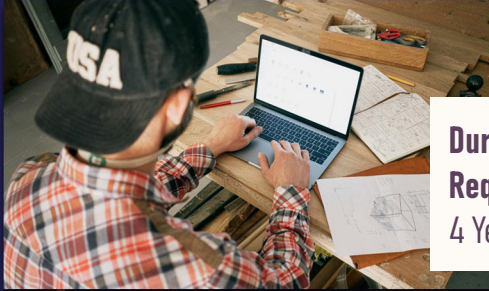## Faculty of

Engineering

AIN SHAMS NATIONAL UNIVERSITY

Academic Programs

For more details:

support@asu.edu.eg

Digital Manufacturing and Materials Engineering

Duration of Study / Total Credit Hours Required for Graduation:
4 Years / 144 Credit Hours

Language of Studying in the Program:
English

Career Opportunities

- Digital Manufacturing Engineer
- Materials Development Engineer
- Additive Manufacturing Specialist (3D Printing)
- Process and Quality Control Engineer
- Industrial Automation Engineer
- Computer-Aided Design/ Manufacturing/ Engineering (CAD/CAM/CAE) Engineer
- Production Planning and Scheduling Specialist
- Supply Chain Analyst
- Research and Development (R&D) Engineer
- Technical Sales Engineer or Applications Engineer in Manufacturing Technology

Target Employment Sectors:

- Automotive and Aerospace Industry
- Oil, Gas, and Petrochemical Industries
- Metal and Alloy Processing
- Industrial Automation

Program/Faculty Classification:

B.Sc. in Mechanical Engineering / Faculty of Engineering

Digital Manufacturing and Materials Engineering

Why choose to join The Digital Manufacturing and Materials Engineering program ?

The Digital Manufacturing and Materials Engineering program integrates materials science with advanced manufacturing technologies, preparing students to meet the demands of future industries. The program emphasizes understanding the relationship between material composition, properties, and applications, enabling students to develop advanced materials for use in sectors such as mechanical systems, petroleum, medicine, electronics, and nanotechnology.

Students acquire advanced skills in digital manufacturing, including process design, automation, smart systems, and quality assurance. The program equips graduates to innovate in material selection, optimize production systems, and enhance industrial process efficiency, aligning with global demand for sustainable and high-performance manufacturing. This interdisciplinary program addresses national and regional needs for advanced engineering education while aligning with global trends in technological development.
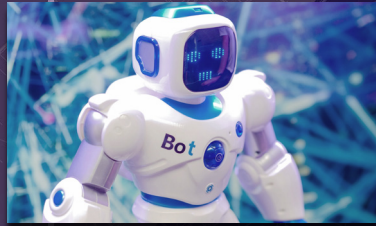

Digital Manufacturing and Materials Engineering

Robotic and Autonomous Systems Engineering

Duration of Study / Total Credit Hours Required for Graduation:
4 Years / 144 Credit Hours

Language of Studying in the Program: English

Potential Career Paths:

Industrial Automation and Robotics:
- Robotics/Automation Engineer
- Systems Integration Specialist

Automotive Industry:
- Autonomous Vehicle Engineer
- Robotic Control Engineer

Healthcare Engineering:
- Robotic Surgery Specialist Engineer
- Prosthetics Designer
- Rehabilitation Robotics Engineer

Agriculture and Environmental Management:
- Agricultural Robotics Engineer
- Environmental Monitoring Specialist

Logistics and Supply Chain:
- Autonomous Systems Engineer
- Drone Technology Specialist
- Warehouse Automation Engineer

Potential Career Paths:

Research and Development:

- Robotics Researcher
- Artificial Intelligence Developer
- Innovation Consultant

Defense and Security:

- Surveillance Systems Engineer
- Unmanned Systems Operator
- Autonomous Aerial Vehicle Engineer
- Autonomous Underwater Vehicle Engineer

Program/Faculty Classification:

B.Sc. in Mechanical Engineering / Faculty of Engineering

Robotic and Autonomous Systems Engineering

Why choose to join the Robotics and Autonomous Systems Engineering program ?

The Robotics and Autonomous Systems Engineering program focuses on preparing engineers capable of designing and developing intelligent robotic systems that operate autonomously and make independent decisions.

