



**Universitas Negeri Surabaya**  
**Faculty of Mathematics and Natural Sciences**  
**Doctoral Study Program in Mathematics Education**

Document Code

**SEMESTER LEARNING PLAN**

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Realistic Mathematics and Ethnomathematics (Realistic Mathematics and Ethnomathematics)	8400202047		T=2	P=0	ECTS=5.04	2	July 18, 2024
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>			<b>Study Program Coordinator</b>	
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**Learning model** Project Based Learning

**Program Learning Outcomes (PLO)** PLO study program that is charged to the course

**Program Objectives (PO)**

<b>PO - 1</b>	Analyzing realistic mathematics and ethnomathematics concepts to solve critical Mathematics Education problems; (S2, P1)
<b>PO - 2</b>	Applying realistic mathematics and ethnomathematics concepts integrated with technology in designing mathematics learning through problem solving
<b>PO - 3</b>	Describe the cultural values of certain regions and their academic ethics based on ethnomathematics and realistic mathematics

**PLO-PO Matrix**

	P.O																			
	PO-1																			
	PO-2																			
	PO-3																			

**PO Matrix at the end of each learning stage (Sub-PO)**

	P.O	Week																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
	PO-1																			
	PO-2																			
	PO-3																			

**Short Course Description** Study of realistic mathematics and ethnomathematics concepts which include cultural concepts and the context of Mathematics education in Indonesia, realistic mathematics concepts, characteristics and principles of realistic mathematics, application of realistic mathematics concepts, ethnomathematics concepts, integration of culture and mathematics, use of culture or traditions in Indonesia that have ethnomathematics value, and design research on realistic and multicultural mathematics. Lectures begin with an explanation of concepts and principles, assignments and discussions with students, as well as presentations using ICT with an assessment system including assignments (30%), participation (20%), mid-semester assessment (20%) and final semester assessment (30%).

**References** **Main :**

1. Ascher, Marcia. 1991. Ethnomathematics: A Multicultural View of Mathematics Ideas . Pasific Grove: Brooks/Cole Publishing Company
2. Fauzan, A.. 2002. Applying Realistic Mathematics Education (RME) in teaching geometry in Indonesian primary schools (p. 346). University Of Twente [Host].
3. Franscois, Karen and Van Kerkhove, Bart. 2011. Ethnomathematics and The Philosophy of Mathematics (Education) . In Benedikt Lowe, Thomas Muller (eds). PhiMSAMP. Philosophy of Mathematics: Sociological Aspects and Mathematical Practice . College Publications, London. 2010. Teks in Philosophy 11; pp.121-154.
4. Gravemeijer, K., & Doorman, M.. 1999. Context problems in realistic mathematics education: A calculus course as an example. Educational studies in mathematics , 39 (1-3), 111-129.
5. Mesquita, Monica, Restivo, Sal. & D'Ambrosio, Ubiratan. 2011. Asphalt Children and City Streets: A Life, A City, and A Case Study of History, Culture, and Ethnomathematics in Sao Paulo . ROTTERDAM: SENSE PUBLISHER.
6. Powell, Arthur B. & Frankenstein, Marilyn (Eds).. 1997. Ethnomathematics: Challenging Eurocentrism in Mathematics Education . New York: State University of New York Press.
7. Van den Heuvel-Panhuizen, M. H. A. M.. 1996. Assessment and realistic mathematics education (Vol. 19). Utrecht University.
8. Van Den Heuvel-Panhuizen, M.. 2003. The didactical use of models in realistic mathematics education: An example from a longitudinal trajectory on percentage. Educational studies in Mathematics , 54 (1), 9-35.
9. Van den Heuvel-Panhuizen, M., & Drijvers, P.. 2014. Realistic mathematics education. Encyclopedia of mathematics education , 521-525.
10. Van den Heuvel-Panhuizen, M.. 1998. Realistic Mathematics Education as work in progress. Theory into practice in Mathematics Education. Kristiansand, Norway: Faculty of Mathematics and Sciences .
11. Wubbels, T., Korthagen, F., & Broekman, H.. 1997. Preparing teachers for realistic mathematics education. Educational Studies in Mathematics , 32 (1), 1-28.
12. Zaranis, N., Kalogiannakis, M., & Papadakis, S.. 2013. Using mobile devices for teaching realistic mathematics in kindergarten education. Creative Education , 4 (7), 1-10.

