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<th>No.</th>
<th>Division</th>
<th>Course code &amp; title</th>
<th>Teacher(s)</th>
<th>Minimum requirement for attendance</th>
<th>Eligibility (for enrolment in Primary Discipline Courses by students in other Divisions)</th>
<th>Cross-institutional course enrolment (i.e. Open to MPhil/PhD from other institutions in Hong Kong)</th>
<th>Primary discipline (24 hrs)/Research methods (12 hrs)</th>
<th>Tentative schedule</th>
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<td><strong>Primary Discipline Courses:</strong></td>
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<tr>
<td>1</td>
<td>ELE</td>
<td>EDUR8023 Seminars on Critical Inquiry in Language and Education Studies (New offering)</td>
<td>A M Y Lin, M M Lo</td>
<td>75% (i.e. 6 out of 8 sessions)</td>
<td>Students from ELE should be prioritized.</td>
<td>No</td>
<td>3 hrs X 8 sessions</td>
<td>Date: Sep 15, 22, 29; Oct 6, 13, 27; Nov 3 and 10, 2017 (Fri) Time: 6:30 - 9:30p.m. Venue: Room 301, Runme Shaw Building (RM301) (for Sep 15); Room 413, Meng Wah Complex (MW413) (for remaining sessions)</td>
</tr>
<tr>
<td>2</td>
<td>ITS</td>
<td>EDUR8032 Research on Developing Computational Thinking in 21st Century Learning (New offering)</td>
<td>G K W Wong</td>
<td>Student should attend all sessions unless there are exceptional circumstances with the prior approval from the course instructor.</td>
<td>Yes</td>
<td>3 hrs X 8 sessions</td>
<td>Date: Sep 9, 16, 30; Oct 7, 14; Nov 4, 11 and 18, 2017 (Sat) Time: 10:00a.m. - 1:00p.m. Venue: Room 646, Meng Wah Complex (MW646)</td>
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<td>3</td>
<td>LDD</td>
<td>EDUR8041 Planning for Theory, Methods and Impact of ‘Learning-based Research’ in Schools and Classrooms (Re-offering with modifications)</td>
<td>C K K Chan, G Chen, R C F Sun</td>
<td>Nil</td>
<td>No</td>
<td>3 hrs X 8 sessions</td>
<td>Wednesday Date: Sep 13, 20, 27; Oct 11; Nov 1, 15 and 22, 2017 (Wed) Time: 6:30 - 9:30p.m. Venue: Room 3.41, The Jockey Club Tower, Centennial Campus (CPD3.41) Tuesday Date: Nov 7, 2017 (Tue) Time: Same as above Venue: Room 204, Runme Shaw Building (RM204)</td>
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<td>4</td>
<td>PASSE</td>
<td>EDUR8052 Equity and Social Justice in Education (Re-offering without modifications)</td>
<td>G A Postiglione, D Wang</td>
<td>100%</td>
<td>Yes, but PASSE students have the priority. If there are still seats in the class, they are open to other institutions.</td>
<td>3 hrs X 8 sessions</td>
<td>Date: Sep 9, 16, 23, 30; Oct 21; Nov 18, 25; and Dec 2, 2017 (Sat) Time: 9:30a.m. - 12:30p.m. Venue: Room 403, Runme Shaw Building (RM403)</td>
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<td>No.</td>
<td>Division</td>
<td>Course code &amp; title</td>
<td>Teacher(s)</td>
<td>Minimum requirement for attendance</td>
<td>Eligibility (for enrolment in Primary Discipline Courses by students in other Divisions)</td>
<td>Cross-institutional course enrolment (i.e. Open to MPhil/PhD from other institutions in Hong Kong)</td>
<td>Primary discipline (24 hrs)/Research methods (12 hrs)</td>
<td>Preferred timeslot(s):</td>
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<td>5</td>
<td>NA</td>
<td>EDUR7058 Regression (Part B) (New offering)</td>
<td>J de la Torre</td>
<td>Nil</td>
<td>Yes</td>
<td>3 hrs X 4 sessions</td>
<td>Date: Sep 12, 19, 26; and Oct 3, 2017 (Tue)</td>
<td>Time: 6:30 - 9:30p.m.</td>
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<tr>
<td>6</td>
<td>NA</td>
<td>EDUR7059 Experimental Design (Part B) (New offering)</td>
<td>J de la Torre</td>
<td>Nil</td>
<td>Yes</td>
<td>3 hrs X 4 sessions</td>
<td>Date: Oct 17, 24, 31; and Nov 7, 2017 (Tue)</td>
<td>Time: 6:30 - 9:30p.m.</td>
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<tr>
<td>7</td>
<td>NA</td>
<td>EDUR7103 Factor Analysis (New offering)</td>
<td>F Reichert</td>
<td>Nil</td>
<td>Yes</td>
<td>3 hrs X 4 sessions</td>
<td>Date: Nov 18, 25; Dec 2 and 16, 2017 (Sat)</td>
<td>Time: 2:00 - 5:00pm</td>
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</table>
Teacher(s):
A M Y Lin, M M Lo (with Guest Speakers)

