



TQF.3 Course Specification

Course Code : MME 5206

Course Title: Seminar in Mathematics Education

Credits: 1(1-2-3)

Semester /Academic Year : 1/2016

Students : Master of Arts Program in Mathematics Education

Lecturers : Asst.Prof. Dr. Supotch Chaiyasang

International College, SuanSunandhaRajabhat University

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Section 1 General Information

1. Code and Course Title: MME 5206 Seminar in Mathematics
Education

2. Credits:1(1-2-3)

3. Curriculum and Course Category :

This course of Master of Arts ,International College, SSRU is categorized in *Requirement Course: Cluster in International Teaching Profession* .

4. Lecturers:

Asst.Prof. Dr. SupotchChaiyasang

5. Year / Semester

Graduate Student Year 1 / Semester 2/2013

6. Prerequisite Course

None

7. Co-requisite Course :

None

8. Learning Location

Building Number :21

Tuesday 13.00 – 16.00 Room No. 2122

9. Last Date for Preparing and Revising this Course:

September 15, 2013

Section 2 Objectives and Purposes

1. Course Objectives

At the end of this course, the student will be able to perform in the following areas of performance :

(1) Able to Integrate all knowledge to discuss on the themes of mathematics education research;

(2) Able to create teaching/learning methods to develop higher-order-thinking skills for meaningful learning;

(3) Able to compare the National Assessment Standards and International Assessment Standards;

(4) Able to design techniques in teaching mathematical process;

(5) Able to write mathematics lesson plan in English by using technologies in teaching/learning mathematics.

2. Purposes for Developing / Revising Course (content / learning process / assessment / etc.)

According to TQF (Thailand Quality Framework: HEd.) and the Teachers' Council of Thailand with the standards of professional knowledge and experience for requirement courses, graduate students program in mathematics education should have essence in Pedagogy-Contents- Knowledge (PCK).

Section 3 Course Structure

1. Course Outline

Integration of all knowledge to discuss on the themes of mathematics education research: Teaching/Learning methods, Developing higher-order-thinking skills for meaningful learning;

Evaluation methods, Learning problems in mathematics, Using technologies in teaching/learning mathematics.

2. Time Length per Semester (Lecture – hours / Practice – hours / Self Study – hours)

| Lecture | Practice/ Field Work/Internship | Self Study | Remedial Class |
|----------------|--|-------------------|---------------------------|
| 32 hours | - | 48 hours | 3+ (if any) |

3. Time Length per Week for Individual Academic

Consulting and Guidance

1 hour / week

Section 4 Developing Student’s Learning Outcomes

| Learning Standards/Outcomes | Learning Activities | Learning Assessment |
|---|---|--|
| 1. Ethics and Morals To have ethic behavior (personal responsibility , corporate responsibility) and moral reasoning. | Work in group to discuss on teachers’ skills and attitudes. | Group discussion Report |
| 2. Knowledge Be able to compile courses to formulate a learning plan for teaching mathematics. | 1. Introduce the trends in mathematics education . 2. Compare and contrast among perspectives on national education and universal education standards. | 1. Term papers 2. Group report presentation |
| 3. Cognitive Skills (1) Be able to organize | 1. Use research-based learning and internet- | 1. Individual portfolio |

| Learning Standards/Outcomes | Learning Activities | Learning Assessment |
|---|---|---|
| <p>activities that promote learning and classify the learners' levels based on evaluation.</p> <p>(2) Able to manage learning resources and classroom environment for specific class (English Program Class / Gifted-Class).</p> | <p>based learning to construct cognitive skills in solving mathematics classroom problems.</p> <p>2. Discussion and presentation of research findings – students write reports, and other forms of work documentation to include in their portfolios or oral presentation their findings from discussion / searching information.</p> | <p>2. Term papers</p> <p>3. Group report presentation</p> |
| <p>4. Interpersonal Skills and Responsibilities</p> <p>4.1 Have responsibility for assignment : select ideas in education from different theoretical perspectives, application to standards.</p> <p>4.2 Can adjust to work in team both as leader or follower.</p> | <p>1. Use research-based learning and internet-based learning on action research in mathematics education.</p> <p>2. Students work in group of five. They plan to use PBL technique to search information demonstrate interpersonal skills and responsibility in diverse situations.</p> | <p>1. Term papers</p> <p>2. Group report presentation</p> |
| <p>5. Numerical Analysis, Communication and Information Technology Skills</p> <p>5.1 Have statistical and mathematical skills to</p> | <p>1. Use research-based learning and internet-based learning to analyze problems in teaching / learning mathematics .</p> <p>2. Students work in group</p> | <p>1. Individual portfolio</p> <p>2. Term papers</p> <p>3. Group report</p> |

