Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students
(2023-24, Term 2)
Institution: The Chinese University of Hong Kong

Course Code	Course Title	Units	Keyword Syllabus or Brief Subject Description	Pre-requisites (if any)	Result Grade	Medium of Instruction	Remarks, if any
ARTS6002	Advanced Studies in the Humanities	3	Course Topic: Discourses and forms of thought in philosophy with respect to their intercultural relevance Course overview The lecture focusses on two main topics, which are intended to shed light on each other with regard to their prerequisites and conditions: On the one hand, the intrinsic structures of historical and systematic approaches to discourse will be presented and discussed with regard to their respective forms of thought; on the other hand, this will be approached with a view to non-European concepts of philosophy. It is therefore not a question of comparing so-called European-Western and non-European thought, which would be too simple anyway and would also encourage certain stereotypes such as "East and West" or "West versus East". Nevertheless, the focus of the lecture will be on the intercultural relevance of philosophical forms of thought, even if these may have been decidedly Western or Eastern at the time of their emergence. Only in the course of the globally active history of thought did it become increasingly clear that and how we owe it to each other to recognise and acknowledge the respective other sides, also in order to prevent our own hegemonic ambitions.	-	A-F	English	-
BASA6002	Research Methodology in Behavioural Studies II	3	This course is the continuation of BASA6001. The course covers selected advanced topics associated with the behavioral research process. In particular, students will learn how to apply various types of research design and statistical methods, and how to interpret the results. Sample topics include among others experimental design, measurement theory, cross-cultural research, significance tests and statistical power, interaction and moderating effects, multi-level analysis, confirmatory factor analysis, and structural equation modeling. 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.	BASA6001 or with instructor's permission.	A-F	English	Quota for visiting students: 5
CENG5270	EDA for Physical Design of Digital Systems	3	This course aims to present the fundamental concepts and algorithms applied in Design Automation (CAD) of VLSI circuits. The scope will include various areas in Physical Design of digital systems, including circuit partitioning, FPGA technology mapping, floor planning, placement, routing, compaction and interconnect optimization.	CSCI2100 or ENGG2020 or ESTR2102 or ESTR2104.	A-F	English	Lecture Required, Interactive Tutorial Optional
CHLL6161	Special Topics in Chinese Linguistics II	3	Traditional philology and modern linguistics, with emphasis on special topics, authors or schools.	-	A-F	Putonghua	-
CHLL6351	Special Topics in Pre-Modern Chinese Fiction and Drama I	3	Critical study of classical Chinese drama and fiction, with emphasis on particular authors, works, or schools.	-	A-F	Putonghua	-
COMM5330	Qualitative Communication Research	3	This course is a graduate-level introduction to the qualitative methodology in communication. It will provide students with hands-on experiences with different approaches such as discourse analysis, ethnomethodology, ethnography and biographic method.	-	A-F	English	Quota for visiting students: 4
COMM6320	Digital Research	3	How has the rise of digital media, new data landscape, and computational tools transformed the process of knowledge generation and academic production? In preparing students to engage with this digital social and research environment, this course has three interrelated foci: (1) To introduce epistemological and ontological perspectives on the concepts of data, analytics, and knowledge production; (2) To discuss emerging theoretical approaches to studying digital media-rich phenomenon; (3) To provide basic training on selecting digital data analytic tools and techniques, with an aim to incorporate these skills in research projects.	-	A-F	English	Quota for visiting students: 4
CSCI5010	Practical Computational Geometry Algorithms	3	This course will discuss data structures and algorithms for solving fundamental problems in computational geometry with good theoretical guarantees. Topics covered include line-segment intersection, polygon triangulation, convex hull, linear programming, orthogonal range searching, point location, voronoi diagram, delaunay triangulation, and so on.	CSCI2100 or ESTR2102 or CSCI2520 or equivalent.	A-F	English	Lecture Required, Interactive Tutorial Optional
CSCI5030	Machine Learning Theory	3	This course first introduces fundamentals of machine learning with a large size of samples, including basic principles (maximum likelihood vs least redundancy) and typical structures (linear systems of hidden factors, mixture of local structures, and Markov temporal models), The second part of the course covers learning theories towards small sample size challenge, including major topics (model selection, learning regularization, two stage implementation, sparse learning, and automatic model selection) and three streams of efforts, namely generalization error estimation (CV, AIC, VC theory), shortest coding length (MML vs MDL) or similarly various Bayes (BIC, MAP, Laplace, marginal, and variational), and BYY learning (BYY system, best harmony theory, Ying-Yang alternation updating, and five action circling implementation).	-	A-F	English	Lecture Required, Interactive Tutorial Optional
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 modelling (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	Lecture Required, Interactive Tutorial Optional. Advisory: Students are expected to have the background of deep learning, machine learning, linear algebra, programming, and data structure.
