

University of Technology

الجامعة التكنولوجية



First Cycle – bachelor's degree (B.Sc.) – Information Engineering

بكالوريوس هندسة - هندسة معلومات



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1. **Mission & Vision Statement**

Vision Statement

Envisioning a future where Information Engineering propels the frontier of innovation, leveraging the immense power of Machine Learning and Data Science to revolutionize Engineering Technologies. We aspire to create cutting-edge solutions that drive efficiency, improve decision-making, and catalyze transformative change across all sectors of industry. Our commitment is to build technologies that harness data not just as numbers, but as a guiding light to navigate the complex landscapes of tomorrow's engineering challenges. Together, we will shape a world where technology is designed and optimized intelligently, enhancing human potential, sustainability, and progress.

Mission Statement

Our mission is to integrate and enhance Information Engineering with the evolving tools of Machine Learning and Data Science to advance the realm of Engineering Technologies. We commit to developing state-of-the-art solutions that optimize operations, support informed decisions, and instigate impactful changes across various industry sectors. We strive to understand and utilize data beyond raw numbers, transforming it into powerful insights and foresights that will navigate complex future engineering obstacles. Our ultimate goal is to design intelligently optimized technology that amplifies human potential, upholds sustainability, and drives forward progress. Together, we are fostering an environment where data-driven decision making and artificial intelligence power the engineering marvels of tomorrow.

2. **Program Specification**

Programme code:	BSc-INE	ECTS	240
Duration:	4 levels, 8 Semesters	Method of Attendance:	Full Time

As you contemplate the future, consider joining us in an adventure of the mind where Information Engineering, Machine Learning, and Data Science intersect to redefine Engineering Technologies. Picture a journey where you won't just consume knowledge but create it, a journey where you're not just a student but a future problem-solver. Enroll in this module to decode the mysteries of data, harness the power of machine learning, and leverage these powerful tools to build and shape the world around you. We're on the cusp of revolutionary change and need bright, ambitious minds like yours to help create it. Come be part of the innovation that's transforming industries and creating a sustainable future for us all. Embark on this journey and witness how your knowledge can pave the path to incredible discoveries and engineering marvels.

In the initial stage, Level 1, students will build a sturdy foundation in the fundamental principles of Information Engineering, Machine Learning, and Data Science. Key concepts, terminologies, and the

pivotal role of data in decision-making and problem-solving will be thoroughly explored. This phase marks the beginning of your journey, providing you with the essential knowledge of basic machine learning algorithms and integral aspects of engineering technologies. As students ascend to Level 2, they will delve deeper, applying learned concepts in practical scenarios. This stage is characterized by hands-on experience with machine learning models, data mining techniques, and information engineering systems, coupled with the effective communication of complex data insights through visualization techniques.

Continuing the journey, Level 3 will offer a dive into the technical intricacies of these subjects. This stage is about mastering advanced machine learning and data science algorithms, gaining expertise in predictive analytics, deep learning, and complex information engineering systems. Students will engage with challenging projects and case studies that replicate real-world situations, fostering an environment of active learning and practical application. Finally, Level 4 represents the culmination of your journey – the achievement of mastery. At this stage, students will be equipped not only to understand and employ existing methods and technologies but to innovate and contribute new ideas to the field. The focus here is on current research, advancements, and their application to engineering problems. With a capstone project to showcase their proficiency and creativity in Information Engineering using machine learning and data science, students will truly demonstrate their readiness to shape the future of technology.

