Faculty of
ENGINEERING

The invention of electricity a hundred years ago brought light to the world. Henry Ford, with his invention of the automobile, made transportation easy. Thirty years ago, email and the internet were just wishful thinking. Engineering and engineers produce inventions and refine them into conveniences. Industrial technology produces high-priced consumer products or appliances from natural raw materials and boosts the economy. New inventions continue to happen and improve the economy. Engineering is not only knowledge, analysis, or problem solving but also bridges science with human life, realizing imagination into reality. The Ubaya Faculty of Engineering plays an active role in producing engineers by delivering quality engineering education.

Programs that are up-to-date and relevant to the needs of the world today are managed by quality lecturers at the Ubaya Faculty of Engineering, most of whom have educational qualifications from abroad. The programs are as follows:

- Intelligent Robotics
- Network and Computer Technology
- Biomedical Engineering
- Chemical Engineering
- Chemical Engineering – Green Materials Business & Technology
- Chemical Engineering – Food Process Engineering
- Industrial Engineering
- Mechanical and Manufacturing Engineering
- Informatics Engineering – Data Science & Artificial Intelligence
- Informatics Engineering – Game Development
- Informatics Engineering – Network & Cyber Security
- Informatics Engineering – Information Management & Enterprise Systems
- Informatics Engineering - Digital Media Technology
- Informatics Engineering – Business Information Systems
- Informatics Engineering – Information Technology (Dual Degree)
- Information System - IT Enterprise Management and Strategy
- Information System - Digital Business Analytics

7 – 8 Semesters

UNDERGRADUATE STUDY PROGRAM

https://teknik.ubaya.ac.id/

UBAYA
UNIVERSITAS SURABAYA

IABEE

AUN-QA
A Touch of Quality

E-waste need not turn ugly

ELECTRICAL ENGINEERING

Degree: Bachelor of Engineering (S.T.)

The Ubaya Electrical Engineering study program was established on October 11, 1986, and since 1998 managed to maintain its "A" accreditation from the National Accreditation Board of Higher Education (BAN-PT). The accreditation is proof of recognition for the quality of education in the Ubaya Electrical Engineering study program.

The 2021 curriculum of the Ubaya Electrical Engineering Study Program has three specializations:
– Intelligent Robotics (IR)
– Network and Computer Technology (NCT)
– Biomedical Engineering (BE)

Intelligent Robotics (IR)

Biomedical Engineering (BE)

Network and Computer Technology (NCT)

CURRICULUM

The 2021 Electrical Engineering study program curriculum aims to make its graduates can take part in the Industrial Revolution 4.0 era and compete with graduates from domestic and foreign universities. Graduates are also ready to face national and international competition. Students are equipped with knowledge (theory) and skills (practice) in electronics, programming, microcontrollers, computer networks, communication technology, automation technology, artificial intelligence, machine learning, robotics, network security, IoT programming (Internet of Things), and gadget programming. Students are also equipped with character education and entrepreneurship skills.

The curriculum is designed with a load of 144 Semester Credit Units (SKS) and can be completed in a normal study period of 4 years or 8 semesters. Students with a good grade point average can finish in 7 semesters.

In the first 4 semesters, all students get the same subjects. While in the 5th semester, students take subjects according to their chosen specialization.

GRADUATE COMPETENCIES

Students who take the **Intelligent Robotics specialization** are equipped with competencies in PLC, robotics, industrial automation, Human-Machine Interface (HMI), Supervisory Control and Data Acquisition (SCADA), Internet of Things (IoT) and database, gadget programming, Artificial Intelligence (AI), data science, and machine learning.

Students who take the **Network and Computer Technology specialization** are equipped with competencies in computer networks (LAN/WAN), network security, wireless communication, cellular communication such as 5G technology, Internet of Things (IoT) and database, and gadget programming.

Students who take **Biomedical Engineering specialization** are equipped with competencies in electro-biomedicine, biomedical imaging, biomedical sensor, Artificial Intelligence (AI), therapeutic device, health-care management, Internet of Things (IoT) and database, and gadget programming.

