

**Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students
(2019-20, Term 1)**

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
ACCT7110	Issues in Financial Accounting	3	Current research topics in financial accounting. These include accounting information and capital market behavior, the economic consequences of both mandatory and voluntarily public announcements made by firms, effects of agency costs and debt covenants on the behavior of firms' reporting choices, fundamental analysis of accounting data, compensation schemes and financial reporting.	-	A-F	English	Quota for visiting students: 5
ANTH5250	Seminars in the Anthropology of China I	3	Students in this course will read and discuss the major ethnographies and other anthropological studies on China. Readings will provide students with general knowledge of the anthropology of China, but will vary year to year depending on the teacher.	-	A-F	English	Subject to teacher's approval on individual application
ANTH6010	Seminars in Anthropological Theory	3	The course provides an advanced review of major theoretical approaches in anthropology, from classic theories of Morgan, Tyler, Weber, and Durkheim, through the influential theories of Boas, Radcliffe-Brown, Levi-Strauss, Geertz and Douglas, to more recent theories.	-	A-F	English	Subject to teacher's approval on individual application
BASA 6001	Research Methodology in Behavioural Studies I	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	-
CHEM5301	Colloids and Surface Chemistry	2	Colloids are of increasing importance in both industry and academics. Not only do many commercial products involve colloids, but research in modern chemistry, biology, material science, and physics often require knowledge of the colloidal domain. This course will give the student an introduction to the physico-chemical principles governing surface phenomena and the properties of colloidal materials. We will explore the interactions and self-organization on the nanometer and micron scale with great relevance for material engineering as well as biological processes.	A good understanding of Physical chemistry	A-F	English	-
CHEM5560	Organometallic Chemistry & Catalysis	2	Catalysis is a cutting-edge science and plays a central role in modern organic synthesis. Enjoying the modification of the ligand, the activity of the transition metal complex can be manipulated to fit specific catalysis. This course will give students an in-depth understanding of catalyst structures via organometallic and organic chemistry approaches, and how those catalyst (transition metal complex) can be applied in sustainable and complex chemical synthesis. The industrial applications of some tailor-made catalysts will also be discussed. In this course, student presentation of current frontier catalysis is required.	-	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 xiaohuo of the Mine). Particular attention will be paid to the parallel transformations of the economy and of the legal system in Mine.	-	A-F	English	Quota for visiting students: 7
CHLL6161	Special Topics in Chinese Linguistics II	3	Traditional philology and modern linguistics, with emphasis on special topics, authors or schools.	-	A-F	Putonghua	Quota for visiting students: 10
CHLL6341	Special Topics in Classical Chinese Poetry II	3	Critical study of classical Chinese poetry, with emphasis on particular authors, works or schools.	-	A-F	Putonghua & Cantonese	Quota for visiting students: 10
COMM 5330	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: 5
CSCI5170	Theory of Computational Complexity	3	This course introduces some of the following topics: deterministic and non-deterministic Turing machine, time and space complexity, NP-completeness, polynomial time hierarchy, probabilistic computation, interactive proofs, complexity of counting, concrete models such as query complexity, communication complexity, formula complexity, branching programs and circuit complexity, quantum computation, complexity-based cryptography, randomness-related topics such as derandomness, pseudorandomness, extractors, random walks, etc.	-	A-F	English	-
CSCI5240	Combinatorial Search and Optimization with Constraints	3	Students will be exposed to various constraint-based combinatorial search and optimization techniques that arise in artificial intelligence, operations research, etc. Topics include, but are not limited to, local propagation, consistency algorithms, Boolean constraint solving, numerical constraint solving, linear programming, search, and their applications.	-	A-F	English	-
CSCI5350	Advanced Topics in Game Theory	3	This course covers fundamental concepts in game theory. The course starts with pure strategy and mixed strategy Nash equilibrium in strategic games. It then discusses some specific types of games, including zero-sum games, Bayesian games, and introduces other types of equilibria including correlated equilibrium and evolutionary equilibrium. Extensive games, subgame perfect equilibrium, sequential equilibrium, framing effects, behavioural strategies will then be discussed. Finally, coalitional games and the core will be discussed.	Advisory: Students are expected to have taken CSCI2110 or ENGG2440 or ESTR2004, ENGG2040 or ENGG2430 or ESTR2002.	A-F	English	-