Course objectives:
This course aims at introducing participants to a variety of critical approaches to inquiry in language and education studies through a range of exemplifying studies that illustrate how researchers can adopt critical theoretical lenses and methodologies in designing their research studies and conducting their research analysis. The philosophical orientations and theoretical assumptions underlying critical inquiry will be discussed and a range of approaches as applied to language and education studies both in Hong Kong and overseas will be included. Sessions will engage course participants in reading the work of and interacting with different speakers on their research studies, with a focus on understanding what motivates critical inquiry and a range of ways in which critical inquiry can be conceptualized, designed and conducted in language and education studies.

Minimum requirement for attendance:
Students must attend 75% of the course (i.e. 6 out of 8 sessions) in order to pass the course.

Pre-requisite:
Nil

Course structure:
The theme of this course is to introduce to the participants different approaches to critical inquiry in language and education studies. In the first session, an overview of critical inquiry and key theoretical orientations underpinning critical approaches to language and education studies will be introduced. The following seven sessions will each engage a speaker presenting his/her research study that illustrates a critical approach as applied to critical inquiry in an area of interest in language and education studies. Course participants will read the work of the speakers and other readings before attending their sessions, in which they will have a chance to interact intensively with the speakers on their research projects.

The course consists of eight sessions (each of 3 hours) on Fridays:

Session 1 (September 15). Introduction to critical inquiry in language and education studies. This session provides an overview of critical inquiry in language and education studies. The ontological and epistemological assumptions, historical development, and recent trends in critical social research in language education will be discussed. (Prof. Angel Lin)
Core readings:

Session 2 (September 22). “Negotiating and appropriating new literacies in English language education in Hong Kong primary schools” (Dr. Margaret Lo; Discussant: Prof. Angel Lin)
In this seminar, Dr. Lo will present aspects of her doctoral research on the discursive constructions, tensions and contradictions of new digital literacies in English language curriculum policy and classroom practice in Hong Kong primary schools. She will explain the study’s post-structuralist, discourse analytic theoretical framing as illuminated by
Lacanian psychoanalytic theories of subjectivity, fantasy and enjoyment, and share analyses of curriculum policy texts, students’ digital multimodal texts, and classroom and online interactions. She will also share issues of researcher reflexivity encountered during the research and how she addressed these.

Core Readings:
Chapter 1 - Technology
2. Lo, M. M. (2014). *Negotiating and appropriating new literacies in English Language classrooms in Hong Kong primary schools: Economies of knowledge, attention and enjoyment*. (PhD), University of Hong Kong, Hong Kong.

Session 3 (September 29). “Critical pedagogy and research in language teacher education” (Speaker: Dr. Margaret Lo; Discussant: Prof. Angel Lin)
In this seminar, Dr Lo will share how she engages with issues of social justice and critical literacy in many aspects of her work in English language teacher education. She will share her recent research into pre-service teachers’ development of critical inclusive pedagogies on a service-learning course involving a one-to-one mentoring programme for disadvantaged youth. Drawing on Judith Butler’s ethical philosophy and other critical social theories, she explores student-teachers’ written narratives of youth mentoring as ethical accounts of the self and other, and discusses some of the challenges of teacher education for social justice.

