RESEARCH ROADMAP

BACHELOR (S1) STUDY PROGRAM IN MATHEMATICS EDUCATION

YEAR 2016 – 2025

BACHELOR (S1) STUDY PROGRAM IN MATHEMATICS EDUCATION

DEPARTMENT OF MATHEMATICS, FACULTY OF MATHEMATICS AND NATURAL SCIENCES

UNIVERSITAS NEGERI SURABAYA

2016

MINISTRY OF RESEARCH, TECHNOLOGY, AND HIGHER EDUCATION
UNIVERSITAS NEGERI SURABAYA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES (FMIPA)
Ketintang Campus, Jalan Ketintang, Surabaya 60231 | Website: fmipa.unesa.ac.id

APPROVAL PAGE

RESEARCH ROADMAP OF THE BACHELOR (S1) STUDY PROGRAM IN MATHEMATICS EDUCATION FOR THE PERIOD 2016 – 2025

This Research Roadmap document of the Bachelor (S1) Study Program in Mathematics Education, Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Negeri Surabaya, has been reviewed, approved, and ratified for use as a reference in carrying out research activities by lecturers and students for the period 2016–2025.

Document Title	:	Research Roadmap of the Bachelor (S1) Study Program in Mathematics Educatio
Study Program	:	Bachelor (S1) in Mathematics Education
Department	:	Mathematics
Faculty	:	Mathematics and Natural Sciences (FMIPA)
University	:	Universitas Negeri Surabaya
Period of Validity	:	2016 – 2025

Surabaya, 31 December 2016

Acknowledged / Approved,

Head of the Coordinating Study Program of S1 Mathematics Education,

Prof. Rooselyna Ekawati, Ph.D

NIP. 198210152005012002

DEAN'S DECREE

No. B/41548/UN38.3/HK.01.02/2016

Concerning

APPROVAL OF THE RESEARCH ROADMAP 2016–2024

The Dean of the Faculty of Mathematics and Natural Sciences (FMIPA), Universitas Negeri Surabaya, hereby:

Considering:

a. That the management of FMIPA Unesa research activities is in accordance with the Vision and Mission of the university as outlined in the FMIPA Research Roadmap;

b. That in order to elaborate the FMIPA Unesa Research Roadmap, a study-program-level research roadmap must be prepared for the Bachelor (S1) Mathematics Education study program. Therefore, it is necessary to establish the approval of the Research Roadmap of the S1 Mathematics Education Study Program for 2016–2025.

In view of:

1. Law No. 12/2012 on Higher Education;

2. Government Regulation No. 4/2014 on the Administration of Higher Education and the Management of Higher Education Institutions;

3. Regulation of the Minister of Research, Technology, and Higher Education No. 15 of 2015 on the Organization and Work Procedures of the Ministry of Research, Technology, and Higher Education;

4. Regulation of the Minister of Research, Technology, and Higher Education No. 50/2018 on the Amendment of Regulation No. 44/2015 on National Standards of Higher Education;

5. The Statute of Universitas Negeri Surabaya.

DECIDES

To Approve:

First: The Research Roadmap of the S1 Mathematics Education Study Program for 2016–2025, as set out in the appendix to this Decree;

Second: This Decree shall take effect from the date it is established.

Established in Surabaya

Dean of FMIPA Unesa,

Surabaya, 12 January 2016

Prof. Dr. Suyono, M.Pd.

NIP. 196006201983031003

PREFACE

We express our gratitude to Allah SWT for His blessing and grace, so that this Research Road Map for 2016 to 2025 of the S1 Mathematics Education Study Program, FMIPA, Universitas Negeri Surabaya, could be completed. This Research Road Map is intended to provide direction for research policy in support of achieving the research-related Mission of the S1 Mathematics Education Study Program. Through well-directed research, it is hoped that the research quality of lecturers in the S1 Mathematics Education Study Program will be achieved, so as to attract cooperation at both the national and regional levels. In addition, the outstanding products generated during research activities are expected to increase publications and Intellectual Property Rights (IPR) for Mathematics Education lecturers.

With the completion of this Road Map, we extend our highest appreciation to all lecturers of the S1 Mathematics Education Study Program, FMIPA Unesa, who have contributed their thoughts to the completion of this book. Should there be any shortcomings or weaknesses in its preparation, we sincerely welcome input and suggestions for improvement from esteemed readers, for the sake of its refinement.

