Program objectives
Entry requirements
Structure of program
Financing
Marketing issues
Program reviews

Curriculum Workshop:
Master of Science (Mathematics for Educators) – A Case Study

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Outline

1. Program objectives

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Outline

1. Program objectives

2. Entry requirements

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Outline

1. Program objectives

2. Entry requirements

3. Structure of program

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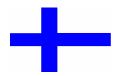Program reviews

Outline

1. Program objectives

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Program vision
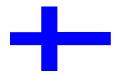
"Begin with the end in mind." – Stephen Covey

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Finland report

Facts

Finland report

Facts

- All teachers hold masters degrees.

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Finland report

Facts

- All teachers hold masters degrees.

- Primary school teachers major in education, while upper grade teachers concentrate their studies in a particular subject, e.g., mathematics, as well as didactics, consisting of pedagogical content knowledge specific to that subject.

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Finland report

Facts

- All teachers hold masters degrees.

- Primary school teachers major in education, while upper grade teachers concentrate their studies in a particular subject, e.g., mathematics, as well as didactics, consisting of pedagogical content knowledge specific to that subject.

- There are no alternative ways to receive a teachers diploma in Finland: the university degree constitutes a license to teach.

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Motivation

To ensure that the quality of teachers increases, the only way is for them to upgrade themselves professionally.

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Motivation

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Key notion

Professional Development (PD)

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Motivation

A strong mastery of mathematics will enable a mathematics teacher to teach better and to promote higher order thinking among mathematics learners.

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Motivation

Education specialists in mathematics will also benefit from this
programme because a good understanding of mathematics is
essential for work such as design of contemporary and relevant
curriculum, assessment of mathematics learning, and development
of teaching resources.

Program title

The program name must match its objective.

Program title

The program is aimed to upgrade the content knowledge in
mathematics for mathematics teachers.

Program title

Master of Science (Mathematics for Educators)

Program objective

The Master of Science (Mathematics for Educators) (MSMAE, for short) programme is a coursework programme designed to provide rigorous training in advanced mathematics to mathematics teachers and other professionals.

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Program objective

This programme differentiates itself from others in that the acquisition of wide and in-depth knowledge in mathematics is emphasised along with its connection to mathematics teaching.

Entry requirements

Applicants should have either:

Entry requirements

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(a) a Bachelor or Science degree with honours in mathematics, or equivalent in a relevant discipline;

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Entry requirements

Applicants should have either:

(a) a Bachelor or Science degree with honours in mathematics, or equivalent in a relevant discipline; or

(b) a Bachelor or Science degree in mathematics, or equivalent in a relevant discipline, and at least one year of professional working experience.

Duration of study

The programme may be completed in 4 years on a part-time basis, and 2 years on a full-time basis.

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Duration of study

The programme may be completed in 4 years on a part-time basis, and 2 years on a full-time basis.

Note

The reason for a part-time track is because this course is catered to teachers who have the work in the day, and can only attend evening classes. However, they are also some teachers/non-teachers who can take the course on the full-time basis because of special leave.

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Levels of courses

There are 2 levels of courses.

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Level 1

Level 1 courses attempt to connect higher mathematics with school mathematics.

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Level 1

Course codes	Course titles
MSM810	Advanced calculus and applications for educators
MSM811	Abstract algebra for educators
MSM812	Elements of mathematical analysis with applications in the teaching of calculus
MSM813	Number theory and teaching of arithmetic
MSM814	Statistical reasoning for educators
MSM815	Discrete mathematics and problem solving
MSM817	Computing and programming techniques

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Level 2

Level 2 courses will further develop expertise in a number of mathematical fields.

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Level 2

Course codes	Course titles
MSM821	Real analysis
MSM822	Functional analysis
MSM823	Commutative and non-commutative algebra
MSM824	Topics in applied algebra
MSM825	Theory and applications of differential equations
MSM826	Advanced techniques in applied mathematics
MSM827	Statistical methods

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Level 2

Course codes	Course titles
MSM828	Topics in mathematica statistics
MSM829	Directed graphs: theory, algorithms and applications
MSM830	Vertex coloring and chromatic polynomials
MSM831	Differential geometry
MSM832	Topology

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Core course

Apart from all the electives offered, there is a mandatory course all students have to take, i.e., the capstone course is

MSM800 Mathematical Inquiry

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Core course

The core course, Mathematical Inquiry, provides the students with an excellent opportunity to examine current research in a chosen area of pure or applied mathematics.