Core Readings:
3. Lo, M. M. (manuscript under review). *Youth mentoring as service-learning: student-teachers ethical accounts of the self.*

Session 4 (October 6). “Beyond testing and accountability regimes: Provocations for Critical English Education” (Guest Speaker: Dr. Aaron Koh; Discussant: Prof. Angel Lin)
How do we teach English in an era of testing and accountability regimes? How can English teachers navigate around National Curriculum Frameworks for English Education where a normalised standardised English Curriculum narrowly defines the English curriculum as learning specific ‘skills’, ‘competencies’, ‘knowledges’, ‘texts’, and ‘assessments’ ostensibly to prepare students for the future global/national labour market. In this seminar Dr. Koh argues that the ‘conjunctural’ moment in which ‘English education’ is now situated warrants a new imagination on how to teach with and against the imposed strictures of national curriculum framework, testing and accountability. Dr. Koh critically examines the teaching of English in Hong Kong, Singapore and Australia, framed around a series of provocations. Taking into consideration a new sociological profile of students in our classrooms who are ‘screenagers’—and who are also culturally and linguistically diverse, Dr. Koh suggests how we might teach with and beyond testing and accountability regimes. The paper concludes with some thoughts on the current rhetoric and discourse around the 21st-century learner and what this might mean for English language education.

Core Readings:
Session 5 (October 13). “Putting critical pedagogies into practice across primary, secondary and tertiary classrooms” (Guest Speaker: Dr. Benjamin Chang; Discussant: Angel Lin)
In this seminar, Dr. Chang will discuss the development and application of a critical pedagogy across his teaching experiences at the primary, secondary, and tertiary level in the US, Hong Kong, and other Pacific Rim contexts. Aside from foundations in critical pedagogy, Dr. Chang's conceptual framework has also been informed by cultural studies, new literacy studies, and sociocultural learning theory. With an overarching concern for marginalized groups in classrooms, and broader educational equity issues, Dr. Chang discusses how theory, practice, reflexivity, and community can come together to address common issues and make for a more transformative and sustainable pedagogy towards social justice.
Core Readings:

Session 6 (October 27). “State-funded outsourcing of education: Practice in Hong Kong secondary schools and its implications for quality and equity of education” (Guest Speaker: Dr. Taehee Choi; Discussant: Prof. Angel Lin)
In this seminar, Dr. Choi draws on a series of projects on outsourcing of English language education in Hong Kong secondary schools, including one funded by the Research Grant Council Hong Kong (ECS 28600216). Many governments have turned to state-funded outsourcing of education (Ed-outsourcing) to enhance the quality and economic efficiency, and ultimately, the competitiveness of their societies. The quality of state-funded Ed-outsourcing, what Burch (2009) termed new education privatisation, however, is disputed in the international literature. It has also been documented that new privatization techniques have reproduced or even increased disparity in learning opportunities in many contexts. In this seminar, Dr. Choi will explore the practice of Ed-outsourcing in Hong Kong secondary schools, drawing on school reports on the use of government funds which allow for Ed-outsourcing, and whether the issues raised are relevant to the Hong Kong context. Implications for educational policy processes and partnership between schools and educational businesses will be discussed.
Core Readings:

Session 7: (November 3). “Language across the curriculum, critical pedagogy, and critical ethnography” (Guest Speaker: Dr. Carlos Soto; Discussant: Prof. Angel Lin)
In this seminar, Dr. Soto will share his experience as a researcher, secondary teacher, and activist to show how these roles and identities (amongst others) are intertwined, sometimes problematically, through the method of critical ethnography. After presenting an overview of his doctoral work in critical pedagogy, Dr. Soto will focus on his recent work in tutoring form six students of South Asian origin attending a low-prestige school. Preparing them for
English and Liberal studies DSE exams involved integrating language and content learning, but was also guided by a critical approach which sought to build critical consciousness through dialogue.

