



**LIST OF COURSES OFFERED TO INTERNATIONAL STUDENTS
NON-DEGREE PROGRAM
EVEN SEMESTER, ACADEMIC YEAR 2025/2026
Faculty of Engineering - Universitas Indonesia**

Course Name: Computer Organization and Architecture

Degree	Bachelor
Department/Study Program	Computer Engineering
Type of Class	International
Lecturer Name	
Course Structure	Lecture
Course Credits	3
Course Overview	This course provides an overview of computer organization and architecture, focusing on microprocessor design, memory hierarchy, assembly language, and the practical application of computer systems.
Course Key Words	
Learning Outcome	Able to implement organizational theory and computer architecture to access resources on a specific microprocessor (C3)
Course Schedule	Introduction; History of Microprocessor; Designing for Performance; Top-Level view of Computer System; Processor Organization; Memory; Peripheral subsystems; Fundamentals of Assembly Programming; Addressing Modes; Transfer Data; Arithmetic and Logic Instruction; Program Control; Programming the Microprocessor
Textbooks, References, and Supplementary Materials (Maximum 3)	<ol style="list-style-type: none"> 1. W. Stallings, "Computer Organization and Architecture," 11th Edition, Pearson International, 2021. 2. Brey Barry B, "The Intel Microprocessors: 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro Processor, Pentium II, Pentium III, Pentium 4," Prentice Hall, 2008.
Grading Component	
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	<p>Students are expected to:</p> <ul style="list-style-type: none"> - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. <p>Avoid any form of academic dishonesty (e.g., plagiarism, cheating).</p>



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Course Name: Electric Circuit

Degree	Bachelor
Department/Study Program	Computer Engineering
Type of Class	International
Lecturer Name	
Course Structure	Lecture
Course Credits	2
Course Overview	This course covers fundamental concepts in electrical circuits, including circuit analysis techniques, network theorems, AC/DC circuits, and the use of circuit simulation software. It provides the foundation for understanding and designing complex electrical systems.
Course Key Words	
Learning Outcome	<ul style="list-style-type: none"> • Able to analyze AC and DC circuits using circuit analysis techniques (C4) • Able to apply network theorems to solve circuit problems (C3) • Able to use circuit simulation software to analyze electrical circuits (P4)
Course Schedule	Basic Concepts of Electricity; Ohm's Law; Kirchhoff's Laws; Series and Parallel Circuits; Mesh and Nodal Analysis; Thevenin's and Norton's Theorems; AC Circuits; Resonance; Power Analysis
Textbooks, References, and Supplementary Materials (Maximum 3)	William H. Hayt, Jack E. Kemmerly, Steven M. Durbin, "Engineering Circuit Analysis," 8th Edition, McGraw-Hill, 2011.
Grading Component	
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	<p>Students are expected to:</p> <ul style="list-style-type: none"> - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. <p>Avoid any form of academic dishonesty (e.g., plagiarism, cheating).</p>



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Course Name: Statistics

Degree	Bachelor
Department/Study Program	Computer Engineering
Type of Class	International
Lecturer Name	
Course Structure	Lecture
Course Credits	3
Course Overview	This course introduces statistical methods and concepts, including data analysis, probability distributions, hypothesis testing, regression, and analysis of variance. Students will apply statistical techniques to real-world problems.
Course Key Words	
Learning Outcome	<ul style="list-style-type: none"> • Able to apply statistical methods to analyze data (C4) • Able to interpret statistical results and draw valid conclusions (C5) • Able to use statistical software for data analysis (P4)
Course Schedule	Descriptive Statistics, Discrete Probability Distribution, Normal Probability Distribution, Confidence Interval, Hypothesis Testing with one and two sample, Correlation, Regression, Chi Square Test, F Measures
Textbooks, References, and Supplementary Materials (Maximum 3)	Ron Larson and Betsy Farber, Elementary Statistics: Picturing the World, 8e, Wiley, 2022
Grading Component	
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	<p>Students are expected to:</p> <ul style="list-style-type: none"> - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. <p>Avoid any form of academic dishonesty (e.g., plagiarism, cheating).</p>