**Supporters:**

**Supporting lecturer** Prof. Dr. Mega Teguh Budiarto, M. Pd.  
 Dr. Rini Setianingsih, M.Kes.  
 Prof. Rooselyna Ekawati, Ph.D.

Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [ Estimated time ]				Learning materials [ References ]	Assessment Weight (%)
		Indicator	Criteria & Form	Offline ( offline )		Online ( online )			
(1)	(2)	(3)	(4)	(5)		(6)		(7)	(8)

1	Sub-CPMK-1.1 Able to explain the concept of Realistic Mathematics, principles and characteristics of Realistic Mathematics	Able to describe the concept of Realistic Mathematics, principles and characteristics of Realistic Mathematics	<b>Form of Assessment :</b> Participatory Activities	Classroom Activities: Collaborative Reciprocity; class discussion Internet-based browsing and searching, dynamic independence in lectures. Interactive discussion (brain storming) theme: Ø <a href="https://www.youtube.com/watch?v=Pv2-dz9dANw&amp;ab_channel=RooselynaEkawatiylna">https://www.youtube.com/watch?v=Pv2-dz9dANw&amp;ab_channel=RooselynaEkawatiylna</a> Check also: Ellis, MW & Berry, RQ: The Mathematics Educator 2005, Vol. 15, no. 1, 7–17 Ø <a href="https://www.youtube.com/watch?v=bMH8zO86fKl&amp;ab_channel=RooselynaEkawatiylna">https://www.youtube.com/watch?v=bMH8zO86fKl&amp;ab_channel=RooselynaEkawatiylna</a> Division and agreement on presentation schedule. Project-based: Meeting lecture topics Presentations and discussions using LMS Vinesa Asynchronous or Synchronous 2 X 50		0%
2	Sub-CPMK2 Able to explain realistic mathematical and ethnomathematics concepts	Able to explain realistic mathematical and ethnomathematics concepts	<b>Form of Assessment :</b> Participatory Activities	Classroom Activities: Collaborative Reciprocity; class discussion Project-based billing from the 1st meeting. Interactive discussion (brain storming) theme: Project-based: Meeting lecture topic k Presentation and discussion using LMS Vinesa Asynchronous or Synchronous 2 X 50		5%
3	Sub-CPMK-3 Able to explain the results of research on learning development using a Realistic Mathematics approach	Able to explain research results related to learning with a realistic mathematical approach at each level of education	<b>Form of Assessment :</b> Participatory Activities	Classroom Activities: Collaborative Reciprocity; class discussion Project-based bills from the 2nd meeting. Interactive discussion and presentation 1 (brain storming) theme: □ Fauzan, A., Slettenhaar, D. & Plomp, T. (2002). Traditional mathematics education Vs realistic mathematics education: Hoping for changes. In P. Valero & O. Skovsmose. Proceedings of the 3rd International Mathematics Education and Society Conference (pp. 1-4). Copenhagen Denmark, Center for Research in Learning Mathematics. □ Stephan, M. (1998). Supporting the Development of One First-grade Classroom's Conceptions of Measurement: Analyzing Students' Learning in Social Context. Unpublished Doctoral Dissertation. Vanderbilt University, Nashville, TN. Project-based: Lecture topic of the 4th meeting. Presentations and discussions use LMS Vinesa Asynchronous or Synchronous 2 X 50		5%
4	Sub-CPMK-3 Able to describe research on mathematical communication, student interaction in learning with a realistic mathematical approach	Able to explain research results on mathematical communication, student interaction in learning with a realistic mathematical approach	<b>Form of Assessment :</b> Participatory Activities	Classroom Activities: Collaborative Reciprocity; class discussion Project-based bills from the 3rd meeting. Presentation-02 & Interactive discussion. 2 X 50		0%
5	Sub-CPMK-3 Able to describe research designs related to learning with realistic mathematics.	Able to describe research designs related to learning with realistic mathematics.	<b>Form of Assessment :</b> Participatory Activities	Classroom Activities: Collaborative Reciprocity; class discussion Presentation-03 & Interactive discussion. Presentation material revision bill-01. Revision of presentation materials-02. Project-based: Lecture topic of the 6th meeting. 2 X 50		0%
6	Sub-CPMK-1 Able to describe the context for mathematics learning and cultural integration.	Able to analyze types of context and cultural integration in mathematics learning	<b>Form of Assessment :</b> Participatory Activities	Classroom Activities: Collaborative Reciprocity; class discussion Presentation-04 & Interactive discussion. Presentation material revision bill-02. Revision of presentation materials-03. Project-based: Lecture topic of the 7th meeting. Presentations and discussions using Vinesa 2 X 50 LMS		0%
7	Sub-CPMK-1 Able to synthesize and describe ethnomathematics concepts	Able to explain the concept of ethnomathematics	<b>Form of Assessment :</b> Portfolio Assessment	Classroom Activities: Collaborative Reciprocity; class discussion Presentation-04 & Interactive discussion. Presentation material revision bill-02. Revision of presentation materials-03. Project-based: Lecture topic of the 7th meeting. Presentations and discussions using Vinesa 2 X 50 LMS		10%
8	Midterm exam		<b>Form of Assessment :</b> Test	2 X 50		30%
9	Sub-CPMK-3 Able to synthesize the use of culture or traditions in Indonesia which has ethnomathematics value	Able to explain cultural benefits that have ethnomathematics value	<b>Form of Assessment :</b> Participatory Activities	Classroom Activities: Collaborative Reciprocity; class discussion Presentation-06 & Interactive discussion. Presentation material revision bill-04. Revision of presentation materials-05. Project-based: Lecture topic of the 10th meeting. Presentations and discussions using Vinesa 2 X 50 LMS		0%
10	Sub-CPMK-3. Able to describe research related to learning development with the integration of Ethnomathematics and Ethnomodelling	Able to synthesize learning development research with the integration of Ethnomathematics and Ethnomodelling	<b>Form of Assessment :</b> Participatory Activities	Classroom Activities: Collaborative Reciprocity; class discussion Presentation-06 & Interactive discussion. Presentation material revision bill-04. Revision of presentation materials-05. Project-based: Lecture topic of the 10th meeting. Presentations and discussions using Vinesa 2 X 50 LMS		5%
11	Sub-CPMK-3 Able to describe research related to the psychology of mathematics education and ethnomathematics.	Able to describe research related to the psychology of mathematics education and ethnomathematics.	<b>Form of Assessment :</b> Portfolio Assessment	Classroom Activities: Collaborative Reciprocity; class discussion Presentation-06 & Interactive discussion. Presentation material revision bill-04. Revision of presentation materials-05. Project-based: Lecture topic of the 10th meeting. Presentations and discussions using Vinesa 2 X 50 LMS		10%
12	Sub-CPMK-3.4 Able to report small research related to realistic mathematics learning and/or ethnomathematics	Able to convey the results of small research related to realistic mathematics learning and/or ethnomathematics	<b>Form of Assessment :</b> Participatory Activities	Classroom Activities: Collaborative Reciprocity; class discussion Project-based bill from the 11th meeting. Asynchronous or Synchronous Independent tasks 2 X 50		0%