Core Readings:

**Session 8** (November 10). “Challenging sexism and heterosexism in critical ELT education through a critical sexual literacy curriculum” (Guest Speaker: Dr. Jason Ho; Discussant: Prof. Angel Lin)

In this seminar Dr. Ho argues for the place of criticality in English language education (Crookes, 2013). It presents how the critical tradition informs various forms of critical literacies (Luke, 1996), and, in this case, a queer language curriculum, which Nelson (2012) has long been calling for. Dr. Ho would introduce a critical sexual literacy curriculum that was used to enhance understanding of multiple perspectives and empathy through engaging heteroglossia and emotions in the classroom. Addressing gender and sexuality topics, which have received little attention in local school curricula in Hong Kong, the critical curriculum was designed with the help of the Content-and-Language Integrated Learning (CLIL) framework by paying attention to the four strains of Content, Cognition, Communication, and Culture. The students were involved in various identity-themed language arts tasks like min-ethnography of local popular magazines, writing embodied metaphors, role-plays, and theatricals (Theatre of the Oppressed). Mixed emotions, especially “ugly feelings”, emerged in the classroom experience. A “pedagogy of discomfort” is proposed here to argue for the strategic use of “ugly feelings” to challenge sexism, heterosexism, and other forms of social injustice like classism, racism, and ageism in the classroom.

Core Readings:

**Key readings:**
Students will be assigned core readings for each session. Please visit the course Moodle for the readings and complete the required readings (and tasks) before coming to class. Additional readings will be posted on the course Moodle site. Students are expected to visit the Moodle site regularly for updates on references and course materials.

**Outcome:**
When you have successfully completed the course, you should be able to:

1. explain the theoretical orientations underlying critical inquiry in language and education studies,
2. explain different conceptualizations of criticality and their implications for inquiry in different areas of language and education studies, and
3. analyse studies that adopt critical approaches to research in language and education studies.
Assessment:

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<th>Assessment</th>
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| The summative assessment will consist of a critical paper (2,500 words) in which participants undertake a detailed critical analysis of a limited and defined body of research in one’s own area of interest in light of the critical concepts and approaches discussed in the course. The paper should include the following:  
1. explaining the theoretical orientations underlying critical inquiry in language and education studies,  
2. explaining different conceptualizations of criticality and their implications for inquiry in different areas of language and education studies, and  
3. analysing studies that adopt critical approaches to research in language and education studies. | O1, O2, O3 |

(Version as at July 18, 2017)
THE UNIVERSITY OF HONG KONG
FACULTY OF EDUCATION

EDUR8032 Research on Developing Computational Thinking in 21st Century Learning
(Semester 1, 2017-18)

Teacher(s):
G K W Wong

Course objectives:
This course aims to introduce cutting-edge research issues in computational thinking, which represents a new digital literacy through computer programming for everyone. The key areas of literature that contributes to the interdisciplinary field of computer science education in K-12 will be surveyed and examined. The course helps novice researchers to develop a comprehensive understanding of where the origin, motives for cognitive development, and educational impacts are in the theory and application of learning. Through this course, students from different disciplines, such as educational psychology, education policy, curriculum and instruction, and language education, can consider the open interdisciplinary research issues under this context. Through collaborative learning environment and interactive seminars, participants will contribute to the class through reading, presenting and criticizing the existing research studies, and therefore identifying a future research agenda in this emerging interdisciplinary field.

Minimum requirement for attendance:
Students should attend all the sessions unless there are exceptional circumstances with the prior approval from the course instructor.