CSCI5390	Advanced GPU Programming	3	The evolution of consumer graphics hardware leads to the introduction of parallel, programmable GPUs (Graphics Processing Units). The strong parallel computational power of GPUs not only supports real-time and realistic rendering, but also the cost-effective platform for scientific computing, such as physical simulation, numerical analysis, evolutionary computation, image processing, and computer vision, etc. This course introduces the evolution of shading language and GPU, the basic concept in GPU programming and the recent advanced usage of GPU in computer graphics and general-purpose computing. Topics covered include: shader programming, procedural texture and modelling, programmable graphics pipeline, modern shading language, GPGPU (general-purpose computing in GPU), limitations of GPU, and case studies of advanced usages of GPU.	CSCI2100 or ESTR2102 or CSCI2520 or equivalent	A-F	English	-

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CULS6001	The Making of Contemporary Culture	3	This course aims to examine the ways in which contemporary culture has been produced, focusing in particular cultural products and phenomena emanating from East Asia as well as scholarship devoting to their analyses. It will introduce a range of topics (such as globalization and nationalism), research objects (film and popular culture), and approaches and methodologies from different disciplines (history, anthropology, etc.). Through the reading items the course will also guide students to reflect on questions relating to dissertation writing, from conceptualizing a topic, presenting a case to styles of argumentation.	-	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	-
EASC5103	Aerosol Physics and Chemistry	3	Knowledge of aerosol physics and chemistry such as condensation and evaporation; thermodynamics; radiative, hygroscopic properties, and cloud formation potential of aerosols; Recent advances in aerosol physics and chemistry researches; Roles of atmospheric aerosols on the critical environmental issues such as air quality, tropospheric smog, and climate change, with focus on observations, laboratory measurements and modelling.	-	A-F	English	Subject to teacher's approval on individual application
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 its 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
ECON5440	International Trade	3	Please visit: http://www.econ.cuhk.edu.hk/econ/en-gb/student-life/programmes/course-offered/postg	Graduate Microeconomics	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
ENGE5240	Creative Writing	3	The course acquaints students with the art of creative writing at an advanced level. Depending on the specialization(s) of the instructor, creative works will be explored and produced in such genres as poetry, short stories, film-scripts, and/or plays. Students will engage in intensive critique of each other's works as well as study the generic conventions of the disciplines which focus the course each year. There will also be some emphasis on exploring local and international publishing or performance avenues.	-	A-F	English	Subject to approval by the Division Head
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
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	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
ENGE5430	Second Language Acquisition	3	This course focuses on how English as a second/foreign language develops in the individual. It provides an overview of four general categories of current interests in the field; they are: 1) the internal mechanisms of learning a second language; 2) the impact of first language on second language learning; 3) the role of learners' psychological and affective characteristics and other social and functional factors in second language learning; and 4) the acquisition of English phonology, syntax, semantics and pragmatics in the second language context. Selected current theories of second language acquisition are reviewed, with particular emphasis on their relevance to Chinese learners of English.	-	A-F	English	Subject to approval by the Division Head

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ENGE5440	Language and Intercultural Communication	3	This course examines the relationship between language and intercultural communication theory, research, and practice to better understand communication between culturally diverse people. It addresses core concepts in this interdisciplinary area of study including: conceptions of culture and multiculturalism; the relationship between language, culture, power, and context; English as the primary language of intercultural/ international communication; language and identity (re)construction; race and ethnicity; generalizations and stereotypes; values, assumptions, and worldviews; nonverbal and verbal communication; intercultural relationship development; language/ culture shock and intercultural adaptation; and intercultural communicative competence.	-	A-F	English	Subject to approval by the Division Head
