726 or CSCI5470 |
| ENGG5301    | Information Theory                                | 3     | Introduction. Shannon's information measures. Entropy rate of a stationary process. The source coding theorem. Kraft inequality. Huffman code. Redundancy of a prefix code. The channel coding theorem. Rate-distortion theory. Universal data compression.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | —                                                                          | A-F          | English                  | —                               |
| ENGG5392    | Lightwave System Technologies                     |       | This course covers the design of advanced optical fiber communication systems. Topics include: optical signal characterization and spectral efficient optical modulation formats, high-speed signal transmission & multiplexing techniques, linear & nonlinear fiber effects and fiber transmission impairments, basic guided-wave optoelectronics and novel integrated optical devices (tunable lasers, planar lightwave circuits, silicon photonics), optical signal amplification, regeneration and performance monitoring techniques, coherent optical communications and enabling digital signal processing techniques, and examples of optical subsystems for optical networks. Advisory: Knowledge of basic optical communication principles is required.                                                                                        | —                                                                          | A-F          | English                  | —                               |
| ENGG5402    | Advanced Robotics                                 | 3     | This course provides a comprehensive overview of robotics for postgraduate level study. The course covers the fundamental concepts and methods to analyze, model, and control of robotic mechanisms. Specific topics include kinematics, inverse kinematics, dynamics, trajectory generation, individual and multivariable control, interaction force control, and sensors. Students will also involve in hands-on programming project to reinforce the basic principles developed in lectures as well as develop robot algorithm implementation skillsets. The course will also expose students to the latest and advanced developments in robotics such as medical robotics, dynamic parameter identification. (Equivalent to BMEG5100.)                                                                                                              | —                                                                          | A-F          | English                  | —                               |
| ENGG5404    | Micromachining and Microelectromechanical Systems | 3     | This course provides a broad overview of microfabrication and microelectromechanical systems. Topics include introduction to basic micromaching techniques such as photolithography; isotropic and anisotropic wet etching; dry etching; physical and chemical vapor deposition; electroplating; metrology; statistical design of experiments; MEMS release etching; stiction; and MEMS device testing. The course also reviews important microsensors, microactuators and microstructures. Topics include accelerometers; pressure sensor; optical switches; cantilever beams; thin-film stress test structures and bulk micromaching test structures. Lastly, the course introduces the fundamentals of central dogma of molecular biology; cell and tissue biology; and principles of transduction and measurements of molecules, cells and tissues. | —                                                                          | A-F          | English                  | —                               |
| ENGG5501    | Foundations of Optimization                       | 3     | In this course we will develop the basic machineries needed for formulating and analyzing various optimization problems. Topics include convex analysis, linear and conic linear programming, nonlinear programming, optimality conditions, Lagrangian duality theory, and basics of optimization algorithms. Applications from different fields, such as computational economics and finance, combinatorial optimization, and signal and image processing, will be used to complement the theoretical developments. No prior optimization background is required for this class. However, students should have a workable knowledge in multivariable calculus, basic concepts of analysis, linear algebra and matrix theory.                                                                                                                           | —                                                                          | A-F          | English                  | —                               |
| ENGG5781    | Matrix Analysis and Computations                  | 3     | Matrix analysis and computations are widely used in engineering fields—such as machine learning, computer vision, systems and control, signal and image processing, optimization, communications and networks, and many more—and are considered key fundamental tools. This course covers matrix analysis and computations at an advanced or research level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | —                                                                          | A-F          | English                  | Quota for visiting students: 5  |
| GPAD5050    | Qualitative Methods of Political Research         | 3     | This course serves to introduce postgraduate students to the fundamental principles of scientific inquiry and major qualitative research methods. Topics to be covered include: conceptual foundation of research in social science, design and structure of political research, and methods for collecting and analyzing qualitative data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | —                                                                          | A-F          | English                  | —                               |

Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students  
(2021-22, Term 1)