Pre-requisite:
Nil

Course structure:
The theme of this course mainly comes from the current research in both computer science and education at K-12 in the global perspective. The course consists of four major themes:

1. Historical development of computational thinking and the notion of constructionism as well as other learning theories since Papert’s work on LOGO programming language
2. The definition of computational thinking and 3-dimensional theoretical frameworks (computational concepts, computational practices, computational perspectives)
3. Curriculum and instructions for computational thinking in K-12, assessment frameworks, and cross-curricular learning and teaching
4. Cognitive development and the acquisition of 21st century high-order thinking skills, such as problem solving skills, critical thinking, and creativity, through computational thinking

There are 8 face-to-face 3-hour scheduled sessions. Participants will be expected to undertake a critique of a research paper based on the selected areas in computational thinking, and lead the panel discussions in class concerning the issues and identifying possible extension of the work in any educational settings including school and out-of-school environment. After each class, each participant will join an asynchronous online discussion and reflect on the ideas presented in the panel discussion. Each participant is required to dedicate at least one hour outside of class to engage in the discussion to enrich the learning experience.

Key readings:


**Outcome:**
1. Identify the key research issues in developing children’s computational thinking and the impact to their cognitive development through education.
2. Demonstrate a comprehensive understanding of the historical development in computational thinking and the current trend in both theory of learning and cognitive tools for children programming.
3. Analyze the current issues in K-12 education with computational thinking, such as child development, education policy, curriculum and instruction, and language education.
4. Develop a systematic literature review to inform the community with a research agenda on computational thinking or related areas.

**Assessment:**

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<tr>
<td><strong>Class Participation (40%)</strong>:</td>
<td>O1, O3</td>
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<tr>
<td>Lead an in-class panel discussion based on existing research papers, and contribute to the online discussion posts based on the panel sharing.</td>
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**Criteria for assessment:**

**The panel discussion:**
- Clarity of presentation: 30%
- Leadership of panel discussion: 30%
- Communication: 20%
- Reflection and feedback: 10%
- Identifying researchable questions and limitations: 10%

**The online posts:**
- Originality: 20%
- Critical perspective: 30%
- Reflective response: 30%
- Supporting references: 20%

**Literature review (60%)**:
A paper of not more than 4,000 words, which should demonstrate a comprehensive understanding of the research issues and propose some reasonable research questions in computational thinking.

*Note: Students have to pass both assessments, regardless of their weighting, in order to pass the course.*

*(Version as at July 14, 2017)*
EDUR8041 Planning for Theory, Methods and Impact of ‘Learning-based Research’ in Schools and Classrooms
(Semester 1, 2017-18)

Teacher(s):
C K K Chan, G Chen, R C F Sun

Course objectives:
The course will combine elements of LDD research topics, a grounding in research methods and consideration of ‘impact’ of research projects;
- The course will also provide for consideration of generic skills required in research writing for research postgraduate students;
- Topics considered within the course will characterize research undertaken within LDD, but in order to provide focus and depth only four representative topics will be explored. In-depth exploration will allow teaching staff to include a theoretical placement of the research area, an application of method, and a consideration of impact of the research;
- Methodological approaches included will consider: quantitative, qualitative, and combined/mixed research;
- Generic skills of research writing will include consideration of: the structure of an empirical-researched doctorate and the structure of a research methods chapter within a doctorate;
- An introduction to doctoral-level writing and critical appreciation of research questions and research approaches.

Minimum requirement for attendance:
Nil

Pre-requisite:
Nil

Course structure:
Over 8 x 3 hour sessions, the course will meet the above objectives by:
- An initial session on the form and writing of a doctoral thesis. This session will focus on: the structure and ordering of an empirical thesis; doctoral-level writing; critical assessment of the literature; and critical choice of research approach and methods. This session will be led by one of the three instructors.
- Three research, methods and impact contributions. Each contribution will be structured around a 1-2 session taught input and will focus on quantitative, qualitative, and mixed methods research that typifies research projects undertaken professoriate staff within LDD. Within each of the 1-2 session inputs, staff will consider: theory and previous research that has supported a particular project; the relationship of the specific research question used by a member of staff to research approach and associated methods; and considerations as to how the research project may be seen to have an impact (whether at the personal, group, or larger social/curricular level). In total, there will be six sessions, with 1-2 each contributed by Chan, Chen, and Yeung.
- A final session which will focus on: the structure and writing of a research methods chapter; and preparation for the essay submission.
- Student participation will be encouraged by: 1) attendance at all sessions; 2) student (small) groups presentations with regard to a methodological approach associated with one of the research/method/impact sessions.

