SURAT KEPUTUSAN
DIREKTUR / KEPALA UKK PPM CEP - CCIT FAKULTAS TEKNIK UNIVERSITAS INDONESIA
NOMOR : 19 TAHUN 2025

TENTANG :
KURIKULUM CEP-CCIT FTUI TAHUN 2025
PROGRAM TEKNOLOGI INFORMASI (TI) DAN *CREATIVE MULTIMEDIA* (CM)

Menimbang :
1. Telah dilaksanakan kegiatan *workshop*, diskusi, dan evaluasi secara berkala untuk melakukan perbaikan terhadap kurikulum pembelajaran program profesional;
2. CEP-CCIT FTUI perlu menetapkan kurikulum yang akan dipergunakan sebagai acuan penyelenggaraan pendidikan program profesional hingga peserta program lulus atau habis masa studi.

Mengingat :
1. Surat Keputusan Dekan Fakultas Teknik Universitas Indonesia Nomor: 653/D/SK/FTUI/X/2003 tanggal 1 Oktober 2003 perihal Pembentukan Pusat Komputasi dan Teknologi Informasi (Center for Computing & Information Technology) Fakultas Teknik Universitas Indonesia;
2. Surat Keputusan Rektor Universitas Indonesia Nomor: 1369/ SK/R/UI/2009 tanggal 17 November 2009 perihal Penetapan Nama Unit Usaha di lingkungan Universitas Indonesia;
3. Surat Keputusan Rektor Universitas Indonesia Nomor: 1020/SK/R/UI/2018 tanggal 27 April 2018 perihal Alih Bentuk *Continuing Education Program – Center for Computing and Information Technology* Fakultas Teknik Universitas Indonesia sebagai Unit Kerja Khusus Pelayanan dan Pengabdian Masyarakat Universitas Indonesia;
4. Peraturan Rektor UI Nomor : 25 Tahun 2019 tentang UKK PPM Universitas Indonesia;
5. Surat Keputusan Dekan Fakultas Teknik Universitas Indonesia Nomor: 265/D/SK/FTUI/II/2022 tanggal 7 Februari 2022 perihal Pengangkatan Kepala *Continuing Education Program – Center for Computing and Information Technology* Fakultas Teknik Universitas Indonesia.

M E M U T U S K A N :

Menetapkan : KURIKULUM CEP-CCIT FTUI TAHUN 2025 PROGRAM TEKNOLOGI INFORMASI (TI) DAN *CREATIVE MULTIMEDIA* (CM).

KESATU : Program Teknologi Informasi (TI) program ini 5 peminatan sebagai berikut:
a. *Full Stack Developer* (FSD)
b. *Internet-based System Automation* (ISA)
c. Cyber Security (CS)
d. *Artificial Intelligence and Data Analytics* (AIDA)
e. Digital Marketing (DM)

KEDUA : Program *Creative Multimedia* (CM) program ini memiliki 2 peminatan yaitu *Multimedia Design* (MD) dan *Animation* (AN).

Surat Keputusan ini akan ditinjau dan diperbaiki kembali seperlunya, bila di kemudian hari terdapat kekeliruan dalam keputusan ini.

Ditetapkan di : Depok
Pada Tanggal : 20 Agustus 2025
Direktur (Kepala UKK PPM),

Prof. Dr. Muhammad Suryanegara. S.T., M.Sc., IPU
NIP 198105142012121001

B. Program Teknologi Informasi *Internet-based System Automation* (TI ISA)

Overview

Industry 4.0 and IoT is the hottest technology today. Many country, scientist, and professional look for any technology to be the best standard which would achieve the Automation in everything. It makes everyone race to upgrade their skills to master this technology since it could transform any kind of business and industry to be a new kind of method.
This technology would be a new jump of the internet which will change how people interact each other, not only people with others but also between the machine to machine. Enhanced with AI, IoT will lead improvement in technology for the future. Thus who are not upgrade their skills in the hottest technology would not plays any role at the future business.

Exit Profile of ISA Curriculum

After completing all modules, the students should be able to:
• Find the solution to enable automation in an environment based on IoT platform
• Design and Implement an automatic system using sensors, controller, database, and enable the data to be accessed by a web based application or mobile applications
• Understand how the IoT (Internet of Things) help the industry 4.0 transformation
• Enhance IoT system with AI technology

Target Students

The course designed for students who have the desire to work as an IoT Developer or an Automated System Developer, but this could be applied for a student who wants to be a Web Developer

Prerequisites

Student should be able to interact in an English Classroom Environment

Entry Profile

• Student at least having a high school graduate certificate
• Student should already comfortable using any OS smartphone, internet, Microsoft Windows / Linux Operating System PC
• Knowledge of electronic circuit or basic networking as well as basic programming would be an advantage