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Course Name: Algorithm Programming and Laboratory

Degree	Bachelor
Department/Study Program	Computer Engineering
Type of Class	International
Lecturer Name	
Course Structure	Lecture, Practicum
Course Credits	3
Course Overview	This course introduces students to the fundamental concepts of algorithm programming and dynamic data structures. Topics include recursion, searching, sorting, linked lists, queues, trees, graphs, dynamic programming, maximum flow, and NP-completeness.
Course Key Words	
Learning Outcome	<ul style="list-style-type: none"> • Able to design efficient complex computational problem-solving algorithms by implementing procedural programming and dynamic data structures (C6) • Able to use procedural computer programming software for dynamic data structures proficiently (P4) • Able to actively contribute, listen well, and appreciate the different views and expertise of Algorithms & Programming teammates (A3)
Course Schedule	Recursive algorithms; Searching and sorting techniques; Linked lists; Queues; Trees; Graphs; Dynamic programming; Maximum flow problems; NP-completeness
Textbooks, References, and Supplementary Materials (Maximum 3)	<ol style="list-style-type: none"> 1. Deitel & Deitel, "C How to Program," 8th Edition, Pearson Education, 2015. 2. Thomas H. Cormen, "Introduction to Algorithms," 3rd Edition, MIT Press, 2009. 3. Anany Levitin, "Introduction to The Design and Analysis of Algorithms", 3rd Edition, Pearson, 2011.



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	4. Robert Sedgewick & Kevin Wayne, “Algorithms,” 4 th Edition, Addison-Wesley Professional, 2011.
Grading Component	
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: <ul style="list-style-type: none">- Attend all classes regularly and on time.- Participate actively in discussions and learning activities.- Maintain respectful behavior toward instructors and peers. Avoid any form of academic dishonesty (e.g., plagiarism, cheating).



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Course Name: Numerical Computation

Degree	Bachelor
Department/Study Program	Computer Engineering
Type of Class	International
Lecturer Name	
Course Structure	Lecture
Course Credits	3
Course Overview	This course introduces numerical methods and their applications in solving mathematical problems, focusing on algorithm design and implementation for root search, linear equations, curve fitting, integrals, differentials, and optimization problems.
Course Key Words	
Learning Outcome	<ul style="list-style-type: none"> • Able to use numerical methods to solve various mathematical problems (C3) • Able to formulate computational solutions from the numerical method created (C4) • Able to take the initiative and be active in deepening understanding of contemporary issues relevant to multimedia signal processing (A3)
Course Schedule	Algorithm Design for: Numerical methods for root search; Numerical methods for solving linear equation systems; Numerical methods for finding curve fitting; Numerical methods for integral and differential equations; Numerical methods for ordinary differential equations; Interpolation concepts; Optimization problems
Textbooks, References, and Supplementary Materials (Maximum 3)	Steven Chapra & Raymond Canale, "Numerical Methods for Engineers," 7th Edition, McGraw Hill, 2014.
Grading Component	
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: <ul style="list-style-type: none"> - Attend all classes regularly and on time. - Participate actively in discussions and learning activities.



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Course Name: Database System and Laboratory

Degree	Bachelor
Department/Study Program	Computer Engineering
Type of Class	International
Lecturer Name	
Course Structure	Lecture, Practicum
Course Credits	3
Course Overview	This course introduces the concepts and techniques of database systems, including data modeling, database design, SQL, and database management systems. Students will gain practical experience through laboratory exercises using a database management system.
Course Key Words	
Learning Outcome	<ul style="list-style-type: none"> • Able to design a relational database based on system requirements (C6) • Able to write SQL queries to manipulate and retrieve data from a database (C3) • Able to use a database management system to implement and manage databases (P4)
Course Schedule	Introduction to Databases; Data Models; Entity-Relationship Model; Relational Model; SQL Basics; Advanced SQL; Database Normalization; Database Design; Transactions and Concurrency Control; Database Security; Case Studies
Textbooks, References, and Supplementary Materials (Maximum 3)	Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database System Concepts," 7th Edition, McGraw-Hill, 2019.
Grading Component	
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	<p>Students are expected to:</p> <ul style="list-style-type: none"> - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. <p>Avoid any form of academic dishonesty (e.g., plagiarism, cheating).</p>