3. Program Objectives

1. **Comprehensive Understanding:** Provide students with an in-depth knowledge of Information Engineering, Machine Learning, and Data Science, along with core principles of Computer and Software Engineering, and foundational aspects of Security in these fields.
2. **Practical Application:** Equip students to apply the learned concepts to real-world scenarios, including development and optimization of software, computer systems, and secure machine learning models.
3. **Technical Proficiency:** Develop students' proficiency in advanced machine learning and data science algorithms, predictive analytics, deep learning, software development, computer system engineering, and cybersecurity strategies.
4. **Research & Innovation:** Create an environment that encourages students to engage with and contribute to cutting-edge research in all areas, stimulating innovation in engineering technologies, secure software development, and computer systems.
5. **Problem-Solving Skills:** Foster students' ability to solve complex, real-world problems by leveraging data-driven insights, machine learning tools, secure software development techniques, and computer systems engineering solutions.
6. **Professional Development:** Prepare students for diverse career paths in the rapidly evolving tech industry, from data science roles to software engineering and cybersecurity positions.

7. **Ethics & Responsibility:** Promote understanding and adherence to ethical guidelines and responsibilities in handling data, deploying machine learning models, developing software, engineering computer systems, and ensuring their security.
8. **Communication Skills:** Cultivate the ability to effectively communicate complex data insights, machine learning concepts, software engineering processes, computer systems design, and security protocols to various audiences.

4. Student Learning Outcomes

Upon completion of this program, students will exhibit a robust understanding of Information Engineering, Machine Learning, Data Science, Computer and Software Engineering, and Cybersecurity principles. They will demonstrate the ability to apply these concepts to practical, real-world situations, showing proficiency in software development, system engineering, and secure machine learning model creation. Students will showcase problem-solving abilities by using data-driven insights and various technical tools to address complex challenges. They will actively engage with and contribute to cutting-edge research, driving innovation in their respective fields. In addition, students will be prepared for diverse careers within the rapidly-evolving tech industry, demonstrating adherence to ethical standards and effective communication of complex insights and concepts. This holistic skillset will empower students to shape the future of technology with innovation, security, and responsibility.

Outcome 1

Understanding Core Concepts: Students will demonstrate a comprehensive understanding of the principles and concepts of Information Engineering, Machine Learning, Data Science, Computer and Software Engineering, and Cybersecurity.

Outcome 2

Practical Application Skills: Students will exhibit the ability to apply learned theories and concepts to real-world scenarios, including the development of secure software and machine learning models.

Outcome 3

Research and Innovation Capabilities: Students will demonstrate the capacity to engage with and contribute to the latest research in the field, fostering innovation in engineering technologies.

Outcome 4

Problem-Solving Skills: Students will display their ability to solve complex real-world problems by effectively leveraging data-driven insights and technical tools.

Outcome 5

Career Readiness: Students will be well-prepared for diverse career opportunities within the dynamic tech industry, including roles in data science, software engineering, and cybersecurity.

Outcome 6

Ethical Awareness: Students will show understanding and adherence to ethical guidelines and responsibilities related to data handling, software development, machine learning model deployment, and security practices.

Outcome 7

Communication Skills: Students will prove their ability to effectively communicate complex data insights, machine learning concepts, software engineering processes, and security protocols to a variety of audiences.

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6. Credits, Grading and GPA

Credits

University of Technology is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4-year B.Sc. degree:

$$\text{CGPA} = [(1^{\text{st}} \text{ module score} \times \text{ECTS}) + (2^{\text{nd}} \text{ module score} \times \text{ECTS}) + \dots] / 240$$

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ELCA111	Electrical Circuits Analysis	93	82	7.00	B	
MATH112	Mathematics I	48	102	6.00	B	
LOCD113	Logic Circuits Design	93	82	7.00	C	
ENDA114	Engineering Drawing and Autocad	63	37	4.00	B	
ENLA107	English language	33	17	2.00	S	
WSHE106	Workshops	90	10	4.00	S	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PRSP121	Problem Solving and Programming	108	67	7.00	C	
MATH122	Mathematics II	48	77	5.00	B	
PECD123	Physics and Electronic Circuits Design	93	57	6.00	B	
DISD124	Digital Systems Design	93	57	6.00	B	
DEHR105	DEMOCRACY	33	17	2.00	S	
WSHE106	Workshops	90	10	4.00	S	

8. **Contact**

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