ENGE5450	Corpus Linguistics	3	A corpus (plural corpora) is body of written text and/or transcribed speech which can serve as a basis for linguistic analysis and description. This course explores the ways in which corpora can be used to study the frequency and distribution of linguistic items, as well as collocations, keywords, and register variation. Most of the lectures are followed by a practical session, during which students gain hands-on experience in using the corpora and software demonstrated and/or discussed in the lectures. The corpora used include the International Corpus of English (ICE), the British National Corpus (BNC), the Chinese Learner English Corpus (CLEC), and many others. Students will learn how to use standard text retrieval software, including WordSmith, ICECUP, and WMatrix. The course is heavily computer-oriented, but no programming skills are required.	-	A-F	English	Subject to approval by the Division Head
ENGE5590	Computer Applications in Second Language Teaching	3	This course enables students to understand the relationship between second language acquisition theories and computer applications to language learning (CALL) and gain familiarity with computer software and Internet resources available for English/second language teaching. Students learn to use computers and the Internet as teaching aids, design learning activities using a range of CALL software, and evaluate software and Internet resources for teaching purposes.	-	A-F	English	Subject to approval by the Division Head
ENGE5600A	Special Topics in Applied English Linguistics: Qualitative research in applied 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
ENGE5620	The Acquisition and Teaching of L2 Pronunciation	3	This course focuses on both the acquisition of a second language (L2) sound system and the teaching of L2 pronunciation. The first part of the course focuses on the acquisition of L2 phonology, and covers child first language (L1) acquisition, theories of L2 phonological acquisition, and linguistic and social factors affecting the acquisition and use of a L2 sound system. In the second part of the course, the focus is on the application of theory into practice, and examines models for English pronunciation teaching; goals, models, and issues in the development of a pronunciation curriculum; and practical guidelines for the teaching of vowels, consonants, and suprasegmentals.	-	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	-
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.	-	A-F	English	-
ENGG5108	Big Data Analytics	3	This course aims at teaching students the state-of-the-art big data analytics, including techniques, software, applications, and perspectives with massive data. The class will cover, but not be limited to, the following topics: advanced techniques in distributed file systems such as Google File System, Hadoop Distributed File System, CloudStore, and map-reduce technology; similarity search techniques for big data such as minhash, locality-sensitive hashing; specialized processing and algorithms for data streams; big data search and query technology; managing advertising and recommendation systems for Web applications. The applications may involve business applications such as online marketing, computational advertising, location-based services, social networks, recommender systems, healthcare services, or other scientific applications.	-	A-F	English	-
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. Advisory: Students are expected to have fundamental probability concepts.	-	A-F	English	-
ENGG5303	Advanced Wireless Communications	3	This course provides an extensive introduction to basic principles and advanced techniques in the physical layer of wireless communications. Topics to be covered include channel coding, MIMO and space-time processing, OFDM and multicarrier systems, spread spectrum and CDMA, channel capacity, opportunistic scheduling and diversity schemes. Advisory: A prior undergraduate level course in wireless communication is highly recommended.	-	A-F	English	-
ENGG5392	Lightwave System Technologies	3	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	-

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ENGG5402	Advanced Robotics	3	Lagrange formulation of robot dynamics, Newton-Euler equations; motion control, force control, visual servoing, grasping analysis, object manipulation; sensors and sensor networks, medical robotics, advanced topics in recent development of robotic theory and applications.	-	A-F	English	-
ENGG5404	Micromachining and Microelectromechanical Systems	3	Broad overview of microfabrication and microelectromechanical systems. Introduction to basic micromachining 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. Review of MEMS microsensors, microactuators and microstructures. Topics include accelerometers, pressure sensor, optical switches, cantilever beams, thin-film stress test structures and bulk micromachining test structures. Fundamentals of central dogma of molecular biology, cell and tissue biology. Principles of transduction and measurements of molecules, cells and tissues.	-	A-F	English	Only for students from HKU and HKUST.
