

Special Topics Courses

Course Code	Course Title	Description	Department Responsible	Default AU
SA1000	Experiential Inquiry	This subject provides the opportunity for students to select an area of interest (eg. inclusive preschool) or a particular group of individuals (eg. adults with autism in vocational settings), which will become the focus of an in-depth experiential inquiry. After identifying the focus for their experiential learning and contacting an appropriate site for attachment, students will engage in activities such as teaching and learning opportunities and working directly with relevant stakeholders to gain a deeper understanding of the quality of service provision. Students are expected to complete an assignment that consists of learning how the particular site(s) cater to its clientele, assessing the quality of services, and proposing a constructive action plan. This subject is particularly applicable for individuals from the PDCM route who may desire to have more direct experiences in SE or EC.	Early Childhood & Special Needs Education (ECSE)	3
SA1001	Researching with Young Children: Connecting Qualitative Methods with Contexts, Issues, and Dilemmas	This course will allow participants to become more aware of the dilemmas and issues involved in ethical qualitative research with young children (preschool primary). Participants will explore issues of power, subjectivity, and voice in researching with children and adult gatekeepers (e.g. research ethics, ways to enter the field, building relationships with participants, representation of data). These issues will be addressed through fieldwork including observations and interviews of children in natural settings, the creation of field notes and transcripts, collection of artifacts; and the analysis of data.	Early Childhood & Special Needs Education (ECSE)	3
SA1002	Assessment of Children and Youth	This course offers an introduction to assessment and testing in early intervention, special needs, and gifted education. Topics to be covered include: foundational concepts in assessment, technical aspects, purposes, assessment processes, approaches, testing procedures, ethical issues, and collaboration with other professionals.	Early Childhood & Special Needs Education (ECSE)	3
SA1003	Learning with Assistive ICT for Diverse Learners	This subject will re-examine the historical changes of curriculum to problematise and reconstruct the nature of curriculum reform. The historicising of curriculum will allow us to rethink curriculum change as a non-linear and uneven transformation contingently formed by the complexity of power relations which draw from different historical trajectories. The amalgamation of multifarious discourses makes impossible the logical and causal history of curriculum that has been taken for granted before.	Early Childhood & Special Needs Education (ECSE)	3
SA1004	Childhood Studies in a Global Context: The Multiple Perspectives and Methodologies	The course will reconceptualize childhood through reviewing the various scholarly work constructing the perspective and phenomenon of childhood around the world. The goal of the course is to offer a space for doctoral and master of students to gain deeper insights when studying a child (or a group of children) by drawing upon a wide range of view; - with attentions to the situated context. It is believed that childhood as a result of socio-cultural construction, which concerns society, culture, economy, family and schooling.	Early Childhood & Special Needs Education (ECSE)	3

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SA1005	Research in Theories and Practices of Special Education	Recent advancement in special and inclusive education calls for a revolutionary consideration of the coupling relationship between special and inclusive education. This course, challenging traditional views of research and practices, introduces how the philosophers of difference in practice lead to action of rethinking inclusive education	Early Childhood & Special Needs Education (ECSE)	3
SA1006	Advanced Topics in Autism Spectrum Disorders	Although the syndrome of autism spectrum disorders (ASD) was identified over six decades ago, it was only in the recent decade that this condition received increased public attention. However, this increased awareness has led to a corresponding increase in the number of students with ASD both in mainstream as well as special number of schools. There has been a corresponding increase in the number of graduate students who are interested in pursuing ASD as topic for research in the fields of early childhood education. Whilst there are courses at the level of professional development, there are no courses pitched at postgraduate level providing research students with an in-depth foundation of the plethora of research conducted in the past decades. There is hence a need to provide graduate students with a course that will provide the foundational grounding in this topic whilst at the same time allowing the flexibility to read more deeply in the specific area of interest	Early Childhood & Special Needs Education (ECSE)	3
SA1007	Social Emotional Learning for Diverse Learners in the Classroom	Recent research has consistently shown how ones social and emotional functioning impact on ones learning and academic achievement (Elias Arnold, 2006; Ee, 2009; Zins, Weissberg, Wang, Walberg, 2004). Recent MOE speeches also call for the important then for educators to be equipped to deal with not just the cognitive needs of their learners, but also have greater soft skills to meet their socioaffective needs and concerns educators of the 21st century would need to be equipped not just with the cognitive tools to teach their academic subjects but also to connect with and understand their diverse learners and build on academic success through soft-skills training of students and addressing their social and emotional learning and advancing their intelligence in the socioaffective domain.	Early Childhood & Special Needs Education (ECSE)	3
SA1009	Using Multicultural Children's Books to Promote Socio-Emotional Learning (SEL) - for Research	Gain an understanding of the elements to look out for in outstanding multicultural childrens books as well as gain a familiarity with various authors, genre, narrative styles that would allow teachers to teach children a greater appreciation of diversity in the classroom Knowledge of picture books and childrens literature that can be tied to the five elements in the SEL curriculum: (1) self-awareness, (2) self-management, (3) social awareness, (4) responsible decision making, and (5) relationship management. Build strategies and techniques on how multicultural childrens stories can be used to facilitate social and emotional learning in the classroom Make use of online resources and awareness of an online community of book bloggers, teachers, librarians, authors, artists, poets who promote SEL through childrens books	Early Childhood & Special Needs Education (ECSE)	3

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SA1010	Using Multicultural Literature and Graphic Novels to Promote Socio-Emotional Learning in the Classroom	<p>While teachers have constantly been tasked to infuse SEL (socioemotional learning) components in the classroom, many are uncertain as to how the framework can be utilized with the use of literature particularly with older readers and adolescents.</p> <p>This course aims to extend the repertoire of teaching strategies available to teachers (Hattie, 2009), for example through the use of multicultural novels and linking this specifically to the elements of the SEL framework (self-identity, self-management, social awareness, responsible decision-making, and relationship management), and how these can be used to promote inclusive practices, compassion, empathy, and kindness towards those who are perceived to be the others in the classroom and in the community.</p>	Early Childhood & Special Needs Education (ECSE)	3
SA1030	Citizenship Education: Trends and Issues	<p>This subject introduces participants to the major concepts, perspectives and models of citizenship education. Key issues such as the contested nature of citizenship education, the democratic ideal, impact of globalisation, citizenship education in the school curriculum will be examined. The major cross-cultural and national studies in citizenship education will be critically analysed for their findings, methodologies and implications. Case studies of citizenship education in the different types of democracies, such as western democracies, Asian democracies, and newly emerging democracies, will be discussed. Special attention will also be given to the development of citizenship education in Singapore. The role of the teacher as a citizenship educator will be addressed.</p>	Curriculum, Teaching and Learning (CTL)	3
SA1031	Sociology of Curriculum	<p>This course will focus on curriculum issues that have a strong combination with contemporary sociological theories. These issues include, but not limited to, the dual notion of power which shapes curriculum knowledge and school projects, equity problematic vs problematic of knowledge in the production of school curriculum, globalization and national imaginaries that bring in the topics of cultural hybridity, cultural anxiety, cultural dislocation and historical amnesia in curriculum decision-making, and cosmopolitanism which normalises the school subjects through demarcating the civilised and non-civilised in educational practices.</p>	Curriculum, Teaching and Learning (CTL)	3
SA1032	Trends and Issues in Contemporary Curriculum Discourses	<p>This course explores main currents in curriculum theory. It involves a variety of curriculum discourses that form multifaceted curriculum understandings. Among others, we will draw attention to curriculum discourses that link political theory, feminism, aesthetics, racial and ethnic theories, institutionalism, phenomenology, and all posts. The reviewing of advanced conversations and debates over various problematics in curriculum would help open new possibilities in the invention of our own curriculum theory(ies).</p>	Curriculum, Teaching and Learning (CTL)	3
SA1033	History and Reform in Curriculum	<p>This subject will re-examine the historical changes of curriculum to problematize and reconstruct the nature of curriculum reform. The historicizing of curriculum will allow us to rethink curriculum change as a non-linear and uneven transformation contingently formed by the complexity of power relations which draw from different historical trajectories. The amalgamation of multifarious discourses makes impossible the logical and causal history of curriculum that has been taken for granted before.</p>	Curriculum, Teaching and Learning (CTL)	3

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SA1034	Inquiry into Curriculum and Teaching I	The course is designed to introduce students to ways of thinking and scholarship in curriculum studies and to promote disciplined inquiry into curricular and pedagogical issues and phenomena, both of which are vital for preparing students to conduct a practice-focused dissertation.	Curriculum, Teaching and Learning (CTL)	3
SA1035	Inquiry into Curriculum and Teaching II	This course aims to help students understand the contexts (social, cultural and political), processes (planning, enactment and evaluation) and conditions (physical, material and psychological) that shape and mediate the curriculum, pedagogy and assessment practices. Student will use a set of lenses to conceptualise, analyse and interrogate teaching, learning and assessment issues and through their inquiry redesign and innovate practices.	Curriculum, Teaching and Learning (CTL)	3
SA1036	Review Methods for Contemporary Issues in Curriculum, Teaching and Learning	This course fills a current gap in the research training of higher degree students in Curriculum, Teaching and Learning Academic Group. As part of their research training, they are expected to develop a robust theoretical framework that underpins their research study, drawing from a critical review of existing theoretical and research literatures. The interrogation of the literature of their chosen study of research is conducted in the context of peer feedback and critique.	Curriculum, Teaching and Learning (CTL)	3
SA1037	Research Designs and Methods in Curriculum, Teaching and Learning	This course fills a gap in the research training of higher degree students in the Curriculum, Teaching, and Learning Academic Group. As part of their research training, students are expected to deepen their conceptual understanding of research designs and methods relevant to studies in curriculum, assessment, teaching, and learning. The application of the research designs and methods will be conducted in the context of students chosen field of study.	Curriculum, Teaching and Learning (CTL)	3
SA1038	Qualitative Research Fieldwork and Data Analysis in Curriculum, Teaching & Learning	The course focuses on assisting higher degree students in curriculum and teaching in conducting, analyzing, and producing a piece of fieldwork in educational settings. Students are required to undertake supervised fieldwork which allows them to gain direct experience with various elements of fieldwork research, in conjunction with a careful study of the theory and methods of naturalistic/interpretive social science research.	Curriculum, Teaching and Learning (CTL)	3
SA1038	Fieldwork in Curriculum and Teaching	The course focuses on assisting higher degree students in curriculum and teaching in conducting, analyzing, and producing a piece of fieldwork in educational settings. Students are required to undertake supervised fieldwork which allows them to gain direct experience with various elements of fieldwork research, in conjunction with a careful study of the theory and methods of naturalistic/interpretive social science research.	Curriculum, Teaching and Learning (CTL)	3
SA1039	Applied Quantitative Methods for Research in Curriculum, Teaching, and Learning	This course intends to increase students understanding and ability to apply and interpret a variety of quantitative research approaches that are relevant to studies within curriculum, teaching, and learning. Objectives are for students to be able to understand several key approaches to quantitative research, use this language to design and implement appropriate analyses for studies of their own. They will focus on the design decisions and processes in creating and finishing a study. Students will also work in depth to analyze data from their own or others studies to address key research questions posed by the class. The specific quantitative methods may vary based on the choices of the class, buy may include survey approaches, quasi-experimental intervention or evaluation studies, and analyses of hierarchical data and/or international large-scale assessments (e.g., PISA).	Curriculum, Teaching and Learning (CTL)	3