Surabaya, January 2016

Head of Study Program,

Prof. Rooselyna Ekawati, Ph.D

NIP. 198210152005012002

CHAPTER I

INTRODUCTION

A. Background

Chapter III of the Statute of Universitas Negeri Surabaya, concerning the Implementation of the Three Pillars of Higher Education (Tri Dharma Perguruan Tinggi), states that research is one component of the Three Pillars of Higher Education. Article 14 of the Statute states that research conducted by Universitas Negeri Surabaya in the fields of education and non-education is carried out by lecturers and students, either independently, in groups, or in cooperation with other parties. The results of such research are published in scientific journals, both national and internationally reputable and Scopus-indexed, and, where possible, may be proposed for the acquisition of intellectual property rights. On this basis, in its strategic plan, Universitas Negeri Surabaya carries one core mission, namely excellence in the field of research.

To achieve excellence in research, one of the missions of FMIPA Unesa is to conduct research that strengthens scientific expertise recognized both nationally and internationally. This mission of FMIPA is then carried out by its study programs, including the Mathematics Education study program. The vision of the S1 Mathematics Education Study Program is to be excellent in mathematics education and strong in mathematical science. More specifically, one of the objectives of the S1 Mathematics Education Study Program is to produce mathematics education research that is relevant to developments in science and technology. Research and community service in the field of mathematics education are essential to achieve excellence at the ASEAN regional level by 2025. To realize this, the Mathematics Education Study Program must formulate a strategic research plan through the preparation of a Research Roadmap covering the period up to 2025.

B. Purpose of the Research Roadmap

The purpose of the Research Roadmap of the S1 Mathematics Education Study Program, FMIPA Unesa, is to facilitate the realization of research programs of the S1 Mathematics Education Study Program in line with the strategic plan of FMIPA Unesa, namely: Conducting MIPA (mathematics and natural sciences) research to strengthen scientific expertise recognized nationally and internationally, and with the operational plan of the S1 Mathematics Education Study Program. This research roadmap is also aligned with the objectives of the S1 Mathematics Education Study Program, detailed as follows:

a. Conducting research in the field of mathematics education to strengthen scientific expertise recognized nationally and internationally (2016–2019)

b. Producing mathematics education research relevant to developments in science and technology (2016–2019)

c. Preparing the study program's resources to prepare for the accreditation process at the ASEAN level in the future (2016–2025)

d. Improving the quality and quantity of lecturer research and scientific publications of mathematics education research results in accredited national journals, indexed proceedings, and reputable international journals (2016–2025)

CHAPTER II

STRATEGIC PLAN

A. Vision of the S1 Mathematics Education Study Program

The vision of the S1 Mathematics Education Study Program is:

"Excellent in mathematics education and strong in mathematical science"

The elaboration of this vision is as follows:

1. Excellence in mathematics education innovation
2. Excellence in the quality of graduates (resilient character, professional, competitive, entrepreneurial spirit, and environmentally aware)
3. Excellence in research and community service in the field of mathematics education that is relevant to developments in science, technology, and the arts (IPTEKS)

Milestones for achieving the vision of the S1 Mathematics Education Study Program through 2025 are as follows:

2016–2019: Beginning to be productive in creative and innovative works
(Mapping and structuring of lecturers based on home-base assignments; through faculty meetings, the study program establishes its research clusters, namely Mathematics Teaching, Psychology of Mathematics Education, and Evaluation of Mathematics Education; lecturers begin completing doctoral degrees; lectures are supported by e-learning; various lecturer works are published; the program has its own journal, the Journal of Research in Mathematics Education and Learning Innovation; student community service and research continue to grow innovatively; together with the Mathematics Study Program, lecturer community service activities are organized at a single location designated by the faculty.)

2020–2025: Productive in creative and innovative works
(The lecturer profile moves toward an increasing number of professors in the field of Mathematics Education; lectures are research-based and supported by e-learning; various lecturer works are published in international journals; the program has its own accredited journal; several copyrights are obtained; student community service and research grow; the alumni network grows.)

By 2025: Toward an S1 Mathematics Education Program on par with Developed Countries in ASEAN
(The lecturer profile moves toward an increasing number of professors in the field of Mathematics Education; lectures are research-based and supported by e-learning; various lecturer works are published in reputable international journals; the program has its own accredited and internationally indexed journal; a strong culture of student community service and research emerges; international classes serve as a driver for other classes; the alumni network grows and develops.)