ENGG5501	Foundations of Optimization	3	Convex analysis, Linear and conic programming, Nonlinear programming, Optimality conditions, Lagrangian duality theory, Basics of optimization algorithms, Selected applications http://www1.se.cuhk.edu.hk/~manchoso/1819/engg5501/	-	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
GDRS5010	Gender Studies: Theory	3	This course addresses the relation of feminism to women's/gender studies and focuses on contemporary developments in feminist theory. How feminist theorists have understood the significance of sexual difference will be considered and how feminism is articulated with theories of representation, subjectivity, and history will be discussed. In the process, how difference and differences work, conceptually and politically, paying particular attention to the complex relations of gender, racial, and class difference will be attended to. This course therefore provides a comprehensive introduction to the contemporary key approaches, theories and debates of feminist theory and the relationship of theory and practice.	-	A-F	English	Quota for visiting students: 5
GPAD5050	Qualitative Methods of Political Science	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	-
GPAD5055	Quantitative Methods of Political Science	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	-
GPAD5111	Advanced Social Science Research Methods	3	This course seeks to help post-graduate students engage with advanced quantitative issues in social science research. The course is organized around modules based on (hard) methodological challenges that social science researchers must confront at the stage of research design or data analysis, or both. The course is conceived as the last course in quantitative training to be offered for second year postgraduate students who are in the process of crafting their own thesis proposal. This course follows GPAD5055 or equivalent.	GPAD5055 or instructor's permission	A-F	English	-
GRMD5100	Advanced Geographical Methodology	3	The course introduces and reviews some of the main methodologies in conducting geographical research. It covers bibliographic research, field investigation, thesis preparation and other practical concerns. Special ways of approaching certain sub-fields of geography will also be introduced and reviewed. New techniques in geographical analysis under certainty and uncertainty will be examined.	-	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 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 & English	-
HIST6011SW	Selected Themes in Traditional Chinese History: Market Development and Government Finances in Late Imperial China 中國古代及近世史專題研究：明清市場發展與政府財政	3	The course studies selected topics on traditional China. Course contents and format are designed by the teacher.	For students in MPhil History	A-F	Putonghua	-
HIST6016WC	Selected Themes in Comparative History: Study of Material Culture: Theory and Method 比較史專題研究：物質文化研究：理論與方法	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	Putonghua	Quota for visiting students: 2
HIST7010	Graduate Seminar on Historiography 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	Putonghua & English	-
HIST7011SW	Selected Themes in Traditional Chinese History: Market Development and Government Finances in Late Imperial China 中國古代及近世史專題研究：明清市場發展與政府財政	3	Market Development and Government Finances in Late Imperial China	For students in PhD History	A-F	Putonghua	-
HIST7016WC	Selected Themes in Comparative History: Study of Material Culture: Theory and Method 比較史專題研究：物質文化研究：理論與方法	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	Putonghua	Quota for visiting students: 2
IERG5020	Telecommunication Switching and Network Systems	3	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	-

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IERG5310	Security and Privacy in Cyber Systems	3	<p>This course discusses the design and realization of security and privacy services in practical large-scale systems. Topics include: Online Identity and Authentication Management ; Safe Browsing ; Geolocation privacy ; Mobile payment systems with Smartcard/ Near Field Communications (NFC) ; e-cash ; Best privacy practices for Online Social Networks and Mobile applications ; Cloud Computing security and privacy; Trustworthy Cloud Infrastructure; Secure Outsourcing of Data and Computation ; Data Provenance; Virtual Machine security. Additional cyber security services/applications such as e-voting systems, secure and anonymous routing systems, digital rights management will also be covered.</p> <p>Advisory: Students are expected to have basic background in Cyber Security.</p>	-	A-F	English	-