CULS6070	Special Topics: Screen Technologies & Cultures	3	The goal of this seminar is to encourage new critical scholarship on the relationships between screen technologies, screen spaces, and cultural screen practices. Participants will leave this seminar able to critically engage with theories, materialities, and cultural accounts linked to screens from a range of interdisciplinary contexts, including that of cinema, television, video, computation, and cultural studies, as well as studies in architecture, urban design, advertising, critical geography, performance, and (often public) infrastructure and art – all further situated within a range of spaces, ecologies, and processes.	-	A-F	English	-
DSME5121	Econometric Theory and Applications	3	This course is designed for business Ph.D. students who need to apply econometrics in their research. The major contents of this course will focus on two parts. The first part will cover fundamental econometrics topics such as ordinary least squares, instrumental variable estimation, panel data models, and generalized linear model. The second part will cover topics about business causal inference by either randomized field/lab experiments or natural experiments such as matching, difference-in-differences, and regression discontinuity design. This course is a graduate econometrics course that emphasizes application in practice. Knowledge of multivariate calculus, linear algebra, statistics, and econometrics at the undergraduate level is preferred.	-	A-F	English	-

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DSME6635	Artificial Intelligence for Business Research	3	Modern artificial intelligence (AI) has largely reshaped our world over the past 10 years. This course is designed to prepare students from a broad range of business areas (e.g. Finance, Marketing, Accounting, Management, Operations, Information Systems, Business Economics, Hotel Management etc.) for the cutting-edge research that connects AI and business. At a high-level, students taking this course will learn the followings: • Fundamental concepts/methods of machine learning (ML) and AI that are used in business research ; • How business researchers have utilized ML/AI and what managerial questions have been addressed by ML/AI in the past several years ; • The huge mismatch between AI technologies and the adoption of AI technologies in our fields.	-	A-F	English	-
EASC5104	Advanced Topics in Atmospheric Dynamics	3	This course introduces the basics of geophysical fluid dynamics. Topics include fundamental governing equations, scale analyses of geophysical flows in the Earth's atmosphere and ocean, filtered models, waves, vorticity, quasi-geostrophic theory, bartropic and baroclinic instabilities.	-	A-F	English	Subject to teacher's approval on individual application.
EASC5140	Seismology	3	This course focuses on the concepts and theory of elastic wave propagation and physics of earthquake. The topics covered include the Earth's internal structure, material elasticity, travel time tomography, seismic ray theory, ray tracing, and earthquake source parameter. Methods and field practice of seismological survey and programming methods of data processing will also be introduced.	-	A-F	English	Subject to teacher's approval on individual application.
EASC5520	Numerical Methods and Modeling for Earth and Atmospheric Sciences	3	This course covers the principles of numerical methods and modeling relevant for earth and atmospheric sciences applications. Topics include: optimization; interpolation; finite differencing; numerical solutions to ordinary and partial differential equations; programming numerical models; filtered models; boundary conditions; subgrid-scale processes; data assimilation; applications in earthquake, climate, air quality, weather forecast and groundwater models. Python will be used in this course.	-	A-F	English	Subject to teacher's approval on individual application.