The program integrates multiple disciplines, including mechanical engineering, electrical and electronics engineering, control systems engineering, software engineering, and artificial intelligence, providing students with a comprehensive scientific foundation and advanced technical skills. These intelligent robotic systems are utilized across diverse fields, including—but not limited to—industrial process automation, advanced robotic manufacturing and production, autonomous vehicles (cars, aircraft, and submarines), smart agriculture, robotic-assisted healthcare and remote surgery, smart home assistance systems, autonomous navigation, and search-and-rescue operations.

The program aims to graduate qualified professionals capable of leading and adapting to the 4th and 5th Industrial Revolutions while meeting the demands of future labor markets, which increasingly rely on automation, robotics, and intelligent systems. Graduates will contribute to developing innovative smart solutions that enhance quality of life, strengthen the national economy through advanced technology, and support digital transformation and autonomous systems development. This will reinforce Egypt's regional and global standing in innovation and enable graduates to actively contribute to cutting-edge technological advancements across vital industries and sectors. The program emphasizes the development of sustainable and intelligent solutions that address future challenges while promoting societal well-being and environmental protection.

Robotic and Autonomous Systems Engineering

Computational Architecture and Intelligent Urban Design

Duration of Study / Total Credit Hours Required for Graduation:
4 Years / 144 Credit Hours

Language of Studying in the Program:
English

Potential Career Paths:

- Computational Designer
- Building Information Modeling (BIM) Specialist
- Smart City Planner
- Urban Data Analyst

Target Employment Sectors:

- Government Ministries
- Municipalities & Urban Planning Authorities
- International Development Agencies
- Engineering & Construction Firms, Design & Planning Consultancies
- Architectural & Urban Consulting Centers
- Research Institutions & Non-Governmental Organizations (NGOs)

Program/Faculty Classification:

B.Sc. in Architectural Engineering / Faculty of Engineering

Why choose to join the Digital Architecture and Intelligent Urban Design program ?

The Digital Architecture and Intelligent Urban Design program is an integrated academic program designed to prepare architecture engineers capable of employing cutting-edge digital technologies and artificial intelligence in architectural and urban design domains. The program focuses on developing students' competencies in utilizing advanced tools including computational design, Building Information Modeling (BIM), Geographic Information Systems (GIS), Internet of Things (IoT), and smart city analytics. This equips them to design sustainable, intelligent urban environments that adapt to evolving human needs and environmental challenges.

Through an interdisciplinary curriculum, students learn to apply digital design technologies, parametric modeling, generative design, preference mechanisms, and digital fabrication, while integrating virtual and augmented reality technologies into design and construction processes. The program fosters critical and creative thinking, encouraging students to adopt innovative solutions for achieving energy efficiency and environmental sustainability in buildings and urban areas, with particular emphasis on global standards for smart urban development.

Computational Architecture and Intelligent Urban Design

Why choose to join the Digital Architecture and Intelligent Urban Design program ?

The program emphasizes developing students' abilities to work in multidisciplinary teams, communicate effectively, and make data-driven decisions through urban information analysis. Upon graduation, students will be qualified to lead advanced architectural and urban projects that combine creativity with technological precision. Graduates will be prepared to work in competitive environments both locally and internationally, contributing to the development of smart, sustainable cities that meet future requirements while enhancing community wellbeing and environmental protection. Key features include:

- Comprehensive training in digital architectural technologies
- Focus on sustainable smart city development
- Interdisciplinary approach integrating multiple technical domains
- Emphasis on practical applications and real-world problem solving
- Preparation for global professional practice

The program maintains rigorous academic standards while addressing contemporary challenges in urban development through technological innovation.

Computational Architecture and Intelligent Urban Design

Electronics and Artificial Intelligence Engineering

Duration of Study / Total Credit Hours Required for Graduation:
4 Years / 144 Credit Hours

Language of Studying in the Program:
English

Career Prospects for Graduates:

Graduates of this program will attain mastery in technical leadership skills within the fields of Electronics Engineering and Artificial Intelligence (AI). These disciplines are currently among the fastest-growing engineering domains worldwide, driven by rapid advancements in areas such as:

- Intelligent Systems
- Machine Learning
- Multimedia Systems
- Data Science
- Cloud Computing
- Cybersecurity & Network Security

- Internet of Things (IoT)
- Embedded Systems
- Computer Engineering
- Electronic Design Automation (EDA)
- VLSI Systems, among others.

Graduates are expected to contribute as highly skilled engineers, capable of effective collaboration and innovation in their respective specializations.

