

Module Descriptions

A **module** is a self-contained **learning unit** within a higher education program that includes thematically related courses and is assigned a **fixed number of credits**. It follows specific **learning objectives**, includes an **assessment component**, and contributes to achieving the qualifications of a degree program. In some countries, “modules” are also named “courses”.

Please provide a module description for each module. In addition to the compulsory and elective modules, this also includes credited internships and the final thesis.

Please summarize all module descriptions in one document (Module Handbook) and create a table of contents so that the modules can be found easily.

Module designation	<i>Realistic Mathematics Education</i>
Semester(s) in which the module is taught	2
Person responsible for the module	<i>Prof. Dr. Drs. Sugiman M.Si.</i>
Language	<i>Indonesian.</i>
Relation to curriculum	<i>Elective.</i>
Teaching methods	<i>Lectures and projects.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload is 90.67 hours per semester which consists of 100 minutes lectures, 120 minutes structured activities, and 120 minutes self-study per week for 16 weeks.</i>
Credit points	2
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<i>After taking this course the students have ability to:</i> <i>CO1. Explain the historical development, theories, principles, and characteristics of Realistic Mathematics Education (RME).</i> <i>CO2. Explain the principles of meaningful contexts and the process of mathematization.</i> <i>CO3. Analyze students' modeling processes and the principle of interconnectedness.</i> <i>CO4. Design learning trajectories based on Realistic Mathematics Education (RME).</i> <i>CO5. Implement Realistic Mathematics Education (RME) in secondary schools.</i>

Content	<i>This course is conducted in an interactive, holistic, integrative, scientific, contextual, thematic, and effective manner. These characteristics are reflected through various student assignments and learning activities. The Realistic Mathematics Education (RME) course explores the historical development, theoretical foundations, principles, and key characteristics of RME. It also delves into the principles of meaningful contexts, the process of mathematization, students' modeling processes, the principle of interconnectedness, the design of learning trajectories based on RME, and its implementation in school settings.</i>
Examination forms	<i>Assignments, presentations and written examinations.</i>
Study and examination requirements	<i>The course assessment is divided into two main components:</i> 1. Cognitive Assessment (50%) <i>This includes the following elements:</i> ○ Attendance: 5% ○ Quiz: 0% ○ Assignment: 20% ○ Midterm Exam (UTS): 0% ○ Final Exam (UAS): 25% 2. Participatory Assessment (50%) <i>This includes:</i> ○ Case Study: 20% ○ Team-Based Project: 30% Total: 100%

Reading list	1. Armanto, D. (2002). <i>Teaching Multiplication and Division Realistically in Indonesian Primary Schools: A Prototype of Local Instructional Theory</i>. Dissertation of University of Twente. Enschede: PrintPartners Ipskamp. 2. Bakker, A. (2000). <i>Historical and Didactical Phenomenology of the Average Values</i>. CD-ROM in Brochure for the 9th International Congress on Mathematical Education (ICME9) in Japan, July 2000 3. Bakker, A. (2004). <i>Design Research in Statistics Education: On Symbolizing and Computer Tools</i>. Dissertation of Utrecht University. Utrecht: CD- Press. 4. Bell, F.H. (1978). <i>Teaching and Learning Mathematics (in Secondary Schools</i>. Second Printing. Dubuque, Iowa: Wm. C. Brown. Company. 5. Feijs, E. (2000). <i>Constructing a Environment that Promotes Reinvention</i>. In Brochure of Freudenthal Institute for the 9th International Congress on Mathematics Education (ICME9) in Japan, July 2000. 6. Gravemeijer, K. (1994). <i>Developing Realistic Mathematics Education</i>. Freudenthal Institute. Utrecht: CDB Press. 7. Gravemeijer, K. (2000). <i>Developmental Research: Fostering a Dialectic Relation between Theory and Practice</i>. In Brochure of Freudenthal Institute for the 9th International Congress on Mathematics Education (ICME9) in Japan, July 2000. 8. Hadi, S. (2002). <i>Effective Teacher Professional Development for Implementation of Realistic Mathematics Education in Indonesia</i>. Dissertation of University of Twente. Enschede: PrintPartners Ipskamp. 9. Lange, J. de. (2000). <i>Freudenthal Institute</i>. In Brochure of Freudenthal Institute for the 9th International Congress on Mathematics Education (ICME9) in Japan, July 2000. 10. Lange, J. de. (2006). <i>Mathematical Literacy for Living from OECD-PISA Perspective</i>. Proceeding Seminar. Tersedia di www.cried.tsukuba.ac.jp/math/apec2006/pdf/ 11. Sembiring, R.K. (2001). <i>Mengapa Memilih RME/PMRI?</i> Makalah Seminar Nasional Pendidikan Matematika Realistik Indonesia di Universitas Sanata Dharma tanggal 14-15 November 2001. 12. Streefland, L. (1990). "Realistic Mathematics Education (RME). What Does It Mean?" In <i>Contexts Free Productions Tests and Geometry in Realistic Mathemtics Education</i>. Editor Gravemeijer, K. et al. Utrecht: OW & OC. 13. Widjaja, Y.B. and Heck, A. (2003). "How a Realistic Mathematics Education Approach and Microcomputer-Based Laboratory Worked in Lessons on Graphing at an Indonesian Junior High School." <i>Journal of Science and Mathematics Education in Southeast Asia</i>, 2003, Vol. 26, No 2, pp. 1-51. [Online] Tersedia di: http://staff.science.uva.nl/~heck/Research/art/JSMESA.pdf. [9 Juni 2008] 14. Simon, M. A. (2006). <i>Key developmental understandings in mathematics: A direction for investigating and establishing learning goals</i>. <i>Mathematical Thinking and Learning</i>, 8(4), 359–371. 15. Simon, M., & Tzur, R. (2004) <i>Explicating the role of mathematical tasks in conceptual learning: An elaboration of the hypothetical learning trajectory</i>. <i>Mathematical Thinking and Learning</i>, 6(2), 91–104.
--------------	--