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SA801	Chinese Writing System (Chinese Paleography)	Research resources and methodology; micro- and macro- studies; origins of the Chinese writing script; formal and structural evolution of the Chinese writing script; relationships between form, structure and meaning; analyses of selected texts in oracle bone and bronze inscriptions.	Asian Languages & Cultures (ALC)	3
SA802	Chinese Syntax	Field of Chinese syntax; methodologies of Chinese syntactic analyses; formation and classes of words; phrase structures and types; sentence structures and types; relationships between word, phrase and sentence.	Asian Languages & Cultures (ALC)	3
SA803	Applied Linguistics	Teaching approaches and methods in language teaching; syllabus design and curriculum development; curriculum evaluation model; comparing and contrasting two languages, interlanguage and error analyses; sociocultural variables in language learning, teacher education in language teaching; research methods in applied linguistics.	Asian Languages & Cultures (ALC)	3
SA804	Chinese Literary Criticism	Literary theories and practices in the Chinese tradition of literary criticism, including literary theories, critical studies of writers and works from the perspective of traditional Chinese literary criticism, in-depth studies of selected works of literary criticism; critical analyses and re-evaluation of traditional Chinese literary criticism in the light of modern western literary theories.	Asian Languages & Cultures (ALC)	3
SA805	Classical Chinese Poetry and Poetics	In-depth study of selected topics in traditional Chinese poetry (including ci) and poetics, including the study of authors and works, poetic theories, and prosody.	Asian Languages & Cultures (ALC)	3
SA806	Chinese History and Culture	Study of selected topics in Chinese history and culture, such as Chinese historiography, traditional government of China, shi and Chinese culture, women in traditional China, Song culture, and cultural changes in modern China.	Asian Languages & Cultures (ALC)	3
SA807	Special Topics in Chinese Lexicology	In-depth study of significant aspects of Chinese lexicology. Selected topics include core vocabulary; lexical semantics; receptive vs. productive aspects of vocabulary; lexical variation; wordlist and frequency counts; collocation; corpus and concordance; wordlist and frequency counts; and the craft of lexicography.	Asian Languages & Cultures (ALC)	3
SA808	Special Topics in Sociolinguistics	Detailed study of sociolinguistics with special reference to the sociolinguistic situation in Singapore. Selected topics include societal multilingualism; qualitative formulas; quantitative approaches; ethnicity and social networks; language attrition; varieties of language; and language planning and standardization.	Asian Languages & Cultures (ALC)	3
SA809	Special Topics in Chinese Rhetoric	Detailed study of selected topics in Chinese rhetorical studies, such as peculiar rhetorical devices, norm and deviance, rhetoric and culture, the language of literary works, revitalization of traditional rhetorical techniques, use of dialectal expressions and essential writings in the history of Chinese rhetoric.	Asian Languages & Cultures (ALC)	3
SA810	Special Topics in the History of Chinese Literature	Studies of one or two topics essential to an in-depth understanding of traditional Chinese literature: society, civil service examination, education system and literature; influence of Confucianism, Taoism or Buddhism on Chinese literature; major themes in Chinese literature; pre-Qin, Tang or Song literature, and their significance in the history of Chinese literature; major literary schools and movements.	Asian Languages & Cultures (ALC)	3
SA811	Studies in Chinese Classics	In-depth study of selected Chinese classics which have far and wide influence in Chinese culture, such as The Analects, Mencius, Daodejing, Zhuangzi, Hanfeizi, Shiji, Jinsi lu, Chuanxi lu, and The Platform Sutra.	Asian Languages & Cultures (ALC)	3

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SA812	Special Topics in Chinese Philosophy and Religion	Study of selected topics in Chinese philosophy and religion, such as pre-Qin Confucianism and Taoism, Wei-Jin Neo-Taoism, Song-Ming Neo-Confucianism, religiosity in Confucianism, the Taoist theory of inner alchemy.	Asian Languages & Cultures (ALC)	3
SA813	Research in Malay Language Studies	The aim of the module is to examine the theories and methodologies used in Malay Language studies. Candidates will be required to be engaged in critical analysis of current works pertaining to research in Malay phonology, morphology, syntax and semantics. Other relevant area of language studies such as comparative and contrastive studies including discourse analysis will also be dealt in depth.	Asian Languages & Cultures (ALC)	3
SA814	Theory and Practice in the Study of Malay/Indonesian Literature	This module examines the general literary theories, criticisms, approaches, methods and system of classification used in the writing of history and development of the Malay and Indonesian literature; main problems and issues related to it; new and latest research findings and view, and important and potential research topics and areas. The module aims to build a strong foundation and to explore new ground, in both theory and practice in the study of Malay and Indonesian literature.	Asian Languages & Cultures (ALC)	3
SA815	Issues in Malay Studies	This module examines the key and existing issues of Malay Studies through a critical review of existing works. Such a critical evaluation aims towards greater knowledge and understanding as well as the building up of research materials wherever possible and necessary. The module aims to identify new areas of research and to encourage the exploration of original and creative methods that could be developed from the current knowledge in Malay Studies.	Asian Languages & Cultures (ALC)	3
SA816	Special Topics in Sociolinguistics	The detailed analytical study of the sociolinguistics with special reference to the sociolinguistic situation in Tamil Nadu and Singapore. Special topics include Tamil as a native, first and second language; multilingual nature; varieties of language, language acquisition and learning; language planning, modernization and standardization.	Asian Languages & Cultures (ALC)	3
SA817	Special Topics in Tamil History and Culture	In-depth study of selected topics in Tamil history and culture such as Ancient Sangam literature. Selected topics include the traditional governments and changes in Tamil culture; introduction of various religions; the primary and secondary roles of women in Tamil Nadu now and then; educational equality and the influence of historical and social changes in Tamil culture.	Asian Languages & Cultures (ALC)	3
SA818	Special Topics in Tamil Syntax	Research methodologies and theories used in Tamil language studies in relation with Tamil Syntax. In-depth study on Tamil phonology, morphology, syntax, methodologies of Tamil syntactic analyses, formation and divisions of words, phrase structure and types, sentence structures and types; relationships between words, phrase and sentence.	Asian Languages & Cultures (ALC)	3
SA819	Graduate Seminar (Chinese Language and Culture)	It is designed to introduce participants to the theoretical foundation of educational research on Chinese language culture. Every participant will be scheduled to present at least one research paper orally during this course. He/she has to discuss the scope of the presentation with his supervisor and submit an abstract of his/her presentation at least one week before the presentation. After the presentation, the lecturer will facilitate a discussion of the research topic amongst all participants. A copy of the paper is to be submitted to the lecturer within the next two weeks.	Asian Languages & Cultures (ALC)	3
SA820	Graduate Seminar (Tamil Language and Culture)	This course is designed to introduce postgraduate students (by research) to the research methodology and to promote disciplined inquiry into their research topics. Through presentations and critical analysis, students will learn to develop new insights with regards to their research topic.	Asian Languages & Cultures (ALC)	3

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SA821	Current Research in Linguistics Pragmatics	This subject will provide an overview of core theories in pragmatics as well as a review of the latest research in pragmatics. Among the topics covered are the nature of reference, information structure, Speech Act Theory, Gricean pragmatics, Conversation Analysis, and common ground.	English Language & Literature (ELL)	3
SA822	Lexical Approaches to Language Description and Vocabulary Learning	The course will explore lexical approaches to language description such as pattern grammars and collocational patterns, Sinclairs idiom principle and Hoey's concept of lexical priming. The impact of such lexically-oriented frameworks for language description on lexicography and language teaching will then be examined through reviews of innovations in dictionary production, syllabus design and vocabulary learning tasks.	English Language & Literature (ELL)	3
SA823	Academic Discourse	The course introduces participants to the conventions of academic discourse in preparation for the writing of their postgraduate thesis/ dissertation. Course participants will analyse texts from their own discipline to observe the discourse practices in their discourse community and learn cognitive and metacognitive strategies for producing these types of writing.	English Language & Literature (ELL)	3
SA824	Written Discourse Analysis	The course will examine a variety of theoretical and analytical models, approaches and concepts concerned with text. It will include consideration of the similarities and differences among different types of discourse and ways in which knowledge about text and text analysis is relevant and applicable to pedagogical contexts.	English Language & Literature (ELL)	3
SA825	English as a Global Language	This course explores varieties of English around the world from a sociolinguistic perspective. Students will analyze the social and historical contexts in which these varieties evolved, the status of new varieties of English in relation to that of more established varieties, their role in forging national and community identities, and problems in standardizing these varieties.	English Language & Literature (ELL)	3
SA826	Advanced Phonetics and Phonology	This course focuses primarily on the history as well as current developments in the field of phonetics and phonology. It aims to provide a very broad and thorough theoretical background for students who may be interested in attempting a post-graduate research topic in this field. A basic methodology for doing experimental work in phonetics and/or phonology will also be introduced.	English Language & Literature (ELL)	3
SA827	Advanced Sociolinguistics	<p>The field of sociolinguistics in the 21st century is a mature, confident and vibrant discipline. At its core is a concern for observable facts of language variation and principled thinking about the reasons and consequences of this variation and change. The course will:</p> <ul style="list-style-type: none"> Set out methods of observation and investigation in sociolinguistics and give a toolkit of field methods available to the sociolinguists. Analyze in depth aspects of the social correlates of language class, gender, age, ethnicity and speech communities. Examine Macro-sociolinguistics matters and the socio-political matters of language change <p>This course provides a useful resource for more advanced sociolinguists and is a necessity for any students interested in pursuing a post-graduate research degree in the field.</p>	English Language & Literature (ELL)	3

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SA828	Language and Globalization	This course explores the impact of globalization on the current spread of English around the world from a sociolinguistic perspective. Students will analyze the historical, social, cultural, economic and political factors that influence the global spread of English in arriving at an understanding of the way certain global structures and practices impinge on sociolinguistics relations and examine their implications for language, culture and identity in a post-modern world. They will critically consider issues such as the global-local interface, ethnocentric and culture, and world Englishes and English as a Lingua Franca in light of the recent debates and controversies arising from these topics.	English Language & Literature (ELL)	3
SA829	Statistical Analyses for Language Assessment	This seminar will cover such topics as basic descriptive statistics for norm-referenced and criterion-referenced tests, inferential statistics, exploratory and confirmatory factor analysis and structural equation modeling for language assessment investigations. Additional topics to be discussed would be quantitative research studies related to validation, reliability, and fairness of language assessment. SPSS software will be used for	English Language & Literature (ELL)	3
SA841	Resource Use: Cooperation and Conflict Resolution	This subject will introduce students to various concepts on resources, resource stewardship and sustainable resource use. It will then document the different types of resource use conflicts from local to global scale, examines the origin of these conflicts and discusses how such conflicts could be alleviated or resolved. Emphasis will be placed on selected conflicts relevant to the Southeast Asian region and the manner in which attempts are being made to resolve them. The course will consist of lectures, seminars and role-playing by course participants to resolve hypothetical conflicts. Students are trained to view conflicts in a holistic manner and to use negotiation in resolving conflicts, which are often complex and multi-faceted. Students are expected to read widely and make extensive use of the web. Assessment will be based solely on seminars and project work on an area of conflict.	Humanities & Social Studies Education (HSSE)	3
SA845	Globalisation & Urban Land Use Change	This subject investigates a series of intriguing questions of land use development in cities: in what ways are the impacts received by world cities in core developed countries different from mega-cities in the developing world? How would the city form be anticipated to develop in these two type of cities? Is the coexistence of concentration and decentralisation of city forms a generally acceptable pattern? In-depth analysis of the dynamics of selected world cities and mega-cities in the developing world is included.	Humanities & Social Studies Education (HSSE)	3
SA848	Transnationalisation of Capital, Networks and Contested Economic Space	This course discusses the changing economic space arising from capital flows. It examines the strengths and weaknesses of local firms in responding to the process of transnationalisation of capital and the options that are open to them in contesting for an economic space in an increasingly competitive global economy. The complexities of corporate networks, cultural links, institutional frameworks and others will also be discussed. The experiences of firms in developing countries will be used as examples.	Humanities & Social Studies Education (HSSE)	3
SA849	Quantitative & Computing Methods in Geography	This course introduces students to a range of quantitative and computing methods and techniques most frequently used for geographical research and problem-solving. A sequence of lectures, practical exercises and course projects will guide students through a range of techniques covering statistical techniques for geographical data analysis; simulation modelling for geographical systems analysis; spatial allocation models; and multi-criteria analysis and linear programming for land use optimisation. Students will gain hands-on experience in using an advanced statistical software package for statistical analysis, a microcomputer-based spreadsheet for simulation modelling, and integration of GIS with multi-criteria analysis for land use allocation	Humanities & Social Studies Education (HSSE)	3

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SA852	Capitalism, Development and Urban Change	Focus is on the relationships between modern capitalist development and the associated spatial evolution involving urban change. The module explores theories and ideologies of development in the context of industrial capitalism of the colonial powers and post-colonial capitalism as applied in post-war independent nations. The dynamics of modernization and urbanization taking place in post-war independent Asian nations are examined in general. Case studies of Asian cities which have grown from small colonial settlements to present-day metropolitan centres will be selected for further illustration and analysis with reference to their specific features	Humanities & Social Studies Education (HSSE)	3
SA853	Transnationalizing Services - Linkages and Networks	The course will look into salient features of the major types of services that have contributed to national economic growth and development. The growth and expansion of key services, namely finance, transport, power and water supplies are discussed to showcase their impact on local and international economies. Specifically, the linkages of selected services to the production and consumption spaces, the roles of the states and transnational corporations and the networking of enterprises in promoting the services are focused on to highlight the challenges of globalization in the twenty-first century.	Humanities & Social Studies Education (HSSE)	3
SA861	History and Popular Culture	This course deals with how history is represented or misrepresented in popular culture. Included are issues such as how accurate are historical films, how history is presented in museum exhibitions and school history textbook ideologies.	Humanities & Social Studies Education (HSSE)	3
SA862	Theoretical Frameworks in International Relations	This course seeks to provide a basic understanding of the three core theoretical approaches governing world politics. These are Realism, Pluralism (or Liberalism) and Marxism (or Structuralism). Each approach will be analysed in terms of their strength, relevance limitations and implications to past and current world events. This analysis will be extended further to include an examination how each approach can help explain global issues such as conflicts, change, cooperation and the interplay between economics and politics. Additionally, the development and role of theory in the social sciences will also be discussed with particular reference to international relations.	Humanities & Social Studies Education (HSSE)	3
SA866	Issues in Contemporary Chinese History	This subject focuses on the key issues in Contemporary Chinese politics: military Communism to Dengs reforms, the Chinese Communist ideology (Marxism-Leninism, Maos thought and De-Maoisation), political institutions of the party-state, the cadre system (leadership style, factionalism and succession), Centralism versus Regionalism, the militarys role in Chinese politics of modernization.	Humanities & Social Studies Education (HSSE)	3
SA867	Readings in Diplomatic and Military History	Students will be expected to master the major historiographic trends within their primary or secondary fields of study. The selection of readings will be tailored to the specific research objectives of the students and the specialisation of the tutor.	Humanities & Social Studies Education (HSSE)	3

