Department of Mathematics Education

1. Educational Goal

Graduate School of Mathematics Education The aim of the Ph.D. program is to train a wide range of knowledge and inquiry skills in mathematics education and mathematics, and to cultivate professional talents capable of creating socially meaningful values. It contributes to the improvement of the quality of mathematics education by developing broad knowledge and research ability about mathematics education and school mathematics and advanced mathematics for fostering mathematics education experts.

2. Educational Objective

We train students to have an understanding of basic concepts and theoretical systems of modern mathematics, logical thinking ability, and rational reasoning ability. We educate capable secondary school teachers, professors, and researchers, equipped with a creative, harmonious personality, and a broad worldview, who can contribute to the development of information science technologies and basic sciences.

3. List of Full-time Faculty

Name	Position	Degree(University)	Field of Instruction	Area of Research
Yoon Yeon-Soo	professor	Ph.D (Korea Univ)	Topology	Algebraic Topology
Lee KyunGja	professor	Ph.D (YonseiUniv)	Algebra	Algebra
Yoo Chung Hyun	professor	Ph.D(Seoul Univ)	Mathematics Education	Mathematics Education
Kim, Jun-Hyung	professor	Ph.D(Seoul Univ)	Differential geometry	Differential geometry
Ryoo Geun Sik	professor	Ph.D (YonseiUniv)	Analysis	Fuzzy Analysis

4. Course Description

Mathematics Education

ME701 학교수학의 원리 (Principle of School Mathematics) 3 credits
-Study the principles of fairness, curriculum principles, guiding principles, learning principles, evaluation principles, and the theoretical backgrounds of technology.

ME702 수학과 문제해결론 (Theory of Mathematics Problem Solving) 3 credits
-We will study the background and goal of mathematical problem solving and develop a teaching and learning model for improving mathematical problem solving ability by studying the relationship between

mathematical thinking education and problem solving instruction.

ME703 추론과 증명론 (Theory of Reasoning and Proof) 3 credits
- It deals with deductive reasoning and probabilistic reasoning. We explore the various methods of guessing and proof, and the role of reasoning in mathematics, and explore the components of proof, the kind of proof, and the proof teaching method in mathematics.

ME704 수학적 의사소통 (Mathematical Communications) 3 credits
- To explore the theories of mathematical communication in mathematics education and to search for practical teaching guidance and evaluation methods.

ME705 수학과 교육과정론 (Theory of Mathematics Curriculum) 3 credits
-The mathematics curriculum of elementary, middle, and high school is compared and analyzed, and the mathematical pedagogical background and related topics are investigated.

ME706 수학과 평가론 (Theory of Mathematics Assessment) 3 credits
- Students will learn objective research methods that measure achievement level of mathematics education and mathematical thinking ability. Develop realistic questions that taught you how to develop measurement tools that support your research goals. Students will learn how to accurately measure achievement and thinking ability using item response theory. Analyze and update the items using the results of the test.

ME707 수학교수학습이론 (Theory of Mathematics Learning and Instruction) 3 credits
-Study the differences and application methods of various teaching theories and learning theories.

ME708 멀티미디어와 수학교육 (Multimedia and Mathematics Education) 3 credits
-We explore mathematics teaching methods and learning methods using computers and the Internet. We analyze the effects of using various software, and explore the application methods and efficiency of various software in mathematics teaching and learning.

ME709 수학교육공학 (Technology in Mathematics Education) 3 credits
- To explore the effects of using various mathematical parcels, including calculators, in mathematics classes and to find ways to use them.

ME710 창의적 수학연구법 (Creative Mathematics Research) 3 credits
- We investigate the mathematical creativity and the origin of mathematical subject, and try to apply the method to the teaching and learning of mathematics at secondary school.

ME711 고급대수교육 (Advanced Algebra Education) 3 credits
- The theoretical background of secondary mathematics is the theory of algebra: the new theory and method of algebra such as county, circle, saga, algebra, algebra etc. are learned and the subject is

cultivated to develop professionalism and to solve various problems creatively.

ME712 중등대수 문제해결 (Problem Solving in Secondary School Algebra) 3 credits
- Lectures on core concepts of algebra, curriculum, evaluation method, and algebra teaching method for developing mathematical thinking ability in secondary mathematics.

ME713 고급기하교육 (Advanced Geometry Education) 3 credits
- Tensor analysis, topological properties and differential geometry of curved surfaces, introduction to classical differential geometry and modern differential geometry, and differential geometry in secondary curriculum from various perspectives and explore new teaching methods.

ME714 중등기하 문제해결 (Problem Solving in Secondary School Geometry) 3 credits
- This course aims to reexamine modern geometry in various aspects such as axioms, non-Euclid geometry, projective geometry, affine geometry, mathematical handling of projection geometry, and secondary curriculum.

ME715 고급해석교육 (Advanced Analysis Education) 3 credits
- This course deals with the concepts of continuity, differentiation, integration, convergence, and series in various perspectives and understands the essence of interpretive education in school mathematics.

ME716 중등해석 문제해결 (Problem Solving in Secondary School Analysis) 3 credits
- The concepts of continuity, differentiation, integration, convergence, and series are dealt with in depth from various viewpoints, and the problems of interpretive education in school mathematics are explored by a genetic approach.

ME717 고급통계교육 (Advanced Statistics Education) 3 credits
- The basic concepts of statistical inference such as sample and sample distribution, basic concept of estimation, property of estimator, point estimation, interval estimation, hypothesis testing, nonparametric method are explored.

ME718 중등통계 문제해결 (Problem Solving in Secondary School Statistics) 3 credits
- Summarize and summarize the statistical data obtained through experiments, surveys, and observations in natural and social phenomena, and discuss statistical methodologies for finding general laws governing observed phenomena based on this. The summary of the data, as well as the observation, the planning of the experiment and the statistical reasoning, ie the understanding of the basic concepts of estimation and testing, and its applications are covered.

ME719 고급이산수학교육 (Advanced Discrete Mathematics Education) 3 credits
- This course is designed to provide students with a comprehensive understanding of the nature of the phenomenon and its applications.

ME720 중등이산수학 문제해결 (Problem Solving in Secondary School Discrete Mathematics) 3 credits
- This course covers the various aspects of discrete mathematics in relation to sets and relations, algorithms and analysis, regression relations, fundamental number theory, graph theory, Boolean algebra, logical circuits, language and grammar, design and construction of finite state machines, Turing machines, And seek new teaching methods.

ME721 수학교육질적연구세미나1 (Seminar in Qualitative research in Mathematics Education 1) 3 credits
- This course will explore recent research trends and research methods in mathematics education.

ME722 수학교육질적연구세미나2 (Seminar in Qualitative research in Mathematics Education 2) 3 credits
- This course will explore recent research trends and research methods in mathematics education.

ME723 박사학위 논문연구1(수학교육) (Dissertation 1 : Mathematics Education) 0-0-0
ME724 박사학위 논문연구2(수학교육) (Dissertation 2 : Mathematics Education) 0-0-0
ME725 박사학위 논문연구3(수학교육) (Dissertation 3 : Mathematics Education) 0-0-0