

The University of Hong Kong
Faculty of Education

Master of Education programme (MEd)
Teaching of Science in an International Context

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This specialism is designed for researchers, educators and pre-service or in-service Science teachers in primary or secondary schools, especially those from Direct Subsidy Scheme schools, mainstream schools and international schools, who want to excel in research and the teaching of Science in local and global contexts. The programme caters for practitioners in the teaching of the science curriculum in Hong Kong, making reference to the teaching of other curricula, such as the International Baccalaureate (IB), GCSE etc.

Who would benefit from this specialism?

Science teachers, educators and professionals directly involved with science education or related fields.

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: Integrating IB Philosophy into the Teaching of Chinese Language, Mathematics and Science (6 credits)

This course includes an in-depth exploration into how to integrate IB DP philosophy in curriculum design, teaching and learning, assessment and research. Students will be guided as to designing and refining Chinese language/Mathematics/Science curriculum to reflect the overall IB DP philosophy and learner profile and at the same time to align with the Chinese language/Mathematics/Science curriculum guides. Students will also be engaged in exploring various pedagogies and technological tools to integrate IB philosophy and learner profiles in language and culture instruction. Students will explore TOK, CAS and the Extended Essay and Chinese language/Mathematics/Science education. Furthermore, the course will enhance students' understanding about how to reflect IB philosophy, cross-disciplinary application and learner profile in assessment design and how to design assessments that reflect IB subject matter specific assessment criteria. In this course, students will not only understand the integration of IB philosophy in various aspects of instruction, but also generate a series of research questions around the integration of IB philosophy in instruction.

Course 2: 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 3: Research and Science Teaching Practice in Classrooms (6 credits)

The aim of this course is to familiarize students with day-to-day teaching practice at internationally minded schools in Hong Kong, by engaging them in authentic teaching in international/ private/ DSS schools in Hong Kong, to identify and tackle students' learning difficulties. This course will have a strong theoretical and practical emphasis on the development of students' research and teaching ability concerning science teaching and learning in classrooms during the teaching practicum. During their school experience, student-teachers will be required to identify their students' learning difficulties; using appropriate theories to analyze; design and conduct a small-scale piece of action research with the application of suitable teaching strategies to deal with the identified learning difficulties. The student-teachers will conduct classroom observation, and compile a self-directed portfolio based on data collected and experience encountered in their action research. This portfolio will contain a journal, lesson plans and teaching materials developed by the student-teachers during the practicum, self-reflections on lessons taught and feedback from the students.

Course 4: The philosophical, Social and Cultural Aspects of Science Education (6 credits)

This course addresses various epistemological perspectives of science, the intricate relationships between science, technology and society, and the roles of representations in conceptual development. It explores the relationship between these features that characterize science as a distinctive discipline, the aims of science education, and the nature of science teaching and learning. This course also investigates students' learning of scientific content in out-of-school settings, and their different approaches to dealing with socio-scientific issues.

Specialist elective: (complete at least ONE of the following two electives)

Course 1: 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 2: 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.

In addition to four specialist courses, students will also have to complete:

- A compulsory core course: Educational Issues and Research (6 credits);
- Three elective courses including at least one of the specialist electives (6 credits each); and
- An option of a professional portfolio (12 credits) or a research project (12 credits).