

THE UNIVERSITY OF HONG KONG
FACULTY OF EDUCATION

Postgraduate Diploma in Education (PGDE)

**Full-time
2011-12**

EDUC6624: Major methods course: Mathematics

Course Description

The aim of the course is to provide professional preparation for student-teachers to become informed, competent and reflective practitioners.

Objectives

The general objectives are to help student-teachers:

- Reflect on the aims and objectives of mathematics education
- Gain an understanding of the mathematics curriculum in Hong Kong
- Become competent in the basic skills of teaching mathematics and assessing student performance
- Broaden their awareness of mathematics as a subject
- Gain an understanding of how school students learn mathematics
- Gain insights and expertise in the use of technology in teaching mathematics
- Consider various current issues pertaining to mathematics education.

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PGDE FT Mathematics Major (Primary & Secondary)

Course Schedule (2011-12)

Themes / Topics	Sessions	Dates
Introduction: Setting the scene; setting the objectives	1-2 (ASML), 3	Sep 2, 5 Sep 8
Planning and developing a mathematics lesson	4-5 (KLW), 6-7	Sep 9, 12 Sep 15, 16
Making use of resources in a mathematics lesson	8, 11	Sep 19, 26
Effective Teaching Skills	9-10 & 12-13 (IM)	Sep 22, 23, 29, 30
Developing mathematical concepts & skills in a mathematics lesson	14-15 (KLW), 16	Oct 3, 6 Oct 7
Teaching Task Presentation (I)	17-19	Oct 10, 13, 14
Reflecting on a mathematics lesson (I)	20-21 (AMSL), 22	Oct 17, 20 Oct 21
Understanding (more about) students' learning of mathematics	23-24 (AMSL), 25	Oct 24, 27 Oct 28
School Experience		
Understanding (more about) different teaching approaches	26-27	Nov 28, Dec 1
Teaching Task Presentation (II)	28-31	Dec 2, 5, 8, 9
Semester Break		
Reflecting on a mathematics lesson (II)	32-33	Jan 16, 20
Rethinking mathematics teaching: an integrated approach	34-39	Jan 30, Feb 3, 6, 10, 13, 17
Main Teaching Practice		
Rethinking mathematics learning	40-41	Apr 23, 27
Getting the whole picture and looking forward	42	Apr 30

Combined sessions (in red) are conducted in RMS 301.

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EDUC6624 Major Methods Course (Mathematics): Assignments

You are required to submit **three** assignments for this course. You have to get a pass on ALL three assignments in order to pass the whole course.

Assignment Grade Descriptors

Each assignment is graded according to the descriptions given below. The specific 'Basic Criteria' are given after each assignment statement.

Grade A: Excellent

Meets all the basic criteria and demonstrates a quality at an outstanding level, showing evidence of one or more of the following: originality, insight and creativity.

Grade B: Good

Meets all the basic criteria and demonstrates reflection and critical thinking.

Grade C: Satisfactory

Meets all the basic criteria at a satisfactory level.

Grade D: Pass

Question/task has been addressed but some shortcomings in meeting some basic criteria

Grade F: Fail

Lacks effort and understanding with serious shortcomings in meeting the basic criteria.

Assignment 1: Reflections on Teaching [20%]

Part 1

Choose **one** lesson from the following sources:

- (a) A Mathematics lesson that you have observed during your SE (The teacher of the lesson should remain anonymous).
- (b) A Mathematics lesson that you taught during your SE

Briefly describe the structure and development of the lesson, paying particular attention to the introduction, the main activities, and the conclusion. Give a detailed evaluation of the lesson based on your own reflections and any discussion you may have had with others (such as your mentor, teacher of the lesson (for (a)), your peers).

Whichever of the above sources you chose, your evaluation should focus on aspects such as: suitability of activities, methods of teacher explanation, types and frequency of questions asked by the teacher, type of interactions between teacher and students, level of student involvement, type of assessment used, how well objectives were achieved etc.

Part 2

Design an *alternative* approach to the same lesson. Briefly describe the plan of the alternative lesson. Explain your design and identify key features of your lesson. Explain carefully in what ways this alternative lesson differs from the previous one and discuss the pros and cons of the two approaches.

Lesson plans and relevant teaching materials (hard or soft copies) could be submitted as attachments, if necessary, to provide an overall description of a lesson and information about the context. Provide complete references if you adapt any teaching ideas or materials from other sources.