It is planned to hold the teaching sessions in a computer lab, which will allow students access to statistical and qualitative analysis programmes for the analysis of data. Course
tutors will be encouraged to allow student access to some of their data and to identify ways by which the data can be analysed.

Key readings:

Outcome:
1. An appreciation of the range of research approaches that have been used within LDD;
2. An understanding of the structure of a doctorate-level thesis and, in particular, the structure and importance of the methods chapter;
3. An understanding the doctoral-level writing must be of a ‘critical’ nature with regard to the evaluation of existing theories, choice of research question and evaluation of research approaches and methods;
4. A working understanding of each of the predominant modes of empirical research approach: quantitative, qualitative, mixed method;
5. An understanding that every empirical research project will have an associated aspect of knowledge exchange/impact;
6. Practical experience of the use of some analytic techniques; and
7. Practical experience of critical writing at this early stage of their doctoral careers.
**Assessment:**

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| The essay (90%) will be a maximum of 4,000 words, on a topic related to the student’s thesis – but drawing upon an appreciation of the integration of theory/literature, methodological approach and perceived impact. The essay will require the student to:  
  a. Identify at least three readings within his/her research area;  
  b. Critically review the theory and previous research that informs this research as presented in the 3+ readings;  
  c. Critically assess the appropriateness of the research approach and methodology used in the 3+ studies; and  
  d. Account for the types of impact that may be associated with the studies, explaining what is meant by impact and how it might be assessed in future. | O1, O2, O3, O4, O5 |
| Course participation (10%)  
Course participation includes individual/collaborative presentations within the seminars the quality of which will be identified by knowledge of course readings and critical thought with regard to the application of research methods to research-based problems. | O6, O7 |

*Note: Students have to pass both assessments, regardless of their weighting, in order to pass the course.*

*(Version as at September 20, 2017)*
Teacher(s):
D Wang, G A Postiglione

Course objectives:
This advanced course takes students into critical analysis of equity and social justice issues related to ability, gender, sexuality, religion, racism, social class, poverty, and other forms and patterns of social and economic inequality. It works with students to help them build an understanding of both theory and research methods that enlighten out thinking about processes across geographical levels from local to global. The course aims to bring theoretical and research approaches for the study of equity and social justice to bear on issues in the lives of students in different levels and institutional arrangements of education systems. The course will begin with multiple theoretical foundations for the concept of equality and proceed to illustrate the relevance of the concepts to educational issues through systematic analysis of the social forces that perpetuate inequality and hinder social injustice. The course takes in interest in social and cultural belief systems that weigh upon the decisions that either protect or diminish social justice in education. The analysis will include the key axes of power and privilege in various social settings, both contemporary and historically based, as well as the way that prejudice, discrimination, and oppression operate in social and educational settings.

Minimum requirement for attendance:
All sessions

Pre-requisite:
A basic social science background

Course structure:
- Introduction: Who are the Chosen? Who are the Marginalized?
- Theories of Justice: Marx, Rawls, Bordieu, Sen, and Piketty
- Structures and processes of equity and social justice
- Social diversity and oppression
- Critical theories, critical pedagogies
- Discourses of fear and hurt vs. discourses of respect and empowerment.
- Methodological sophistication: Quantitative
- Critiquing methodological: Qualitative

Key readings:
Amartya Sen (1979) Equality of What?
**Outcome:**
1. Students will design a format to promote equity, cultural diversity and social justice for a particular educational setting that is grounded in theoretical and practical knowledge.
2. Students will demonstrate how empirical research can be used to ensure that educational practices improve social justice.
3. Students will justify how and why certain forms of knowledge are capable of creating educational environments that promote a fair, just, diverse, equitable and inclusive educational community.
4. Students will provide a theoretical explanation of structure and agency on education and social stratification.
5. Students will design empirical research that deals with poverty, gender, race and ethnicity in a specific setting and apply concepts of social and cultural capital in analyzing educational success.