B. Mission of the S1 Mathematics Education Study Program

1. Organizing innovative, research-based mathematics education and learning to produce graduates who are environmentally aware, have an entrepreneurial spirit, and possess global competitiveness.

2. Conducting research in the field of mathematics education to strengthen scientific expertise recognized nationally and internationally.

3. Conducting community service in the field of mathematics education grounded in social responsibility to the community.

4. Establishing sustainable cooperation with stakeholders and various institutions to improve the quality of mathematics education and the image of the study program.

5. Implementing accountable, transparent, effective, efficient, and independent management and organization of the mathematics education study program, in accordance with standardized quality assurance standards.

C. Objectives and Targets of the S1 Mathematics Education Study Program

No.	Objective	Target
1.	Producing mathematics education graduates with resilient character, who are professional, competitive, entrepreneurial, and environmentally aware	1. Availability of qualified human resources, both scientifically and professionally, in delivering mathematics education 2. Availability of learning facilities and infrastructure in terms of both quality and quantity 3. Improvement of the quality of education and teaching 4. Improvement of the quality of study program management 5. Graduates of the mathematics education study program achieving a minimum GPA of 3.25, who are resilient, well-mannered, professional, competitive, entrepreneurial, and environmentally aware
2.	Producing mathematics education research relevant to developments in science and technology.	1. Every lecturer conducting at least 1 research project per year from varied funding sources 2. Increased number of research articles in proceedings indexed by reputable databases 3. Increased number of journal articles/copyrights resulting from lecturer research
3.	Applying research results to community service activities in mathematics education grounded in social responsibility to the community.	1. Every lecturer conducting at least 1 research project per year from varied funding sources 2. Increased number of journal articles/copyrights resulting from lecturer research and community service
4.	Carrying out sustainable cooperation with stakeholders and various institutions to improve the quality of mathematics education and the image of the study program.	1. Increased involvement of the study program in building and fulfilling cooperation with stakeholders
5.	Implementing accountable, transparent, effective, efficient, and independent management and organization of the mathematics education study program, in accordance with standardized quality assurance standards.	

D. Roadmap Development Process

The roadmap was developed through the stages of the product development process, namely: (1) needs analysis, (2) draft development, (3) revision, (4) Focus Group Discussion (FGD), and (5) Panel Group Discussion. Needs analysis and draft development were carried out by the Roadmap Drafting Team. The needs analysis was conducted by reviewing the Unesa Statute, the Unesa Strategic Plan, the Unesa Research Master Plan (RIP), the FMIPA Unesa Strategic Plan, and the Operational Plan of the Mathematics Department. The FGD aimed to discuss the draft that had been prepared, involving the Drafting Team, the Accreditation Team, and lecturers of the S1 Mathematics Education Study Program. The Panel Group Discussion aimed to disseminate the results of the revision after it had been reviewed through the FGD.

E. Research Targets and Strategy

The implementation of the research roadmap of the S1 Mathematics Education Study Program is based on the targets and strategies of the S1 Mathematics Education Study Program as shown in the following table.