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Course Name: Embedded System and Laboratory

Degree	Bachelor
Department/Study Program	Computer Engineering
Type of Class	International
Lecturer Name	
Course Structure	Lecture, Practice
Course Credits	3
Course Overview	This course covers the fundamental concepts and applications of embedded systems. Students will learn about microcontrollers, embedded programming, interfacing, and real-time operating systems, with practical experience through laboratory exercises.
Course Key Words	
Learning Outcome	<ul style="list-style-type: none"> • Able to design and implement embedded systems for specific applications (C6) • Able to program microcontrollers using embedded C (C3) • Able to interface microcontrollers with various peripheral devices (P4)
Course Schedule	Introduction to Embedded Systems; Microcontroller Architecture; Embedded C Programming; Input/Output Interfacing; Timers and Counters; ADC/DAC; Communication Protocols (UART, SPI, I2C); Real-Time Operating Systems; Embedded System Design and Case Studies
Textbooks, References, and Supplementary Materials (Maximum 3)	Muhammad Ali Mazidi, Janice Gillispie Mazidi, and Rolin McKinlay, "The 8051 Microcontroller and Embedded Systems: Using Assembly and C," 2 nd Edition, Pearson, 2007.
Grading Component	
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	<p>Students are expected to:</p> <ul style="list-style-type: none"> - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. <p>Avoid any form of academic dishonesty (e.g., plagiarism, cheating).</p>



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Course Name: Operating System and Laboratory

Degree	Bachelor
Department/Study Program	Computer Engineering
Type of Class	International
Lecturer Name	
Course Structure	Lecture, Practicum
Course Credits	3
Course Overview	This course provides a comprehensive understanding of operating systems, including process management, memory management, file systems, and input/output systems. Students will gain practical experience in configuring and managing operating systems.
Course Key Words	
Learning Outcome	<ul style="list-style-type: none"> • Able to explain the basic concepts and functions of operating systems (C2) • Able to configure and manage an operating system for different applications (C3) • Able to analyze system performance and troubleshoot common operating system issues (C4)
Course Schedule	Introduction to Operating Systems; Process Management; Threads and Concurrency; CPU Scheduling; Synchronization; Deadlock; Memory Management; Virtual Memory; File Systems; Input/Output Systems; Security and Protection
Textbooks, References, and Supplementary Materials (Maximum 3)	Abraham Silberschatz, Peter B. Galvin, and Greg Gagne, "Operating System Concepts," 10th Edition, Wiley, 2018.
Grading Component	
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	<p>Students are expected to:</p> <ul style="list-style-type: none"> - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers. <p>Avoid any form of academic dishonesty (e.g., plagiarism, cheating).</p>



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Course Name: Software Engineering

Degree	Bachelor
Department/Study Program	Computer Engineering
Type of Class	International
Lecturer Name	
Course Structure	Lecture, Case Study
Course Credits	3
Course Overview	This course introduces the principles and practices of software engineering, covering software development life cycles, requirements analysis, design, implementation, testing, and maintenance. It emphasizes the use of modern software development methodologies and tools.
Course Key Words	
Learning Outcome	<ul style="list-style-type: none"> • Able to analyze software requirements and design appropriate solutions (C4) • Able to implement software engineering principles in software projects (C6) • Able to work effectively in a team environment on software development projects (A3)
Course Schedule	Software Development Life Cycle; Requirements Engineering; Software Design and Architecture; Implementation and Coding; Software Testing and Quality Assurance; Software Maintenance and Evolution; Agile Methodologies; Case Studies
Textbooks, References, and Supplementary Materials (Maximum 3)	Ian Sommerville, "Software Engineering," 10 th Edition, Pearson, 2015.
Grading Component	
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	<p>Students are expected to:</p> <ul style="list-style-type: none"> - Attend all classes regularly and on time. - Participate actively in discussions and learning activities. - Maintain respectful behavior toward instructors and peers.