IERG6120	Advanced Topics in Information Engineering I	3	<p>This course will have two parts of contents. Part I is on optimizations in networked systems including wireless networks and cloud systems. Part II is on optimization in energy systems including data centers and power grids.</p> <p>Part I: Many networked-system design problems are optimization problems in nature. Many of these large-scale problems require distributed solutions that only incur local and simple actions and at the same time attain global optimality. Distributed and stochastic optimization has become a powerful modeling language and solution tool for addressing these design problems.</p> <p>Part II: A critical challenge faced by today's energy systems is to optimize the long-term system performance subject to future demand/supply uncertainty? Recently, online optimization and algorithm design have shed new lights on addressing this "new" challenge, and have provided paradigm-shift solutions for energy systems including data centers and power grids. Optimization has also found relevant in addressing new challenges in transportation systems.</p> <p>In this course, we will study the fundamental of distributed and stochastic optimization, as well as online optimization and algorithm design. We plan to discuss two frameworks in addressing general convex and combinatorial network problems, and two frameworks on online optimization and algorithm design. We will discuss their principles, approaches, and issues involved. To keep the math vibrant, we will demonstrate their applications in various problem domains, ranging from wireless to cloud computing to power systems. We wish to illustrate how the frameworks can be applied to synthesize effective solutions, providing a useful guideline in protocol and system design in practice. In both theory and practical problem domains, we will cover classic results, current research, and open problems.</p>	-	A-F	English	-
IERG6300	Theory of Probability	3	<p>The course covers the following topics: Construction of measures, integration, transformation, product spaces, distributions, expectation, Borel-Cantelli lemmas, characteristic functions, weak convergence, independence, weak law of large numbers, strong law of large numbers, central limit theorem, conditional expectation, Markov chains, stopping times and renewal times, martingales, martingale convergence Theorems, Doob's decomposition theorem, up-crossing inequality, and Birkhoff's ergodic theorem. The focus will be on mathematical rigor and development of all the tools to prove the results formally.</p> <p>Advisory: Students are expected to have basic background in probability and real analysis at undergraduate level.</p>	-	A-F	English	-
LING6902	Phonological Theory	3	<p>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.</p>	-	A-F	English	-
LING6920	Topics in Language Acquisition	3	<p>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.</p>	-	A-F	English	-
LING6940	Linguistics Research Seminars	1	<p>This course aims at engaging 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.</p>	-	A-F	English	-
LING6970	Special Topics in Linguistics	3	<p>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.</p>	-	A-F	English	-
MAEG5030	Geometric Computing for Design and Manufacturing	3	<p>Advanced topics in recent development of computer-aided geometric design. The detailed course contents may be changed from year to year depending on the current development.</p>	-	A-F	English	-
MAEG5120	Nanomaterials and Nanotechnology: Fundamentals and Applications	3	<p>This course provides both fundamental knowledge of nanomaterials and nanotechnology and advanced topics related to applications. These topics cover basic principles, which include the scaling law, the surface science for nanomaterials, observation and characterization tools for nanomaterials, the nanofabrication techniques, building blocks for nanodevices and systems, etc. In the second half of this course, advanced topics on applying nanomaterials and nanotechnology for applications in mechanical engineering, energy engineering and biomedical engineering will be covered.</p>	-	A-F	English	-
MAEG5130	Computational Mechanics	3	<p>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.</p>	-	A-F	English	-

**Course list for Cross-institutional Course/Subject Enrolment Scheme for Research Postgraduate Students
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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: - Exploration of data and probability distributions - Population, sampling and confidence Intervals - Hypothesis testing I - Hypothesis testing II	-	A-F	English	Quota for visiting students: 10
MGNT6232	Advanced Seminar in Management Theory	3	This course is an advanced seminar in management theory. The theoretical perspectives emphasized in the course include: 1) transaction cost theory; 2) agency cost theory; 3) institutional theory; 4) organizational ecology/recourse dependence theory; 5) organization learning; 6) resource-based view of the firm; 7) knowledge-based view of the firm; 8) evolutionary perspective of organizations; 9) developing a research proposal; 10) philosophy of science; 11) formulating the research problem or question; 12) grounded methods of problem formulation; and 13) building theory. Each perspective will be studied by examining and contrasting the main theoretical statements in depth, then critically discussed and evaluated.	-	A-F	English	-
MUSC6202	Ethnomusicology III: Current Issues	3	This seminar familiarizes students with some of the major discussions in ethnomusicology and related fields that have driven scholarly inquiry in recent decades. Organized typically, 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 upon them.	Permission of the instructor	A-F	English	Note to interested students: Please email Prof. Kielman with a brief introduction of yourself and how this course fits into your studies.