**Assessment:**
PAPER: Students will design a theoretically sophisticated empirical piece of research that systematically examines how and why an underserved cultural community is empowered in a socially just way to overcome the obstacles to the educational success of their children.

PRESENTATION: Students will provide a review of the literature about a specific concept that is central to research on equity and social justice in education.

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<td><strong>Class presentation 20%</strong></td>
<td>O2, O3, O4</td>
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<td>Prepare and execute a detailed presentation (about 15 minutes)</td>
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<td><strong>Final paper 80%</strong></td>
<td>O1, O2, O3, O4, O5</td>
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<td>Write and defend a paper of between 2,000 and 3,000 words.</td>
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*Note: Students have to pass both components to pass the course.*

*Version as at July 14, 2017*
Course objectives:
This is a two-part course that focuses on techniques for analyzing non-experimental data, primarily multiple regression analysis. The goals of the course are to help students 1) gain an understanding of how data are analyzed and interpreted in non-experimental research; 2) recognize the different situations under which the use of multiple regression analysis is appropriate; 3) learn various ways of formulating regression models, and 4) implement standard and nonstandard regression analyses in SPSS.

Minimum requirement for attendance:
Nil

Pre-requisite:
EDUR7056 Regression (Part A); or
a course that covers the basic formulation, analysis, and interpretation of multiple regression models

Course structure:
The course will introduce student to various models and procedures that can be used in regression analysis. In each meeting, the theoretical foundation of these procedures will be discussed; in addition to worked out examples, students will also have the opportunity to implement these procedures in SPSS when applicable.

For Part B of the course, below are the topics that will be covered in each meeting.

Meeting 1 will cover the use of quantitative and qualitative predictors in multiple regression models. It will discuss polynomial regression models, different ways of coding qualitative predictors, models with different types of predictors, and interaction models. In addition to model formulations, interpretation of the different models will be emphasized.

Meeting 2 will introduce Analysis of Covariance (ANCOVA) for situations where qualitative variables are of primary interest, and quantitative variables are used simply as covariates or control variables. The meeting will cover the rationale for using ANCOVA, as well as its underlying assumptions.

Meeting 3 will cover how the “best” multiple regression models can be selected and validated. Various criteria and procedures for model selection, as well as strategies for model validation will be discussed.

Meeting 4 will focus various diagnostics that can be used to examine the appropriateness of a multiple regression model. Problems unique to regression models with multiple predictors such as outlying observations in multidimensional space and multicollinearity will be emphasized. Remedial measures that can be used to address these problems will also be discussed.

Key reading:
Outcome:
1. To provide students with the knowledge that will allow them to recognize the use of appropriate models and procedures for regression analysis; and
2. To provide students with the skills that will allow them to implement a software package that performs multiple regression analysis

Assessment:

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<td>Students will have to complete four homework assignments for the materials covered in the four meetings. An assignment will be given after each meeting, and will be due the week after. The homework assignments will consist of problems pertaining to computation, computer implementation, and interpretation of results. Each homework assignment will be worth 25% of the final score. A final score of at least 80% is needed to pass the course.</td>
<td>O1, O2</td>
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(Version as at July 14, 2017)
Teacher(s):
Prof. J de la Torre

Course objectives:
This is a two-part course that focuses on techniques for analyzing experimental data. The goals of the course are to help students 1) gain the conceptual and statistical knowledge needed to properly design and analyze data from experiments; 2) understand the assumptions, requirements, and limitations of analysis of variance (ANOVA); 3) develop the language and concepts necessary for interpreting and reporting results from experiments; and 4) gain facility to implement ANOVA in SPSS.

Minimum requirement for attendance:
Nil

Pre-requisite:
EDUR7057 Experimental Design (Part A);
or a course that covers the formulation, analysis, and interpretation of the two-way factorial design

Course structure:
The course will introduce student to various models and procedures that can be used in experimental design. In each of the four meetings, the theoretical foundation of these procedures will be discussed; in addition to worked out examples, students will also have the opportunity to implement these procedures in SPSS.