EASC5540	Remote Sensing – Principles and Applications	3	Remote sensing observations are critical for monitoring regional and global changes, determining spatial and temporal variability of the Earth System, and addressing fundamental global issues. This course introduces the basic physical principles of remote sensing, including electromagnetic waves and radiation, optical, microwave, and non-imaging remote sensing. It also presents key concepts and examples on remote sensing applications in Earth system science, such as the atmosphere, lithosphere, hydrosphere, cryosphere, and global changes. This course also provides computer-based lab exercises that facilitate the understanding of remote sensing principles and the processing of remote sensing data.	-	A-F	English	Subject to teacher's approval on individual application.
EASC5550	Practical Atmospheric Modeling	3	Numerical modeling is indispensable in atmospheric science. This course introduces the basic principles behind atmospheric numerical modeling and provides hands-on practice in performing numerical simulations on computers. Specifically, students will learn pre-processing data, modeling, and post-processing data. We will introduce basic skills in model development as well. Students can anticipate grasping the basic skill of using one atmospheric model (or one atmospheric chemistry model).	-	A-F	English	Subject to teacher's approval on individual application.
ECON5150	Applied Econometrics	3	Please visit: https://www.econ.cuhk.edu.hk/econ/en-gb/programs/curriculum/course-offered/postg	Graduate Econometrics or Mathematical Statistics.	A-F	English	-
ECON5160	Game Theory	3	Please visit: https://www.econ.cuhk.edu.hk/econ/en-gb/programs/curriculum/course-offered/postg	Graduate Microeconomics and Macroeconomics.	A-F	English	-
ECON5180	Economics and Data Science	3	Please visit: https://www.econ.cuhk.edu.hk/econ/en-gb/programs/curriculum/course-offered/postg	Graduate Microeconomics and Macroeconomics.	A-F	English	-
ECON5480	Industrial Organization	3	Please visit: https://www.econ.cuhk.edu.hk/econ/en-gb/programs/curriculum/course-offered/postg	Graduate Microeconomics and Econometrics.	A-F	English	-
ELEG5060	Applied Functional Analysis and Approximation Theory	3	This course will provide graduate students with a panorama of functional analysis and approximation theory in multiple dimensions, adopting a systematic dual point of view (functions defined through a collection of measurements, weak formulations). The emphasis will be laid on the simplest, albeit modern mathematical concepts and mechanisms, with a view to avoid extraneous formalism and more abstract (e.g., topological) considerations. This knowledge will be used to modelise engineering problems (e.g., data acquisition, sampling), to devise methods for solving exactly or approximately the inverse problems that are related (e.g., resulting from partial differential equations), and to analyse the error resulting from the approximations.	-	A-F	English	Quota for visiting students: 5
ENGE5270	Major Contemporary Novels	3	This course explores, at an advanced level, the nature of twentieth-century fiction. Topics to be considered include developments in the form of narration particularly in relation to modernism and postmodernism, the changing concerns of twentieth-century writers, and the relationship of the novel to other contemporary genres. Throughout, attention will be paid to ways in which the novel remains a powerful vehicle for the communication of ideas in our time.	-	A-F	English	-
ENGE5280	Aspects of Contemporary Poetry	3	This course focuses on poetry of the twentieth century, covering such trends as modernism and postmodernism, formalist poetry, language poetry, and the long poem. Students are encouraged to read poetry against the background of specific historical and cultural developments of the twentieth century including post-colonialism and feminism. The course will also review twentieth-century innovations in poetic form as well as contemporary themes and values in poetry and the relationship of poetry to other forms of artistic expression.	-	A-F	English	-

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ENGE5410	Psycholinguistics	3	The course will examine some linguistic, behavioural, and neural aspects of language and speech in an English-as-a-second/foreign-language (ESL/EFL) or English-related bilingual context. Selected issues in speech perception, language comprehension and language production as well as the intermediate stages that comprise the language of thought will be considered. Special attention will be given to some current, representative models of discourse comprehension and production and their relevance to second language teaching and learning.	-	A-F	English	-
ENGE5420	Sociolinguistics	3	This course provides a survey of the relationship between social variables (e.g., age, gender, ethnicity, attitude, style, location, time, social status, power, politics, and network membership) and variations in language in use. Some key areas covered include language attitudes and choice, language maintenance and shift, code alternation, contact languages, standard and vernacular languages, language planning and policy, regional and social dialects, influences of age and gender on language in use, politeness theory, linguistic stereotyping, as well as culture and language. Sociolinguistic research methods are also introduced.	-	A-F	English	-
