

The University of Hong Kong  
Faculty of Education

Master of Education programme (MEd)  
Science Education

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This specialism aims to develop teachers' understanding of various issues and global trends in science education (e.g. STEM education) to enable them to contribute more effectively towards initiating, designing and implementing innovative teaching in science education in Hong Kong or worldwide. The specialism also aims at equipping teachers with the knowledge and skills in planning and implementing STEM education.

Who would benefit from this specialism?

Science teachers and professionals directly involved with science education or related fields. This specialism would also be suitable for those who are interested in STEM education.

Mode of study:

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

Outline of Specialist Courses:

Course 1: Assessment in Science Education (6 credits)

This course considers the importance of assessment for learning and quality assessment of learning in science. A wide range of strategies, such as questioning, practical work, scientific inquiry, probing and building student conceptual understanding, skills and attitudes in doing science, will be examined. Assessment literacy related to setting of assessment items and assessment rubrics will be discussed.

Course 2: Science Curriculum: Concepts and Themes (6 credits)

This course discusses the frequently encountered concepts and themes in the scholarly and professional dialogues on the science curriculums. After an initial survey of the different schools of thought on the aims and roles of science education, the key concepts and significant controversies associated with the four major categories of learning goals, namely, learning science, doing science, learning about science, and addressing socio-scientific issues will be considered. Subsequently, selected contemporary topics (e.g. crosscutting concepts, interdisciplinary STEM education, out-of-school science learning) will be explored. It is expected that students' sphere of curricular concern will be gradually expanded throughout the course to become scholarly and transformative curriculum developers and leaders.

Course 3: Teaching and Learning in Science (6 credits)

This course gives an overview of theories and research on the teaching and learning of science. It begins with an overview of students' common difficulties in learning science. Findings in children's understanding of science over the school years will be considered in light of a range of learning theories. Issues relating to approaches to teaching science including use of analogies, diagrams, modelling and mental visualization will be discussed. In addition, examples of investigation of teachers' pedagogical content knowledge, beliefs, professional noticing, assessment related to the teaching and learning of science will be examined.

Course 4: Trends and Issues of Science Education (6 credits)

This course looks at major trends and issues in science education with particular reference to the following issues: gender, sociocultural perspective, language issues (teaching science to second language learners, language across the curriculum), nature of talk through different theoretical perspectives (between teacher and students, between students and students), learning progression of key scientific ideas at different levels of study, attitude towards science and school science, transition between primary and secondary school science (in terms of, e.g., language and conceptual demands). It also examines the role of mobile digital technology in shaping the goals and means of developing science instructions and building learning environments.

Specialist elective: Classroom Practice of STEM Education (6 credits)

This course adopts the integration of scientific inquiry and engineering practice model (Weber and Sansone, 2016) and aims to introduce a variety of cross disciplinary hands-on and mind-on STEM exemplars activities/projects (e.g., monocular telescope making, conducting dough inquiry learning project, molecular gastronomy menu) which not only enhance students' generic skills, such as problem-solving skills, critical thinking skills and creativity etc., but also facilitate students' innovative designs through practical solutions. Besides, how Micro:bit, Arduino and other e-learning tools can be introduced and integrated into existing science and STEM curriculum pragmatically so as to enhance students' learning and teachers' teaching will be discussed. The course aims to promote teachers' capacity to promote STEM education both within and beyond the classroom.

In addition to the four specialist core courses and a specialist elective, students will also have to complete:

- The compulsory core course Educational Issues and Research (6 credits);
- Two elective courses (6 credits each); and
- An option of a professional portfolio (12 credits) or a research project (12 credits).