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Course Name: Signal Theory and System Analysis

Degree	Bachelor
Department/Study Program	Computer Engineering
Type of Class	International
Lecturer Name	
Course Structure	Lecture
Course Credits	2
Course Overview	This course introduces the fundamental concepts of signal theory and system analysis, covering topics such as signal representation, Fourier analysis, Laplace transform, Z-transform, and sampling theory. It provides a comprehensive understanding of how signals can be analyzed and processed in both continuous and discrete time.
Course Key Words	
Learning Outcome	<ul style="list-style-type: none"> • Able to analyze continuous and discrete-time signals and systems (C4) • Able to apply Fourier, Laplace, and Z-transforms in analyzing signals and systems (C3) • Able to model simple physical systems using signal processing techniques (C6)
Course Schedule	Introduction to Signal Theory; Signal Representation and Properties; Fourier Series and Transform; Laplace Transform; Z-Transform; Sampling Theorem; Discrete-Time Signal Processing; System Analysis; Stability and Causality; Convolution; Frequency Response
Textbooks, References, and Supplementary Materials (Maximum 3)	<ol style="list-style-type: none"> 1. Alan V. Oppenheim, Alan S. Willsky, with S. Hamid Nawab, "Signals and Systems," 2nd Edition, Pearson, 1996. 2. Simon Haykin and Barry Van Veen, "Signals and Systems," 2nd Edition, Wiley, 2003.
Grading Component	
Other (i.e. Expectations on Classroom)	<p>Students are expected to:</p> <ul style="list-style-type: none"> - Attend all classes regularly and on time.



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Conduct and Decorum etc.)	<ul style="list-style-type: none">- Participate actively in discussions and learning activities.- Maintain respectful behavior toward instructors and peers. Avoid any form of academic dishonesty (e.g., plagiarism, cheating).
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Course Name: Artificial Intelligence

Degree	Bachelor
Department/Study Program	Computer Engineering
Type of Class	International
Lecturer Name	
Course Structure	Lecture
Course Credits	3
Course Overview	This course covers the fundamentals of artificial intelligence (AI) and machine learning, including regression, clustering, artificial neural networks (ANN), deep learning, and AI system design. It provides both theoretical understanding and practical experience.
Course Key Words	
Learning Outcome	<ul style="list-style-type: none"> • Able to design machine learning-based recognition, grouping, and prediction systems (C6) • Able to apply appropriate modern tools/devices to create artificial intelligence (C3) software models • Able to actively contribute, listen well, and appreciate the different views and expertise of artificial intelligence project team members (A3) • Able to manage conflicts that arise in the context of an artificial intelligence team judiciously (A3)
Course Schedule	Introduction to machine learning and artificial intelligence; Regression; Clustering; Non-ANN classifiers; ANN classifiers; Back-propagation algorithms; PCA for data reduction; Deep learning; ANN-based recognition system design
Textbooks, References, and Supplementary Materials (Maximum 3)	<ol style="list-style-type: none"> 1. Oliver Theobald, "Machine Learning for Absolute Beginners: A Plain English Introduction," Independently published, 2018. 2. Andrew Ng, "Deep Learning Specialization," Online course at Coursera, 2024. 3. Christopher M. Bishop, "Pattern Recognition and Machine



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	Learning,” Springer, 2006.
Grading Component	
Other (i.e. Expectations on Classroom Conduct and Decorum etc.)	Students are expected to: <ul style="list-style-type: none">- Attend all classes regularly and on time.- Participate actively in discussions and learning activities.- Maintain respectful behavior toward instructors and peers. Avoid any form of academic dishonesty (e.g., plagiarism, cheating).

*** Note: Please add additional sheets for the next courses.**