UNIVERSITAS NEGERI PADANG
FACULTY OF MATHEMATICS AND NATURAL SCIENCES MATHEMATICS DEPARTMENT, MATHEMATICS STUDY PROGRAM
Main Campus Universitas Negeri Padang.
Jalan Prof. Dr. Hamka Air Tawar Padang, Sumatera Barat
Telepon: +62 751 7053902, Fax: +62 751 7055628
Email: humas@unp.ac.id

Bachelor of Science in Mathematics **MODULE HANDBOOK**

Module name:	Mathematical Biology
Module level,if applicable:	Bachelor
Code:	MAT2.62.7011
Subheading,if applicable:	-
Classes,if applicable:	Mathematical Biology
Semester:	7th (seventh)
Module coordinator:	Head of Applied Mathematics Expertise Group
Lecturer(s):	Rara Sandhy Winanda, S.Pd., M.Sc.
Language:	Indonesian Language and English
Classification within the curriculum:	Elective course in the fourth year (7th semester) Bachelor Degree
Teaching format / class hours per week during the semester:	a. Lectures: Project Based Learning with methods such as expository, discussion, and presentation. (3 x 50 minutes = 150 minutes). b. Structured assignment: Weekly group written assignment. (3 x 60 minutes = 180 minutes). c. Individual study (3 x 60 minutes = 180 minutes)
Workload:	The total workload is 136 hours per semester, which consists of 150 minutes lectures, 180 minutes structured activities, and 180 minutes of self-study. In total, there are 16 weeks per semester, including midterm and final exams.
Creditpoints:	3 sks = 4.53 ECTS
Prerequisites course(s):	Ordinary Differential Equation and Partial Differential Equation

Course outcomes:	After taking this course, the students have the ability to: CO1. Apply and extend classical models in mathematical biology. CO2. Understand theoretical mathematics in the fields of mathematical biology and statistics in a systematic and coherent manner. CO3. Use sophisticated mathematical techniques in the analysis of mathematical models in biology. CO4. Construct mathematical models for biological systems. CO5. Apply critical thinking to address problems in biological systems. CO6. Effectively communicate across disciplinary boundaries.
Content	1. Interactions and population growth 2. Kinetics of Enzymes 3. Nonlinear systems theory 4. Epidemiology 5. Other biological math problems (HIV-AIDS, TB, cancer, malaria)
Study/ exam achievement	The final grade will be weighted as follows: The assessment consists of a final project (50%), a midterm exam (30%), and an assignment (20%). The final project entails group discussion of the topic, reviewing the paper, analyzing it, giving an oral presentation, and writing the final report. A midterm test is taken to examine whether students understand the theory covered in the half-semester course. The group gives a weekly assignment to debate open questions in Mathematical Biology.
Forms of media:	White Board, laptop, Projector, e-learning via elearning2.unp.ac.id, and zoom meeting.

Literature:	1. Fred Brauer, and Carlos Castillo-Chavez, 2012, Mathematical Models in Population Biology and Epidemiology, 2nd Ed, Springer Verlag, New York. 2. B. Barnes, and G.R. Fulford, 2008, Mathematical Modelling with Case Studies, 2nd Ed, Taylor & Francis, London. 3. Ronald W. Shonkwiler, James Herod (auth.)-Mathematical Biology_ An Introduction with Maple and Matlab-Springer-Verlag New York (2009) 4. Murray J.D.-Mathematical biology 1. An introduction-Springer (2002)

PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1			✓							
CO2			✓							
CO3									✓	
CO4			✓							
CO5		✓								
CO6								✓		