The University of Hong Kong
Faculty of Education

Master of Education (MEd)
<u>Mathematics Education</u>

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This specialism is designed for teachers and other educators directly involved with mathematics education. It aims to provide a comprehensive overview that will cover relevant research and contributions to the discipline from a variety of perspectives, namely the social and cultural context, teaching and learning, the curriculum, philosophy, and the impact of technology.

Who would benefit from this specialism?
Teachers in either primary, secondary or tertiary sectors, and other educators who are directly involved with mathematics education. The specialism also provides an important foundation for students who would like to carry out a PhD or EdD study in the field of mathematics education.

Mode of study:
The specialism is available in 1-year full-time and 2-year part-time modes of study.

Outline of the four specialist courses:

Course 1: Research into the Teaching and Learning of Mathematics (6 credits)

This course gives an overview of theories and research on the teaching and learning of mathematics. Research in the teaching and learning of some major areas in mathematics such as algebra is reviewed. In addition, examples of investigation of mathematics teacher's pedagogical content knowledge, teacher conception, and assessment related to the teaching and learning of mathematics, classroom research, small-scale and large-scale studies will be discussed. The course and assessment are designed in such a way for an introduction to a virtual experience of research culture for mathematics teachers and professionals. It is hoped that in the course the students will read, talk about, reflect upon how research may have an implication in their profession. They are expected to make presentations, plan their own research, and develop an awareness of how a research culture can be an enhancement of their life-long professional development. At the end of the course, students should be able to: (1) be aware of the issues and topics related to research in the teaching and learning of mathematics; (2) carry out literature review for specific issues of interest, reflect and discuss in relation to the local context and their workplace; (3) write a research proposal for school-based development for the mathematics teaching and learning.

Course 2: Curriculum Research and Development in Mathematics (6 credits)

This course discusses issues that revolve around the mathematics curriculum and its development in schools. Without limiting the discussion to Hong Kong, a deeper understanding of the issues and concepts concerned with curriculum research and development is expected to be emerging from a better knowledge about the mathematics curricula in various other countries. Important issues to be discussed include: the ongoing development of curriculum in mathematics; current mathematics curriculum projects overseas; the history of the mathematics curriculum; forces that shape the mathematics curriculum in Hong Kong;

the relevance of school mathematics; mathematics across the curriculum; assessment in mathematics; school mathematics that caters for individual differences; and diversification and standardisation of the mathematics curriculum.

Course 3: Innovation and Development of Instructional Design in Mathematics (6 credits)

This course focuses on research and development of educational design in mathematics. By analysing cases of pedagogical practice and innovation, students will understand and reflect on principles and theoretical frameworks guiding the process of developing mathematics pedagogy. There will be study of task design, involving different tools and representations, situated in various contexts of mathematics learning, from the perspectives of teachers, designers and researchers. Special attention will be given to the role of digital technology in shaping the goals and means of developing mathematics instructions and building learning environments.

Course 4: The Philosophical, Social and Cultural Aspects of Mathematics Education (6 credits)

This course focuses on the features that characterise mathematics as a distinctive discipline. It explores the relationship between the nature of the discipline, the aims of mathematics education, and the nature of mathematics teaching and learning. The effect on teachers' and students' beliefs and attitudes, and on students' achievement will also be discussed. In addition, this course investigates the social and cultural factors that affect the teaching and learning of mathematics. This includes international comparisons of socio-cultural differences; ethnomathematics from anthropological and utilitarian perspectives; social inequalities including gender issues; and the relationship between language and mathematics. The objectives of the course are to enable students to (1) reflect critically on the features that characterise mathematics as a distinctive discipline, and be aware of the conflicting views on the nature of mathematical knowledge; (2) explore the relationship between the nature of mathematics and the nature of mathematics teaching and learning; (3) explore the social and cultural factors that affect the teaching and learning of mathematics; (4) reflect upon the aims of mathematics education and how mathematics instruction should be conducted, and (5) reflect critically on how teachers' views of mathematics and mathematics education affect their own practice.

In addition to four specialist courses, students will also have to complete:
- The compulsory core course Educational Issues and Research (6 credits);
- Three elective courses (6 credits each); and
- An option of a professional portfolio (12 credits) or a research project (12 credits).