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MODULE HANDBOOK

Module Name	*Topics in Control Theory*
Module level, if applicable	*Doctor*
Code, if applicable	*MMM 7314*
Subtitle, if applicable	-
Courses, if applicable	
Semester(s) in which the module is taught	1st or 2nd semester
Person responsible for the module	*Chair of the Lab. of Applied Mathematics*
Lecturer(s)	*Prof. Dr. Salmah, M. Si.* *Dr. Solikhatun, M.Si.*
Language	*Bahasa Indonesia*
Relation to curriculum	*Elective course in the first year (1st semester) Doctoral in Mathematics.*
Teaching methods	*Lectures, structured activities (assignments, quizzes), seminar, project*
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 must be competence in linear algebra and differential equations.*

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

CO 1. modelling the control problems.

CO 2. design the controller systems.

CO 3. competence in the advanced control design.

CO 4. apply the control theory in real problems.</td></tr>
<tr><td>Content</td><td>In this lecture, students must carry out several academic activities under the supervision of the lecturer. Academic activities are carried out based on literature studies to competences one or more of the topics in control theory, including: control system modeling, advanced system theory such as descriptor systems, bilinear systems, nonlinear systems, and bisimulation, linear quadratic optimal control theory and Riccati equations, advanced control methods, such as model predictive control (MPC), distributed MPC, hierarchical control, adaptive predictive control, robust control, dynamic game theory, model order reduction, Kalman Filter, and application of control theory to real problems.</td></tr>
<tr><td>Examination forms</td><td>Written assignments, oral presentation and essay exam.</td></tr>
<tr><td>Study and examination requirements</td><td>To pass the course, the minimum grade is B.
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/Project Based</th></tr>
<tr><td>1.</td><td>Final Examination (essay exam)</td><td>30 %</td><td>10 %</td><td>20 %</td></tr>
<tr><td>2.</td><td>Mid-Term Examination</td><td>30 %</td><td>20 %</td><td>10 %</td></tr>
<tr><td>3.</td><td>Quiz, Homework (Written assignments)</td><td>20 %</td><td>10 %</td><td>10 %</td></tr>
<tr><td>4.</td><td>Oral presentation</td><td>20 %</td><td></td><td>20 %</td></tr>
<tr><td></td><td>Total</td><td>100 %</td><td>40 %</td><td>60 %</td></tr>
</table></td></tr>
<tr><td>Media employed</td><td>Projector, board, computer, online lecture via Zoom.</td></tr>
<tr><td>Reading list</td><td>1. Lewis F.L., 1992, Applied Optimal Control, Prentice Hall International.
2. Geert Jan Olsder, 1994, Mathematical Systems Theory, 1’st Edition, Delft University of Technology.
3. Katsuhiko Ogata, 1990, Modern Control Engineering, 2nd ed. Englewood Cliffs, N.J,: Prentice Hall, Inc.
4. Rama K. Yedavalli, 2014, Robust Control of Uncertain Dynamic System: A Linear State Space Approach, Springer Science+Business Media.
5. Yuri Shtessel, Christopher Edwards, Leonid Fridman and Arie Levant Sliding, 2014, Mode Control and Observation, Springer Science+Business Media.
6. Camacho,E.F., Bordons,C. 2007. Model Predictive Control, 2nd ed. Springer Verlag, London.</td></tr>
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CO-PLO Mapping

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

Last Modified Date : 12 August 2022