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SA870	Multicultural Studies	Our globalising world implies that dealing with multicultural contexts has become an inevitable part of modern life and particularly life in a post-industrial and urbanised world. In Singapore the terms multicultural and multiculturalism have been used increasingly in recent years. Multiculturalism has often also been assumed to speak only of race or ethnicity, but it is much more than that. Multiculturalism also addresses class, gender and other social structures. It also speaks of a frame of mind, of whether a society is pluralistic, that is, really open to and truly embraces diversity, of the multiplicity of voices that help to find a consensus that best guarantees equality and justice.	Humanities & Social Studies Education (HSSE)	3
SA871	Oral History and Memory	This subject covers the practice of oral history and theoretical issues that it raises. These include the nature of memory and how it is reconstructed in the present through reinterpretation. Also covered is the reliability of oral testimony generations after the historical events being discussed have passed. The relationship between oral history as a historical source and other sources, such as the written word is also assessed. Students will be introduced to the ways oral history has been represented, such as in museum exhibitions, community history, film and the media.	Humanities & Social Studies Education (HSSE)	3
SA872	Designing Inquiry-Based Social Studies Curriculum	This course will consist of two main components: 1. Historical research and a comparative historical study that investigates issues related to Venice and Singapore as city states. Research and the comparative study will focus on key issues and content central to Singapore's Social Studies Curriculum 2. Approaches to be in inquiry-based curriculum design and development. Different curriculum perspectives and designs will be studied to design an inquiry-based curriculum	Humanities & Social Studies Education (HSSE)	3
SA873	Readings in Social Studies and Education Research	This course is for students who wish to establish a rigorous knowledge base in the area of social studies education and research. It is a tailored readings course that will be negotiated between student and instructor. Students will critically engage with the works of key scholars in the areas of education in general and social studies in particular. The course will develop critical reading skills and introduce students to strategies for writing a literature review. Students will be required to draw up a learning contract and a workable schedule for self-study and consultation. Assessment will be in the form of an annotated bibliography and two critical review papers.	Humanities & Social Studies Education (HSSE)	3
SA874	Seminar in Research in Social Studies	Participants will become acquainted with trends in research on social studies theory and practice. They will analyze significant research studies in the field, develop a personal research plan, and engage in the critique of one another's work. Each participant will craft a final problem statement and literature review focusing on their own research interests in policy, practice or theory. They will be expected to share their work with the group and to offer productive critiques of one another's efforts.	Humanities & Social Studies Education (HSSE)	3
SA875	Theories and Readings in Aspects of Imperialism	The course explores the theoretical grounding, critical perspectives (in forms, dimensions, and comparisons in imperialism), as well as special sub-topics and case studies in the theme of imperialism, as they might be raised by the candidates. In the process, it is hoped that candidates enrolling in the course will not only have a fuller appreciation of the phenomenon, but for those engaging in further research, the discussions can serve to enrich and be applied to their thesis-writing.	Humanities & Social Studies Education (HSSE)	3
SA876	Heritage Studies: Theory and Practice	This course aims to explore the relationship between history and heritage. It examines how heritage focuses on using history for purposes of identity and tourism. Covered are the various theoretical conceptualizations of heritage, such as those of David Lowenthal, J. Tunbridge and G.J. Ashworth, David Throsby, and Laurajane Smith.	Humanities & Social Studies Education (HSSE)	3

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SA877	Readings in Late Imperial Chinese History	<p>This course is designed with doctoral graduate research students who intend to work on Chinese history in mind.</p> <p>For any research student planning to work on Late Imperial China, it is extremely important for the candidate to not only be familiar with the historical sources, the various genres of sources and the textual nuances within these documents but also be sufficiently proficient in reading classical Mandarin. The skills of text interpretation and translation from classical Chinese into English would also be emphasized in this course. These are skill sets that are important to any candidate wishing to embark upon research on imperial China.</p>	Humanities & Social Studies Education (HSSE)	3
SA878	Historiography of 18th and 19th Century India	<p>The shift of the 18th and early period of 19th century in India has usually been described as transitional and tumultuous for the sub-continent. From the economic angle, the extent to which regional economies were resilient and not broken down in the post-Mughal period continues to be hotly discussed topics. To what extent was there a new mode of economic operandi with the British coming is a related topic that has been visited by doyen historian of British imperial, Indian and global history, Christopher Bayly. Politically and militarily, the extent to which the coming of British was able to achieve hegemony via the coercion of arms or collaborative alliance with regional maharajas has also been discussed passionately as well. On the social and especially the intellectual fronts, how and if the above developments manifested as a progressive force or a mere manipulation of the existing system by a new hegemon; and how postcolonial or subaltern studies continue to prolong an image of an underdeveloped state of India is currently revived in Rajiv Maholtras purvapaksa debate. This course hopes to examine the historiography of the agendas raised in a number of sub-fields and see if historical studies on the eve of British coming or the modern era are ripe or at the dawn of another renaissance.</p>	Humanities & Social Studies Education (HSSE)	3
SA879	War and Non-War Violence in 18th and 19th Century India	<p>The shift of the 18th and early period of 19th century in India has usually been described as transitional and tumultuous for the sub-continent. This course extends from the Historiography of 18th and 19th Century India course to explore the themes of violence in war and non-war situations in India in a supposedly unsettled time on the sub-continent. Connecting with the various sub-fields in economic, political, military, social and intellectual histories, the central these of the course hope to probe if the causes of violence can be explained from generic or contextual reasons. Specifically, gender-related issue and regional geographical variance in violence will be highlighted for discussion in connection to the theses of the research candidates. On a broader front, an attempt will be made to assess if India in the early modern period was a more violent place compared to other regions of the world.</p>	Humanities & Social Studies Education (HSSE)	3
SA881	Music Composition	<p>The main project involves a composition by each participant. Genres chosen are subject to practical performance considerations. Seminar sessions are based on the presentation and discussion of works-in-progress by the participants as well as their completed compositions, focusing on compositional approach and technique as well as analysis. Selected works representing a range of recent movements in composition will also be studied. The course will also involve studying procedures used during the rehearsal of the composition projects and will culminate in a performance recital of the participants works.</p>	Visual & Performing Arts (VPA)	3

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SA882	Music Analysis	A study of various analytical concepts and methods applicable to music from the common-practice period and the twentieth century. Major analytical theories will be introduced and their merits evaluated so that appropriate analytical approaches can be adopted according to the analytical demands at hand. Meta-theoretical issues will be considered.	Visual & Performing Arts (VPA)	3
SA883	Performance Studies In Music	A written submission of about 5000 words on one of the following areas: <ul style="list-style-type: none"> * Studies in theoretical accounts of instrumental technique and performance practice; * Studies of repertoire of a particular period in relation to performance practice and instrumental technique; * A study of a single substantial work with implications for performance practice and instrumental technique. <p>A lecture and public recital of the works discussed in the written submission.</p>	Visual & Performing Arts (VPA)	3
SA884	Performance Studies in Ethnomusicology	The candidate will undertake studies in one instrument of a specific musical culture. This will culminate in a public solo or ensemble recital of about 30 minutes accompanied by a presentation about the ethnic instrument. (A recording may be admissible under certain circumstances)	Visual & Performing Arts (VPA)	3
SA885	Aesthetics and Philosophy in Music	This module is concerned with the way in which music is viewed from perspectives in aesthetics and philosophy. This module makes a selection from the notated and non-notated repertoire of western art music as well as the art and folk music traditions around the world. A discussion of the practice of music is the starting point for this module, although greater emphasis is placed, from an interdisciplinary perspective, on the critical implications of viewpoints expressed by practitioners, philosophers, theorists and aestheticians.	Visual & Performing Arts (VPA)	3
SA886	Research in Musicology	An introduction to musical historiography, giving the student a good foundation for research in musicology. The course will help the student acquire basic music research skills. At the same time, the history of the discipline and more recent trends in the field will be discussed to help the student contextualise his/her own research.	Visual & Performing Arts (VPA)	3
SA887	Advanced Music Research Topic	This module offers the student a chance to explore in some detail a second topic besides the dissertational one. This can be a more advanced study on a specific topic in the area of Music Education, Musicology, Ethnomusicology, Music Theory, or any music-related subjects including interdisciplinary ones.	Visual & Performing Arts (VPA)	3
SA901	Art and Technology	The different technologies of image-making, past and present, have offered various possibilities (and constraints) for the manipulation of imagery, the expression of ideas and the representation of the world. This topic will involve students considering a range of technologies available in past and present times for the making of art, including some traditional art materials, the technologies of print, and also electronic media. In both theoretical and practical work, students will consider the variety of ways technologies have shaped the expression of ideas and emotions.	Visual & Performing Arts (VPA)	3
SA902	Review and Interpreting Exhibitions of Artworks	This involves the critical appraisal and review of artworks in an exhibition. The project will entail study of a range of approaches to the interpretation and analysis of artworks. To this end, students will be expected to acquaint themselves with key writings on the study of meaning in art works and theories of interpretation and analysis. The project will culminate in students preparing a written review of an exhibition of artworks.	Visual & Performing Arts (VPA)	3

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SA903	Performance and Time-based Art	This topic will entail the study of performance, movement, dance and other time-based art forms and their potential for the expression of ideas and feelings. The topic will involve studies of some aspects the history of performance art and dance, and will culminate in the students presenting a time-based, performance work or dance.	Visual & Performing Arts (VPA)	3
SA904	Artmaking and Aesthetic Inquiry	This module explores contemporary aesthetics studies in the visual arts. Implications about current visual theories and their application to art processes will be considered. The final project constitutes a commitment in working with a body of original work taken through to exhibition status.	Visual & Performing Arts (VPA)	3
SA905	Visual Arts Research Methods	This module examines the history of the discipline and explores various methodologies, critical theory, and resource material for visual arts research. This involves techniques of scholarly and critical writing and evaluation of bibliographic sources. At the same time the conceptual and theoretical issues attending the integration of technology into visual arts research are explored.	Visual & Performing Arts (VPA)	3
SA921	Theatre Forms: Theory and Practice	This module will involve examining important theatre forms that have influenced theatre making practices and philosophies- with the view to equipping teachers with an ability to craft theatre in schools drawing on these resources and ideas. This module will also be useful as an introduction to twentieth-century and present day theatre practice for graduate students new to the area.	Visual & Performing Arts (VPA)	3
SA922	Learning through Drama: Theory and Practice	This module will explore ways in which the art form of drama can improve learning opportunities and enhance the learning environment in schools and other educational settings. Central to this module will be examination of the pedagogical practices of Gavin Bolton, Dorothy Heathcote, Jonathan Neelands, John OToole and other contemporary theorists.	Visual & Performing Arts (VPA)	3
SA941	Professionalism in the Healthcare Sector	It has become apparent that several of our Doctorate students are from the healthcare Sector. We have had educator-doctors and educator-nurses apply to our doctoral programmes. This course will focus on the questions and debates about professionalism in healthcare sector. These questions and debates will be more relevant to candidates who work in the health sector. It would therefore complement the generic courses on professionalism in the educational profession. It would also give these students a chance to research in depth on matters that are of interest to their particular professions as doctors, nurses or healthcare professionals and educators.	Policy & Leadership Studies (PLS)	3
SA942	Understanding and Appraising a Major Educational Theorist	This course allows the student to focus on a major educational theorist of his/her choice in order to achieve a great depth of understanding of the theorist. Current courses usually cover several theorists and their theories, and so compromise some depth even at the doctoral level. Especially for students writing a dissertation after the coursework, not everything in these broad-based courses is relevant for his or her topic, especially if the thesis topic is very specialized. Such a course will complement these courses, and allow the student to research and gain an in-depth conceptual and socio-historical understanding of a major educational theorist who is relevant to the students area of interest. In this way the student is able to fully master and assess the thinking of the educational theorist he or she is interested in, and with this mastery should be able to develop new educational insights built on an expert grasp of the theorist's ideas.	Policy & Leadership Studies (PLS)	3

