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Undergraduate Programme in Physics

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MODULE HANDBOOK

Module Name	Physics and Technology of Semiconductors
Module level, if applicable	Bachelor
Code, if applicable	FIS424034
Subtitle, if applicable	-
Courses, if applicable	Physics and Technology of Semiconductor
Semester(s) in which the module is taught	4th (fourth)
Person responsible for the module	Dr. Widayanti, M.Si
Lecturer(s)	Dr. Widayanti, M.Si
Language	Indonesia
Relation to curriculum	Compulsory course in the second year (4th semester) Bachelor Degree
Type of teaching, contact hours	100 minutes lectures and 120 minutes structured activities per week.
Workload	Total workload is 90.7 hours per semester, which consists of 100 minutes lectures per week for 14 weeks, 120 minutes structured activities per week, 120 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam
Credit points	2
Requirements according to the examination regulations	Minimum attendance 75% All assignments submitted Attendance on time
Recommended prerequisites	No prerequisites stated on
Module objectives/intended learning outcomes	After completing this course, the students: CO 1. able to understand semiconductor theory CO 2. able to explain semiconductor devices. CO 3. able to analyze semiconductor technology. CO 4. able to analyze applications of semiconductor materials
Content	Semiconductor Theory: Free Electrons and Holes in Semiconductors, Energy Bands in Semiconductors, Bonding in Semiconductors Charge Carrier Concentration: Intrinsic and Extrinsic Semiconductors, Donors and Acceptors Charge Carrier Transport Phenomena: Carrier Drift, Carrier Diffusion, Generation and Recombination Processes, Thermionic Emission, Fermi Semiconductor Characterization: Electrical, Optical, Structural Analysis, Surface Analysis Methods, Microscopy Techniques Semiconductor Devices: p-n Junction, Transistors, Diodes Photonic Devices: Light-Emitting Diodes, Semiconductor Lasers, Solar Cells, Photodetectors

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	Semiconductor Technology: Crystal Growth and Epitaxy, Thermal Oxidation, Semiconductor Deposition Applications of Semiconductor Materials
Study and examination requirements and forms of examination	The final mark will be weighted as follows:

NO	Assessment methods (components, activities)	Weight (percentage)
1	Final Examination	40%
2	Mid-Term Examination	30%
3	Class Activities : Quiz, Homework, etc.	30%

The final assessment is expressed in the form of a letter value converted from a number value with the following categories:

NO	Number Value	Letter Value	NO	Number Value	Letter Value
1	≥ 95	A	7	65-69.99	B/C
2	90-94.99	A-	8	60-64.99	C+
3	85-89.99	A/B	9	55-59.99	C
4	80-84.99	B+	10	50-54.99	C-
5	75-79.99	B	11	55-34.99	D
6	70-74.99	B-	12	<35	E

Media employed	White-board, Lcd Projector, e-learning (https://daring.uin-suka.ac.id/)
Reading list	1. S.M. Sze and M.K. Lee. *Semiconductors Devices : Physics and Technology 3rd ed*. John Willey & Sons. 2. Ferendeci M, A. 1991. *Physical Foundations of Solid State and Elsctron Device*. Singapore : McGraw-Hill. 3. Kwok, K. 1995. *Complete Guide To Semiconductor Devices*. USA : McGraw-Hill.

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							√		