CAREER OPPORTUNITIES

Intelligent Robotics
- Automation / Robotics Engineer
- Automation / Robotics System Designer
- Intelligent System Designer
- Mechatronics Engineer
- Smart Home/Building Engineer
- IoT System Designer
- Research & Development
- Entrepreneur

Network and Computer Technology
- IT Network Engineer
- Wireless Network Engineer
- Network Security Engineer
- Telecommunication Infrastructure Designer
- Smart Home/Building Engineer
- IoT System Designer
- Research & Development
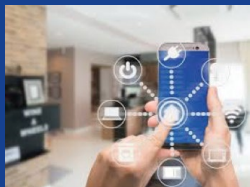- Entrepreneur

Biomedical Engineering
- Medical Device Engineer
- Medical Application System Designer
- Medical Device Innovators Designer
- IoT System Designer
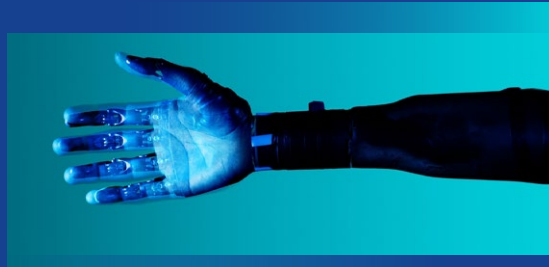- Research & Development
- Entrepreneur

CHEMICAL ENGINEERING

Degree: Bachelor of Engineering (S.T.)

The chemical industry process converts raw materials into valuable products, such as in the food industry, petrochemical industry, paper, toiletries, alternative energy production processes (biodiesel, biogas, bioethanol), and so on. The chemical industry's development requires experts in research and development, project and process engineers, quality control and quality assurance, waste handling, and technopreneurs. The Ubaya Chemical Engineering study program equips students with knowledge and practice of economically beneficial production processes and steps involving chemical and/or physical events.

Currently, the Ubaya Chemical Engineering study program has been accredited **"Superior"** by the National Accreditation Board for Higher Education (BAN-PT). In addition, the study program has also been **fully accredited** through **the General Accreditation process by the Indonesian Accreditation Board for Engineering Education (IABEE)**.

GRADUATE COMPETENCIES

The study program has an educational program that prioritizes (1) Understanding of concepts that are steady and structured, (2) The development of motor skills needed to apply the basic concepts of Chemical Engineering in conducting analysis, synthesis, and evaluation of processes and process systems. Graduates are expected to be able to communicate orally and in writing in conveying ideas/opinions, and (3) Have social and ethical responsibilities and concern for environmental sustainability as a result of the development of science.

CURRICULUM

The curriculum is designed with a load of 144 Semester Credit Units (SKS) and can be completed in a normal study period of 4 years or 8 semesters. The study program offers 3 specializations:

1. **Chemical Engineering**
2. **Green Materials Business & Technology**
3. **Food Process Engineering**

The curriculum emphasizes the theme of **"Green and Innovative Chemical Engineering"**, which will accommodate several important current issues such as:

- Green Product Engineering
- Green Process Engineering
- Sustainable Development
- Green House Gas Reduction
- Pollution Prevention
- Entrepreneurship & Technopreneurship
- Energy Efficiency and Optimization
- Food Technology

CAREER OPPORTUNITIES

- Safety, Health, and Environmental (SHE) Engineer
- Environmental and Protection Development
- Entrepreneur in Process
- Plant Operation/Production Supervision
- Quality Control and Quality Assurance
- Research and Development (R&D)
- Process Engineer
- Project Engineer
- Field Engineer
- Technical Sales
- Consultant
- Lecturer and/or Researcher

INDUSTRIAL ENGINEERING

Degree: Bachelor of Engineering (S.T.)

Achieving global competence through integrated-sustainable systems approach

To respond future industrial challenges for the benefit of mankind, the Ubaya Industrial Engineering study program is committed to preparing insane resources with integrity and professionalism and effective in applying multi-disciplinary knowledge, industrial systems, and techno-economics in the design, development, and installation of integrated systems that utilize smart technology with sustainability considerations. The Ubaya Industrial Engineering study program has been accredited **"Superior"** by BAN-PT since 2021 (previously accredited "A" since 1998). In 2019, the study program obtained **regional certification** from ASEAN University Network Quality Assurance **(AUN-QA)** so that graduates are recognized in ASEAN countries. Currently, the study program has also obtained **General Accreditation** from the Japan Accreditation Board for Engineering Education/Indonesia Accreditation Board for Engineering Education **(JABEE/IABEE)**.

