



# UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 552243 Fax: +62 274 555131 Email: [math@ugm.ac.id](mailto:math@ugm.ac.id) Website: [math.fmipa.ugm.ac.id](http://math.fmipa.ugm.ac.id)

## Undergraduate Programme in Mathematics

Telp : +62 274 552243

Email : [maths1@ugm.ac.id](mailto:maths1@ugm.ac.id); [kaprodi-s1-matematika.mipa@ugm.ac.id](mailto:kaprodi-s1-matematika.mipa@ugm.ac.id)

[sekprodi-s1-matematika.mipa@ugm.ac.id](mailto:sekprodi-s1-matematika.mipa@ugm.ac.id)

Website : <http://s1math.fmipa.ugm.ac.id/>

## MODULE HANDBOOK

Module name	Mathematical Biology															
Module level, if applicable	Bachelor															
Code, if applicable	MMM-2303															
Subtitle, if applicable																
Courses, if applicable	Mathematical Biology															
Semester(s) in which the module is taught	Fourth Semester (Second Year)															
Person responsible for the module	Chair of the Lab. of Applied Mathematics															
Lecturer(s)	Dr. Fajar Adi Kusumo and Dr. Lina Aryati															
Language	Bahasa Indonesia															
Relation to curriculum	Elective Course															
Type of teaching, contact hours	150 minutes lectures and 180 minutes structured activities per week.															
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 180 minutes structured activities per week, 180 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.															
Credit points	3															
Requirements according to the examination regulations	Students have taken Mathematical Biology course (MMM-2303) and have an examination card where the course is stated on.															
Recommended prerequisites	Students have taken Elementary Differential Equations course (MMM-2301), Introduction to Probability Model course (MMM-2410), and have participated in the final examination of the course. Before taking this course, students must have a good understanding about some concepts on Probability, Differential Equations, and Stability.															
Module objectives/intended learning outcomes	Upon successful completion, students CO 1: are able to solve simple problems on Genetic. CO 2: are able to solve simple problems Pharmacology. CO 3: are able to solve simple problems on Population Growth. CO 4: are able to solve a simple problem on Epidemiology in order to handle more complicated problems.															
Contents	<ol style="list-style-type: none"> <li>1. Genetics.</li> <li>2. Pharmacology.</li> <li>3. Discrete Population Growth.</li> <li>4. Continuous Population Growth: Single and Two species.</li> <li>5. Epidemiology: SIR and SIS</li> </ol>															
Study and examination requirements and forms of examination	<p>The final mark will be computed from a proportional weight of assignments, mid examination and final examination. The final mark will be weighted as follows:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Assessment methods (components, activities)</th> <th>Weight (percentage)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final Examination</td> <td>30</td> </tr> <tr> <td>2</td> <td>Mid-Term Examination</td> <td>30</td> </tr> <tr> <td>3</td> <td>Project and Presentation</td> <td>25</td> </tr> <tr> <td>4</td> <td>Other Activities: Quiz, Homework, etc.</td> <td>15</td> </tr> </tbody> </table>	No	Assessment methods (components, activities)	Weight (percentage)	1	Final Examination	30	2	Mid-Term Examination	30	3	Project and Presentation	25	4	Other Activities: Quiz, Homework, etc.	15
No	Assessment methods (components, activities)	Weight (percentage)														
1	Final Examination	30														
2	Mid-Term Examination	30														
3	Project and Presentation	25														
4	Other Activities: Quiz, Homework, etc.	15														

	The initial cut- off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively.
Media employed	Boards, projectors, Laptop/Computer
Reading List	<ol style="list-style-type: none"> <li>1. B. Barnes, and G.R. Fulford, 2002, <i>Mathematical Modelling with Case Studies</i>, Taylor &amp; Francis, London.</li> <li>2. Fred Brauer, and Carlos Castillo-Chavez, 2001, <i>Mathematical Models in Population Biology and Epidemiology</i>, Springer Verlag, New York.</li> <li>3. Stanley I. Grossman, and James E. Turner, 1974, <i>Mathematical for Biological Sciences</i>, MacMillan Publishing Co., Inc., New York.</li> <li>4. Jagat Narain Kapur, 1985, <i>Mathematical Models in Biology &amp; Medicine</i>, Affiliated East-West Press Private Limited, New Delhi.</li> </ol>

### PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
CO 1						√			
CO 2		√			√	√			√
CO 3		√			√	√			√
CO 4		√			√	√	√		√