Career Opportunities:

The Electronics and AI Engineering program equips graduates with access to high-level career prospects in:

- Electronics Engineering
- Artificial Intelligence & Machine Learning
- Networks & Communications
- Software Engineering
- Distributed & Mobile Computing
- Embedded Systems
- Cybersecurity
- Multimedia Systems
- Data Science, and related fields.

This program addresses the rising demand for professionals in this field, meeting labor market needs at the local, regional, and international levels

Program/Faculty Classification:

B.Sc. in Electrical Engineering / Faculty of Engineering

Why choose to join the Electronics and Artificial Intelligence Engineering program ?

The Electronics and Artificial Intelligence Engineering program is designed to meet the growing demand for skilled electronics and computer engineers in the local market, specializing in electronics engineering and AI applications.

The rapid expansion of the electronics and AI sectors has outpaced the supply of qualified professionals.

This program offers an interdisciplinary curriculum combining electronics engineering, computer engineering, and business knowledge, equipping students with the fundamental principles and technical skills required to thrive in today's fast-evolving computing and electronics industries.
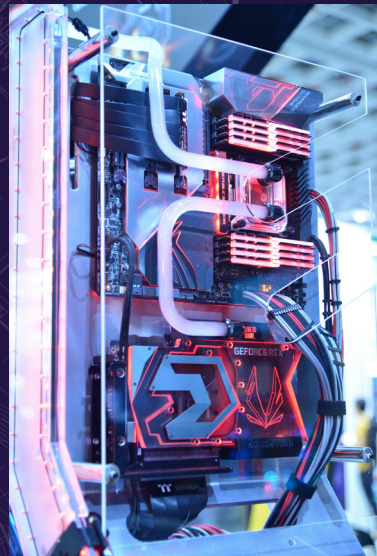
The curriculum spans both technical and non-technical domains, covering:

· The nature of information and organizational requirements in electronics and computer engineering.
· Innovative techniques to address industry demands.
· Critical professional skills in communication, design, development, and management necessary for component creation, implementation, and system validation.

Additionally, the program fosters organizational and managerial competencies, preparing graduates to meet national, regional, and international labor market needs.

Electronics and Artificial Intelligence Engineering

Civil Engineering and Environmental Informatics

Duration of Study / Total Credit Hours Required for Graduation:
4 Years / 144 Credit Hours
Language of Studying in the Program: English

Career Prospects for Graduates:

- Environmental/Civil Engineer
- Smart Infrastructure Planner
- Urban Sustainability Specialist
- Water Resources Engineer
- Air Quality/Noise Pollution Analyst
- Ecological Systems Data Analyst
- Green Infrastructure Designer
- AI & Data Science Engineer (Environmental Applications)
- Environmental Policy Expert (with Technical Background)
- Resilient Infrastructure Researcher (with Expertise in Environment & Transportation)

Target Employment Sectors:

· Government Ministries (e.g. Transportation, Housing, Environment)
· Municipalities & Urban Planning Authorities
· International Development Agencies (UN, World Bank)
· Engineering & Construction Firms
· Environmental Consulting Companies
· Research Institutions & NGOs

Program/Faculty Classification:

B.Sc. in Civil Engineering / Faculty of Engineering

Civil Engineering and Environmental Informatics

Why choose to join the Civil Engineering and Environmental Informatics program ?

The Civil Engineering and Environmental Informatics program focuses on the scientific assessment and development of engineering solutions for civil engineering challenges with environmental impacts. These challenges include issues such as safe drinking water, wastewater treatment, solid and hazardous waste disposal, outdoor and indoor air pollution, transportation-related noise pollution, human and environmental health risk management, and pollution prevention through product or process design. Given the complexity of these environmental challenges and the vast amounts of associated data, informatics becomes essential for mastering methodologies and developing tools to transform complex big data into actionable insights.

The Bachelor of Science in Civil Engineering and Environmental Informatics aims to prepare civil and environmental engineers capable of utilizing advanced modern technologies while developing the necessary hardware and software tools to predict and better manage environmental needs. The program emphasizes clean environments and the planning of green infrastructure in alignment with smart city concepts.

Graduates will develop critical analytical, decision-making, and data modeling skills, which are essential for the job market and for conducting ongoing research to solve complex environmental problems using appropriate tools, including artificial intelligence. They will be qualified to work in local and global multidisciplinary environments, addressing challenges in civil and environmental engineering by integrating contributions from engineers, scientists, lawyers, business professionals, and the public.

Civil Engineering and Environmental Informatics