Curriculum Contents

Semester 1		
Modules	**Credits**	**Exit Profile**
Introduction to Information Technology	3	After completing this course, the students will be able to: • Identify application areas of IT • Explore various components of a computer • Explore the Windows Operating System • Work effectively on the computer

Introduction to Information Technology Project	1	• Explore the usage of Internet • Troubleshoot PC and its peripherals • Classify network architecture and topologies • Identify resources used to connect a network • Secure your system and mobile devices • Use the Microsoft Office Application Suite including Word, Excel, PowerPoint, and Outlook
Algorithm and Data Structure	3	After completing this module, the student will be able to: • Understand the fundamentals of algorithms and programming • Interpret and create flowcharts • Write and compile simple programs in C • Implement conditional statements and loops • Work with arrays and matrices • Define and invoke functions in C • Implement Bubble Sort, Insertion Sort, and Selection Sort algorithms • Implement Linear Search and Binary Search algorithms • Create and manipulate singly, doubly, and circular linked lists • Understand and implement queues
Algorithm and Data Structure Project	1	
Relational Database Design	2	After completing this module, the student will be able to: • Understand how to design a relational database • Create an entity-relationship model • Map an entity-relationship diagram to tables • Normalize and denormalize data in tables • Apply the ER / Normalization while designing a database
Tools and Technique for Analyzing Data*	3	After completing this course, the students will be able to: • Process data from business transactions • Summarize data • Analyze data for decision making • Exchange data between various sources • Analyze and present complex data • Collaborate with other users • Automate the business operations
Implementing Database Design on MySQL Server	3	After completing this module, the student should be able to: • create and implement a database using database management system • Query data from tables • Manage and manipulate databases • Implement stored procedures, triggers and functions • Implement triggers and transactions • Map an entity-relationship diagram to tables • Normalize and denormalize data in tables
Implementing Database Design on MySQL Server Project	1	
Information Systems Architecture and Technology	2	After completing this module, the student will be able to: • Understanding the analysis and design of an information system architecture • Understanding of methodological due to process and best practice for ISA development • Understanding of the challenges and critical success factors of ISA development • Understand the individual architectural component and the relations

Operating System	2	After completing this module, the student will be able to: • Understand what is an operating system and the role it plays • Have a high level understanding of the structure of operating systems, applications, and the relationship between them • Explain some knowledge of the services provided by operating systems • Explore some details of major OS concepts
Total Credits	21	Output of Semester 1 : Database Developer or Junior Analysts

Semester 2		
Modules	**Credits**	**Exit Profile**
Object Oriented Programming	2	After completing this module, the student should be able to : • Understand the basic of C++ programming • Understand structure of C++ programming language • Design an application with C++ based on the study case • Programming Microcontroller with C++
Backend Programming	2	After completing this module, the student should be able to : • Understand the basic of python programming • Understand structure of python programming language • Design an application with python based on the study case • Programming AI on computer vision technology with python
Backend & OOP Programming Project	1	After completing this module, the student should be able to : • Utilize programming environment development tools • Develop an application / AI with programming tools • Solving study case problem based on project
Electronic Circuit and Sensors	3	After completing this module, the student should be able to : • Understand the concept of electronic components • Understand how of electronic circuit works • Design an electronic systems based on study case • Creating the electronic circuit with design application
Electronic Circuit and Sensors Project	1	
Web Application	3	After completing this module, the student should be able to: • Understand the concepts of web programming • Develop Web applications using MySQL and PHP • Design interactive Web applications
Developing Enterprises Information System using Framework	3	After completing this course, the students will be able to: • Introduce MVC • Build Web applications using the PHP framework Laravel • Implement API (Application Programming Interface)
Web Programming Project	1	After completing this module, the student should be able to : • Utilize programming environment development tools • Develop an application with required tools • Solving study case problem based on project
Computer Network	2	After completing this module, the student should be able to : • Understand about Computer network architecture • Understand about network topology and IP addressing • Understand how to do server installation • Able for doing network installation and configuration
Computer Network Design Project	1	

Software Engineering*	2	After completing this module, the student will be able to: • Understand the software development life cycle and the importance of software engineering principles • Understanding of software requirements engineering and the process of eliciting, analyzing, specifying, validating, and managing software requirements
Leadership and Communication Skills	1	After completing this module, the student will be able to: • Improve communication skills • Improve self-presentation skills • Work effectively in a team environment
Total Credits	22	Output of Semester 2 : Junior IT Professional