GRADUATE COMPETENCIES

The Ubaya Industrial Engineering graduates are able to apply the knowledge and skills needed in the Industrial Engineering profession. Through a systems approach to design, develop, run and innovate integrated systems by considering global sustainability. The graduates are able to work and communicate effectively in multi-disciplinary teams and various stakeholders and demonstrate leadership qualities. Not only that, graduates are able to recognize needs and continue to develop skills and knowledge to embrace changes in society and the profession.

CURRICULUM

The curriculum is designed with a load of 145 Semester Credit Units (SKS) and can be completed in a normal study period of 4 years or 8 semesters. Students are equipped with theoretical mastery and extensive hands-on learning via various industries and research opportunities. The curriculum also accommodates the Independent Learning Independent Campus (MBKM) program. From semester 6 to 8, students can take part in various forms of MBKM activities, such as student exchanges, internships/work practices, teaching assistance in educational units, research, humanitarian projects, entrepreneurial activities, independent studies/projects, and building villages/thematic community service program.

Students can choose one of two specialization areas:
- **Sustainable Enterprise Systems:** expertise in analyzing and designing enterprise systems (intra-company) through an integrated-sustainable systems approach.
- **Sustainable Supply Chains Systems:** expertise in analyzing and designing supply chains (inter-company) through an integrated-sustainable systems approach.

CAREER OPPORTUNITIES

The Ubaya Industrial Engineering graduates have been well-trained to take a role in business and industry, academia, government, and non-profit organizations, at the national, regional, and international levels. Career opportunities for the Ubaya Industrial Engineering graduates are very diverse because of the very high versatility of the Industrial Engineering application, including:

- Product Analyst
- Engineering Manager
- Project Management Analyst
- Cost Control Engineer
- Occupational Health and Safety
- Quality Control Engineer
- Logistics Specialist
- Industrial Consultant
- Sales Engineer
- Engineer
- Entrepreneur
- Academician

MECHANICAL AND MANUFACTURING ENGINEERING

Degree: Bachelor of Engineering (S.T.)

Ubaya Mechanical and Manufacturing Engineering study program equips students with competencies in **Product Design** and **Manufacturing Processes**, one of which is through Computer-Aided Design, Manufacturing, and Engineering (CAD/CAM/CAE). With this technology, students make digital prototyping starting from concept design with digital 3-dimensional modeling of products, mechanism design, simulation and analysis of engineering performance, making technical drawings, designing and analyzing manufacturing processes, to making assembly models.

In addition, students are also taught about Computer Numerical Control (CNC) technology needed in making products with high precision and accuracy. In manufacturing systems that involve a lot of equipment, raw materials, tools, and other resources, students can **design and engineer manufacturing** systems to increase production productivity, quality, and product selling value.

CAREER OPPORTUNITIES

Graduates of the Ubaya Mechanical and Manufacturing Engineering study program have extensive career opportunities, both in the manufacturing industry or business in the field of Product Design and Manufacturing Technology. All career opportunities related to product design, manufacturing process design, or production systems can be applied to all industrial sectors.

- Engineering Product Designer
- Process Planer
- Mechanical and Manufacturing Entrepreneur
- Tool Designer
- Mould Designer
- Engineering Consultant

CURRICULUM & GRADUATE COMPETENCIES

The Ubaya Mechanical and Manufacturing Engineering study program's curriculum, with excellence in **Product Design, Manufacturing Technology and Manufacturing System Management** is designed to produce graduates who can solve problems and develop manufacturing industries based on Digital Technology and Automation. The curriculum is designed with a load of 144 Semester Credit Units (SKS) that can be completed in a normal study period of 4 years or 8 semesters and to gain experience participating in the Independent Learning Independent Campus (MBKM) program.

The objectives and methods of learning in the design field have been matched with a certification program in engineering design that applies in the industry. Through this program, Ubaya Mechanical and Manufacturing Engineering students can obtain **Certified SOLIDWORKS Associate (CSWA)-Mechanical Design certification (internationally recognized)**. In addition to CAD / CAM / CAE and CNC technology, learning is also supported by **3D Printer and 3D Scanner technology**.