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SA943	School Reform and Leadership: Policy and Practice	The course is designed to equip participants with rudimentary skills in appreciating the myriad issues related to school reform and leadership and their implications to educational policy and practice. Participants would be introduced to the foundations of leadership amidst dynamic school reform enabling them to critically explore the issues of a constantly shifting policy context. Participants would be made familiar with the challenges of leadership and implementation of policy allowing them to critically investigate implications to school practice	Policy & Leadership Studies (PLS)	3
SA944	Interdisciplinary Thinking for Education	The major trends of the 21st century indicate that although the sequential, literal, functional, textual, logical and analytical thinking skills that enabled us to excel in the 20th century are still going to be important and necessary in the 21st century, they are no longer sufficient if our aim is to be a global leader in our chosen fields of specialisation. The key concerns, events and developments of the last 10 years have shown very clearly that we also need to interpret and understand things in inventive, simultaneous, metaphorical, aesthetic, contextual, empathic and synthetic ways if we want to continue to experience growth and success in the 21st century. The implication for education (formal, informal and non-formal) is that we will have to make significant modifications to what and how we learn and teach. Only then can we adequately prepare ourselves and others for professional success in the 21st century. A recommended change is to introduce into our educational curriculum a component that aims to teach for creative, empathic and meaningful applications of logical thinking skills, subject-specific inquiry techniques and subject-specific content knowledge. This requires breaking through traditional disciplinary boundaries and innovating in an intermediate zone where such boundaries do not properly apply. There is therefore a need for a course that focuses on interdisciplinary thinking for educators.	Policy & Leadership Studies (PLS)	3
SA945	Critical Ethnography in Educational Research	Although qualitative research method has gained more prominence and acceptance in the field of educational research, postgraduate students are generally less cognizant of the epistemology and ontology that underpin the designs or approaches to qualitative research. This is partly due to the predominance of the positivist paradigm that underpins quantitative research. Postgraduate students, who are unfamiliar with the epistemological and ontological underpinnings of the positivist paradigm, may inadvertently use this paradigm to make sense of qualitative data. A strategy that could be used to expose postgraduate students to alternative paradigms such as the interpretive or critical paradigms is by introducing critical ethnography. In this regard, a course on critical ethnography will enable postgraduate students to understand both the interpretive and critical paradigms at one go. Ethnography has been commented by some researchers to be qualitative research at its best. It incorporates data collection and analysis approaches such as observation, interview and artifact analysis, and epistemological and ontological underpinnings within the interpretive paradigm. Critical ethnography then adds epistemological and ontological concepts pertaining to the critical paradigm to ethnography, along with implications to the entire research process.	Policy & Leadership Studies (PLS)	3

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SA946	Advanced International Perspective in Mentoring	This course will benefit candidates who seek to maximize the advantages of adult learning in an evolving mentoring paradigm. Mentoring engagement in human resource development has the vast potential to facilitate being on the leading edge of desired change in creative re-positioning. Analysis and synthesis of such development strategy necessitate an exploration of fluidity and distillation of essence across international borders. The numerous generic and local complexities as well as probable strategies to overcome pitfalls will be examined. The role of mentoring in the 21st century and beyond will also be illuminated and challenged.	Policy & Leadership Studies (PLS)	3
SA947	Strategic Organisational Management and Development in Schools	As the world enters the 21st century and faces increasing challenges as a consequence of globalization, organizational leaders have acknowledged that their organizations need to be flexible and seek to renew themselves to meet such dynamic forces. Organizations face constant innovation and transformation aimed at enhancing organizational effectiveness. Ultimately, the goal of strategic organizational management and development are to ensure the organization continues to achieve a high level of competitiveness by operating more effectively and efficiently, while providing more opportunities for individuals to develop their full potential.	Policy & Leadership Studies (PLS)	3
SA948	Teachers as Reflective Practitioners: A Critical Perspective	The notion of the reflective practitioner is a common and dominant discourse in education. Originally conceptualized as a way of describing how professionals (should) think in, and with, their expertise, the reflective practitioner has since been discursively constructed and situated for a variety of different purposes. These include the pursuit of other agendas such as performativity, discipline and confession, and the reduction of teacher identity and expertise as disparate competencies. This course invites its participants to understand the originating tenets of the reflective practitioner in order to critically judge its contemporary manifestations.	Policy & Leadership Studies (PLS)	3
SA949	Qualitative Data Analysis	This course is designed for participants who have a basic knowledge of qualitative research methods and are interested to explore more advanced analytical techniques and procedures to help them make better sense of their qualitative data. Given the increased use of verbal and visual data in social science and educational research, either on its own or as part of mixed methods, there is a pressing need for researchers to develop a more critical stance towards qualitative data and the findings it generates.	Policy & Leadership Studies (PLS)	3
SA950	The 21st Century Education	The processes of globalisation and their consequences defy geographic and political boundaries and therefore have reshaped the world in business, education, government and private sectors. Globalisation has redefined the relationships among nation-states, international institutions, governmental and non- governmental organisations, ethnic, cultural and religious groups that. It brings with it opportunities and threats for every country and its education system. Global forces such as increasing population movement and the exponential increase in technology have opened doors for those who are highly mobile, highly skilled and highly educated and at the same time removed those who are poorly or inadequately educated. Given these changes, there is a need for a course that studies the global trends and how they affect the construction and delivery of educational programmes.	Policy & Leadership Studies (PLS)	3
SA951	Globalisation, Rights and Education	This study aims to look at the nature of globalization and trends regarding human rights and the consequences these have for education. It examines the impact of globalization on social policies, especially in the area of education. The study also deals with international trends on human rights, in particular, rights of school children, and the educational and legal implications this has for schools.	Policy & Leadership Studies (PLS)	3

Special Topics Courses

SA952	Towards a Better Understanding of Educational Policy-Making in Singapore	The processes of globalisation and their consequences defy geographic and political boundaries and therefore have reshaped the world in business, education, government and private sectors. Globalisation has redefined the relationships among nation-states, international institutions, governmental and non- governmental organisations, ethnic, cultural and religious groups that. It brings with it opportunities and threats for every country and its education system. Global forces such as increasing population movement and the exponential increase in technology have opened doors for those who are highly mobile, highly skilled and highly educated and at the same time removed those who are poorly or inadequately educated. Given these changes, there is a need for a course that studies the global trends and how they affect the construction and delivery of educational programmes.	Policy & Leadership Studies (PLS)	3
SA971	Advanced Topics in Applied Cognitive Developmental Psychology	The latest empirical findings and theories in cognitive developmental psychology will be examined in this course. A specific focus is the development of working memory and executive functioning. Other topics that may be covered are the development of attentional processes, knowledge representation, and the neural substrates of behaviour. Relating cognitive development to childrens academic performance will be a particular focus of this course.	Psychological Studies (PS)	3
SA972	Advanced Research Methodologies in Psychology	Recent advances in research methodologies are studied using a series of readings and exercises. Topics may include longitudinal designs, functional magnetic resonance imaging, and the use of multivariate techniques in applied research settings.	Psychological Studies (PS)	3
SA973	Advanced Topics in Creativity and Talent Development	This module aims to present the state of art and new understanding of creativity and talent development. The topics include identification, diagnosis and counselling of potential talented students and talented students with learning disabilities. The new approaches highlight the total talent or strength development for all students, positive growth, individualised counselling, improved academic achievement, and engaged learning paths. The module also examines successful creativity and talent development projects, school-based programs, services, interventions, mentoring, curriculum and creative pedagogies.	Psychological Studies (PS)	3
SA974	Social Emotional Learning: Curriculum Development and Research	<p>Social and emotional learning (SEL) is a process for helping children and even adults develop the fundamental social-emotional competencies for life effectiveness. SEL programming teaches the skills we all need to handle ourselves, our relationships, and our work, effectively and ethically. These skills include recognizing and managing our emotions, developing caring and concern for others, establishing positive relationships, making responsible decisions, and handling challenging situations constructively. This course focuses on research, theory, educational practices that promote the social, emotional, and academic competence of preschool through young adults.</p> <p>An examination of research-based strategies and practical approaches that policy makers, educational administrators, teachers, mental health professionals, and parents can implement to foster the optimal development of children and adolescents. Participants will learn about current evidence-based SEL programming in schools locally and internationally for curriculum implementation purposes.</p>	Psychological Studies (PS)	3
SA991	Advanced Educational Research and Evaluation	<p>The purpose of this course is to continue the development of students knowledge and effectiveness in conducting data analyses they apply to inquiry in the social sciences. Inquiry includes the process by which educational phenomena are understood, the specification of models for that understanding, the assumptions of those models, and the linkage between theories, concepts, researchable problems, and methods of analysis. The choice of analytic approach as part of the research process is not routine and, therefore, is often open to discussion.</p> <p>More specifically, this course is intended to introduce students to advanced means of analyzing data, including data collected at one point in time (i.e., cross-sectional), several points in time (longitudinal), or at different organizational levels (e.g., students in class, classes in schools). Some of these methods include factor analysis (exploratory and</p>	Policy & Leadership Studies (PLS)	3

Special Topics Courses

SA992	Issues in Educational Marketing	<p>As the new millennium progresses, the educational climate continues to evolve into one that is becoming progressively complex yet exciting at the same time. Owing to easier access to information and exposure to a wider range of educational services, students and their parents are becoming more sophisticated and expect more in relation to their educational experiences. Gone are the days when education is seen as public service to a homogeneous group of customers. As a result, diversity in offerings may very well represent the key to a schools success, future growth and possibly competitive advantage in the education industry. The aim of this course is to explore the contemporary and emerging development in educational marketing, and to introduce students to the latest theories in marketplace and academic thinking. Upon completion of this course, participants will be equipped with cutting edge marketing knowledge, concepts and practical applications in solving school operational and strategic problems. This course is also designed to allow participants to develop their marketing knowledge, by drawing the subject matter from various topics such as consumer behavior, international marketing, services marketing, social marketing, public sector marketing, and societal marketing. These topics will reflect popular debate.</p>	Policy & Leadership Studies (PLS)	3
SA993	Building Citizenship Values through Sustainability Education	<p>Teaching and learning about social and environmental challenges, and the ways these are related to social and economic systems, is vital for developing students who have the knowledge, skills, perspectives, and values to make responsible lifestyle choices in a community-based context. Environmental education, a vital aspect of the United Nations Decade of Education for Sustainable Development (2005-2014), is an effective multi-disciplinary approach that educators can take to help young people understand the nature and complexity of environmental challenges and help build student capacity to make responsible decisions for appropriate practices that contribute towards the building of healthy communities, and hence, active citizenship.</p> <p>This course will be useful to candidates who see the importance of, and welcome the opportunity to, analyze current needs and research possible relevant approaches to building capacity for environmental leadership in Singapore schools/institutions while also fostering greater community engagement in promoting changes in individual action and organizational practices.</p>	Policy & Leadership Studies (PLS)	3
SC801	Trends in Chemical Science and Technology	<p>The chemical trade and industry of Singapore, petrochemical and pharmaceutical industry their allied industry. Modern chemistry and technologies pertaining to environmental pollution, chemical waste management and good practices. Small chemical producers and businesses. This module is intended to give students a comprehensive understanding of the contributions of chemical science and technology to the national economy and policy of Singapore. Course content may vary from year to year.</p>	Natural Sciences & Science Education (NSSE)	3
SC802	Experimental Design and Biostatistics for Non-Mathematics Graduate Students	<p>Data description and types of biological data; frequency distributions, samples from populations, random sampling. The arithmetic mean, median, mode, range, mean deviation, variance, standard deviation, coefficient of variation, indices of diversity. Chi-square goodness of fit, statistical significance, statistical errors in hypothesis testing, contingency tables.</p> <p>One sample hypotheses: two-tailed one-tailed hypotheses concerning the mean, reporting variability about the mean, sample size and estimation of the population mean.</p>	Natural Sciences & Science Education (NSSE)	3