Semester 3		
Modules	**Credits**	**Exit Profile**
Introduction to IoT	1	After completing this course, the students will be able to: • Understand the meaning and impact of the digital transformation, Explore the IoT world including sensors, actuators, and controllers • Understand how digitization allows business processes to embrace a more intelligent automation • Explore the evolving job market, opportunities in the increasingly digitized world
Internet of Things Circuit	4	After completing this course, the students will be able to: • Use sensors and an Arduino microcontroller to read data from physical world and control actuators with C++ language • Use Python to program a Single Board Computer (Raspberry Pi) • Learn the principal IoT Networking Protocols. Learn how an IoT system distributes computing between Fog and Cloud networks, interconnect systems using RESTful APIs • End-to-End case study on how to create an IoT Prototype
Big Data and Analytic	4	After completing this course, the students will be able to: • Understand the concepts of Big Data & Analytics, and the role of Big Data in IoT systems • Understand the basics of descriptive statistics, the practical aspects in acquiring data from a sensor and how to create visual representations of the data •Learn about AI based predictive analytics, approaches to Machine Learning and how to make predictions from the data
Embedded system	4	After completing this course, the students will be able to: • Identify the function and types of microcontroller • Learn how an microcontroller and embedded system works • Programming an embedded system • Troubleshoot embedded system and its peripherals • Explore the opportunity of embedded system use • Design an embedded system for automation

IoT Framework and Platforms	2	After completing this course, the students will be able to: • Understand the building blocks, the interconnections and the information flow of an IoT System • Explore the usage of Internet and communication data with platform • Understanding the data flow of an IoT system • Connecting the system with network cellular and internet hotspot • Implementing AI with integration API on IoT platform
Professional Ethics	2	After completing this module, the student will be able to: • Improve business communication skills • Develop knowledge, skills, and competence • Develop interview skills • Understand concepts of organization policies and procedures • Understand what is a job and the related tasks in an organization • Practice aptitude questions to prepare for interview • Understand the basic concepts related to sales, finance and accounting, customer service, email and business communication
Management Information System	1	After completing this module, the student will be able to: • Understanding of enterprise-level analytical skills to allow them to contribute to the analysis and design of information system architecture (ISA) • Understanding of methodological due to process and best practice for ISA development • Understanding of the challenges and critical success factors of ISA development • Understand the individual architectural component and the relations
IoT Project I	2	After completing this course, the students will be able to: • Manage data communication for IoT system workflow • Integrate IoT platform and framework with embedded system • Implement platform automation for IoT system workflow
Total Credits	22	Output of Semester 3 : Junior IoT Developer

Semester 4		
Modules	**Credits**	**Exit Profile**
Security Concept	1	After completing this module, the student will be able to: • Understand what is security concept • Identify various security concept in computer science • Identify the various method to solve a threat in computer science • Identify benefit of implementing such algorithm in a computer program • Better understanding of benefit the security concept usage to solve problems ecovery and Incident Response
Programming in Java	3	After completing this course, the students will be able to: • Get familiar with Java • Implement operators • Work with conditional and loop constructs • Work with arrays, enums, and strings • Implement inheritance and polymorphism

Programming in Java Project	1	• Handle errors • Design a user interface • Handle events • Finally the student will be able to develop object-based application using Java
Mobile Application on Android Platform	3	After completing this course, the students will be able to: • Identify the components of the Android Platform • Understand the Android Building Blocks and development basics • Manage Data Persistence in Android Platform (SQLite) • Working with Location-based Services and managing connectivity • Deploy Android Applications
Mobile Application on Android Platform Project	1	
Writing Methodology	1	After completing this module, the student will be able to: • Develop hypotheses based on research questions. • Identify the relevance and significance of research problems. • Identify gaps and opportunities for further research through literature analysis. • Choose between qualitative, quantitative, or mixed-methods approaches. • Develop data collection instruments and procedures. • Analyze qualitative and quantitative data using appropriate statistical or thematic techniques. • Apply ethical considerations to the design, implementation, and reporting of research. • Effectively communicate research findings through written reports and presentations.
Integration System	4	After completing this course, the student will be able to: • Find the solution to enable automation in an environment using sensors • Design and Implement an automatic system using a controller, database, and enable the data to be accessed by a web-based application or mobile applications • Enable a sensor as the main part to collect data • Develop an internet based application to help user collecting data from sensors
Administering Network Operating System	3	After completing this module, the student should be able to: • Install distro and add feature from the repository • Introduce bash command, configure the hardware, system operation architecture • Implement network management, configuring email and Securing system.
Linux Server Configuration	3	After completing this module, the student should be able to : • Understand about Server Configuration • Understand about Web Server, Mail Server, Proxy Server, Samba Server, FTP Server, DNS Server • Understand DHCP and Firewall • Able for doing Router command
Linux Server Configuration Project	1	
Total Credits	21	Output of Semester 4 : Junior System Automation Developer