ENGE5560	Second Language Teaching	3	This course is designed to help students develop robust understanding about how instruction can facilitate second language acquisition. It begins with theories underlying implicit and explicit second language instruction. Then, various pedagogical approaches to second language grammar and vocabulary development are introduced, highlighting the differences between input-based and output-based instruction. In addition, this course reviews empirical findings on the effects of various pedagogical interventions on second language learning so that students can understand the importance of theoretically supported pedagogical approaches in second language teaching.	-	A-F	English	-
ENGE5620	The Acquisition and Teaching of L2 Pronunciation	3	This course focuses on both the development of a second language sound system as well as how to teach second language pronunciation.	-	A-F	English	-
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	-
ENGE5720	Comparative Approaches in Literary Studies	3	The course serves as an introduction to the advanced study of literature from comparative perspectives. With a view to enhancing their ability in identifying problems and topics for research, students will be familiarized, through team-work instruction, with the basic techniques and methods of bibliographical research and textual criticism. This will involve the use of specific primary texts. Emphasis will be put on giving the students an overview of historical as well as current research in the field. The concept of comparative literature will be investigated along with the various cultural as well as literary issues particularly involved in the studies of literature in the Chinese-Western context. Traditional areas of research, such as influence and reception, themes and motifs, genres and forms, and interrelations of literature and art, will be reviewed in the light of recent literary and cultural theories. In this course students will have to read major literary and critical texts with regard to the various perspectives on comparative literature.	-	A-F	English	-
ENGE5750	Special Topic(s) in Genre Studies	3	Specific area(s) of investigation will be defined every year to cover one or more of the following aspects in the critical and comparative studies of literary genre: poetics, prosaics; dramatic theories; narrative theories; questions of form and structure; issues in theme and style; concepts of character and hero; problems of generic convention and institution; as well as other topics related to the study of particular genres or subgenres of poetry, drama and fiction. Emphasis will be put on the dialectic between theory and practice. Textual analysis will be treated in relation to the critical investigation of possible cultural and historical contexts. Subject to the approval of the Division Head, students are allowed to take the above course more than once and gain the units each time they pass the course. However, students cannot take courses with the same course code more than once in a single term.	-	A-F	English	-
ENGE5950	Special Topic(s) in Critical Studies	3	This course is designed to investigate areas of specialisation normally not covered under generic studies or literary history. It may involve any one of the following areas in the comparative and interdisciplinary studies of literature: thematology, textual criticism and reader response, aesthetics, Western critical theories and Chinese literary studies, problems in the histories of literary criticism; twentieth-century critical theories; literature and the other arts; literature and sociology; literature and philosophy; literature and history; literature and language; literature and culture. Subject to the approval of the Division Head, students are allowed to take the above course more than once and gain the units each time they pass the course. However, students cannot take courses with the same course code more than once in a single term.	-	A-F	English	-
ENGG5202	Pattern Recognition	3	This course provides an introduction to the important concepts, theories and algorithms of pattern recognition. The topics cover Bayesian decision theory, maximum likelihood and Bayesian parameter estimation, support vector machine, boosting, nonparametric pattern recognition methods, and clustering. It also includes applications of pattern recognition in different fields. Students taking this course are expected to have the background knowledge of calculus, linear algebra, probability and random process as a prerequisite. Pre-requisite: ELEG3410 or with the consent of the instructor.	-	A-F	English	Quota for visiting students: 5
ENGG5281	Advanced Microwave Engineering	3	This course is designed to introduce the Advanced Microwave Engineering. Topics will be selected from the following: Linearization techniques for RF power transmitters, high frequency circuit packaging, microwave filter design, LTCC/MCM technology, computer-aided design of microwave circuits, electromagnetic simulation, antennas and propagation.	Students should have attended courses in antennas and propagation, electromagnetic fields, and microwave engineering.	A-F	English	Quota for visiting students: 5
