

School of Mathematics

Module MA3473 — Mathematics Education
(JS & SS Mathematics; SS TSM)

2010-11

Lecturer: E. Oldham

Requirements/prerequisites:

Duration: 1 semester (Michaelmas term)

Number of lectures per week: 2 plus tutorials

Assessment: a mathematical autobiography (5%); a project (details and timing to be specified).

ECTS credits: 5

End-of-year Examination: No.

Description:

This module is designed for people who are interested in mathematics education at all levels, but particularly in second level schools; it is likely to be of interest to — but not only to — those considering a career in school teaching. It discusses recent changes in school curricula and addresses theories of learning and teaching mathematics. By considering students' (and lecturers') own experience of mathematics, and the perceptions of mathematics in the wider population, it leads to consideration of the nature of mathematics and the philosophies of mathematics education.

Aims The module aims to introduce key issues in mathematics education, with particular focus on current developments in Ireland.

Learning Outcomes: Learning outcomes On successful completion of this module, students will be able to:

- Describe and critique major theories about mathematics teaching and learning;
- Outline and critique the context, aims, objectives, content and assessment procedures of Irish school mathematics curricula;
- Articulate their own current beliefs about the nature of mathematics and their philosophies of mathematics education;
- Apply their knowledge and understanding of mathematics education to working in a mathematics classroom (where relevant);
- Research and present a mathematical project on a topic of their choice.

Content The following topics will be considered:

1. Attitudes to mathematics.
2. Learning and teaching mathematics:

- meaningful learning (understanding, problem solving and applications);
- teaching for meaningful learning;
- resources, including technology in mathematics teaching.

3. Mathematics curricula.

4. The nature of mathematics and philosophies of mathematics education.

Teaching and learning methods The main methods used are lectures, discussions (face-to-face and online), and workshops. People involved in Irish mathematics and mathematics education may be invited to speak, where appropriate.

Bibliography

1. Davis, P. J., and Hersh, R. *The Mathematical Experience*. Boston: Birkhauser, 1980; also Harmondsworth: Pelican Books, 1983.
2. Department of Education and Science / National Council for Curriculum and Assessment. *Mathematics Junior Certificate: Guidelines for Teachers*. Dublin: The Stationery Office, 2002.
3. Johnston-Wilder, S., Johnston-Wilder, P., Pimm, D., and Westwell, J. *Learning to Teach Mathematics in Secondary School: A Companion to School Experience*. 2nd ed. London: Routledge, 2005.
4. National Council for Curriculum and Assessment. *Review of Mathematics in Post-Primary Education: A Discussion Paper*. Dublin: National Council for Curriculum and Assessment, 2005.
5. Noyes, A. *Rethinking School Mathematics*. London: Paul Chapman Publishing, 2007.
6. Tanner, H., and Jones, S. *Becoming a Successful Teacher of Mathematics*. London and New York: RoutledgeFalmer, 2000.

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