Special Topics Courses

SC804	Biotechnology and Microbiology	Growth mechanisms. In vitro Biology. Explant culture and micropropagation techniques. Organogenesis, somatic embryogenesis and protoplast culture. Genetic stability and variation: somaclonal. Genetic manipulation via transformation, cellular hybridization and mutagenesis. Control and alteration of metabolic pathways and hormonal metabolisms. Biotechnology of crop improvement and commercial application. Recombinant technology in medical sciences. Cellular defence mechanisms and immunology. Diagnosis using DNA probes, production of monoclonal antibodies. Transgenic animals. Microbial growth and manipulations. Fermentors and bioreactor systems. Microbes in health, disease, industrial, food and environmental applications. Fermentation technologies. Recent advances in rapid automation and detection methods for microbes.	Natural Sciences & Science Education (NSSE)	3
SC805	Molecular Biology	Topology of nucleic acids. Genetic regulation of prokaryotes: control at transcriptional and translational levels. Recombinant DNA technology: principles of gene isolation, cloning. Types of cloning vectors. DNA, RNA and protein analysis methods. DNA sequencing and polymerase chain reaction. Dynamics of DNA in genomes. Satellite DNAs and molecular markers for differentiation. Transformation and transgenics in eukaryotes. Genes in the development of prokaryotes and eukaryotes. Scientific discussion and seminars are included.	Natural Sciences & Science Education (NSSE)	3
SC806	Population Ecology	Analyses of density and estimation of growth rates and parameters for species with age structure, and for open and closed populations; population dynamics and regulation; one species, and two-species (pairwise interactions) models; equilibrium density; deterministic dynamics; population dynamics with stable equilibrium point, with an unstable equilibrium point; metapopulation dynamics of rare species; stability, resilience, and resistance in stochastic systems; role of evolution, models in population ecology; application of population ecology in commercial harvesting of natural populations and environmental problems.	Natural Sciences & Science Education (NSSE)	3
SC807	Genetics	Transmission genetics. Mendel's laws of inheritance. Genes, phenotype, alleles and recombination. Structure and function of DNA, genes and chromosomes. The central dogma: DNA → RNA → Protein. DNA replication and recombination. Cloning and manipulation. Regulation of genes and its expression. Genetic codes and protein synthesis. Genes and development. Genetic analyses of viruses and bacteria. Extrachromosomal inheritance. Population and evolutionary genetics.	Natural Sciences & Science Education (NSSE)	3
SC808	Current Issues in Life Sciences	Recent developments in life sciences, and the implications of these developments and their impacts on society will be covered. Readings and discussions on the latest issues in the life sciences will be the focus of this course.	Natural Sciences & Science Education (NSSE)	3
SC809	Herpetology	Biodiversity, taxonomy, phylogeny, and biogeography of selected taxa, such as, amphibians, turtles and crocodylians, lizards and snakes. Thermal ecology and physiological ecology in squamate reptiles; energetics; foraging and trophic ecology; evolution of parasite-host relationship, and anti-predator adaptations; life history strategies; parental investments; reptilian assemblages and spatial organisation; homeostasis; population dynamics and modelling of endangered taxa.	Natural Sciences & Science Education (NSSE)	3

Special Topics Courses

SC810	Advanced Molecular Genetics	Molecular cloning, different cloning and expression vectors, advanced molecular cloning and sequencing techniques. Application of modifying enzymes and different types of Taq polymerases, trouble shooting and cloning using PCR. Protein expression and purification technology. Current topics in molecular biology will be discussed and seminars will be conducted.	Natural Sciences & Science Education (NSSE)	3
SC811	Plant Pathology	Molecular research in plant microbe interactions: pathogenicity, symbiosis and biocontrol. Current problems in epidemiological and disease control studies. Recent advances for early detection and diagnosis of plant diseases: automation, immunoassays, DNA probes. Trends in development of fungicides, integrated pest management strategies, induced plant defences (immunisation, systemic acquired resistance or SAR), genetic engineering of disease resistant plants.	Natural Sciences & Science Education (NSSE)	3
SC812	Biochemical and Physiological Adaptations	This module deals with the physiological and biochemical adaptations of various organisms eg. <i>Onchidium tumidium</i> (intertidal gastropods), <i>Phascolosoma arcuatum</i> , (Sipunculid), mudskippers (amphibious fish), snake-head, catfish and eel (freshwater fishes) to their specific habitats. Nitrogen metabolism, acid-base balance, osmoregulation, anaerobic metabolism, metabolic arrest and tolerance to high toxicants in the environment will be included. The topics taught will vary from time to time and will be based on the most current information in this area of research.	Natural Sciences & Science Education (NSSE)	3
SC814	Intertidal Ecology	Physical, chemical and biological features of the intertidal zone. Fauna of special habitats. Tolerance of environmental stress. Establishment and maintenance of zonation patterns. Energy acquisition in the intertidal zone: food resources and energy partitioning, mechanisms of feeding and factors affecting rate of feeding. Food webs and keystone species.	Natural Sciences & Science Education (NSSE)	3
SC815	Advanced Plant Physiology	The processes of plant adaptation to both abiotic and biotic environmental factors. The biochemical, physiological and morphological attributes of plants and the molecular mechanisms underlying the expression of these attributes. The topics will be learnt through lectures, cooperative learning, and discussion on selected current research literatures of plant physiology.	Natural Sciences & Science Education (NSSE)	3
SC818	Evolution and Phylogeny	The shared history and ancestry of living things can account for the unity as well as the diversity of living things. It can also explain the myriad modes of life and adaptations of living things to their environment. This course will explore the history, concepts, and applications of evolutionary biology, and look at the related field of systematics and phylogeny. In addition, there will be emphasis placed on the discussion of current topics in evolutionary biology and a hands-on familiarization of methods in phylogenetic.	Natural Sciences & Science Education (NSSE)	3
SC819	Seminars on Special Topics in the Applied Plant Sciences	This course is intended to broaden exposure of higher degree students to current and relevant topics and issues in the field of applied plant sciences through discussion and dialogue with both academics and industry players. It will cover broad areas such as microbial soil biology, ecophysiology, horticulture, urban greening and natural resources usage.	Natural Sciences & Science Education (NSSE)	3
SC820	Plant Molecular Genetics and Development	The objective of this course is to deliver the trends in plant science with an emphasis on fundamental developmental biology. It will provide student with experimental methodology to study gene expression and regulation in plant development; content knowledge in hypothesis and theories from recent research on plant science; and hands-on experience on working with plant materials.	Natural Sciences & Science Education (NSSE)	3

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SC821	Physical Methods in Structural Elucidations	Principles of electronic absorption spectroscopy, nature of radiation, ground states and excited states and selection rules. Simple symmetry treatment of molecules leading to IR/Raman active modes. Mass spectrometry, principles and simple fragmentation patterns. Magnetic susceptibility measurements and magnetic behaviour of inorganic compounds. Magnetic resonance spectroscopy, principles and interpretation of nuclear magnetic resonance NMR spectra (proton and other common nuclei), electron magnetic resonance ESR spectra.	Natural Sciences & Science Education (NSSE)	3
SC823	Advanced Research Techniques in Chemical Synthesis	Design of synthetic pathways, thermodynamic and kinetic factors, feasibility from logistic and economic considerations; limitations and precautions. Purification techniques and methods for growing of single crystals for X-ray crystallography and preparation of samples for spectroscopic analysis. Handling of air- and moisture-sensitive compounds.	Natural Sciences & Science Education (NSSE)	3
SC825	Environmental Analytical Chemistry	Introduction and overview of advanced analytical methods and instrumentation in environmental science and related services. The chromatographic theory. Trace metal and organic pollutant analyses. Capillary electrophoresis. Detection methods /devices and quality control. Modern trends in the ultra-trace analysis for potable water and on-line analysis. Case study.	Natural Sciences & Science Education (NSSE)	3
SC826	Separation and Purification of Materials	This subject seeks to promote students awareness and understanding of the science and technology of separation and purification of raw materials or intermediates needed by commercial and industrial sectors. A strong growth in the value-added products for raw materials as well as intermediates is expected for the regional and global growth.	Natural Sciences & Science Education (NSSE)	3
SC827	Polymer Chemistry	Introduction and classification of polymers, biopolymers and synthetic polymers, solubility and miscibility of polymers, molecular mass and molecular mass distribution, polymerization processes; kinetic and mechanism of step-reaction (condensation) polymerization and radical-chain reaction (addition) polymerization, common plastics and their applications, thermosets and thermoplastics, biopolymeric materials and their applications, specialty polymers.	Natural Sciences & Science Education (NSSE)	3
SC828	Surfactant Chemistry	Introduction to surface and colloid chemistry: thermodynamics of surfaces, surface tension, capillarity, surfactants, micelles, thermodynamic of micellization, solubilization, Gibbs adsorption equation and Langmuir adsorption isotherm.	Natural Sciences & Science Education (NSSE)	3
SC829	Plant Secondary Metabolites	Traditionally, secondary metabolites from plants play a major role in drug discovery for the treatment of various human ailments. By understanding the various classes of these biomolecules as well as its mode of action, it would help students appreciate the importance of plants as potential drug source.	Natural Sciences & Science Education (NSSE)	3
SC830	Bioactive Natural Products and Their Derivatives	The main rationale for introducing this course to highlight the importance of natural products as an important source for drug discovery and development. Various aspects of natural products, including the chemistry and its biosynthesis, will be emphasized. The emergence of multi-drug resistant strains of pathogenic bacteria as well as drug resistant cancer forms underscore the importance of natural products as therapeutic agents.	Natural Sciences & Science Education (NSSE)	3
SC831	Chemical Zoology	Chemical communication is a fascinating topic that entails the understanding of various bioorganic molecules and its ecological functions. By dissecting the function(s) of these natural molecules, it would lead to better understanding and appreciation of the dynamic interactions between organisms.	Natural Sciences & Science Education (NSSE)	3

Special Topics Courses

SC832	Polymer Chemistry and Biomaterials	This is an advanced course which emphasizes the fundamentals of polymer chemistry, colloids, self assembly and biomaterials science. In order to understand and appreciate the macroscopic properties of materials and their applications in life sciences a complete understanding of the properties in molecular level is crucial. In this course, the fundamental physical principles that lead to the observed macroscopic properties of polymeric materials in life sciences will be discussed in detail. The latest development in this field will also be highlighted and updated.	Natural Sciences & Science Education (NSSE)	3
SC833	Synthetic and Catalytic Organic Chemistry	This graduate course is focused on the rapidly expanding developments in organic synthesis and is appropriate for graduates in chemical sciences, pharmacy or related disciplines. It will provide students with a good foundation in synthetic chemistry with an emphasis on stereoselective synthesis and applications to complex molecule synthesis. It will also benefit those initiating or enhancing their career progression within the pharmaceutical, synthetic research and academic professions.	Natural Sciences & Science Education (NSSE)	3
SC834	Bioinorganic Chemistry	The role of metals in biological systems is an area of great interest to chemists and biologists alike. Life in its present form would not be possible without the involvement of the metallic elements. This course deals with the key ways in which metals participate in biochemical processes, focusing on biomolecules that incorporate metal atoms in their molecular structures. The ways in which the chemical properties of selected metals define the biological function of the systems they are found in will be discussed. Important applications of inorganic and coordination chemistry in medicine will also be highlighted.	Natural Sciences & Science Education (NSSE)	3
SC835	Fundamentals and Applications of Material Science	This is an advanced course which emphasizes the fundamentals of material science and advanced characterization methods for material characterization. In order to understand and appreciate the macroscopic properties of materials and their applications in life sciences a complete understanding of the properties in molecular level is crucial. In this course, the fundamental physical principles that lead to the observed macroscopic properties of materials such as metals, ceramics, glass, and polymers will be discussed in detail. The latest development in this field will also be highlighted and updated.	Natural Sciences & Science Education (NSSE)	3
SC836	Chemistry of Biological Systems	The interface between chemistry and biology is one of the most exciting of modern science. This course integrates chemical principles into lectures on the structure and function of biological molecules as well as gives an introduction to the standard tools and techniques employed in Chemical Biology research. provide advanced training in modern organic, inorganic and analytical chemistry applied to the understanding of biological systems; provide the student with an appreciation of how biological systems work from a chemical perspective and an appreciation of why and how chemical understanding of biological processes are important in scientific and medical research; enable the student to achieve a high level of research competence and to acquire necessary skills through training in advanced organic, inorganic and analytical chemistry techniques.	Natural Sciences & Science Education (NSSE)	3