ENGG5282	Nanoelectronics	3	Review of semiconductor physics. Electrons in nanostructures: density of states, quantum confinement, transport properties, nanocontacts, Coulomb blockade. Nanoscale fabrication and synthesis: lithography, nanopatternning, epitaxy and heterostructure, self-assembly, other techniques. Nanoscale characterization: scanning probe microscopy and other microscopic techniques, nanoscale electrical measurements. Nanoscale devices: nano-MOSFETs; carbon nanotube devices, nanowire- and nanoparticle-based devices, organic thin film devices, molecular electronic devices, applications, and commercialization.	ELEG2510 or equivalent.	A-F	English	Quota for visiting students: 5

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ENGG5403	Linear System Theory and Design	3	Linear system theory and design is the core of modern control approaches, such as optimal, robust, adaptive and multivariable control. This course aims to develop a solid understanding of the fundamentals of linear systems analysis and design using the state space approach. Topics covered include state space representation of systems; solution of state equations; stability analysis; controllability and observability; linear state feedback design; observer and compensator design, advanced multivariable control systems design, decoupling and servo control. This course is a must for higher degree students in control engineering, robotics or servo engineering. It is also very useful for those who are interested in signal processing and computer engineering.	-	A-F	English	-
ENGG5601	Principles of Biomechanics and Biomaterials	3	This course focuses on biomechanics (biostatics, biodynamics, mechanics of biological solids), biomaterials (metals, ceramics, synthetic polymers, natural polymers, composites; characterization of biomaterials; biomaterial scaffolds for regenerative medicine) & clinical applications in the musculoskeletal system (including, sports, traumatology, and rehabilitation), cardiovascular system, and dentistry.	-	A-F	English	Quota for visiting students: 5
GPAD5290	Contemporary Political Science	3	The objective of this course is to acquaint students with the state of the art in political science. The course will analyse recent developments of the discipline pertaining to its scope, methodology, theory and approach. Particular attention will be given to areas where debates and controversies have contributed to the development of knowledge in the field. The ethos, concerns and research concentration of the discipline will also be discussed.	-	A-F	English	-
HIST6016KW	Selected Themes in Comparative History: Japanese-Chinese Translation for Historical Research	3	This course enables students to acquire thorough understanding of the Japanese grammar including morphology and syntax up to advanced level, sentence patterns as well as important Japanese reference tools, which are instrumental in reading different kinds of historical works in Japanese. Details: https://www.history.cuhk.edu.hk/course/2023242_hist6016kw/	-	A-F	Putonghua & Japanese	Quota for visiting students: 2
HIST7016KW	Selected Themes in Comparative History: Japanese-Chinese Translation for Historical Research	3	This course enables students to acquire thorough understanding of the Japanese grammar including morphology and syntax up to advanced level, sentence patterns as well as important Japanese reference tools, which are instrumental in reading different kinds of historical works in Japanese. Details: https://www.history.cuhk.edu.hk/course/2023242_hist7016kw/	-	A-F	Putonghua & Japanese	Quota for visiting students: 2
LING6902	Phonological Theory	3	The course aims to introduce the development of phonological theory over the past half centruy 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	-
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	-
LING6970	Special Topics in Linguistics (Syntax and Syntactic Typology)	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 pcourse. However, students cannot take the same topic twice.	-	A-F	English	-
LING6980	Research Methodology	3	The course adopts an interactive, problem-based approach, with an aim to training students in conducting linguistics research on a topic of their interest. Focus will be on linguistic analysis and empirical methods in language rsearch. Students may be required to conduct linguistic research through field trips.	-	A-F	English	-
MAEG5030	Geometric Computing for Design and Manufacturing	3	Geometric computing tools have been widely used in modern product design and realization, such as all kinds of Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM) and Computer-Aided Engineering (CAE) software systems. However, the capability of simply using these CAD, CAM and CAE software systems is not sufficient for future products design and manufacturing. This course aims to help students in understanding the principles of geometric computing behind CAD, CAM and CAE systems, and provides students with deep understanding of computational techniques and practical experience in developing novel computational design and manufacturing applications.	-	A-F	English	-
MAEG5070	Nonlinear Control Systems	3	This course consists of two parts. The first part is analysis of nonlinear systems, which includes state space description of nonlinear control systems, phase plane analysis of second order dynamic systems, Lyapunov's stability theory such as Lyapunov's first method, second method, Barbalat's lemma, and total stability. The second part is design of nonlinear control systems, which includes Jacobian linearization, feedback linearization, sliding mode control, and backstepping method.	-	A-F	English	-
