UNIVERSITAS GADJAH MADA
Faculty of Mathematics and Natural Sciences
Department of Mathematics
Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 552243 Fax: +62 274 555131 Email: math@ugm.ac.id Website: http://math.fmipa.ugm.ac.id

Master in Mathematics

Telp : +62 274 552243
Email : maths2@ugm.ac.id; kaprodi-s2-matematika.mipa@ugm.ac.id
sekprodi-s2-matematika.mipa@ugm.ac.id
Website : http://s2math.fmipa.ugm.ac.id/

MODULE HANDBOOK

Module Name	*Mathematical System Theory*
Module level, if applicable	*Master's degree*
Code, if applicable	*MMM 6305*
Subtitle, if applicable	-
Courses, if applicable	*Mathematical System Theory*
Semester(s) in which the module is taught	*1st (first)*
Person responsible for the module	*Chair of the Lab. of Applied Mathematics*
Lecturer(s)	*Dr. Ari Suparwanto, M.Si.* *Dr. Solikhatun, M. Si.*
Language	*Bahasa Indonesia*
Relation to curriculum	*Elective course in the first year (1st semester) Master in Mathematics.*
Teaching methods	*Lectures, structured activities (assignments, quizzes, team-cases)*
Workload (incl. contact hours, self-study hours)	*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*
Required and recommended prerequisites for joining the module	*Students should be have good knowledge in Linear Algebra and Introduction to System Theory.*

<table>
<tr><td>Module objectives/intended learning outcomes</td><td>After completing this course, the students have ability to:

CO 1. formulate the model from a real problem to time varying state space

CO 2. evaluate the solution of linear time varying and the linear time invariant systems

CO 3. Analyze the properties of linear time varying systems include of stability, controllability and observability

CO 4. Synthesize the system in the form of minimal realization.</td></tr>
<tr><td>Content</td><td>Mathematical systems. Linearization of the nonlinear systems. Solution of the linear time varying and linear time invarian systems. Impulse respons. Discretization. System properties: stability, controllability and observability. Minimal realization.</td></tr>
<tr><td>Examination forms</td><td>Written assignments, written exams, quizzes and case based assignments.</td></tr>
<tr><td>Study and examination requirements</td><td>To pass the course, the minimum grade is C.
The final mark will be weighted as follows:
<table>
<tr><th>No</th><th>Assessment methods (components, activities)</th><th>Weight (percentage)</th><th>Cognitive</th><th>Case Based</th></tr>
<tr><td>1.</td><td>Final Examination (written exams)</td><td>35 %</td><td>20 %</td><td>15 %</td></tr>
<tr><td>2.</td><td>Mid-Term Examination</td><td>35 %</td><td>25 %</td><td>10 %</td></tr>
<tr><td>3.</td><td>Quiz, Homework (Written and case based assignments)</td><td>30 %</td><td>15 %</td><td>15 %</td></tr>
<tr><td></td><td>Total</td><td>100 %</td><td>60 %</td><td>40 %</td></tr>
</table></td></tr>
<tr><td>Media employed</td><td>Projector, board, computer, e-learning via http://elok.ugm.ac.id, simaster, online lecture via Zoom.</td></tr>
<tr><td>Reading list</td><td>[1] Chi-Tsong Chen, 1984, “Linear Systems Theory and Design”, Holt Rinehart & Winston.

[2] Olsder, G.J., 2006, “Mathematical Systems Theory”, VSSD, The Netherland. M</td></tr>
</table>

CO and PLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
CO 1		V	V			
CO 2		V	V			
CO 3		V	V			
CO 4		V	V			

Compilation Date	**:**	
Modified Date	**:**	**9 August 2022**