No.	Target	Strategy
1.1	Availability of qualified human resources, both scientifically and professionally, in delivering mathematics education	a. Recruitment of lecturers and support staff according to needs and opportunities from Unesa b. Sending lecturers for further study, targeting 60% of lecturers holding doctoral degrees by 2020 c. Training for lecturers and support staff, especially to improve lecturers' English proficiency and staff competence d. Recruitment of quality prospective students, with an applicant-to-acceptance ratio above 15:1
1.2	Availability of learning facilities and infrastructure in terms of quality and quantity	a. Optimizing the S1 Mathematics Education Study Program's RBA budget allocation to complete lecture and laboratory facilities b. Utilizing other sources (research and cooperation) to complete lecture and laboratory facilities
1.3	Delivery of quality teaching and mentoring	a. Applying learning and mentoring standards and procedures, as well as monitoring and evaluation within the framework of FMIPA's ISO 9000:2008 and the Academic Information System (SIAKAD) b. Lecture-preparation workshops (preparation and validation of: Semester Learning Plans (RPS), Student Worksheets (LKM), assessment tools), at the beginning of every semester
1.4	Improvement of study program management quality	a. Applying FMIPA's service standards and procedures within the framework of ISO 9000:2008
1.5	Graduates with competence, resilient and excellent character, and the ability to compete and collaborate (reflected by an average GPA above 3, and at least a good assessment from graduate users regarding attitude and general capability)	a. Developing and implementing the S1 Mathematics Education curriculum and its supporting documents (RPS, LKM, teaching materials), with periodic curriculum review b. Conducting periodic tracer studies used as input for curriculum and learning process improvement
2.1	Every lecturer conducting at least 1 research project per year from varied funding sources	a. Allocating RBA funds for lecturer research grants, at least 4 titles/year b. Workshops on preparing research proposals for external funding
2.2	Increased number of journal articles/IPR resulting from lecturer research	a. Organizing and/or sending lecturers to attend article-writing training and/or IPR application training
3.1	Every lecturer conducting at least 1 community service project per year from varied funding sources	a. Allocating RBA funds for lecturer community service grants, at least 4 titles/year b. Workshops on preparing community service proposals for external funding
3.2	Increased number of journal articles/IPR resulting from lecturer community service	a. Organizing and/or sending lecturers to attend training on writing articles from community service results and/or IPR application
4.1	Increased involvement of the study program in building and fulfilling cooperation with stakeholders	a. Reviewing MoUs at the university and faculty levels, building communication, and fulfilling MoUs b. Initiating MoUs through training activities in cooperation with partners, to be followed up as MoUs at the faculty/university level

Targets 2.1 and 2.2 indicate that the S1 Mathematics Education Study Program is very serious about improving lecturer research performance, particularly to produce innovative works published in national and international journals, as well as works with the potential to generate intellectual property rights. The strategy pursued involves engaging lecturers in various training programs and having them compete for research funding, ranging from faculty-level policy research to national-level competition. Through this program, it is hoped that lecturer research performance will improve every year.

CHAPTER III

RESEARCH FOCUS OF THE S1 MATHEMATICS EDUCATION STUDY PROGRAM

A. Field of Mathematics Education Research

In line with its vision and mission, research at the S1 Mathematics Education Study Program, Universitas Negeri Surabaya, is essentially research aimed at improving the quality of mathematics education. Based on the vision and mission of the S1 Mathematics Education Study Program, the research carried out by lecturers of the study program is essentially research aimed at increasing the quantity and quality of scientific publications.

To facilitate the achievement of this basic objective, and taking into account the study program's lecturer resources and their respective areas of expertise, the study program divides the research field of the S1 Mathematics Education Study Program into several research focus areas:

1. Psychology of Mathematics Education (problem solving, problem posing, analysis of student cognition)
2. Mathematics Learning Models and Materials
3. Evaluation of Mathematics Education

These three research focus areas of mathematics education are expected not only to strengthen expertise in mathematics education, but also to increase the role of Unesa's Mathematics Education program in supporting government programs to improve the quality of education. In line with the vision and mission of the S1 Mathematics Education Study Program, the research carried out by the study program's lecturers is essentially aimed at increasing the quantity and quality of scientific publications. This division of research fields corresponds to the adequacy and qualifications of Mathematics Education Study Program lecturers relevant to their respective research focus areas.

B. External Influences

Besides being influenced by internal factors, the research focus described in Section A is also influenced by external factors. Several external factors that may influence the focus of mathematics education research include (1) the curriculum, which is continually revised or revitalized to adapt to developments in science and technology as well as social life, (2) student learning and characteristics, which is the field most susceptible to change due to social and environmental changes as well as advances in science and technology, (3) educational media and facilities, which are highly dependent on developments in science and technology, and (4) government policies in the field of education.

These external factors not only affect the direction and orientation of mathematics education research, but also influence the availability of research funding through the availability of research schemes provided by both the government and other institutions, domestic and foreign.

C. Internal Influences

Internal factors that influence research in the S1 Mathematics Education Study Program include: (1) the availability of resources, particularly lecturers who carry out research activities, (2) the

availability of adequate funding to meet lecturer research targets, (3) the availability of facilities and infrastructure required for research activities, and (4) university policy in the field of research. Research within the S1 Mathematics Education Study Program depends heavily on lecturer expertise, so that both the type and quality of research depend on lecturer competence. In this regard, the study program organizes its lecturers so that expertise is available across all research focus areas, enabling the S1 Mathematics Education Study Program to contribute to national development through research. The availability of research funding remains very limited to date, making it quite difficult to target international publications and IPR. Nevertheless, incentive funds can serve as a trigger and stimulus for conducting research activities in line with the vision and mission of Unesa.