MATH5022	Theory of Partial Differential Equations II	3	This course introduces basic theories on elliptic partial differential equations. The topics include: Classic theories on harmonic functions, Maximum principles, W2,p estimate (Calderon Zygmund theory), Schauder estimate, and De Giorgi-Nash-Moser estimate. If time permits, the following special topics will also be introduced: Regularity theories on harmonic maps, Dirichlet eigenvalue problems, Steklov eigenvalue problems, and Related topics on the nodal set of eigenfunctions. The course will be evaluated by final exam (50%) and students' presentation on some selected topics (50%). Reference: Fanghua Lin and Qing Han: Elliptic partial differential equations second editions; Gilbarg and Trudinger: Ellptic partial differential equations of second order; Ambrosio: lectures on Elliptic partial differential equations; Fanghua Lin and Changyou Wang: The analysis of harmonic maps and their heat flows. Leon Simon: Regularity theory for harmonic maps	-	A-F	English	-
MATH5061	Riemannian Geometry I	3	This course is intended to provide a solid background in Riemannian Geometry. Topics include : affine connection, tensor calculus, Riemannian metric, geodesics, curvature tensor, completeness and some global theory. Students taking this course are expected to have knowledge in differential geometry of curves and surfaces. Textbook and References : We will not be using just one single textbook for the course. Instead, we will pick up some topics in the following references: • S.S. Chern, W.H. Chen and K.S. Lam, Lectures on Differential Geometry • M. do Carmo, Riemannian Geometry • S. Gallot, D. Hulin and J. Lafontaine, Riemannian Geometry • J. Jost, Riemannian Geometry and Geometric Analysis • J.M. Lee, Riemannian Manifolds: An Introduction to Curvature Assessment Scheme • Assignments: 50% • Final Examination (to be confirmed): 50%	-	A-F	English	-

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MATH6042B	Topics in Differential Equations II	3	This is a topic course on recent progress in free-boundary problems in mathematical fluid dynamics. I will discuss several papers in this direction. The assessment of this course is based on: class attendance - 10% final project - 90%	-	A-F	English	-
MATH6082	Topics in Analysis II	3	This course will consist of two parts. In the first part, I will present some basic concepts in geometric measure theory (e.g., Hausdorff measure, content, dimension of sets and measures). In the second part, I will introduce the fundamental theory of Diophantine approximation. This theory consists of defining properly a notion of speed rate of approximation by a sequence of dense points of interest (actually we will mainly deal with rational numbers in this course) and studying the Hausdorff dimension and measures of the sets of points approximable at a given speed rate. In particular, we will establish a Hausdorff measure version of the theorem of Koivusalo and Rams (the so-called Mass transference principle from ball to arbitrary shape, https://arxiv.org/pdf/1812.08557.pdf) and compute the Hausdorff dimension of various sets using an appropriate version of it. Here are some references for this course: 1. H. Koivusalo and M. Rams, Mass transference principle: from balls to arbitrary shapes. Int. Math. Res. Not. IMRN(2021), no. 8, 6315–6330. 2. V. Beresnevich, S. Velani, A mass transference principle and the Duffin-Schaeffer conjecture for Hausdorff measures. Ann. of Math. 164 (2006), 971–992. 3. B.-W. Wang, J. Wu, J. Xu, Mass transference principle for limsup sets generated by rectangles. Math. Proc. Cambridge Philos. Soc. 158 (2015), no. 3, 419–437.	-	A-F	English	-
MGNT6022	Advanced Seminar in Organizational Behavior and Human Resource Management	3	This course is an introduction to theories and research pertaining to individuals and teams in organizations. Topics covered include prosocial and deviant behaviors, creativity and motivation, decision making, affect, trust, justice, leadership, diversity, team dynamics and cross-cultural research.	-	A-F	English	-
MGNT6182	Advanced Social Psychology for Business Research	3	This course is designed to survey the major theories and research in understanding human behaviors in social contexts. In the first two weeks, students will be required to learn about or re-familiarize themselves with classic theories and research in social psychology. In the remainder of the course, students will learn major theories that guide contemporary research in social psychology and how the theories can be used to generate novel hypotheses in business studies.	-	A-F	English	-
MGNT6232	Advanced Seminar in Management Theory	3	This seminar course introduces students to the foundations and applications of major management theories used in organizations and management. The course will begin with an overview of the theoretical paradigms in management and trace the development of influential management theories such as transaction cost theory, agency theory, institutional theory, resource based view, resource dependence theory, and organizational learning theory. The course covers seminal articles of each theory as well as its applications in the fields of management. The focus is on theory development, theorization of management phenomena, and theory extension.	-	A-F	English	Quota for visiting students: 5 Interested students are advised to contact Professor William Wan first.