Special Topics Courses

SC837	Separation and Analytical Techniques	The isolation and purification of the targeted component as well as an adequate understanding of their structures at the molecular level are crucial in life sciences research, such as discovery of new drugs, development of bio-materials, and environmental analysis. The course covers topics like introduction of physical and physico-chemical methods of separation; chromatographic method and preparative separation; purification and isolation of trace substances; analytical spectroscopic techniques; current trends and development.	Natural Sciences & Science Education (NSSE)	3
SC838	Green Chemistry	The main objective of this course is to familiarize participants with the trends in this significant emerging field in modern chemistry, namely green chemistry. Green chemistry embodies the concept of benign by design and involves tailoring or modifying chemical processes to minimize or eliminate hazardous waste(s) from being produced during chemical generation, use and eventual degradation. The course covers topics like waste minimization, atom efficiency, solvent selection, (bio)catalysis, renewable resources and energy efficient processes.	Natural Sciences & Science Education (NSSE)	3
SC839	Medicinal Chemistry	The main objective of this course is to familiarize students with current trends in medicinal chemistry. This course introduces the basic principles and practice of medicinal chemistry. This is illustrated by how ideas for new drugs are taken through the various stages from initial discovery, generation of lead compounds, optimization of biological activity, and finally into clinical trials. This mechanism of actions of clinical drugs (e.g. antiviral, antibacterial, and anticancer) used for the treatment of human ailments will be discussed. To provide advanced training on current concepts and practices in medicinal chemistry. To provide students with knowledge on drug discovery and development process. To familiarize students on modern techniques used in medicinal chemistry through hands-on laboratory sessions.	Natural Sciences & Science Education (NSSE)	3
SC840	Comparative Functional Anatomy	The focus of this course is on vertebrate and invertebrate studies at the organismic level, emphasizing comparative, anatomical, developmental morphology, adaptive radiation, and functional characteristics of evolutionary significance. The study of this subject in contemporary zoology is vast; consequently, selected themes and taxa, their phylogeny, and systems, will form the topics of study. Laboratory work with preserved and live specimens and demonstrations emphasize comparative functional anatomy and techniques of biological systematics. Evolutionary innovation and the contemporary role of comparative anatomy as a path-breaking, pioneering discipline in solving new problems and generating novel theories crossing traditional interdisciplinary barriers of biological disciplines and engineering science are highlighted.	Natural Sciences & Science Education (NSSE)	3

Special Topics Courses

SC841	Dimensions of World Energy Problem- Role of Plasma Fusion	This subject surveys the various sources and resources of energy available to the world. It looks at historical consumption pattern and projects world requirements into the future, using various scenarios. It is apparent that within a century from now, new sources of energy will be needed. The strongest candidate as a long-term solution is fusion energy from plasmas. The historical route of science towards the present status of world fusion programmes will be traced. Large programmes will be briefly described, as will small programmes which has led to international scientist-to-scientist collaboration, resulting in networks which have strengthened research capacity in developing countries leading to many applications as spin-offs to the research on fusion plasmas. Thus a scenario is sketched in which the long-term energy problem of the world is solved, ensuring continuity in the progress of human civilization. At the same time many important applications related to advanced materials, microelectronics, radiation and the environment are also brought to fruition.	Natural Sciences & Science Education (NSSE)	3
SC842	Laser and Optical Technology	At the end of the course, students will be familiar with technology associated with solid state lasers, gas lasers, dye lasers, diode lasers. Laser Control: Longitudinal and transverse mode selection, mode locking, Q-switching, laser amplifiers, pulse chopping, pulse lengthening, pulse compression, frequency selection. Laser Optics: laser optics (mirrors, polarizers, lenses, electro-optical, nonlinear, fibre optics), Aberrations (spherical, chromatic), Materials Characterization of a laser: Energy, pulse shape, wavefront, divergence, coherence, modes, polarisation Techniques to characterise lasers: calorimetry, photo-diodes, PMT, correlation, interferometry, spectrometry. Students will have to complete assignments related to the course and their project.	Natural Sciences & Science Education (NSSE)	3
SC844	Plasma Diagnostics	Measurements of amplitudes and phases of rf current and voltage. Wire-wound and Hall magnetic probe diagnostics. Langmuir probe measurements for plasma density, electron temperature, plasma potential and electron energy/probability distribution functions. In-situ optical emission spectroscopy of plasma species. Mass spectroscopy of radicals and nonradical neutrals in chemically active plasmas.	Natural Sciences & Science Education (NSSE)	3
SC845	Wave Propagation	Wave equations. Wave propagation in dissipative medium. Maxwell equations. Telegrapher equation and specialisation to transmission line equation. Path integral methods and application to solving telegrapher equation. Waveform distortion, prediction and restoration.	Natural Sciences & Science Education (NSSE)	3
SC847	Industrial Applications of Infrared Spectroscopy	The infrared vibrational spectroscopy is a technique that is widely used in industry. It provides information on the chemical structures and physical characteristics of materials; they are used for identification of substances by fingerprinting and they are used to provide quantitative information on products and processes. The technique is now used to characterise by-products, end and formulated products, feedstock, fabricated materials, semiconductor materials, gas pollution, and in de-formulation (reverse engineering) studies of competitors products. It has multi-disciplinary applications across all sciences. The content of this subject consists of the theory and principle of infrared spectroscopy, instrumentation, sampling techniques and accessories, and quantitative analysis. The course will be conducted in the form of lectures, tutorials, and laboratory work on some industrial products using an infrared spectrometer.	Natural Sciences & Science Education (NSSE)	3

Special Topics Courses

SC848	Applications of Physics in Medicine and Biology	Waves vs Photon; Atomic Spectra; Biological Examples of Emission, Absorption, and Fluorescence. Production of X-rays; Absorbed Dose and Exposure; Biological Effects of Radiation; Medical Uses of X rays. Nuclear Decay Rate and Half- Life; Cumulated Activity and Sample Dose Calculation; Nuclear Medicine. Laser; Autofluorescence; Laser Induced Autofluorescence Techniques and Cancer research. Ultrasound and Doppler Effect; Ultrasound to Measure Motion; Ultrasound pictures. The Source of Magnetic Moment and Magnetic Moment in an External Magnetic Field; Relaxation Times; Introduction to Magnetic Resonance Imaging.	Natural Sciences & Science Education (NSSE)	3
SC849	Quantum Computation	Quantum Computation is an emerging interdisciplinary field that with great potential as the next generations of computer technology. It is not merely able to miniaturise the storage capacity of conventional computers; it is also able to perform certain task deemed computational hard in classical computer. This course aims to provide an overview of this emerging field with sufficient rigor for a working in this area.	Natural Sciences & Science Education (NSSE)	3
SC850	Introduction to Quantum Field Theory	The course will begin with path integral in quantum mechanics, followed by quantization of classical fields. The lambda-phi ⁴ model will be treated in detail, ending with ideas of renormalization.	Natural Sciences & Science Education (NSSE)	3
SC851	Quantum Mechanics 1	Introduction to quantum mechanics, wave packets, wave equation, Schrodinger equation, operator algebra, principles of wave mechanics, solution of Schrodinger equation with different potentials, WKB approximation, variational methods, vector spaces, eigenvalues and eigenvectors of operators and angular momentum.	Natural Sciences & Science Education (NSSE)	3
SC852	Quantum Mechanics 2	Scattering, quantum dynamics principles of Feynman's path integral formulation, spin, polarization and scattering, density matrix, measurement and information, rotation and other symmetry operations, perturbation theory.	Natural Sciences & Science Education (NSSE)	3
SC853	A Primer to Quantum Cryptography	Secure and robust communication systems based on quantum devices have experimentally been demonstrated and shown to be viable commercially. The module covers some rudiments regarding quantum mechanics; an introduction to classical and quantum cryptographic scheme and a brief discussion of experimental work in this field.	Natural Sciences & Science Education (NSSE)	3
SC854	Photovoltaic Physics and Solar Cells	Today the traditional energy sources based on fossil fuels are depleting at an ever fast rate and will be exhausted in the next centuries. Photovoltaic solar energy becomes one of the most feasible alternative energy sources that will provide energy demand for mankind in the future. This course deals with the issues of an alternative sustainable energy source that relies on the direct conversion of Sun light into electrical energy in solar cells based on the photovoltaic effect.	Natural Sciences & Science Education (NSSE)	3

Special Topics Courses

SC855	Plasma Physics and Fusion Energy	<p>Thermonuclear Fusion has been identified as one of the clean and long term future energy sources. Thermonuclear fusion uses extremely high temperatures with hot dense plasma of fusion fuel being confined for sufficiently long durations for net energy output. The major objectives of this advanced course are:</p> <p>(i) to highlight the advantages of Fusion over other energy resources;</p> <p>(ii) to understand the role of plasma heating and plasma confinement in achieving controlled thermonuclear fusion; and</p> <p>(iii) to provide in-depth coverage of magnetic fusion and inertial confinement fusion schemes.</p> <p>The major topics included are: World energy scenario; Fusion as clean and long-term energy source; Fundamentals of plasmas; Fundamentals of fusion process; Magnetic confinement schemes including magnetic mirror and tokamak; Inertial confinement fusion; and magnetic fusion device - plasma focus.</p>	Natural Sciences & Science Education (NSSE)	3
SC861	Topics in Analysis	Selected topics from functional analysis (Banach spaces and geometry of Banach spaces), real analysis (theory of integration), and topology.	Mathematics & Mathematics Education (MME)	3
SC862	Topics in Algebra	Selected topics from commutative Algebra, category theory, ordered structures.	Mathematics & Mathematics Education (MME)	3
SC863	Topics in Probability and Statistics	Selected topics in probability theory, stochastic processes, mathematical statistics (theory of estimation and hypothesis testing), applied statistics (regression analysis, time-series analysis, design of experiments, etc).	Mathematics & Mathematics Education (MME)	3
SC864	Topics in Mathematics	Selected topics from real analysis, functional analysis, algebra and topology.	Mathematics & Mathematics Education (MME)	3
SC865	Topics in Applied Mathematics	Selected topics from differential equations, mathematical modeling, optimization, computational science, probability and statistics.	Mathematics & Mathematics Education (MME)	3
SC866	Topics in Mathematics II	Selected topics from real analysis, functional analysis, algebra and topology.	Mathematics & Mathematics Education (MME)	3
SC867	Topics in Applied Mathematics II	Selected topics from differential equations, mathematical modeling, computational science, probability and statistics.	Mathematics & Mathematics Education (MME)	3
SC868	Algebra and the Teaching of Algebra	<p>The content of this module will be based on three main themes. Firstly, the role structure plays within the mathematical content of number and algebra will be discussed, for example, within the learning of number names, counting, early arithmetic, an awareness of rules and patterns, manipulation of algebraic expressions, and algorithms. In addition, consideration will be given to the deliberate use of structure within teaching approaches to number and algebra. A second theme looks at research in the area of teaching and learning of algebra. What are some of the misconceptions learners have of algebraic concepts. A third theme of the use of technology will look at calculators and specific computer software, and the implications of this technology on teaching and learning issues, along with implications this technology has for the number and algebra curriculum.</p> <p>Throughout the course, links between number and algebra will be considered, along with problems relating to language and notation.</p>	Mathematics & Mathematics Education (MME)	3

Special Topics Courses

SC869	Assessment in Mathematics	The content of this module will address three main areas. Firstly, the concepts and issues of assessment and alternative assessment will be examined from both a local and international perspective. Secondly, concepts, methods and functions of paper and pencil tests will be examined. Thirdly, the form and functions of alternative assessment will be rigorously examined. Throughout the course assessment of learning, for learning and as learning will provide an overarching organizing framework.	Mathematics & Mathematics Education (MME)	3
SC870	Curriculum Studies in Mathematics	The course focuses on the nature of the school mathematics curriculum and the various factors that impact on it. Some of the topics that are discussed include curriculum models, curriculum design, and evaluation and assessment as they relate to mathematics education. Other areas also covered in the course include: the nature of mathematics, aims of teaching mathematics, curriculum development and curricular materials, major reforms in mathematics curricula in the world, international studies, development of specific areas of mathematics, socio-cultural issues and ethnomathematics. In particular, the implications of the above areas for the Singapore mathematics curriculum is a major aspect of the course.	Mathematics & Mathematics Education (MME)	3
SC871	Developments in Problem Solving in Mathematics	The content of this course is problem solving in mathematics. It will address research in the field from both a local and international perspective. Specifically the course will examine the variables: cognitive, metacognitive, affective, curriculum, teacher and classroom, of problem solving in mathematics. It will also examine the assessment of problem solving, the use of scales and rubrics to grade problem solving tasks.	Mathematics & Mathematics Education (MME)	3
SC872	Fundamental Concepts in Mathematics	This course develops, through a series of historical case studies, an awareness of the origin of mathematical concepts, and how resulting mathematical solutions were interpreted in real terms. Particular emphasis will be placed on understanding the context in which mathematicians were working at the time they developed certain concepts and hence the variety of different mathematical concepts developed in different cultures at different times. Implications will be drawn for teaching of mathematics at Primary and Secondary level both with a view to improving current practice. Topics may be selected from the following areas: Counting, measure, geometry abstract algebra, analytic geometry probability and statistics.	Mathematics & Mathematics Education (MME)	3
SC873	Geometry and Geometry Education	This course consists of two parts: Foundation of geometry and research ideas about teaching school geometry. The main objective is to provide the educators with knowledge about foundations of geometry, develop Euclidean geometry using axiomatic approach, introduce non-Euclidean geometry, and familiarise learners with relating research literature to the teaching of geometry. The overarching model that connects these two parts of the course is the van Hiele's theory of geometric reasoning. As educators, the course participants will experience working through the materials in the Primary-Secondary grades (for the purpose of teaching geometry at these levels) and tertiary grades (for the purpose of learning geometry at the advanced levels) that roughly correspond to the five levels in the van Hielean framework.	Mathematics & Mathematics Education (MME)	3