Institution: The Chinese University of Hong Kong

| Course Code | Course Title                                                                                                                | Units | Keyword Syllabus or<br>Brief Subject Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Pre-requisites<br>(if any)    | Result Grade | Medium of<br>Instruction | Remarks, if any                |
|-------------|-----------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------|--------------------------|--------------------------------|
| GPAD5055    | Quantitative Methods of Political Research                                                                                  | 3     | This course serves to help postgraduate students develop working knowledge of a number of statistical methods that are widely used in political and social studies. Topics to be covered include major principles of data collection and analysis and a variety of statistical models.                                                                                                                                                                                                                                                                                                                                                                                                                               | —                             | A-F          | English                  | —                              |
| GRMD5110    | Statistical Applications in Geography                                                                                       | 3     | This course is an introduction to statistical methods in geographic research. The goal of this course is to provide a practical understanding of the application of statistical analysis to geographic problem solving. Emphasis is placed on the application of appropriate methods to analyse geographic data, the appropriate procedures for research design, and the interpretation of research results. Topics include: geographical data and data manipulation, spatial autocorrelation, multiple linear regression, logistic regression, principal components analysis, factor analysis, cluster analysis and discriminant analysis.                                                                          | Basic Statistics              | A-F          | English                  | Quota for visiting students: 5 |
| HIST6010    | Graduate Seminar on Historiography<br>歷史學研習班                                                                                | 3     | The course examines the principles and methods governing the study of history. Course contents and format are designed by the teacher.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | For students in MPhil History | A-F          | Putonghua &<br>English   | —                              |
| HIST6016MC  | Selected Themes in Comparative History: Ancient Egypt: History, Art, Religion, and Modern Perceptions<br>比較史特別專題：古埃及文明之現代詮釋 | 3     | The course studies selected topics on comparative history. Course contents and format are designed by the teacher.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | For students in MPhil History | A-F          | English                  | Quota for visiting students: 5 |
| HIST7010    | Graduate Seminar on Historiography<br>歷史學研習班                                                                                | 3     | The course examines the principles and methods governing the study of history. Course contents and format are designed by the teacher.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | For students in PhD History   | A-F          | P/E                      | —                              |
| HIST7016MC  | Selected Themes in Comparative History: Ancient Egypt: History, Art, Religion, and Modern Perceptions<br>比較史特別專題：古埃及文明之現代詮釋 | 3     | The course studies selected topics on comparative history. Course contents and format are designed by the teacher.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | For students in PhD History   | A-F          | English                  | Quota for visiting students: 5 |
| IERG5020    | Telecommunication Switching and Network Systems                                                                             |       | Basic telephony; concepts of switching, transmission, multiplexing and concentration; circuit switching, time-space-time switching; virtual-circuit/label switching; crossbar/bus/shared-memory switches; Ethernet switches at edge and metro; switching characteristics of interconnection networks; parallel switching control in sorting, concentration, multicasting and distribution. Advisory note: Students are expected to have background in Signals and Systems.                                                                                                                                                                                                                                           | —                             | A-F          | English                  | —                              |
| IERG5320    | Digital Forensics                                                                                                           |       | This course is an introduction to digital forensics and cyber crime investigation. It will discuss techniques, methods, procedures and tools for applying forensic science and practice to the acquisition and analysis of evidence existing in digital form for the purposes of cyber crime investigation. Specific topics include computer (hard disk, file-systems) forensics, network/intrusion forensics, mobile device forensics, and a brief introduction to multimedia forensics. Techniques for detecting, tracking, dissecting and analyzing malware and other malicious cyberspace activities will also be covered. Advisory: Students are expected to have basic background in C/C++ programming skills. | —                             | A-F          | English                  | —                              |
| IERG5350    | Reinforcement Learning                                                                                                      | 3     | This course aims to cover the fundamental topics relevant to Reinforcement Learning (RL), a computational learning approach where an agent tries to maximize the total amount of reward it receives while interacting with the complex and uncertain environments. The course content includes the basics of Markov Decision Processes, model-based and model-free RL techniques, policy optimization, RL distributed system design, as well as the case studies of RL for game playing such as AlphaGo, traffic simulation, and other robotics applications. Advisory: Students are expected to have solid foundation on signal processing.                                                                         | —                             | A-F          | English                  | —                              |

Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students

(2021-22, Term 1)

Institution: The Chinese University of Hong Kong

| Course Code | Course Title                                                          | Units | Keyword Syllabus or<br>Brief Subject Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Pre-requisites<br>(if any) | Result Grade | Medium of<br>Instruction | Remarks, if any |
|-------------|-----------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------|--------------------------|-----------------|
| IERG6200    | Advanced Topics in Computer Networks (Advanced Topics in Embedded AI) | 3     | This is a systems course that will enable students to have in-depth understanding of key AI algorithms and their implementation for embedded and Internet of Things (IoT) systems. The topics cover 1) overview of basic signal processing algorithms such as FFT and digital filters; 2) advanced AI algorithms such as acoustic and visual signal processing, spatial sensing, machine learning etc.; 3) their implementation on cutting-edge IoT platforms and key system issues such as energy efficiency and real-time in the contexts of a set of representative IoT applications such as smart health, environmental monitoring, smart homes/buildings, smart cities etc. Students will work on an individual or team project to build an end-to-end system. The project should have a significant AI algorithm components and include implementation on real embedded IoT platforms. In addition to course project assignments, students will also read and discuss latest publications in the areas of embedded AI, Internet of Things, Cyber-Physical Systems, mobile systems, and ubiquitous computing. | –                          | A-F          | English                  | –               |
| LING6902    | Phonological Theory                                                   | 3     | This course aims to introduce the development of phonological theory over the past half century and to provide a critical survey of the current issues in phonological research. Topics include segmental alternation, syllable structure, tone, stress, and prosodic effect in word formation. Students will gain a solid understanding of the characteristics of different phonological frameworks over the course of the development of phonological theory, and will learn how to analyze a variety of language data within different phonological frameworks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | –                          | A-F          | English                  | –               |
| LING6920    | Topics in Language Acquisition                                        | 3     | This course focuses on current issues in language acquisition with a strong emphasis on the interface of theoretical analysis of linguistics phenomena and central research questions in studies of language acquisition. Selected topics from first language acquisition, bilingual acquisition, second language acquisition, and sign language acquisition will be covered. Data from different languages will be used for illustration. Empirical coverage that extends beyond one language is essential. Topics vary from year to year.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | –                          | A-F          | English                  | –               |
| LING6940    | Linguistics Research Seminars                                         | 1     | This course aims at engage students in the Department's Linguistics Research Seminars and in-house research activities. These activities will deepen students' knowledge of various fields of specialization, and help prepare them for their future academic and professional careers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | –                          | A-F          | English                  | –               |
| LING6953    | Topics in Neurolinguistics & Psycholinguistics                        | 3     | This course introduces students to selected topics concerning neurobiology of language as well as language representation, processing and production. Major theoretical debates and contemporary issues that address different aspects of language will be discussed. The selected topics vary from term to term, but may include syntactic and phonological priming as evidence for language representation, computational modeling of language phenomena, neural correlates of first and second language acquisition, explanatory neurolinguistics, comparative studies of language processing ,models of speech production, lexical tone processing, cross-modal studies of language processing, and the bilingual brain.                                                                                                                                                                                                                                                                                                                                                                                       | –                          | A-F          | English                  | –               |
| LING6970    | Special Topics in Linguistics                                         | 3     | From time to time, a course focusing on a specific area of linguistics or applied linguistic research that is not covered in the regular linguistic programme may be offered. Students are allowed to take this course more than once (but not within the same term), and gain the units each time they pass the course. However, students cannot take the same topic twice.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | –                          | A-F          | English                  | –               |
| MAEG5080    | Smart Materials and Structures                                        | 3     | The contents of this course include overview of smart materials technology, characteristics of smart materials such as piezoelectric materials, magnetorheological fluids, and shape memory alloys. It covers smart actuators and sensors; structural modelling and design; dynamics and control for smart structures; integrated system analysis; and applications in biomedical devices, precision machinery, transportation, and buildings.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | –                          | A-F          | English                  | –               |
| MAEG5130    | Computational Mechanics                                               | 3     | Mechanics is the foundation of many emerging research and engineering topics. With the rapid advancement in computing power, numerical methods are preferred to solve differential equations governing the physical process. It opens a whole new domain in industrial design, manufacturing process analysis, material behaviour prediction, etc. This course covers theoretical fundamentals in computational mechanics, including continuum mechanics, finite element methods, and computational plasticity. In addition, the course will also introduce practical skills to applying computational mechanics in research, including multi-physics simulation and advanced finite element simulation techniques.                                                                                                                                                                                                                                                                                                                                                                                                | –                          | A-F          | English                  | –               |

**Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students**

**(2021-22, Term 1)**

**Institution: The Chinese University of Hong Kong**

| Course Code | Course Title                          | Units | Keyword Syllabus or<br>Brief Subject Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Pre-requisites<br>(if any)                                                                                        | Result Grade | Medium of<br>Instruction | Remarks, if any                 |
|-------------|---------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------|--------------------------|---------------------------------|
| MAEG5160    | Design for Additive Manufacturing     | 3     | This course provides a theoretical and practical guidance on how to design parts to gain the maximum benefit from what additive manufacturing (AM) can offer. It begins by describing the main AM technologies and their respective advantages and disadvantages. It then examines strategic considerations in the context of designing for additive manufacturing (DfAM), such as designing to avoid anisotropy, designing to minimize print time, and post-processing, before discussing the economics of AM. The course then focuses on computational tools for design analysis and the optimization of AM parts, part consolidation, and tooling applications. Both designing for polymer AM and metal AM and its corresponding design guidelines will be provided. The main benefit of the course is its combined theoretical and practical approach, which provides directly applicable, “hands-on” information and insights to help students adopt AM in their daily practice. | –                                                                                                                 | A-F          | English                  | –                               |
| MEDP6002    | Biostatistics                         | 1     | This is a compulsory course on Biostatistics for MPhil or PhD students in the Faculty of Medicine, CUHK. This course will cover below topics:<br>- Exploration of data and probability distributions<br>- Population, sampling and confidence Intervals<br>- Hypothesis testing I<br>- Hypothesis testing II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | –                                                                                                                 | A-F          | English                  | Quota for visiting students: 10 |
| MUSC6200    | Ethnomusicology I: History and Theory | 3     | This seminar is the first of three core courses in ethnomusicology. As a primer in ethnomusicology, it introduces students to the intellectual history, theories, and methods of the field. Students will read seminal publications and primary sources by major scholars in the field. The goal is to familiarize students with the range of activity and research agenda in the field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | RPg only                                                                                                          | A-F          | English                  | –                               |
| MUSC6202    | Ethnomusicology III: Current Issues   | 3     | This course familiarizes students with some of the major discussions in ethnomusicology and related fields that have driven scholarly inquiry in recent decades. Organized topically, each session engages a theme or group of themes through both foundational works of social theory and through ethnographic writings in the field of ethnomusicology that draw on them.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Permission of instructor; contact Prof. Kielman (kielman@cuhk.edu.hk) for more information if you are interested. | A-F          | English                  | –                               |
| PHYS5330    | Instrumentation I                     | 3     | This course provides an introduction to the working principles and operation techniques of instruments commonly used in experimental physics. Topics covered include: transducers and sensors; signal conditioning, propagation and conversion; noise, signal recovery techniques, computer interface, vacuum techniques, and integrated-circuit instrumentation. This course also includes laboratory experiments for practice and illustration of the subject matter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | –                                                                                                                 | A-F          | English                  | Quota for visiting students: 3  |
| PHYS5410    | Advanced Quantum Mechanics            | 3     | This course will discuss various theoretical topics of non-relativistic quantum mechanics at the graduate level. The quantum mechanics of many-body systems will also be introduced. Topics covered include: operator methods in quantum mechanics, addition of angular momenta, variational method, stationary perturbation theory, time-dependent perturbation theory, scattering theory, and introduction to the quantum theory of many-body systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | –                                                                                                                 | A-F          | English                  | –                               |
| PHYS5560    | Topics in the Frontiers of Physics    | 3     | Topics of contemporary interest will be selected both from fundamental physics and from physics with important applications to technology. The objective is to introduce students to the frontiers of physics. The level of presentation assumes basic understanding of undergraduate physics.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | –                                                                                                                 | A-F          | English                  | –                               |
| PHYS5590    | Modern Atomic Physics                 | 3     | This course will discuss various fundamental topics of modern atomic physics at the postgraduate level. The first part of the course focuses on atomic structures, the semi-classical theory of atom-light interactions and their application to the understanding of laser cooling and related topics. The second part is on atom-atom interactions at ultracold temperatures, including its application to evaporative cooling for reaching quantum degeneracy. An advanced topics section is also included to introduce the most recent developments in this field. Students should have undergraduate level Quantum Mechanics before taking this course.                                                                                                                                                                                                                                                                                                                          | –                                                                                                                 | A-F          | English                  | –                               |

**Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students**

**(2021-22, Term 1)**

**Institution: The Chinese University of Hong Kong**

| Course Code | Course Title                   | Units | Keyword Syllabus or<br>Brief Subject Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Pre-requisites<br>(if any)                | Result Grade | Medium of<br>Instruction | Remarks, if any                                                                             |
|-------------|--------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------|--------------------------|---------------------------------------------------------------------------------------------|
| PHYS5610    | Introduction to Biophysics     | 3     | Biophysics investigates biological phenomena using theoretical and experimental approaches derived from physics, such as statistical mechanics, fluid mechanics, and optics. This course provides an introduction to biophysics for postgraduate students with no biology background. Students will be introduced to basic biology and physics concepts relevant to the course, followed by topics including the functions of biomolecules, dynamics of regulatory networks, physics of cellular behavior, and recent development of live-cell manipulation techniques. Through this course, students will become familiar with the scope and basic approaches of biophysics research, learn how to perform computer simulations on biomolecules, and develop interest in exploring new territories of biophysics. Students should have undergraduate level thermodynamics and statistical mechanics before taking this course.                                                                                                                                                                             | –                                         | A-F          | English                  | –                                                                                           |
| SEEM5330    | Speech and Language Processing | 3     | This course introduces the underlying statistical approaches and major modelling techniques used in state-of-the-art automatic speech recognition (ASR) systems and speaker verification systems, with a particular focus on the core statistical models that are used in current speech recognition systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | –                                         | A-F          | English                  | –                                                                                           |
| SEEM5340    | Stochastic Calculus            | 3     | This course provides a comprehensive introduction to the theory of continuous time stochastic processes (martingales, diffusions and Levy processes in particular) and stochastic calculus. Throughout the course, examples (in particular from finance) will be provided to illustrate the applications. The course consists of the following parts.<br>- A review of probability essentials.<br>- Continuous time stochastic processes; martingales.<br>- Brownian motions: constructions, properties, quadratic variation, the Cameron-Martin-Girsanov formula, multidimensional Brownian motions.<br>- Stochastic Integration: definition, Ito's formula, change of measure, time change, martingale representation.<br>- Stochastic differential equations and diffusion processes: strong and weak solutions, the Feynman-Kac formula, diffusions.<br>- Backward stochastic differential equations: existence and uniqueness, BSDEs and PDEs.<br>- Levy processes: definition, the Levy-Khinchin representation, the Levy-Ito decomposition, Ito's formula for Levy processes, the Esscher transform. | –                                         | A-F          | English                  | –                                                                                           |
| SEEM5350    | Numerical Optimization         | 3     | This course introduces modern numerical optimization methods and underlying theory for complex/large scale systems. Particular focuses will be given to direct search methods, various gradient methods and acceleration techniques, stochastic/randomized algorithms, cutting plane methods and level function methods. It will also introduce fundamental theory of convex and quasi-convex optimization. At the end of the course, students are expected to apply the learned optimization methods to solve practical problems arising from areas such as big data analytics, machine learning, statistics and signal processing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | –                                         | A-F          | English                  | –                                                                                           |
| SEEM5580    | Advanced Stochastic Models     | 3     | The course introduces basic stochastic models. We will discuss Poisson Process, Discrete and Continuous time Markov Chains, Martingales and Brownian motions. Applications including queueing models, inventory models and financial models will also be discussed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | –                                         | A-F          | English                  | –                                                                                           |
| SOCI6001    | Advanced Theory                | 3     | Please see the URL <a href="http://www.soc.cuhk.edu.hk/postgraduate/mphil-phd-programme/mphilphd-course-list/">http://www.soc.cuhk.edu.hk/postgraduate/mphil-phd-programme/mphilphd-course-list/</a> (effective from August 1, 2021)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | –                                         | A-F          | English                  | –                                                                                           |
| SOCI6002    | Advanced Methodology           | 3     | Please see the URL <a href="http://www.soc.cuhk.edu.hk/postgraduate/mphil-phd-programme/mphilphd-course-list/">http://www.soc.cuhk.edu.hk/postgraduate/mphil-phd-programme/mphilphd-course-list/</a> (effective from August 1, 2021)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | –                                         | A-F          | English                  | –                                                                                           |
| STAT5005    | Advanced Probability Theory    | 3     | Measure theory concepts needed for probability. Expectation, distributions. Laws of large numbers and central limit theorems for independent random variables. Characteristic function methods. Conditional expectations, martingales and martingale convergence theorems. (For students in MPhil-PhD Statistics)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | A good understanding of basic probability | A-F          | English                  | Subject to teacher's approval on individual application.<br>Quota for visiting students: 10 |

**Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students  
(2021-22, Term 1)**

**Institution: The Chinese University of Hong Kong**

| Course Code | Course Title                        | Units | Keyword Syllabus or<br>Brief Subject Description                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Pre-requisites<br>(if any)                                                | Result Grade | Medium of<br>Instruction | Remarks, if any                                                                             |
|-------------|-------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------|--------------------------|---------------------------------------------------------------------------------------------|
| STAT5010    | Advanced Statistical Inference      | 3     | This course is concerned with the fundamental theory of statistical inference. Topics include exponential families of distributions, sufficient statistics, convex loss functions, UMVU estimators, performance of the estimators, the information inequality and the principle of equivariance. Bayes estimation, minimax estimation, large-sample comparisons of estimators and asymptotic efficiency. (For students in MPhil-PhD Statistics; For students in MPhil Risk Management Science)               | For students in MPhil, or PhD Statistics or permission of Instructor      | A-F          | English                  | Subject to teacher's approval on individual application.<br>Quota for visiting students: 10 |
| STAT5050    | Advanced Statistical Computing      | 3     | This course covers the theory and application of advanced statistical computer algorithms for solving analytically intractable problems. Typical problems include root finding, numerical integration, optimization, model selection. Specific algorithms discussed may include Newton-Raphson, Monte Carlo integration, EM, importance sampling, Markov chain Monte Carlo algorithms, simulated annealing, and bootstrap.                                                                                   | Statistical Inference course for PhD students or permission of Instructor | A-F          | English                  | Subject to teacher's approval on individual application.<br>Quota for visiting students: 10 |
| STAT5060    | Advanced Modeling and Data Analysis | 3     | This course covers recent developments in statistical modeling and data analysis. Topics may include generalized linear models (GLM), mixed effects models, hierarchical models, mixture models, generalized additive models, hidden Markov model, Bayesian network, and other advanced statistical models. Statistical analysis for different types of data, such as discrete data, non-normal continuous data, hierarchical/heterogeneous data, longitudinal data, and incomplete data, will be discussed. | Course for PhD students or permission of Instructor                       | A-F          | English                  | Subject to teacher's approval on individual application.<br>Quota for visiting students: 10 |