MKTG7162	Advanced Seminar in Marketing - Analytical Models	3	This seminar course emphasizes on analytical modeling methods in marketing studies. It will cover a wide range of topics including consumer search models, marketing-mix models, competitive marketing strategies, behavioral industrial organization, and research advances in e-marketing. The course will also introduce some basic analytical tools from areas of decision science, economics, and statistics.	-	A-F	English	-
PHYS5350	Techniques in Materials Characterization	4	Principles and operation of materials characterization techniques with electron sources atom and ion sources, X-ray diffractometry and other techniques. This course also provides experiments on microstructural analysis of materials for practice and illustration of selected subject matters.	-	A-F	English	-
PHYS5420	Classical Electrodynamics	3	This course is intended to provide an introduction to the theory of classical electrodynamics at the graduate level. The emphasis is on the problems of electromagnetic radiation and the covariant formulation of electrodynamics. Selected topics of current research interest will also be discussed.	-	A-F	English	Quota for visiting students: 3
PHYS5520	Topics in Theoretical Physics (Introduction to Many-body Theory)	3	This course provides an introduction to the basic concepts and theoretical techniques of the quantum theory of many-body systems at zero-temperature as well as at finite temperature. Topics covered include: second quantization, Green's functions at zero-temperature, Green's functions at finite temperature, perturbation theory and Feynman diagram, equations of motion of the Green's functions, linear response theory, and applications of many-body theory in condensed matter physics.	PHYS4021, 4031, 4050 or their equivalents, or permission of teacher.	A-F	English	-
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 frontier biophysics 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	-
SEEM5120	Advanced Topics in SE&EM (I) 系統工程與工程管理學高級專題(一)	3	This course is designed to investigate and to discuss selected advanced topics of current interest in Systems Engineering and Engineering Management.	For students in MPhil-PhD Systems Engineering and Engineering Management.	A-F	English	-
SEEM5121	Advanced Topics in SE&EM (II) 系統工程與工程管理學高級專題(二)	3	This course is designed to investigate and to discuss selected advanced topics of current interest in Systems Engineering and Engineering Management.	For students in MPhil-PhD Systems Engineering and Engineering Management.	A-F	English	-
SEEM5202	Seminars in Systems Engineering and Engineering Management (II)	3	Students are required to attend all seminars during the term.	For students in MPhil-PhD Systems Engineering and Engineering Management.	P/U	English	-

Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students
(2023-24, Term 2)
Institution: The Chinese University of Hong Kong

Course Code	Course Title	Units	Keyword Syllabus or Brief Subject Description	Pre-requisites (if any)	Result Grade	Medium of Instruction	Remarks, if any
SEEM5350	Numerical Optimization	3	This course is to teach students modern numerical optimization methods for large scale systems. Topics covered in this course include gradient method, subgradient method, proximal gradient method, Nesterov's acceleration technique, alternating direction method of multipliers, coordinate descent method, and stochastic / randomized algorithms. Applications of these optimization methods for solving problems in contemporary applications arising from big data analytics, machine learning, statistics, signal processing etc. will also be discussed.	For students in SEEM MPhil/PhD programme and RPg programmes under Faculty of Engineering.	A-F	English	-
SEEM5570	Numerical Methods in Finance	3	This course emphasizes the use of numerical methods for solving financial problems. The numerical methods include: binomial trees, Monte Carlo simulation, stochastic programming, linear/quadratic control models and semidefi nite programming techniques. Those techniques will be applied, among other things, to: option pricing, index tracking, portfolio optimization, interest rate models, and asset/liability management.	For students in MPhil-PhD Systems Engineering and Engineering Management.	A-F	English	-