INFORMATICS ENGINEERING
DATA SCIENCE & ARTIFICIAL INTELLIGENCE PROGRAM

Degree: Bachelor of Computing (S.Kom.)

Data Science and Artificial Intelligence (DSAI) is a part of informatics that synergizes computer science and statistics. Currently, DSAI is a rapidly growing field needed by many companies around the world. In the industrial revolution 4.0 era, DSAI plays an essential role in transforming industrial digitalization. The DSAI program is offered to meet the needs of visionary experts in Data Science and Artificial Intelligence.

CURRICULUM

The DSAI Program curriculum is designed to equip students with good informatics knowledge, especially Data Science and Artificial Intelligence, to enable them to apply their knowledge to find innovative solutions to real problems in various domains, including science, technology, business, finance, and industry. Thus, DSAI Program graduates have an excellent chance to compete in the job market in the digital economy era. Topics studied in the DSAI Program include Python Programming for Data Science, Data Mining, Big Data Analytic, Artificial Intelligence, Machine Learning, Deep Learning, Intelligence Information Retrieval, Digital Image Processing, Computer Vision, Multimedia Information Retrieval, Natural Language Processing, Decision Support System, Soft Computing, Internet of Things (IoT), and so on.

GRADUATE COMPETENCIES

DSAI graduates are expected to have technical skills in data exploration to solve complex problems, be able to develop self-learning machines and systems, have the expertise in exploring large-scale data, be able to manage infrastructure and tools for large-scale data, have the expertise to develop intelligent systems, have the expertise to design, be able to conduct research in Data Science and Artificial Intelligence, and analyze information from the results of these studies.

CAREER OPPORTUNITIES

- Data Scientist
- Machine Learning Engineer
- Big Data Engineer
- Intelligent System Developer
- Research Scientist
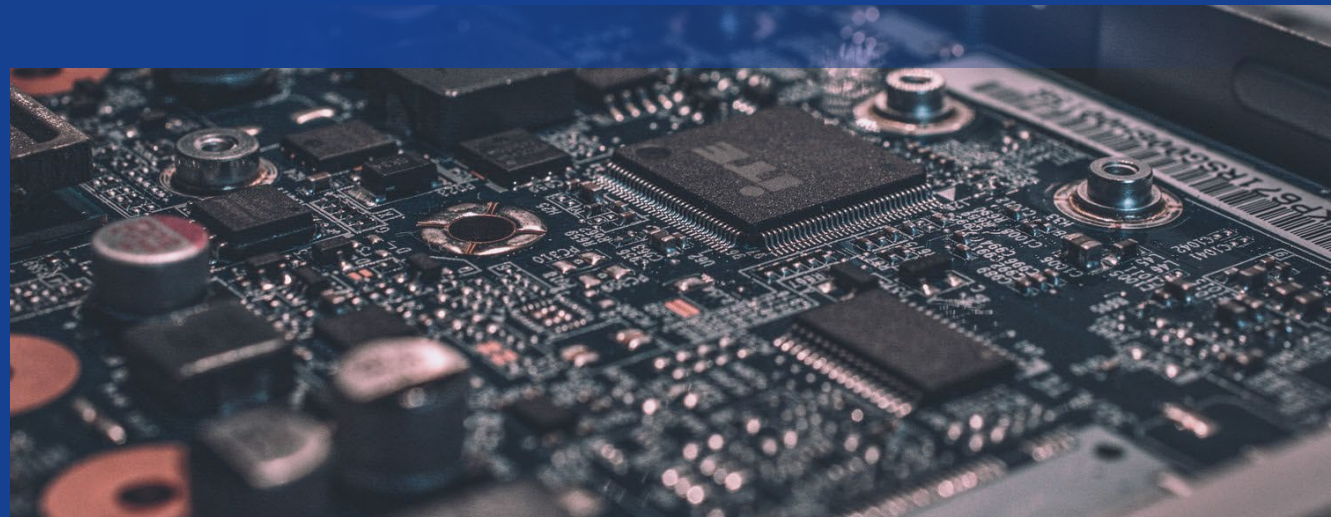
INFORMATICS ENGINEERING
GAME DEVELOPMENT PROGRAM

Degree: Bachelor of Computing (S.Kom.)

