UNIVERSITAS NEGERI PADANG
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
MATHEMATICS DEPARTMENT, MATHEMATICS EDUCATION STUDY PROGRAM
Main Campus Universitas Negeri Padang.
Jalan Prof. Dr. Hamka Air Tawar Padang, Sumatera Barat
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Module name:	Mathematical Modeling
Module level, if applicable:	Bachelor
Code:	MAT2.61.8201
Sub-heading, if applicable:	-
Classes, if applicable:	Mathematical Modeling
Semester:	8th (Eigth)
Module coordinator:	Dra. Media Rosha, M.Si.
Lecturer(s):	Dra. Media Rosha, M.Si., and Team
Language:	Bahasa Indonesia
Classification within the curriculum:	Study Program Elective Course
Teaching format / class hours per week during the semester:	Teaching format: • Lectures (face to face activities): project-based learning, problem-based learning, independent task, presentation and discussions • Structured assignment such as individual task and group task • Independent activities • Practice. 3 x 170 minutes = 510 minutes = 8.50 hours
Workload:	16 weeks per semester include Midterm Exam and Final Exam which consist of: • 1.67 hours lectures (2 x 50 minutes) per week, • 2 hours tutorial assignments (2 x 60 minutes) per week, • 2 hours individual study (2 x 60 minutes) per week • 2.83 hours practice (1 x 170) per week. 16 x 170 x 3 = 8160 Minutes =136 hours = 4.53 ECTS
Credit points:	3 SKS (4.53 ECTS)
Prerequisite's course(s):	Ordinary Differential Equations, Mathematical Statistics 1, Discrete Mathematics, and Introduction to Operations Research
Course outcomes:	After taking this course the students have ability to: CO1: Explain the concept of mathematical modeling and the procedure to design mathematical modeling. CO2: Apply the concept of mathematical modeling and its procedure to design and solve the problems in others field, such as physics, biology, epidemiology, engineering, etc. CO3: Analyze the problems that connect to mathematical modeling and its procedure in others field, such as physics, biology, epidemiology, engineering, etc.

	CO4: Show responsibility attitude towards works by self and by team works.
Content:	This course discusses: 1. modelling change 2. modelling process, proportionality, and geometric similarity 3. model fitting 4. experimental modelling 5. modelling with a differential equation 6. modeling with a systems of differential equations
Study/exam achievements:	Total score= (40% x Final Exam Score) + (40% x Individual Reports) + (20% x Affective Assessment at Class Activities: Participation, Attitude, and Presence) The initial cut - off points for grades A, A-, B+, B, B-, C+, C, C-, and D should not be less than 85, 80, 75, 70, 65, 60, 55, 50, and 40 out of 100 respectively. **Explanation:** **1. Final Exam** ✓ Final exam is held at the 18th meeting ✓ Final exam is a written exam and carried out in the classroom with an implementation time of 120 minutes which follows the Final exam implementation schedule of the department **2. Individual Report** ✓ Individual report is given as exercise before Final exam ✓ Individual report is about analyzing problem in daily life and solve it with the concept of the content in Mathematical Modelling. ✓ Assignments are given as individual task and it is submitted in limited time. **3. Affective Assessment** ✓ Affective assessment is held in every meeting by observing students' attitude in classroom and daily interaction at campus such as punctuality, responsibility etc. ✓ The assessment based on observation sheet and it was given score by affective rubric assessment.
Forms of media:	Board, LCD Projector, Laptop/Computer
Literature:	1. Mass, J., et.al. (2018). Mathematical Modelling for Teachers: A Practical Guide to Applicable Mathematics Education. Cham: Switzerland *2.* Fox, W. P., et. al. (2014). A First Course in Mathematical Modelling, 5th edition. Boston. Cengage Learning *3.* Teacher College Columbia University. (2012). Mathematical Modeling Handbook. Bedford: COMAP 3. *4.* Brauer, F., and Castillo-Chavez, C., (2010), *Mathematical Modeling,* 3rd Edition, Brooks/Cole, USA *5.* Widowati, Sutimin, (2007), *Buku Ajar Pemodelan Matematika*, FMIPA. *6.* De Vries, G., Hillen, T., Lewis, M., Muller, J., and Schonfisch, B., (2006), A Course in mathematical Biology: Quantitative Modeling with Mathematical and Computational Methods, SIAM, Philadelphia *7.* Giordano Maurice, (2003), *A First Course in Mathematical Modelling*, Brooks/Cole , USA

PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO 9	PLO1 0	PLO1 1
CO1	✓										
CO2	✓										
CO3	✓										
CO4										✓	