D. Research Opportunities

Research opportunities in the S1 Mathematics Education Study Program, viewed from its research focus, are very substantial. Research opportunities can be viewed from two aspects: competitive opportunities and collaborative opportunities with other institutions. Competitive research opportunities exist with research funding providers such as the government, non-governmental institutions, and the private sector. Collaborative opportunities are pursued with government agencies and other parties that establish cooperation for research activities in accordance with the expertise of lecturers in the S1 Mathematics Education Study Program at Unesa.

E. Research Challenges

The main challenge in developing research within the S1 Mathematics Education Study Program to date is the limited availability of research funding, resulting in increasingly intense competition to obtain research funds, the shrinking research budgets of various collaborating institutions, and the limited research budgets at the study program, faculty, and university levels. To address these challenges, study program leadership needs to implement specific strategies to ensure that all lecturers are involved in research activities every year, such as providing supplementary stimulus funding for research and involving lecturers in research proposal-writing training. Through such proposal-writing activities, lecturer enthusiasm for submitting research proposals is expected to increase, along with improvements in the quality and quantity of lecturer research proposals. In addition, every lecturer is expected to be able to carry out independent research activities according to their respective abilities. With opportunities to conduct research supported by research funding, study program lecturers can also strive to increase scientific publications at both the National and International level. Although lecturers face constraints related to English proficiency and publication fees in increasing their publications, these can be addressed through participation in manuscript-clinic workshops organized by the University and by applying for publication rewards from the University.

CHAPTER IV

RESEARCH ROADMAP

A. Objectives

The objectives of the research roadmap of the S1 Mathematics Education Study Program at Unesa can be described as follows:

1. Increasing lecturer participation in carrying out research activities
2. Improving the quality of lecturer and student research
3. Increasing cooperation in the field of research
4. Increasing the application of research results to the community through community service (PKM)
5. Improving lecturers' ability to publish research results in reputable international journals and to obtain IPR

Achievement Indicator	Measurement
Lecturer participation in research	Number of Mathematics Education Study Program lecturers involved in research each year
Quality of lecturer and student research	Number of research projects accepted in national and international competitive research schemes, free of plagiarism, and compliant with research ethics
Application of research results through community service (PKM)	Number of lecturer community service (PKM) projects based on research results each year
Cooperation in the field of research	Number of collaboration-based research projects
Lecturers' capability in publishing research results	Number of research articles published in reputable international journals (Q1, Q2, Q3, and Q4) each year Number of lecturer IPR each year Number of citations Number of presentations at international seminars

B. Strategy for Achieving the Objectives

There are 5 strategic steps that the S1 Mathematics/Sciences Education Study Program can take to achieve these objectives.

Strategic Steps	Target
Raising awareness of the importance of research	Every lecturer has the motivation and desire to write at least one research proposal per year
Increasing the research budget	Every year a stimulus budget is provided for lecturer research, covering at least 4 research titles
Building collaborative research with various parties, both government and private	* Every year there is at least one collaborative research project with an external party ** Every year the study program explores research cooperation with various parties

Strategic Steps	Target
Improving lecturers' research capacity, quality, and innovation	All lecturers submit proposals under competitive research schemes to obtain research grants, both domestic and international
Improving lecturers' scientific publication capability	* All lecturers publish their research results in various scientific journals ** All lecturers submit articles from their research results to reputable international journals

C. Types of Research

The research cluster carried out by lecturers and students of the S1 Mathematics Education Study Program is Mathematics Learning, with the theme of Mathematics Learning to Develop Attitudes and Thinking Skills Based on Realistic Mathematics. Research by lecturers and students of the S1 Mathematics Education Study Program can be divided into several sub-themes, such as (1) Mathematics Learning Media, (2) Mathematics Learning Materials, (3) Cognitive Psychology in Mathematics Education, (4) Mathematics Learning Innovation, (5) KKNI (Indonesian National Qualifications Framework) Curriculum, and (6) Assessment. Based on these research sub-themes for lecturers and students of the S1 Mathematics Education Study Program, there are several types of research: basic research to strengthen theories in mathematics education, policy research to evaluate and produce strategic policy recommendations for institutional development, development research in the field of mathematics education, and applied research resulting from basic research.