Working in the gaming industry has promising prospects after the movie and music entertainment industries. According to the Indonesian Game Association (AGI), the gaming market in Indonesia continues to grow. It is predicted that in 2030, Indonesia will become the top 5 game market worldwide, with a revenue of USD 4.3 billion. Government support is ratified in the Creative Economy Bill to support the interests of the local industry. This Game Development program provides a comprehensive briefing to students about the game development cycle from pre-production to the publishing process.

CURRICULUM

The Game Development curriculum emphasizes technical aspects: learning flow and programming for games, utilization of Artificial Intelligence (AI) for games, physically based animation, mixed reality game development (AR & VR), gameplay design, development and exploration of mobile game technology, game asset development, analysis & design, and entrepreneurship & innovation.

GRADUATE COMPETENCIES

Graduates of this program will have excellent qualifications to contribute to the game industry. Graduates can design and develop game applications that are interesting, creative, and useful.

CAREER OPPORTUNITIES

- Game Programmer
- Virtual/Augmented Reality Producer
- Game Producer
- Game Researcher

INFORMATICS ENGINEERING
NETWORK & CYBER SECURITY PROGRAM

Degree: Bachelor of Computing (S.Kom.)

The Network & Cyber Security program focuses on networking and data security. The curriculum is designed to give graduates good knowledge in informatics, especially data security, Intranet service provision, and Internet and system security, which can be applied to find innovative and safe solutions to real problems in business, science, and technology problems. Thus, the Network & Cyber Security program graduates have an excellent opportunity to compete in the digital economy era and fully support using the latest technology in the Industry 4.0 era.

CURRICULUM

The Network & Cyber Security curriculum is designed with the latest learning flow of the latest needs and technology in computer networks and security. This curriculum is also based on technical and practical aspects of various research topics and the needs required in business and industrial processes. Some major topics covered in the Network & Cyber Security curriculum are IoT, Cryptography, Digital Forensics, Network Infrastructure and Management, and Information Security Management Systems.

GRADUATE COMPETENCIES

Graduates are expected to be able to analyze, design, and implement network and data security in the industrial world and their business processes. The curriculum is divided into Network Infrastructure Technology, Network Security, Data Security, and their implementation in the industrial world. It is designed to make graduates competent in designing and implementing networks with the latest research focus, such as Cloud Computing, IoT, Digital Forensics, Cryptography, and Computer Network Defense.

CAREER OPPORTUNITIES

- System Administrator
- Network and Security Consultant
- Security Specialist
- Security Analyst
- Network Infrastructure Engineer
- Cloud Engineer
- IoT Engineer

INFORMATICS ENGINEERING
INFORMATION MANAGEMENT
& ENTERPRISE SYSTEM PROGRAM

Degree: Bachelor of Computing (S.Kom.)

The Information Management and Enterprise Systems program addresses the management, analysis, consolidation, processing, and presentation of information to support the integration and acceleration of business processes running in various functional areas of enterprise systems with the application of the latest information technology, algorithms, and methodologies.

CURRICULUM

Topics studied in this program include database modeling and management, management information systems, enterprise system implementation, supply chain management accounting systems, business intelligence & data analytics, and many more.

GRADUATE COMPETENCIES

After completing this program, students will have expertise in building an integrated enterprise system ecosystem by applying effective and efficient technologies, algorithms, and methodologies to support the company's competitiveness globally.

CAREER OPPORTUNITIES

- System Analyst
- Database Designer
- Database Administrator
- Enterprise System Engineer
- Enterprise Solution Architect
- Enterprise System Developer
- Information Specialist
- Full Stack Developer
- IT Consultant

INFORMATICS ENGINEERING
DIGITAL MEDIA TECHNOLOGY PROGRAM

Not just design, but design equipped with technology is the soul of the Digital Media Technology Program to answer the needs of various aspects of life and business. Digital media technology products such as games, videos, 2D/3D animations, and interactive web or mobile applications have become daily needs and lifestyles.