| Learning Standards/Outcomes | Learning Activities | Learning Assessment |
|---|---|--|
| <p>present research finding on Pedagogy-Content-Knowledge in mathematics education.</p> <p>5.2 Can use correct language in oral and written presentations.</p> <p>5.3 Can use computer and IT to follow the progress management in learning and classroom, and educational assurance.</p> | <p>of five. They plan to use technology to analyze data and present their report both in oral and written.</p> | <p>presentation</p> |
| <p>6. Learning Management Skills</p> <p>6.1 Be able to design learning activities and learning environments within the context of a unit of mathematics and real world.</p> <p>6.2 Be able to develop the learners with essential opportunities to enhance learning concepts and motivate active engagement in mathematical process for problem solving.</p> | <p>1. Use research-based methods to enhance learning management skills and support National Test and International Test (O-NET/TIMSS / PISA).</p> <p>2. Discussion and presentation of learning and teaching theories and research on the learning of mathematics, development of mathematical thinking and knowledge in school and other settings.</p> | <p>1. Individual portfolio 2. Term papers 3. Group report presentation</p> |

Section 5 Lesson Plan and Assessment

1. Lesson Plan

| Week | Topic/Outline | Hours | Learning Activities and Medias |
|--------|--|-------|--|
| 1- 4 | Unit 1 Pedagogy-Content-Knowledge | 8 | <ol style="list-style-type: none"> 1. Introduce the concepts of PCK. 2. Students work with a group of five to discuss about the research on PCK. |
| 5 - 8 | Unit 2 Olympic Mathematics | 8 | <ol style="list-style-type: none"> 1. Prepare students' abilities of solving problems in Olympic Mathematics Test. 2. Students work with a group of five to discuss about higher-order thinking in mathematics test designs (Olympic Mathematics Test). |
| 9 - 12 | Unit 3 O-NET, TIMSS , PISA | 8 | <ol style="list-style-type: none"> 1. Introduce types of National Test and International Test (TIMSS, PISA). 2. Students work with a group of five to discuss about students' results in taking tests to improve teaching/learning mathematics strategies. |

| Week | Topic/Outline | Hours | Learning Activities and Medias |
|-----------------------|--|--------------|---|
| 13 - 16 | Unit 4 Action Research in Mathematics Education | 8 | <ol style="list-style-type: none"> 1. Introduce research-based learning, project-based learning, and community-based learning. 2. Students discuss about real situation in learning mathematics by using research-based learning, project-based learning, and community-based learning. 3. Students plan to design action research integrated all knowledge they have learned. |
| Total of Hours | | 32 | |

Remark : Reserve 1 – 2 weeks for searching related topics.

2. Learning Assessment Plan

| Learning Outcomes | Assessment Activities | Time Schedule (Week) | Proportion for Assessment (%) |
|---|--|-----------------------------|--------------------------------------|
| <p>1. Ethics and Morals</p> <p>To have ethic behavior (personal responsibility , corporate responsibility) and moral reasoning.</p> | <p>1.Individual portfolio</p> <p>2.Group discussion</p> | <p>Through out semester</p> | <p>5 %</p> |
| <p>2. Knowledge</p> <p>(1) To compile courses to formulate a learning plan for teaching mathematics.</p> <p>(2) To design a learning model improve teaching and learning standards;</p> <p>(3) To develop strategies for enhancing students' abilities in problem solving.</p> | <p>1.Term papers</p> <p>2.Group report presentation</p> | <p>Through out semester</p> | <p>40 %</p> |
| <p>3. Cognitive Skills</p> <p>(1) To organize activities that promote learning and classify the learners' levels based on learning standards.</p> | <p>1. Individual portfolio</p> <p>2. Term papers</p> <p>3. Group report presentation</p> | <p>Through out semester</p> | <p>30 %</p> |