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Core course

For mathematical inquiry, a number of projects are proposed by
different professors in a given semester. These projects will belong
to one or some of the following categories:

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Core course

For mathematical inquiry, a number of projects are proposed by
different professors in a given semester. These projects will belong
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- read chapter(s) of a book or an entire book, and complete
  exercises;

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Core course

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- read journal papers on current research mathematics;

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Core course

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different professors in a given semester. These projects will belong
to one or some of the following categories:

- read chapter(s) of a book or an entire book, and complete
  exercises;
- read journal papers on current research mathematics;
- write computer programs and simulations for mathematical or
  statistical modelling processes.

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Core course

Near the end of the course, students will be assessed based on

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Core course

Near the end of the course, students will be assessed based on

- their understanding of the materials they were assigned to
  read:
    1. original work
    2. improvement
    3. alternative proofs
    4. examples

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Core course

Near the end of the course, students will be assessed based on

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Core course

Near the end of the course, students will be assessed based on

- desk study:
  1. objectives
  2. background
  3. literature search
  4. references

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Core course

Near the end of the course, students will be assessed based on

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Core course

Near the end of the course, students will be assessed based on

- research initiative:
  1. attitude
  2. effort
  3. enthusiasm
  4. independence

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Core course

Near the end of the course, students will be assessed based on

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Core course

Near the end of the course, students will be assessed based on

- report and presentation:
    1. correctness
    2. general flow
    3. overall structure
    4. clarity

Course implementation

- In each semester, classes are run in the evening from 6 to 9 pm.

Course implementation

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- There are 4 to 5 courses running, about an equal number of Level 1 and Level 2 courses simultaneously in different days of the week.

Course implementation

- In each semester, classes are run in the evening from 6 to 9 pm.
- There are 4 to 5 courses running, about an equal number of Level 1 and Level 2 courses simultaneously in different days of the week.
- There are 2 semesters in a year.

Course implementation

- Each lesson runs for 3 hours.

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Course implementation

- Each lesson runs for 3 hours.
- It is up to the professor's discretion how the lectures and tutorials are distributed.

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Course implementation

- Each lesson runs for 3 hours.
- It is up to the professor's discretion how the lectures and tutorials are distributed.
- Usually, a course schedule is drawn up at the beginning of the course.

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Assessment modes

There are no final examinations. Instead we have instead:

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Assessment modes

There are no final examinations. Instead we have instead:

- quizzes

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Assessment modes

There are no final examinations. Instead we have instead:

- quizzes
- tests

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Assessment modes

There are no final examinations. Instead we have instead:

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- tests
- assignments

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Assessment modes

There are no final examinations. Instead we have instead:

- quizzes

- tests

- assignments

This preferred form of assessment leans closer to formative assessment than summative assessment.

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Staff issues

Usually, we match the staff who is expert in an area to the topic taught.

Fees

An integral part of any academic programme is the fee system.

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Fees

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Item	Cost (in SGD, inclusive of GST)
Tuition Fees	S$12, 840
Miscellaneous Fees: A 1-time fee payable on admission Amenities fees (paid annually by full-time students only)	S$321 S$12.80
Group Hospitalisation and Surgical Insurance Scheme (GHSI) (paid annually by full time Singapore, PR's and international students	S$79

Marketing issues

For sustainability reasons, it is important to promote publicity of this course to the in-service teachers. This is usually done with formal advertisements on newspapers, roadshows to the Singapore schools explaining to the teachers why they need to upgrade their content knowledge in mathematics, website advertisements, etc.

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Program review

At the end of 5 years, there is review process in place, which looks into some of the following issues:

1. Relevance of the courses

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Program review

At the end of 5 years, there is review process in place, which looks into some of the following issues:

1. Relevance of the courses
2. Staff and student feedback

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Program review

At the end of 5 years, there is review process in place, which looks
into some of the following issues:

1. Relevance of the courses
2. Staff and student feedback
3. Logistics issues

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Program review

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Program review

At the end of 5 years, there is review process in place, which looks into some of the following issues:

1. Relevance of the courses
2. Staff and student feedback
3. Logistics issues
4. Assessment modes
5. Structure of the course