Length: Approx. 2,000 words

Date of Submission: January 16, 2012 (Monday)

Basic criteria for Assignment 1:

- question/task has been adequately addressed
- satisfactory coverage
- coherent description and critical evaluation of lesson design/ teaching strategies
- evidence of understanding of the curriculum, nature of the mathematical content and students' learning
- relevant and practical, aware of possibilities and constraints
- clear presentation and use of references

Assignment 2: Significant Incidents File [35%]

During your MTP you should collect and record a set of **five** 'significant' incidents or events that occur in the classroom and submit them in a file. As far as possible these events should come from your own teaching of mathematics but you may include up to two that you have observed of another teacher. You should select your incidents/events based on their value in terms of intrinsic interest and in terms of the way they might influence your thinking and future teaching. (If you have records of any significant events that occurred during your SE, you can also use them).

For each incident/event, you should include the following:

- a) a title and the background data (i.e. age and ability of pupils, topic etc.)
- b) a description of the event, including both the teacher's (i.e. usually your own) and the pupils' inputs.
- c) a critical analysis and evaluation of the event (e.g. what you have learned from it and how it may affect your future actions).

You may include any incident/event that you think is 'significant' in the way described earlier. A list of different types of possible event is given below for guidance. However, you should not include more than two incidents of the **same** type.

- i) an example of a teaching strategy/idea that you feel worked well and was *successful*.
- ii) an example of a teaching idea that you feel was *unsuccessful* (or at least, not completely satisfactory).
- iii) an example of a *misconception* from a pupil (or pupils).
- iv) an interesting *suggestion* or *question* or *method of solution* from a pupil.
- v) a description and critical analysis of the *use of IT* in teaching a mathematical topic
- vi) an example of an *assessment task* and the students' performance on the task
- vii) an event (of whatever nature) that was completely *unanticipated* by you (i.e. surprising, unpredictable).

Note: You are encouraged to keep regular notes of incidents/events in your Portfolio (so that you form a habit of identifying and recording them) but you should only submit the file of your final record of the 5 incidents/events.

Length: Approx. 2500 words (So each incident/event is approx. 500 words. However, this should be interpreted as an average. That is, some incidents could be longer, others shorter.)

Submission date: April 27, 2012 (Friday)

Basic criteria for Assignment 2:

- question/task has been adequately addressed
- satisfactory coverage
- coherent description and critical evaluation of the incidents/events
- evidence of understanding of the issues underpinning the incidents (e.g. interaction between teaching strategy and student learning)
- appropriate choice of incidents/events in terms of their relevance and interest
- clear presentation and use of references

Assignment 3: Pedagogical Investigation [45%]

Conduct an investigation on a mathematical concept of your own choice. You may identify an interesting topic in the mathematics curriculum for your investigation and your work should lead to your deeper understanding of the topic as well as better insight into its teaching and learning.

In order to make good use of your experience in the teaching practicum and make your investigation relevant to the school context, you are required to seek advice from your mentor (or other mathematics teachers in your practicum school) in your early stage of formulating a plan for your investigation, which probably takes place during SE. To choose a suitable topic and formulate a set of meaningful and manageable questions for your investigations, you may consider some of these factors:

- how a topic is difficult to learn or teach;
- whether a topic is crucial in the curriculum or well connected with many important concepts;
- possibility of observing teaching of a topic during your practicum;
- possibility of analyzing students' work or diagnosing students' conceptions regarding learning of a topic;
- availability of experimental teaching resources.

In your investigation, you will reflect on your own experience of learning or teaching of the topic, understand more about the nature of the mathematical concepts involved and relevant literature of educational research or professional discussion. During the MTP, you will explore the teaching and learning process in your practicum school through appropriate means such as lesson observation, interview with teachers or students, conduct simple diagnostic tests, etc. Based on your findings, literature review and personal reflection, identify the critical aspects in teaching and learning of the topic and suggest possible means or direction towards improvement of students' learning.

After the SE, you will submit a plan for your investigation (in one page) and receive feedback from the course tutors (this part will not be graded). After the MTP, you will write up a report of this investigation and submit your report for grading and feedback. You are also expected to contribute a copy of your report to your practicum school together with any detailed findings from the teachers and students of the school in order to express your gratitude for their support.

Length: Approx. 3,000 words

Date of Submission: May 18, 2012 (Friday)

Basic criteria for Assignment 3:

- question/task has been adequately addressed
- satisfactory coverage
- appropriate strategies for investigation
- evidence of insight gained from the investigation
- evidence of understanding of the implications for teaching
- clear presentation and use of references