| Learning Outcomes | Assessment Activities | Time Schedule (Week) | Proportion for Assessment (%) |
|---|---|-----------------------------|--------------------------------------|
| <p>4. Interpersonal Skills and Responsibilities</p> <p>4.1 Have responsibility for assignment : select ideas in education from different theoretical perspectives, application to standards.</p> <p>4.2 Can adjust to work in team both as leader or follower.</p> | <p>1. Checklists</p> <p>2. Interviews</p> | <p>Through out semester</p> | <p>5 %</p> |

| Learning Outcomes | Assessment Activities | Time Schedule (Week) | Proportion for Assessment (%) |
|--|--|-----------------------------|--------------------------------------|
| <p>5. Numerical Analysis, Communication and Information Technology Skills</p> <p>5.1 Have statistical and mathematical skills to present research finding on learning standards.</p> <p>5.2 Can use correct language in oral and written presentations.</p> <p>5.3 Can use computer and IT to follow the progress management in learning standards.</p> | <p>1. Individual portfolio</p> <p>2. Term papers</p> <p>3. Group report presentation</p> | <p>Through out semester</p> | <p>10 %</p> |
| <p>6. Learning Management Skills</p> <p>6.1 Be able to design learning activities and learning environments within the standard frame.</p> | <p>1. Individual portfolio</p> <p>2. Term papers</p> <p>3. Group report presentation</p> | <p>Through out semester</p> | <p>10 %</p> |

| Learning Outcomes | Assessment Activities | Time Schedule (Week) | Proportion for Assessment (%) |
|---|------------------------------|-----------------------------|--------------------------------------|
| 6.2 Be able to develop the learners with essential opportunities to enhance learning concepts and motivate active engagement in mathematical process for problem solving. | | | |

Section 6 Learning and Teaching Resources

1. Textbook and Main Documents

National Council of Teacher of Mathematics. (1989). *Curriculum and evaluation standards for school mathematics*. Reston. VA: NTCM.

Manocha, R. (2000). *Mathematics Olympiad*. Meerut: Sarika Offset.

OECD. (2013). *PISA 2012 Assessment and analytical framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy*. OECD Publishing.

2. Important Documents for Extra Study

Silver, E.A. (In press). *The QUASAR Project: The Revolution of the Possible in Mathematics Instructional Reform in Urban Middle Schools*. Urban Education.

3. Suggestion Information (Printing Materials/Website/CD/Others)

Keywords for searching : Rethinking in Mathematics, Mathematics Instructional Reform, Action Research in Mathematics

Section 7 Course Evaluation and Revising

1. Strategies for Course Evaluation by Students

Using survey questions to collect information from the students' opinions to improve the course and enhance the curriculum. Examples of questions:

- (1) Content objectives were made clear to the students.
 - (2) The content was organized around the objectives.
 - (3) Content was sufficiently integrated.
 - (4) Content was sufficiently integrated with the rest of the first year curriculum.
 - (5) The instructional materials used were effectively.
 - (6) The learning methods appropriate assessed the students' understanding of the content.
 - (7) Overall, Students are satisfied with the quality of this course
- etc.

2. Strategies for Course Evaluation by Lecturer

2.1 Lecturers team observe the class and discuss the results as

follow:

- (1) The lecturer is well prepared for class sessions.
 - (2) The lecturer answers questions carefully and completely.
 - (3) The lecturer uses examples to make the materials easy to understand.
 - (4) The lecturer stimulated interest in the course.
 - (5) The lecturer made the course material interesting.
 - (6) The lecturer is knowledgeable about the topics presented in this course.
 - (7) The lecturer treats students respectfully.
 - (8) The lecturer is fair in dealing with students.
 - (9) The lecturer makes students feel comfortable about asking question.
 - (10) Course assignment are interesting and stimulating.
 - (11) The lecturer's use of technology enhanced learning in the classroom.
- etc.

1.2 The director / head of program construct assessment items to evaluate four dimensions of lecturer's competencies : teaching skills, organization and presentation of materials, management of the learning environment, and teaching attitudes.

3. Teaching Revision

Lecturer revises teaching / learning process based on the results from the students' survey questions , the lecturer team's observation, and classroom research.

4. Feedback for Achievement Standards

International College Administrator Committee monitor to assessment process and Grading.

5. Methodology and Planning for Course Review and Improvement

(1) Revise and develop course structure and process every two years.

(2) Assign different lecturers teach this course to enhance students' performance.