	16. Sugiman. 2010. <i>Dampak Pembelajaran Matematika Realistik Terhadap Peningkatan Kemampuan Pemecahan Masalah Dan Keyakinan Matematik Siswa Sekolah Menengah Pertama Di Kota Yogyakarta</i>. Disertasi UPI 17. Sugiman. 2022. <i>Jembatan Model sebagai Solusi Matematisasi dalam Kearifan Sang Profesor: Manusia, Sains, dan Alam Merdeka</i>. Editor: Sony Nopembri. Yogyakarta: UNY Press. 18. <i>Journal on Mathematics Education</i>. Link http://jme.ejournal.unsri.ac.id/index.php/jme 19. <i>Mathematical Investigations for Primary Schools</i>. A product of the IMPoMe project. Link https://www.fisme.science.uu.nl/en/impome/ 20. Amin, S., Julie, H., Munk, F. and Hoogland, K. (2010). The development of learning materials for PMRI. In R. Sembiring, K. Hoogland and M. Dolk (Eds.), <i>A decade of PMRI in Indonesia</i>. Bandung, Utrecht: APS International. 21. Freudenthal, H. (1973). <i>Mathematics as an educational task</i>. Dordrecht: Reidel Publishing Company. 22. Freudenthal, H. (1983). <i>Didactical phenomenology of mathematical structures</i>. Dordrecht: Reidel Publishing Company. 23. Freudenthal, H. (1991). <i>Revisiting mathematics education: China Lectures</i>. Dordrecht: Kluwer Academic Publishers. 24. Gravemeijer, K. (1994). <i>Developing Realistic Mathematics Education</i>. Utrecht: CD-β Press/Freudenthal Institute 25. Gravemeijer, K. and Terwel, J. (2000). Hans Freudenthal a mathematician on didactics and curriculum theory. <i>Journal of Curriculum Studies</i>, 32(6), 777-796. 26. Gravemeijer, K. and Cobb, P. (2006). Design research from the learning design perspective. In van den Akker, K. Gravemeijer, S. McKenney, and N. Nieveen (Eds.), <i>Educational design research: The design, development and evaluation of programs, processes and products</i>. London: Routledge. 27. Sembiring, R., Hadi, S. and Dolk, M. (2008). Reforming mathematics learning in Indonesia classroom through RME. <i>ZDM – The International Journal on Mathematics Education</i>, 40(6), 927-939 28. Simon, M. (1995). Reconstructing mathematics pedagogy from a constructivist perspective. <i>Journal for Research in Mathematics Education</i>, 26, 114– 145. 29. Treffers, A. (1991). <i>Realistic Mathematics Education in the Netherlands 1980- 1990</i>. In L. Streefland (ed.), <i>Realistic Mathematics Education in Primary School</i>. Utrecht: CD-β Press / Freudenthal Institute, Utrecht University. 30. Treffers, A. (1993). <i>Wiskobas and Freudenthal: Realistic Mathematics Education</i>. In L. Streefland (ed.), <i>The legacy of Hans Freudenthal</i>. Dordrecht: Kluwer Academic Publisher
--	---