For Part B, below are the topics that will be covered in each meeting.

Meeting 1 will discuss comparisons for marginal means and analyses of simple effects, as well as various ways of analyzing different types of interaction in the context of a two-way factorial design. In addition, the concept of multiple tests and methods for controlling Type I error will be covered.

Meeting 2 will cover the single-factor within-subject (or repeated-measure) design, where each subject is exposed to all the treatment conditions of a factor. In addition to the analysis of such a design, the advantages and limitations, model formulation, and assumption of the design will be discussed. The concept of counterbalancing will also be introduced.

Meeting 3 will present the two-factor within-subject design, which is another repeated-measures design where each subject receives all the treatment combinations that can arise from crossing the levels of two factors. It will cover the various types of analyses associated with the design, model formulation and assumptions, and counterbalancing involving one or both factors.

Meeting 4 will discuss the two-factor mixed design, where each subject receives all levels of one factor, and only one level of the other factor. The model formulation and assumption, overall analysis, multivariate alternative, and treatment of unequal sample sizes will be covered. In addition, various analyses pertaining to the between-subject factor, within-subject factor, and interaction will also be considered.
Key readings:

Outcome:
1. To provide students with the knowledge that will allow them to properly design experimental studies and analyze experimental data
2. To provide students with the skills that will allow them to implement a software package that performs ANOVA and related methods

Assessment:

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<tr>
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<th>Outcome(s) to be assessed</th>
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<tr>
<td>Students will have to complete four homework assignments for the materials covered in the four meetings. An assignment will be given after each meeting, and will be due the week after. The homework assignments will consist of problems pertaining to computation, computer implementation, and interpretation of results. Each homework assignment will be worth 25% of the final score. A final score of at least 80% is needed to pass the course.</td>
<td>O1, O2</td>
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(Version as at July 14, 2017)
Course objectives:
This course focuses on exploratory and confirmatory factor analysis as tools for examining the dimensionality of constructs and scale building. The goals of the course are to help students (1) gain an understanding of the aims of and the differences between exploratory factor analysis and confirmatory factor analysis; (2) understand when to choose which approach; (3) learn to implement different factor analytical models; (4) interpret the results factor analysis and evaluate construct reliability; and (5) develop an awareness of common problems in factor analysis.

Minimum requirement for attendance:
Nil

Pre-requisite:
- Basic knowledge of regression analysis; or
- EDUR7056 Regression (Part A); or
- EEDD6701 Research Methods I; or
- EDUR6021 Quantitative Research Methods II; or
- GRSC6007 Applied Quantitative Research Methods

Course structure:
The course introduces students to factor analysis. In each meeting, the theoretical foundation of these procedures will be discussed; in addition to worked out examples, students will also have the opportunity to implement these procedures in SPSS/Amos (or R or Mplus) if applicable.

Meeting 1 will introduce the concepts of manifest and latent variables, as well as formative and reflective measurement. This meeting will discuss the conditions for factor analysis and the steps in factor analysis. In particular, extraction of factors, how to decide upon the number of factors, factor rotation, factor scores, and the interpretation of the factors will be discussed.

Meeting 2 will introduce confirmatory factor analysis. It will discuss when to use exploratory and confirmatory factor analysis, how both can be combined, and the conditions for confirmatory factor analysis. It discusses how to specify models, model identification, as well as parameter estimation and the evaluation of model fit.

Meeting 3 will delve deeper into confirmatory factor analysis. Students will apply confirmatory factor analysis, and learn about model modification and how to develop parsimonious models. This meeting will also compare the assessment of reliability and validity in exploratory and confirmatory factor analysis.

Meeting 4 will make students aware of other special factor analytical models (e.g. hierarchical factor models), and discuss common problems in factor analysis, as well as the uses and risks of parameter constraints.
Key readings:

Outcome:
1. To provide students with the knowledge that will allow them to recognize the use of appropriate factor analytical models and procedures for building reliable scales;
2. (b) To provide students with the skills that will allow them to implement a software package that performs factor analysis.

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