13	Sub-CPMK-3.4 Able to report small research related to realistic mathematics learning and/or ethnomathematics	Able to convey the results of small research related to realistic mathematics learning and/or ethnomathematics	<b>Form of Assessment :</b> Participatory Activities	Classroom Activities: Collaborative Reciprocity; class discussion Project-based bill from the 11th meeting. Asynchronous or Synchronous Independent tasks 2 X 50			0%
14	Sub-CPMK-3.4 Able to report small research related to realistic mathematics learning and/or ethnomathematics	Able to convey the results of small research related to realistic mathematics learning and/or ethnomathematics	<b>Form of Assessment :</b> Participatory Activities	Classroom Activities: Collaborative Reciprocity; class discussion Project-based bill from the 11th meeting. Asynchronous or Synchronous Independent tasks 2 X 50			5%
15	Sub-CPMK-3.4 Able to report small research related to realistic mathematics learning and/or ethnomathematics	Able to convey the results of small research related to realistic mathematics learning and/or ethnomathematics	<b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Classroom Activities: Collaborative Reciprocity; class discussion Project-based bill from the 11th meeting. Asynchronous or Synchronous Independent tasks 2 X 50			30%
16							0%

#### Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	20%
2.	Project Results Assessment / Product Assessment	30%
3.	Portfolio Assessment	20%
4.	Test	30%
		100%

#### Notes

- Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
- The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
- Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
- Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
- Indicators for assessing** ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.
- Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
- Forms of assessment:** test and non-test.
- Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
- Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
- Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
- TM=Face to face, PT=Structured assignments, BM=Independent study.