MUSC6401	Advanced Tonal Music Analysis	3	This cross-listed seminar for research postgraduate and advanced undergraduate students explores issues surrounding the interpretation of tonal music through the study of musical works from different genres, styles and repertoires. Course content includes both close examination of selected repertoire and critical reading of scholarly writings representative of current music-theoretical methodologies. Students should study the assigned repertoire and readings in advance and engage with the technical, interpretative or theoretical issues arising therein. RPg students taking 6401 will receive an extra 1-hour tutorial every week.	Grade of B+ or above in undergraduate theory/analysis courses, or equivalent	A-F	English	Subject to permission of instructor
PHYS620	Topics in Experimental Physics (Thin Film Physics and Technology)	3	This course provides an introduction to the physical properties of thin films as well as the preparation methods. Topics covered include: vacuum science and technology, thin film deposition techniques, growth processes and modes, characterization, epitaxy, lattice engineering, optical and electrical properties of thin films. State-of-the-art scientific research on thin film preparation and properties will also be selectively introduced.	-	A-F	English	-
PUBH6008	Foundations of Public Health	1	This course is an introductory course for all students which aims to provide an overview on the history, basic concepts and current issues in the field of public health. Students will gain a broad, general understanding of how public health issues can be framed in the three interrelated domains of health protection, health improvement, and health services. This foundation course will equip students with analytic lens that is essential for deeper learning in each of the three domains.	-	A-F	English	Quota for visiting students: 5
SEEM5330	Speech and Language Processing	3	This course introduces the statistical approaches and modelling techniques used in state-of-the-art automatic speech recognition (ASR) systems, as well as text to speech (TTS) synthesis and speaker verification systems, with a particular focus on the core statistical models that are used in current speech recognition systems.	-	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 investment models will also be discussed.	Calculus, Linear Algebra, Probability	A-F	English	-
SEEM5670	Advanced Models in Financial Engineering	3	The course introduces some basic concepts of stochastic calculus, an important mathematical tool used in financial engineering, and based on it, treats systematically the theory of risk neutral pricing. It will discuss extensively various applications in option pricing and financial modeling.	stochastic processes	A-F	English	-
SOC16001	Advanced Theory	3	Refer to the website http://www.cuhk.edu.hk/soe/MPhil-PhD/en/counselist.html	-	A-F	English	-
SOC16002	Advanced Methodology	3	Refer to the website http://www.cuhk.edu.hk/soe/MPhil-PhD/en/counselist.html	-	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	Quota for visiting students: 10 Subject to teacher's approval on individual application
STAT5040	Studies on Selected Topics I	3	Functional Data Analysis This course introduces ideas and methodology in functional data analysis (FDA) as well as the use of packages. Students will learn the idea of different methods and the related theory, and also the numerical and estimation routines to perform functional data analysis. Students will also have an opportunity to learn how to apply FDA to a wide array of application areas. The course will demonstrate applications where functional data analysis techniques have clear advantage over classical multivariate techniques. Some recent development in FDA will also be discussed. Chapter 1. Introduction Chapter 2. Representing functional data and exploratory data analysis (Including: basic expansions, smoothing, The fda package) Chapter 3. Functional PCA (Including: Covariance structure, Functional and Dynamical Functional PCA) Chapter 4. Functional Linear models (Including: Functional linear regression model with scalar response variable, functional time series and functional linear model with functional response) Chapter 5. Bayesian nonparametric regression using Gaussian process prior (Including: Gaussian process regression analysis, the GPFDA package) Chapter 6. Registration Chapter 7. Further problems	Course for MPHIL/PHD students or permission of Instructor	A-F	English	Quota for visiting students: 10 Subject to teacher's approval on individual application
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	Quota for visiting students: 10 Subject to teacher's approval on individual application

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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	Quota for visiting students: 10 Subject to teacher's approval on individual application
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