Special Topics Courses

SC874	Number Theory and the Teaching of Arithmetic	This course is designed to strengthen the understanding of number systems and terminology for effective teaching of arithmetic in schools. Number theory on divisibility, primes and congruences will be emphasized (for example, greatest common divisor, Eulers Theorem and the Chinese Remainder Theorem), as well as applications of number theory in check digits and cryptography. The focus will be to broaden teachers repertoire and ability in designing mathematical tasks for investigation in the classroom.	Mathematics & Mathematics Education (MME)	3
SC875	Research and Issues in Mathematics Education	<p>Researchers and reflective practitioners in mathematics education should be acquainted with the crucial issues in the field. This course introduces them to the key theoretical frameworks, research methodologies, and specific findings about selected issues that are relevant to the Singapore context but also aligned with contemporary international trends. The issues include affect and beliefs, curriculum, problem solving, classroom teaching and learning, teacher professional development, use of ICT, and assessment. On the basis of this broad perspective, the students can select one major issue as their own research project.</p> <p>The students will explore these issues through guided reading, class discussion, independent research search of the literature, and reflection through writing. They will demonstrate their learning by critically reviewing a significant issue and drawing implications for theory and practices related to the issue.</p>	Mathematics & Mathematics Education (MME)	3
SC876	Teaching and Learning Mathematics	<p>Mathematics has always been a critical school subject but many students find it difficult and tedious to learn. Reforms in mathematics education all over the world have provided rich theoretical frameworks and strong research findings from which sound mathematics pedagogy can be developed and investigated. Furthermore, insights about mathematics teaching can also be analysed from many different disciplines, including psychological, sociological, philosophical and mathematical perspectives.</p> <p>This course will deal with theories, research, and practices from well-known proponents such as Skemp, Dienes, Bruner, van Hiele, Skinner. General theories such as constructivism and information processing will be discussed in relation to practices and research in mathematics teaching and learning at the school levels.</p>	Mathematics & Mathematics Education (MME)	3
SC877	Using Technology in Mathematics Education	This course covers various aspects of ICT such as Dynamic Geometry software, Graphing utilities, Spreadsheets, Calculators (including Graphing Calculators), Computer Algebra Systems, and the Internet. Their role in providing practice and developing mathematical concepts will be examined and discussed. The focus will be on how these technologies have been or could be used as tools in the teaching and learning of mathematics in schools.	Mathematics & Mathematics Education (MME)	3
SC878	Discrete Mathematics and Problem Solving	This course uses Combinatorics and Introductory Graph Theory as a basis for students to engage in personal problem solving (PS) and so put themselves in their students shoes. Polya's basic PS model is introduced, amongst others, to guide the PS process and to lead on to the teaching of PS and the reading of mathematics texts. Research in PS, such as different teacher knowledges for teaching PS, Kahnemann's two systems of thinking, and implementing PS in the classroom, will infuse the Combinatorics and Graph Theory lectures and tutorials.	Mathematics & Mathematics Education (MME)	3

Special Topics Courses

SC879	Statistics and the Teaching of Statistics	<p>The course is designed to look at the research in statistics education with the focus on the implications of that research for teaching statistics. This has been done through a focus on misconceptions (which, implicitly, implies looking at conceptualisation). Many of the misconceptions exist among people at all levels, from primary school through to adults. The major goals of the course are:</p> <p>To provide you with an overview of selected components of the statistical education research literature</p> <p>To discuss the implications of the literature for the teaching of statistics in the curriculum</p> <p>To provide an opportunity for you to operationalise one aspect of the statistics curriculum that you will be able to apply to your teaching.</p> <p>Many of the topics span issues from different levels. While some of the topics may appear on the surface to be primary, students in secondary school as well as adults have some of these misconceptions, so the issues are appropriate at different levels.</p>	Mathematics & Mathematics Education (MME)	3
SC881	Advanced Studies in Science Education	This subject involves an in-depth study and review of research in science education, particularly in the area of research of the doctoral student.	Natural Sciences & Science Education (NSSE)	3
SC882	Advanced Issues in Science Education	This subject involves an in-depth study and review of the issues which are relevant to science education and how they influence the research area of the doctoral student.	Natural Sciences & Science Education (NSSE)	3
SC883	Interaction and Discourse in Education Research	This course is designed to introduce alternative means of examining educational practices in schools. Educational activities are complex and hence difficult to make sense of them. We argue here that there is more than one way to examine educational practices. Examination and assessment grades of students are a common way to prove the success of an educational activity. However, merely focusing on grades as a measure of educational success is limiting as it disregards the processes which students and teachers journey through. The social dimension of the educational experience, if ignored, presents education as a purely cognitive and individualistic activity. In this course, students will be exposed to alternative ways of understanding educational activities by examining the talk and interaction between learners and teachers.	Natural Sciences & Science Education (NSSE)	3
SC884	Mixed Methods Inquiry in Science Educational Research and Evaluation	Mixed methods is often misunderstood as simply mixing qualitative and quantitative methods. In this course, we talk about mixing at sophisticated levels involving methods, methodologies, and/or theories and paradigms to strengthen a research design and argue the rationale for the mixing. The course is designed to address the theory and practice of mixing inquiry methods and methodologies in science educational research and curriculum/program evaluation. The topics covered will include the argument for mixing methods, different concepts of mixed methods design, analysis, and practice, and challenges involved in mixed methods practice. Selected evaluation theorist will be introduced and their evaluation advocacies will also be discussed. The emphasis of the course is on practice and will feature critiques of empirical work primarily.	Natural Sciences & Science Education (NSSE)	3
SC885	Biosensors: Theory and Applications	<p>This is an interdisciplinary course involving chemistry and biology, and some fabrication engineering knowledge. It will be a useful broad based course for PhD students so that students can appreciate the roles, functions, working principle of biosensors which serve many potential application areas: e.g. clinical, environmental, food and defense areas.</p> <p>To appreciate the roles of biosensors for various applications: historical development until the present</p> <p>To apply relevant transducing principles for the development of appropriate biosensors for different types of analytes</p> <p>To apply suitable chemical principles for the immobilization of bioreceptors</p> <p>To assess the applications of biosensors to suit different application areas based on different parameters</p>	Natural Sciences & Science Education (NSSE)	3

Special Topics Courses

SC891	Environmental Health and Toxicology	<p>The course is relevant to all higher degree by research students and is a current topic in environmental science. The study of the effect of pollution on natural ecosystems by examining biological responses at all organismal levels (molecular to whole organism) using biomarkers is an increasingly popular tool for managing environmental health by various governmental bodies.</p> <p>Higher degree by research candidates who take this course as a special topic will have an opportunity to run laboratory experiments using known pollutants. Field sampling will be</p>	Natural Sciences & Science Education (NSSE)	3
SC892	Current Topics in Animal Behaviour	<p>The course examines research topics of current importance in animal behaviour, behavioural biology, and ethical issues on the use of animals in behavioural studies. With recent advances in molecular biology and miniaturisation of technology, there have been significant developments in the field. The course covers topics like techniques for studying animal behaviour in laboratory and field; behavioural and phenotypic plasticity; population and sex differences in behaviour; optimality, spatial memory, aggression, dispersal and territoriality; and applications of behavioural studies to animal welfare and wildlife conservation.</p>	Natural Sciences & Science Education (NSSE)	3
SE801	Topics in Learning and Technologies	<p>The content for these topics change as new understanding arise. Topics may include the theoretical approaches to teaching/learning with technologies; recent development in technologies that support effective learning practice; design and study of learning environments; cognitions and learning; relations between the growth of conceptual understanding and cognitive skills; collaborative learning with technologies; and engaged learning.</p>	Learning Sciences & Technologies (LST)	3
SE802	Design of Asynchronous Online Discussion	<p>This course will discuss how the asynchronous online discussion can be used as an effective instructional strategy. The topics covered will include the integration of the asynchronous collaborative online discussion environment with the face-to-face approach, the role of the teachers in designing and evaluating the environment, and the use of scaffolds in the online discussion environment to facilitate critical thinking skills.</p>	Learning Sciences & Technologies (LST)	3
SE803	An Introduction to Analyzing and Designing Systems	<p>This course aims to equip learners with the capability to examine, analyse and design systems from a systemic perspective. Learners will discuss the characteristics of non-living and living systems based on general systems theory, cybernetics, control systems, and chaos theory. Through the designing and building of natural and learning systems using various computational systems modeling tools such as STELLA and VisSim, learners will be to analyse the requirements and the dynamic behaviours of systems. This course is relevant to professionals from various fields who wish to gain a broader aspect of systems and learn to identify system problems and opportunities in order to efficiently and effectively manage system changes. After completing this course, learners should be able to: 1. Analyse phenomena from a systemic perspective 2. Design and build dynamic models of living and non-living systems 3. Examine and evaluate the problems and opportunities presented in the models Assessment Mode: Possible assessment components: 1. Students computational system models 2. Students written assignments</p>	Learning Sciences & Technologies (LST)	3
SE808	Advanced Literature Review and Analysis	<p>This course is designed to help students analyse and synthesise the literature for their respective research, thereby establishing the significance of their research proposal. The outcome of this course will therefore be a literature synthesis paper with clear articulation of gaps in the field of research of students interests and strong justifications for the significance of the study. It will lay down a working structure for the literature review chapter for their respective proposals. Some advanced library skills will also be introduced.</p>	Learning Sciences & Technologies (LST)	3

Special Topics Courses

SE809	Advanced Special Topics in the Learning Sciences	How learning is distributed, mediated, contextualised, changed and supported in today's technologically dynamic society is a key area of concern for all educators. The Learning Sciences is a cross-disciplinary field of study that investigates the phenomenon of learning. Based on the interests and backgrounds of the participants, this course will guide them to explore emerging areas of interest in the field. Some possible areas include collaborative learning and knowledge building in face-to-face and mediated environments, situated learning within immersive virtual learning environments and the development of multi-literacy.	Learning Sciences & Technologies (LST)	3
SE810	Advanced Qualitative Research Methodologies	While the Masters courses equip graduate students with basic qualitative research methods, PhD students usually need advanced methodologies to address their research questions. This course will focus on advanced qualitative research methodologies. Possible areas include phenomenology, grounded theory, ethnography, discourse analyses, hermeneutics and design research. It will also cover issues related to the establishment of trustworthiness in qualitative studies. The outcome of this course can form the foundation for the candidate's methodology chapter if s/he uses qualitative research methods in the research study.	Learning Sciences & Technologies (LST)	3
SE811	Advanced Quantitative Research Methodologies	Continuing from the Masters courses on basic statistical methods, this seminar exposes students to advanced quantitative methodologies for in-depth and meaningful data analysis and interpretation, required skills for PhD candidates. This course will focus on advanced statistical skills such as multivariate statistics, structural equation modelling, social network analysis and the principles of survey design. It will also cover issues related to validity and reliability of quantitative studies. The outcome of this course can form the foundation for the candidate's methodology chapter if s/he uses quantitative research methods in the study.	Learning Sciences & Technologies (LST)	3
SE812	Quantitative Research Design And Analysis	This course covers the concepts, theories and practices associated with the design, measurement, analysis and inference procedures of quantitative educational research. The course addresses a range of topics: The purposes and roles of quantitative research; The generation of research questions/hypotheses; Experiment/non-experimental design and implementation; Survey (including mail, phone, and web-based/ e-mail surveys) sampling, questionnaire, and instrumental design; Data collection, management, exploration, analysis, and presentation; Ethical and diversity issues (confidentiality in handling data, cultural and language issues). Descriptive and inferential statistics will be covered when appropriate, with the focus on conceptual understanding, appropriate selection and utilization of statistical procedures rather than on statistical theory and computation per se.	Learning Sciences & Technologies (LST)	3
SE813	Functions and Modeling	The goal of this course is to model pedagogy which could be used in secondary school mathematics classrooms. One of the major themes is that of modeling teachers tend to teach the way they were taught. This course will demonstrate and allow students to participate as learner and observers, in a variety of group activities, problem solving and class discussion techniques.	Learning Sciences & Technologies (LST)	3

