



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Department of Computer Science and Electronics

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Bachelor in Electronics and Instrumentation

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MODULE HANDBOOK

Module name	Electronics Workshop
Module level, if applicable	Undergraduate
Code, if applicable	MII-1305
Courses, if applicable	NA
Semester(s) in which the module is taught	Even Semester
The person responsible for the module	Muhammad Auzan S.Si.,M.Cs.
Lecturer(s)	Muhammad Auzan S.Si.,M.Cs.
Language	Bahasa Indonesia and English
Relation to curriculum	1. It is a mandatory course for the undergraduate degree program in 2nd semester. 2. It is a mandatory course for the international undergraduate degree program in 2nd semester.
Teaching methods	1. Undergraduate degree program delivered using lectures and practicum instruction with students less than 30. 2. International undergraduate degree program delivered using lectures and practicum instruction with students less than 30.
Workload (incl. contact hours, self-study hours)	1. Lectures: 2 x 50 = 100 minutes per week. 2. Exercises and Assignments: 1 x 50 = 50 minutes per week. 3. Self-study: 1 x 50 = 50 minutes per week.
Credit points	2 Credit Points
Requirements according to the examination regulations	A student must have attended at least 75% of the lectures to sit in the exams.
Required and recommended prerequisites for joining the module	None
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to: CO1. Students can trace electronic circuits and draw examples of integrated circuit designs CO2. Students can operate software to perform integrated circuit design with PCB manufacturing best practice principles CO3. Students can plan and arrange electronic components on integrated circuit boards that are shaped through holes or surface mounts

	CO4. Students can find problems on integrated circuit boards and design solutions to integrated circuit schemes and design problems <table><tr><th colspan="2">PLO</th><th>CO1</th><th>CO2</th><th>CO3</th><th>CO4</th></tr><tr><td rowspan="5">Program Learning Outcome (PLO)</td><td>PLO1</td><td></td><td></td><td></td><td></td></tr><tr><td>PLO2</td><td>√</td><td></td><td></td><td></td></tr><tr><td>PLO3</td><td></td><td>√</td><td>√</td><td></td></tr><tr><td>PLO4</td><td>√</td><td></td><td></td><td></td></tr><tr><td>PLO5</td><td>√</td><td>√</td><td>√</td><td>√</td></tr></table>	PLO		CO1	CO2	CO3	CO4	Program Learning Outcome (PLO)	PLO1					PLO2	√				PLO3		√	√		PLO4	√				PLO5	√	√	√	√																						
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Content	- How to trace an electronic circuit - Simple electronic circuits, essential components of electronics, along with symbols and notation of electronic circuits - Electronic circuit scheme using EDA software - Electrical Rule Check (ERC) - PCB design by using EDA software - Design Rule Check (DRC) - Conversion of electronic circuit design and scheme - PCB manufacturing files - Integrated circuit board manufacturing process through the design process, design to PCB transfer, etching, and drilling - Integrated circuit board manufacturing process through the design process, design to PCB transfer, etching, and drilling - Soldering on integrated circuit boards with proper component placement - Probing with a multimeter to see problems on the integrated circuit board - Known problems with integrated circuit boards (S.9) - Soldering on integrated circuit boards with proper component placement - Probing with a multimeter to see problems on the integrated circuit board - Known issues with integrated circuit boards																																																						
Study and examination requirements and examination forms	The evaluation is done in three forms, namely: - Project-based assignment - Six individual assignments are to be completed within a specific timeframe, and Assessment is done using a rubric to measure student understanding related to the target and class rank.																																																						
Media employed	e-learning Platform (ELOK), projector, whiteboard, and presentation.																																																						
Assessments and evaluation	<table><tr><th>Type</th><th>Percentage</th><th>CO1</th><th>CO2</th><th>CO3</th><th>CO4</th></tr><tr><td>Individual Task 1</td><td>8</td><td>√</td><td></td><td></td><td></td></tr><tr><td>Individual Task 2</td><td>8</td><td></td><td>√</td><td></td><td></td></tr><tr><td>Individual Task 3</td><td>8</td><td></td><td>√</td><td></td><td></td></tr><tr><td>Individual Task 4</td><td>8</td><td></td><td>√</td><td></td><td></td></tr><tr><td>Individual Task 5</td><td>9</td><td></td><td></td><td>√</td><td></td></tr><tr><td>Individual Task 6</td><td>9</td><td></td><td></td><td>√</td><td></td></tr><tr><td>Project Assignment</td><td>50</td><td>√</td><td>√</td><td>√</td><td>√</td></tr><tr><td>Total</td><td>100</td><td></td><td></td><td></td><td></td></tr></table>	Type	Percentage	CO1	CO2	CO3	CO4	Individual Task 1	8	√				Individual Task 2	8		√			Individual Task 3	8		√			Individual Task 4	8		√			Individual Task 5	9			√		Individual Task 6	9			√		Project Assignment	50	√	√	√	√	Total	100				
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Reading list	1. EMA Design Automation. The Hitchhiker's Guide to PCB Design. English: 2021. 2. Mitzner, Kraig. Complete PCB design using OrCAD capture and editor. Newnes : 2009.

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