SEEM5650	Integer Programming	3	The course deals with theory and algorithms for solving integer and combinatorial optimization problems. Theoretical topics include general concepts such as relaxations, bounds, duality, and total unimodularity. Solution methods cover branch-and-bound, cutting planes, branch-and-cut, Lagrangian relaxations, local search, and metaheuristics. Optimization software and programming languages will be used to implement the methods for solving optimization problems.	For students in MPhil-PhD Systems Engineering and Engineering Management.	A-F	English	-
SOCI6003	Advanced Statistical Analysis	3	This course focuses on the causal modelling on different types of data. A major part of the discussion will be given to OLS regression in order to illustrate the modelling techniques needed for causal analysis. With this foundation, the lecture will move on to discuss the more sophisticated methods that require a deeper understanding of the statistical literature. Discussion will emphasize both the statistical reasoning underlying these methods and their empirical applications. At the end of the course, students should have sufficient exposure to a wide range of analytical methods, helping them to appreciate the quantitative research literature and to conduct their own empirical analyses.	-	A-F	English	-
SOCI6004	Advanced Qualitative Methods	3	This course examines qualitative methods used in social science research. Since qualitative research is both an 'analytic mentality' and a set of practical skills, the course will focus both discussions of key methodological and empirical readings as well as on practical skills, such as case and informant selection, field experiences, interview techniques, writing field notes, and analyzing and writing qualitative data. The course is in a seminar format. Lectures will be interwoven with discussions. Students are also required to conduct a small-scale pilot qualitative research project using the skills discussed in the seminar.	-	A-F	English	-
STAT5020	Topics in Multivariate Analysis 多元分析專題	3	This is an advanced course on multivariate analysis. Topics may include: Multivariate central theorem, and its applications, factor analysis, structural equation models, and latent variable models.	For students in MPhil, or PhD Statistics or permission of Instructor.	A-F	English	Subject to teacher's approval on individual application. Quota for visiting students: 10
STAT5030	Linear Models 線性模型	3	This course introduces fundamental elements related to linear statistical models. The major substance of this course covers: classical distribution theory; full-rank linear models; non-full-rank linear models; advanced topics related to modern linear models, including penalized regression, variable selection and screening methods, etc.	For students in MPhil, or PhD Statistics or permission of Instructor.	A-F	English	Subject to teacher's approval on individual application. Quota for visiting students: 10
STAT6040	Studies on Selected Topics II 研討班	3	This is a graduate-level seminar course. Recent topics on computer-intensive statistical method are selected for discussion. For this semester, the topics are on probabilistic modelling and computing through Bioinformatics.	Undergraduate level probability and statistical inference.	A-F	English	Quota for visiting students: 10
STAT6060	Studies on Selected Topics IV 研討班	3	This course will mainly focus on two topics in statistics. One is quantile regression, which extends classical least squares methods for estimating conditional mean functions by offering a variety of methods for estimating conditional quantile functions. The quantile regression enables us to explore more thoroughly heterogeneous covariate effects. The course will offer an introduction to quantile regression methods and briefly survey some recent developments. The other one is random forest, which is an ensemble of regression and classification trees constructed from recursive partitions. It is a powerful tool for prediction and is widely used across many fields. The course will offer an overview of the random forest and focus on one recent development, generalized random forest. Course lectures will be complemented by several computationally oriented interludes designed to give students some experience with applications of the methods. These sessions will be conducted in the opensource R language and will rely heavily on quantreg package, grf package, and other related packages.	Course for MPHIL/PHD students or permission of Instructor.	A-F	English	Subject to teacher's approval on individual application. Quota for visiting students: 10