MINISTRY OF HIGHER EDUCATION, SCIENCE, AND TECHNOLOGY
UNIVERSITAS NEGERI SURABAYA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
UNDERGRADUATE PROGRAM OF MATHEMATICS EDUCATION
Ketintang Campus, Jalan Ketintang, C8 C9 Building, Surabaya 60231
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Module Name:	Penelitian Pengembangan Developmental Research
Module Level:	Sarjana (S-1) / Undergraduate
Abbreviation, if applicable:	8420202238
Sub-heading, if applicable:	-
Course included in the module, if applicable:	-
Semester/term:	VII/ Fourth year
Module Coordinator(s):	Prof. Dr. Tatag Yuli Eko Siswono, M. Pd.
Lecturer(s):	- Prof. Dr. Tatag Yuli Eko Siswono, M. Pd. - Prof. Rooselina Ekawati, Ph.D - Dr Siti Habibah, M. Pd. - Dr. Sri Suryanti, M. Si.
Language:	Indonesia (Indonesian Language)
Classification within the curriculum:	~~Compulsory course~~/Elective studies
Teaching format/class hours per week during the semester	2 contact hours of lectures (Indonesia credit semester or sks*)
Workload:	16 weeks per semester consisting of: • 2 hours lectures (2 × 50 minutes) per week, • 2 hours structured assignments (2 × 60 minutes) per week, • 2 hours independent study (2 × 60 minutes) per week, Total workload: 16 × 2 × 170 minutes = 5,440 minutes = 90.67 hours = 3.18 ECTS*.
Credit Point:	2 CU (3.18 ECTS)
Requirements:	N/A
Learning Goals :	**Programme Learning Outcomes (PLO) addressed:** • **PLO-2 :** Demonstrate a tough, collaborative, adaptive, innovative, inclusive, lifelong learner, and entrepreneurial character. • **PLO-3 :** Develop logical, critical, systematic, and creative thinking in carrying out specific work in their area of

	expertise and in accordance with the work competency standards of the relevant field • **PLO-7 :** Communicate ideas and research results effectively, orally, and in writing • **PLO-8 :** Make decisions based on data/information in completing tasks that are the student's responsibility and evaluating the work that has been done • **PLO-11 :** Demonstrate knowledge related to mathematics education research. **Course Learning Outcomes (CLO): after completing this module, students are able to:** • CLO-1: Explain the principles, purposes, characteristics, ethics, and major models of developmental research in mathematics education (PLO-3, PLO-11). • CLO-2: Identify instructional problems and analyse learner needs, curriculum requirements, and relevant research to justify a mathematics education product (PLO-3, PLO-8, PLO-11). • CLO-3: Design a systematic developmental research proposal, including product specifications, development procedures, instruments, and data analysis plans (PLO-2, PLO-3, PLO-11). • CLO-4: Evaluate product validity, practicality, and effectiveness using appropriate evidence and make justified decisions for product revision (PLO-3, PLO-8, PLO-11). • CLO-5: Communicate and defend a developmental research proposal clearly and ethically, both orally and in writing, while collaborating constructively (PLO-2, PLO-7).
Content:	The module introduces developmental research in mathematics education through the following topics: 1. Foundations, characteristics, scope, and research ethics of developmental research. 2. Identification of educational problems, needs analysis, and review of relevant literature. 3. Development models: ADDIE, 4-D, and Borg & Gall; selection and justification of an appropriate model.

<table>
<tr><td></td><td>4. Design of mathematics learning products, including teaching materials, media, learning activities, and assessment instruments.
5. Research design: participants, development stages, data collection, and instrument construction.
6. Expert validation, pilot testing, product revision, and documentation of the development process.
7. Analysis of validity, practicality, and effectiveness using appropriate quantitative and qualitative evidence.
8. Preparation, presentation, peer review, and refinement of a developmental research proposal.</td></tr>
<tr><td>Study/exam achievements</td><td>• Assessment components (proposed; subject to programme approval):
a. Needs analysis and literature review: 15%.
b. Product concept and development design: 20%.
c. Research instruments and analysis plan: 20%.
d. Proposal presentation and peer feedback: 15%.
e. Final developmental research proposal: 30%.
• Final index is defined as follow:
<table>
<tr><td>Index</td><td>Converted Score</td><td>Score Range</td></tr>
<tr><td>A</td><td>4.00</td><td>$85 \leq A \leq 100$</td></tr>
<tr><td>A-</td><td>3.75</td><td>$80 \leq A- < 85$</td></tr>
<tr><td>B+</td><td>3.50</td><td>$75 \leq B+ < 80$</td></tr>
<tr><td>B</td><td>3.00</td><td>$70 \leq B < 75$</td></tr>
<tr><td>B-</td><td>2.75</td><td>$65 \leq B- < 70$</td></tr>
<tr><td>C+</td><td>2.50</td><td>$60 \leq C+ < 65$</td></tr>
<tr><td>C</td><td>2.00</td><td>$55 \leq C < 60$</td></tr>
<tr><td>D</td><td>1.00</td><td>$40 \leq D < 55$</td></tr>
<tr><td>E</td><td>0.00</td><td>$0 \leq E < 40$</td></tr>
</table></td></tr>
<tr><td>Forms of Media</td><td>LCD, PowerPoint slides, worksheets</td></tr>
<tr><td>Literature</td><td>1. Branch, R. M. (2009). Instructional Design: The ADDIE Approach. Springer. https://doi.org/10.1007/978-0-387-09506-6
2. Plomp, T., & Nieveen, N. (Eds.). (2013). Educational Design Research: An Introduction. SLO, Netherlands Institute for Curriculum Development.
3. van den Akker, J., Gravemeijer, K., McKenney, S., & Nieveen, N. (Eds.). (2006). Educational Design Research. Routledge.</td></tr>
</table>

	4. McKenney, S., & Reeves, T. C. (2019). Conducting Educational Design Research (2nd ed.). Routledge. 5. Thiagarajan, S., Semmel, D. S., & Semmel, M. I. (1974). Instructional Development for Training Teachers of Exceptional Children: A Sourcebook. Indiana University.
Note	Based on Regulation of the Minister of Higher Education, Science, and Technology of the Republic of Indonesia Number 39 of 2025 on Quality Assurance in Higher Education, one credit unit (CU) represents approximately 45 hours of learning per semester. UNESA's curriculum uses 170 minutes per CU per week over 16 weeks, including midterm and final assessments. For Qualitative Research (2 CU), the total workload is 2 × 170 × 16 = 5,440 minutes, or 90.67 hours per semester. Using UNESA's institutional conversion of 1 CU = 1.59 ECTS, the course is equivalent to 3.18 ECTS.