CURRICULUM

The curriculum includes multimedia design & technology (games, animation, video) and information technology (mobile technology, web, artificial intelligence). In addition, students will also be equipped with soft skill development, including entrepreneurship, leadership, and professional ethics, so the Digital Media Technology Program graduates are expected to have a balance of knowledge and holistic expertise.

Game to introduce National Heroes

Traditional Fairytale Motion Comic

Protected Animals 3D Museum

GRADUATE COMPETENCIES

Digital Media Technology Program graduates can identify consumer needs and design and implement innovative, interactive, creative, and informative multimedia solutions, supported by aesthetic and communicative interface designs, by utilizing information technology and intelligent systems.

CAREER OPPORTUNITIES

- 2D/3D Modeler
- 2D/3D Animator
- 2D/3D Artist
- Videographer
- Video Editor
- UI / UX Designer

- Game Developer
- Creative Art Director
- Multimedia Artist & Developer
- Web Designer & Developer
- Full Stack Developer

- Apps Developer
- Social Media Content Creator
- New Media Developer
- Multimedia Producer
- IT Developer

INTERNATIONAL PROGRAM

INFORMATICS ENGINEERING
INFORMATION TECHNOLOGY PROGRAM

Degree: Bachelor of Computing (S.Kom.), B.IT.

The Information Technology Program is one of the international programs in Ubaya. The program prepares students to be the leading IT professionals at both national and international levels. The Ubaya Informatics Engineering Department offers the Information Technology Program as a dual-degree program in partnership with the Faculty of Science and Engineering, Queensland University of Technology (QUT), Australia. Students can be awarded dual degrees, *Sarjana Komputer* from Ubaya and Bachelor of Information Technology (BIT) from QUT. The program has been established since 2008 and has already delivered outstanding graduates.

CURRICULUM

The curriculum of the Information Technology Program is designed with 144 credits, consisting of 102 credit points in Information Technology Program, Ubaya and the equivalent of 42 credit points in Faculty of Science and Engineering, QUT. Students study in Computer Science major at QUT. All academic subjects given in this program are delivered in English, excluding Pancasila & Civic Education, Scientific Writing & Presentation, Entrepreneurship & Innovation, and Religion Education.

CAREER OUTCOMES

Information Technology graduates have technical data exploration skills to solve complex problems, able to develop machines and systems that can learn by themselves. Graduates have expertise in exploring large-scale data and are able to manage infrastructure and tools for large-scale data. Graduates also have expertise to develop, design, and conduct research in the fields of Data Science and Artificial Intelligence.

CAREER OPPORTUNITIES

- Data Scientist
- Machine Learning Engineer
- Big Data Engineer
- Intelligent System Developer
- Research Scientist

INFORMATION SYSTEM
IT ENTERPRISE MANAGEMENT & STRATEGY | DIGITAL BUSINESS ANALYTICS

Information Technology has an important role in supporting business growth in various sectors. The Ubaya Information System Study Program is ready to meet these challenges through curriculum design with an approach from information technology and business aspects.

In the **technological aspect**, students study various components of information systems such as hardware, software, data, procedures, humans/users, as well as networks and communications to process data into information. In the **business aspect**, students study management concepts and various business processes in companies, as well as forms of support for the application of information technology. The combination of mastery in these two aspects forms the unique-ness of the study program, namely focusing on developing and integrating various business processes in a company information system. This uniqueness was established to answer the needs of the business community for a profession that can not only carry out the role as a business system designer but also as an information system application programmer, especially in companies.

Equipped with the best facilities and resources, the Ubaya Information System Program is ready to enable students to become part of the **"Creative and Young Digital Business Professionals"** community.

There are two specializations that students can choose, including:
1. **IT Enterprise Management & Strategy**: ability to manage IT infrastructure and strategic planning in the company;
2. **Digital Business Analytics**: ability to analyze business data to produce information and knowledge that can provide added value to the business.

CAREER OPPORTUNITIES

- ERP Specialist
- Business System Analyst
- Database Specialist
- System Analyst
- Data Analyst
- Software Engineer

To be an engineering higher educational institution that produces excellent graduates, research, and service with contribution to the society, in order to aspire for international reputation.

INFORMATION

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