Development research is carried out to develop innovative products in the field of mathematics education, such as learning materials, modules, textbooks, teaching materials, and learning media, among others, that support effective mathematics learning or address problems in mathematics education and learning. In addition, research related to cognitive psychology in mathematics education includes topics such as misconceptions, thought processes in mathematical problem-solving, higher-order thinking skills, and others.

D. Research Roadmap of the Mathematics Education Study Program

The Research Roadmap of the S1 Mathematics Education Study Program is divided into four diagrams corresponding to the four research focus areas, in which the research focus of each area becomes the central point that guides the direction of research within that area. All research roadmaps refer to the vision, mission, and objectives of the S1 Mathematics Education Study Program, implemented over the period 2016–2025, in accordance with the objectives of the S1 Mathematics Education Study Program in the short term (2016–2017), medium term (2018–2019), and long term (2020–2025). The first diagram is the Research Roadmap for the field of Psychology of Mathematics Education. The next diagram is the Research Roadmap for the field of Mathematics Learning Models and Materials. The following roadmap is the Research Roadmap for the field of Evaluation of Mathematics Education, followed by the Research Roadmap for the field of Realistic Mathematics and the Socio-Cultural Aspects of Mathematics Education.

Fig. 1. Research Roadmap of the S1 Mathematics Education Study Program — Field of Cognitive Psychology in Mathematics Education

2016	2017	2018–2019	2020–2025
Cognitive processes, conceptions, misconceptions, profiles and patterns of mathematical thinking and reasoning, abstraction among students	Mathematical literacy, problem posing, abstraction, problem solving among students and pre-service teachers	Analysis of cognitive processes, conceptions, and misconceptions with the integration of technology in mathematics learning	Identification of cognition and development of intervention programs for mathematics learning based on the cognitive profiles that have been studied

Fig. 2. Research Roadmap of the S1 Mathematics Education Study Program — Field of Mathematics Learning Models and Materials

2016	2017	2018–2019	2020–2025
Development of learning materials/resources/textbooks/media based on a particular learning model/approach (Realistic Mathematics)	Implementation of mathematics learning that has been developed with a particular model/strategy/learning resource/media using the Realistic Mathematics approach for a wider scope, replication, or a different topic	Development of technology-based/vi-learn models/strategies/learning resources/media for mathematics learning	Implementation of technology-based/vi-learn models/strategies/learning resources/media for mathematics learning for a wider scope, replication, or a different topic

Fig. 3. Research Roadmap of the S1 Mathematics Education Study Program — Field of Evaluation of Mathematics Education

2016	2017	2018–2019	2020–2025
Development of mathematics learning assessment to explore and support decision-making related to existing problems	Development of authentic assessment in mathematics learning to explore and support decision-making related to emerging problems (HOTS, KKNI, Mathematical Literacy)	Development and implementation of authentic assessment and other forms of technology-based assessment (HOTS, KKNI, Mathematical Literacy)	Development and implementation of authentic assessment and other forms of technology-based assessment (HOTS, KKNI, Mathematical Literacy) for a wider scope, replication, or topic

Fig. 4. Research Roadmap of the S1 Mathematics Education Study Program — Field of Realistic Mathematics and Socio-Cultural Aspects of Mathematics Education

2016	2017	2018–2019	2020–2025

Mapping of difficulties and needs of teachers and pre-service teachers in implementing learning with a realistic approach or learning based on ethnomathematics or the history of mathematics	Development of task designs and learning trajectories using a realistic approach or based on ethnomathematics or the history of mathematics	Development and implementation of learning using a realistic approach or based on ethnomathematics or the history of mathematics	Development, implementation, and digitalization of learning resources and media to support learning using the Realistic Mathematics Education (RME) approach based on ethnomathematics or the history of mathematics

CHAPTER V

CLOSING

With the publication of this research roadmap, lecturer research is to be directed in accordance with the roadmap. The Study Program extends its highest appreciation to all lecturers of the S1 Mathematics Education Study Program, FMIPA Unesa, who have contributed their thoughts to the completion of this book. As no porcelain is without a crack, we humbly apologize for any shortcomings or weaknesses in the preparation of this document, and for the sake of its refinement, we sincerely welcome input and suggestions for improvement from esteemed readers.