Module designation	**Developmental Research** **Indonesian title:** *Penelitian Pengembangan* **Course code:** 8420202238
Semester(s) in which the module is taught	Semester 7 (Fourth year)
Person responsible for the module	**Coordinator:** Prof. Dr. Tatag Yuli Eko Siswono, M. Pd. **Teaching staff:** Prof. Dr. Tatag Yuli Eko Siswono, M. Pd.; Prof. Rooselina Ekawati, Ph.D; Dr Siti Habibah, M. Pd.; Dr. Sri Suryanti, M. Si.
Language	Indonesian
Relation to curriculum	Elective
Teaching methods	Lectures **Media and tools:** LCD, PowerPoint slides, worksheets
Workload (incl. contact hours, self-study hours)	**(Estimated) total workload:** 2 CU × 170 minutes × 16 weeks = 5,440 minutes = 90.67 hours (≈ 3.18 ECTS) **Contact hours:** lectures, 2 × 50 minutes per week × 16 weeks = 26.67 hours (class hours per week: 340 minutes = 5.67 hours, including structured activities) **Private study including examination preparation:** structured assignments, 2 × 60 minutes per week × 16 weeks = 32.00 hours; independent study, 2 × 60 minutes per week × 16 weeks = 32.00 hours (total 64.00 hours)
Credit points	2 CU (3.18 ECTS) *1 CU = 170 minutes per week × 16 weeks = 45.3 hours; 1 ECTS = 28.48 hours (144 CU = 229 ECTS), so 1 CU = 1.59 ECTS (UNESA Rector's Decree No. 736/HK/KM/2023).*
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	**Programme learning outcomes (PLO) addressed:** • PLO-8: Design, implement and evaluate mathematics learning using IT. • PLO-9: Demonstrate knowledge related to mathematics education research. • PLO-10: Make decisions based on data/information in completing tasks that are the student's responsibility and evaluating the work that has been done.
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. 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.

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<tr><td></td><td>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>Examination forms</td><td>Assessment as described under study and examination requirements.</td></tr>
<tr><td>Study and examination requirements</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 (grade conversion):
<table>
<tr><th>Index</th><th>Converted score</th><th>Score range (A = final score)</th></tr>
<tr><td>A</td><td>4.00</td><td>85 ≤ A ≤ 100</td></tr>
<tr><td>A-</td><td>3.75</td><td>80 ≤ A < 85</td></tr>
<tr><td>B+</td><td>3.50</td><td>75 ≤ A < 80</td></tr>
<tr><td>B</td><td>3.00</td><td>70 ≤ A < 75</td></tr>
<tr><td>B-</td><td>2.75</td><td>65 ≤ A < 70</td></tr>
<tr><td>C+</td><td>2.50</td><td>60 ≤ A < 65</td></tr>
<tr><td>C</td><td>2.00</td><td>55 ≤ A < 60</td></tr>
<tr><td>D</td><td>1.00</td><td>40 ≤ A < 55</td></tr>
<tr><td>E</td><td>0.00</td><td>0 ≤ A < 40</td></tr>
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<tr><td>Reading list</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.
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.</td></tr>
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