Special Topics Courses

SE814	Analyzing Talk in Interactive Learning Environments	To provide students with an understanding of: Theoretical and methodological grounding for different methods for analyzing talk and interaction; Research literacy regarding modes of analysis and their uses and tenets in educational research and the learning sciences; Application of analysis to pedagogy and practice; Peer critique and discussion regarding preliminary analyses and various approaches in a workshop-style context; Practice trying out different methods using their own or the instructors data sets.	Learning Sciences & Technologies (LST)	3
SE815	Educational Philosophy	This course will investigate the aims of education and the means for achieving those aims. It will interrogate the many tacit assumptions that permeate the discourse of education. It will do so by considering aspects of metaphysics, values, ideologies, and practice that bear upon education and educational research. Students will engage deeply with seminal ideas of great thinkers in educational philosophy. They will develop a critical understanding of educational choices in relation to a space of possible alternatives for the development of educational capital and social good.	Learning Sciences & Technologies (LST)	3
SR801	Educational Research Methods for Improved Pedagogical Practice	This module introduces students to several contemporary educational research methods and how research proposals are written from the point of view of different research paradigms. The assignment components of the module will discuss the mechanics of research such as framing the research question within educational enquiry, reviewing literature to support the study and creating appropriate methodology which addresses the research questions and provides a well-structured, robust, ethical, and critical study. In particular, it will discuss contemporary approaches, action research and how this might be considered a specific implementation of ethnographic and case study methods. It will also introduce the concept of design experiments and how they provide a well conceptualized yet ecologically relevant approach to social science field based investigations. The module will explore these methods by: Providing students with the necessary technical instruction to explore the conceptual scope of research question and proposal development. Guiding students through the investigation of a research question and development of research proposals so that they complete basic planning and have documented their approach to the research task.	Centre for Research in Pedagogy & Practice (CRPP)	3
SR802	School-Based Applied Educational Research	This course introduces teachers to the nature of educational change and reform, and then focuses on the conduct of dissertation research. Participants will engage in critical discussion of research approaches, and identify their strengths, weaknesses and best contexts in which to apply them. Instructors will the help to de-mystify the dissertation process. Drawing on insights from previous units, students will work individually and collaboratively to develop and present research proposals. Peer and instructor feedback will be provided. Participants will learn how to conduct high quality educational research to solve school-based problems and undertake the development of a draft dissertation. The course will also provide them with skills and experiences to identify their research needs and support their colleagues in research roles.	Centre for Research in Pedagogy & Practice (CRPP)	3

Special Topics Courses

SR803	Approaches to the Analysis of Classroom Discourse	<p>This course introduces students to the study of situated language use in the social setting of the classroom. Not only is language the basic medium through which teaching and learning take place, but it also has a powerful influence on older childrens language development.</p> <p>The key questions raised are the following:</p> <p>How do interaction patterns and overall lesson structure affect the learning that happens and the quality of knowledge?</p> <p>How can teacher structure interaction effectively to involve students actively in the construction of knowledge?</p> <p>How do teachers achieve the kind of connected learning and coherence across larger units than the lesson that allows their students knowledge and understanding to be accumulated, modified and deepened?</p> <p>Do patterns of classroom discourse vary across the key learning areas and if so how?</p> <p>How do patterns of classroom disclosure position students differently with respect to educational opportunities.</p>	Centre for Research in Pedagogy & Practice (CRPP)	3
SR804	History and Philosophy of Pedagogy and Practice	<p>This course is an introduction to the history and philosophy of pedagogy and practice. Topics might include historical and philosophical foundations of pedagogy and practice, and subjects covered include core philosophers such as Dewey, Vygotsky, Bakhtin, Bourdieu etc as well as Bernstein and Bruner.</p>	Centre for Research in Pedagogy & Practice (CRPP)	3
SR805	Current Issues and Reform Issues in Pedagogy	<p>The course is an introduction to the current issues in pedagogy and educational reform. Topics might include globalization, comparative research, school effectiveness and critical pedagogy, social equity, etc.</p>	Centre for Research in Pedagogy & Practice (CRPP)	3
SR806	Videography and Research in Pedagogy and Practice	<p>The course is an introduction to videography as a theory and as a methodology in educational research. The topics will include theoretical and epistemological foundation for the use of videography in educational research, videography as it is used within and across different research traditions, and the methods for conducting video data collection and analysis.</p>	Centre for Research in Pedagogy & Practice (CRPP)	3
SR807	Analysis and Publication of Professional Research Literature in Educational Linguistics	<p>A graduate course in understanding and using discourse analysis for reading, as well as analyzing, research publications with the explicit aim of publishing substantive articles or book chapters in strategically chosen publications or publishers in the field of educational linguistics. After initially exploring possible forums for publication, and investigating and analyzing samples of successful writing in these, students will re-work substantially, both in content and form, high-quality term papers or rough drafts of research projects in order to meet the topical and rhetorical requirements of the forum of their choice.</p>	Centre for Research in Pedagogy & Practice (CRPP)	3
SR808	Teacher Knowledge and Teacher Development - Foundations, Methods and Findings of Research	<p>This course is designed to give interested graduate an overview of research in the area if teacher knowledge and teacher development. It aims to introduce the student what we know and how we know about teacher knowledge and teacher development from past and current research. We explore the major philosophical and epistemological foundations guiding the research in posing and framing questions, selecting methods to answer them as well as the major research findings that fuel the policy debate and inform policy making for teacher education and professional development.</p>	Centre for Research in Pedagogy & Practice (CRPP)	3
SR809	Structural Equation Modeling for Education Research	<p>This course covers the theory of structural equation modeling and its application in educational research. Issustrations and applications using software packages will be a feature of the course. Application on educational research projects is the emphasis of the course.</p>	Centre for Research in Pedagogy & Practice (CRPP)	3

Special Topics Courses

SR810	Understanding by Design: Building Teacher Capacity in Curriculum and Pedagogical Design in NT Classrooms	This module uses Understanding by Design as an approach for improving teachers capacity as design for student learning. Working within the NT curriculum, this module will help teacher-researchers clarify learning goals, devise assessments that reveal student understanding, and craft effective engaging learning activities.	Centre for Research in Pedagogy & Practice (CRPP)	3
SR811	Social Class and Education	This seminar introduces advanced degree students to a major area of research in the sociology of education: the relationship between social class and education. The seminar will begin with an examination of how social class has been conceptualized and measured. The class will examine research in the area of social stratification and how that relates to educational achievement and educational attainment. Other themes in the seminar include the role of capital, the ethnicity gap in achievement, and school effectiveness research.	Centre for Research in Pedagogy & Practice (CRPP)	3
SR812	Independent Study: Contemporary Social Organization	This course is designed as an independent study where the student will explore and critically examine an area of interest relevant to postmodern social organization and the discourse between structure and agency. Special reference will be made along the works of key contemporary social theorists, e.g. Bauman, Beck, Castells, Giddens, Lash.	Centre for Research in Pedagogy & Practice (CRPP)	3
SR813	Alternative Assessment in Education	This module aims to provide students with alternative assessment knowledge and skills. It will address ways to assess higher order thinking skills and real-world problem solving in the day-to-day classroom teaching and assessment contexts. Theoretical discussion and hands-on activities that enhance understanding of various types of authentic assessments, assessment task development, and alignment between assessment, curriculum, and pedagogy will be included. Toward the end of the module, students will be able to develop one type of the alternative assessments in a complete unit lesson plan, to communicate the assessment results with parents and students, and to defend their views of alternative assessment in school improvement.	Centre for Research in Pedagogy & Practice (CRPP)	3
SR814	Hierarchical Linear and Non-Linear Modeling	Hierarchical linear and non-linear modeling was widely used in educational and social science research because of the nested nature of the data (eg. Student nested in class, class nested in school). This course introduces and covers hierarchical linear and non-linear modeling. The objectives are to give students and reasearchers the knowledge as to when these techniques might be useful, and understanding of the theory and statistics involved in these techniques and their limitations, an ability to read and criticize, publish research using these techniques, and an oveview of current issues and developments. Illustrations and applications using software packages will be the main feature of the couse. Assessment Mode: Assignments and quiz	Centre for Research in Pedagogy & Practice (CRPP)	3
SR819	Vygotsky and Pedagogy	Set against the backdrop of the need to prepare students for life in the 21st Century through schooling, crucial issues remain concerning the nature of learning and its relationship to psychological development and pedagogy. This course seeks insights into these matters from the seminal work of the Soviet psychologist Lev Semyonovich Vygotsky (1896-1934). The course is organised into two main parts: (i) a close and communal reading of Vygotskys book, Mind in society: The development of higher psychological processes (1986); and (ii) an exploration/critque of the Zone of Proximal Development (ZPD) and the notion of scaffolding in contemporary Singapore classrooms. The course also considers some recent data collected as part of CRPPs CORE 2 research programme into pedagogy and assessment in Singapore schools.	Centre for Research in Pedagogy & Practice (CRPP)	3

Special Topics Courses

SR820	Statistics Skills Lab: Applied Statistics for Psychological and Educational Research	This special topic course is intended for students who are pursuing a Ph.D. or Master by research and NO extensive statistical knowledge is required. This is a hands-on skills development course entirely conducted in the computer lab to gain experience in applied statistics for psychological and educational research. The aims of the course are to provide students with the essential skills to confidently conduct a repertoire of statistical analyses typically required for the doctoral level and provide a solid foundational skillset for postdoctoral research. Moreover, the course will prepare students to be able to report/defend actual findings of statistical analyses in a scientific manner using APA guidelines and practices.	Centre for Research in Pedagogy & Practice (CRPP) Curriculum, Teaching and Learning (CTL)	3
SR821	Teacher Learning and Professional Development: Past, Present and Future	<p>The field of teacher learning and professional development is diverse and complex, having grown and evolved considerably in the past decades. Numerous initiatives based on different theories of learning have designed and implemented, and there is currently a wide spectrum of perspectives and approaches in the field. Existing models on how teachers learn and change range from unidirectional theories (where learning is understood a direct consequence of certain conditions) to complexity theories (where learning is understood as an unpredictable, dynamic and systemic process). Similarly, approaches to teacher professional development include learning formats as diverse as traditional one-time workshops and conferences, highly scripted courses and packages, collaboration in professional learning communities, and community-based models of learning and development.</p> <p>The present course is targeted to graduate students interested in teacher learning and professional development across different content areas and educational levels. The course aims to provide a platform for them to deepen their understanding of the past, present and future of research and practice in the field of teacher learning and professional development. Such understanding will allow students to become aware of the current issues and trends in the field, which will give them the ability to draw implications for their own work as educational researchers. Equipped with this knowledge and competencies, students will be able to inform Singapore policy makers and practitioners, both at the school and national levels, to plan and implement profitable professional development that benefits teacher learning, which will in turn benefit student learning.</p>	Centre for Research in Pedagogy & Practice (CRPP)	3
SR822	New Media, Multimodality and Learning	<p>The emergence of new media and the rapidly increasing needs of today's learners are placing unprecedented demands on educational landscapes to restructure and transform. In particular, educators seek paradigmatic changes in pedagogy where the growing presence of digital technologies has produced a vibrant and challenging body of theoretical and practical interest in how meaning-making can be spread over a variety of modes of representation (e.g. writing, images, speech, gestures, and sound).</p> <p>By the end of the course, participants will be better able to:</p> <ul style="list-style-type: none"> Identify and describe the ways in which new media communication technologies and practices potentially shape processes of meaning making; Identify and describe the competencies of, and the strategies used by, the digitally literate; Identify the learning and new media literacy needs of students and teachers in the 21st Century; Describe and explain educational theories underpinning contemporary pedagogy and practice with digital technology in learning; Provide theoretical support for teaching and learning practices in digitally-rich classrooms; and Work ethically with digital information in the design, implementation and evaluation of learning tasks. 	Centre for Research in Pedagogy & Practice (CRPP)	3

Special Topics Courses

SR823	Brain, Body, and Cognition	<p>Rapid changes in the milieu of 21st century learning culture and environments foregrounds the criticality for educators to be cognizant of the multi-dimensional aspects of human cognition. Oriented towards maximizing learner potential, this course entails an in-depth understanding of the nature of human learning and cognition that stems from the neurobiological to the sociocultural. Traversing human learning mechanisms that are inextricable from physical, biological, social, and cultural-historical contexts, this course offers a unique point of convergence between front-lines of the science of learning as interfaced between neuroscience (brain), physiological and behavioural sciences (body) and its situated environment (context).</p> <p>Having a grasp of the interfacing dimensions between brain, body, and context allows for a deep understanding of how learning occurs, particularly in the current milieu. This course will provide a strong foundation for students wishing to pursue graduate study in education and the learning sciences.</p>	Office of Education Research (OER)	3
ST1001	Curriculum Design for Games, Game-based Worlds and Immersive Environments	<p>This course will introduce teachers to fundamental principles of the design of learning environments and curricular units around Game-based Worlds and Immersive Environments. The course is crafted in recognition of the increasing interest among teachers in leveraging the affordances for learning of such worlds and environments in both formal and non-formal contexts within schools. Participants will be introduced to a robust and proven curriculum design framework, as applied to a diversity of authentic examples from school-based usage cases in Singapore; no prior experience or knowledge of games or immersive environments will be assumed.</p>	Office of Education Research (OER)	1