

Program Catalogue

**First Cycle – Bachelor's degree (B.Sc.)
Kut University College
Department of Electrical Engineering Techniques**

**بكالوريوس
في تقنيات الهندسة الكهربائية (الدورة الأولى)**

Program Catalogue Bachelor's degree (B.Sc.)
Department of Electrical Engineering Techniques | 2023-2024

Table of Contents / المحتويات جدول

1. Mission & Vision Statement
2. Program Specification
3. Program (Objectives) Goals
4. Program Student learning outcomes
5. Academic Staff
6. Credits, Grading and GPA
7. Modules

1. Mission & Vision Statement

Vision Statement

At the Electrical Engineering Techniques department, our vision is to be a globally recognized leader in electrical engineering education, research, and innovation. We strive to empower our students with the knowledge, skills, and ethical values necessary to excel in the rapidly evolving field of electrical engineering. Through cutting-edge research, industry collaborations, and community engagement, we aim to make significant contributions to the advancement of electrical engineering techniques and their applications. Our vision is to foster a culture of excellence, creativity, and inclusivity, where students, faculty, and staff are inspired to push the boundaries of knowledge and contribute to the betterment of society. By producing highly skilled graduates and pioneering breakthrough research, we envision shaping the future of electrical engineering, addressing emerging challenges, and driving technological advancements that transform industries, enhance sustainability, and improve the quality of life for people worldwide.

Mission Statement

The mission of the Electrical Engineering Techniques Engineering department is to provide a comprehensive and exceptional education that prepares students to become skilled electrical engineers capable of meeting the complex challenges of the modern world. Through a rigorous curriculum, hands-on laboratory experiences, and industry-relevant projects, we aim to equip our students with the technical expertise, critical thinking abilities, and practical skills required for success in the field of electrical engineering. We are committed to fostering a dynamic learning environment that promotes innovation, collaboration, and lifelong learning. Our faculty, consisting of accomplished educators and researchers, is dedicated to delivering high-quality instruction, conducting impactful research, and engaging in professional development to stay at the forefront of the discipline.

In line with our mission, we actively seek partnerships with industry leaders, government agencies, and research institutions to facilitate knowledge exchange, promote applied research, and address real-world challenges. By cultivating strong ties with the industry, we ensure our curriculum remains relevant and aligns with the needs of employers, thus enhancing the employability of our graduates.

Furthermore, we strive to instill ethical values, social responsibility, and a commitment to sustainable practices in our students. We aim to produce engineers who are not only technically proficient but also conscious of the impact of their work on society and the environment. Ultimately, our mission is to empower our students to become innovative problem solvers, leaders, and agents of positive change in the field of electrical engineering. We are dedicated to contributing to the advancement of knowledge, fostering economic growth, and improving the well-being of individuals and communities through excellence in education, research, and service.

2. Program Specification

Program code:

BSc-ENG EET ECTS

240 Duration:

4 levels, 8 Semesters Method of Attendance:

Full Time

The Electrical Engineering College offers a comprehensive and rigorous undergraduate program in Electrical Engineering. The program is designed to provide students with a solid foundation in electrical engineering principles, advanced technical knowledge, and practical skills. It equips students with the expertise required to design, analyze, and optimize electrical systems, as well as to contribute to technological advancements in various industries.

Educational Objectives:

The program aims to achieve the following educational objectives:

- A. Technical Excellence: Graduates will possess a strong understanding of electrical engineering theories, principles, and practices. They will demonstrate proficiency in applying this knowledge to analyze and solve complex engineering problems related to power systems, electronics, control systems, and telecommunications.
- B. Professional Competence: Graduates will be well-prepared to embark on successful careers in the electrical engineering industry or pursue advanced studies. They will exhibit the ability to adapt to technological advancements, work effectively in multidisciplinary teams, and demonstrate strong communication and leadership skills.
- C. Innovation and Research: Graduates will be equipped with the skills necessary to contribute to research and innovation in electrical engineering. They will demonstrate the ability to identify emerging challenges, develop creative solutions, and apply new technologies to address real-world problems.
- D. Ethical and Social Responsibility: Graduates will understand and adhere to ethical standards and professional codes of conduct. They will recognize the importance of social responsibility, sustainability, and the impact of their work on individuals, communities, and the environment.

Curriculum:

The curriculum of the Electrical Engineering College is designed to provide students with a comprehensive understanding of electrical engineering principles, while allowing flexibility for specialization. The program includes core courses covering key areas such as:

- A. Mathematics, Physics, and Engineering Sciences
- B. Circuit Analysis and Design
- C. Electromagnetic Fields and Waves.
- D. Power Systems and Energy Conversion.
- E. Electronics and Integrated Circuits.
- F. Control Systems and Automation.
- G. Communication Systems and Networks.
- H. Digital Signal Processing.
- I. Renewable Energy Technologies.
- J. Engineering Ethics and Professional Development.

In addition to the core courses, students can choose from a range of elective courses to tailor their studies according to their interests and career goals.

Laboratory Facilities:

The Electrical Engineering College provides state-of-the-art laboratory facilities equipped with modern instruments, software tools, and simulation platforms. The labs cover areas such as circuit analysis, power systems, electronics, control systems, communication systems, and digital signal processing. These facilities enable students to gain hands-on experience, reinforce theoretical concepts, and develop practical skills.

Industry Collaboration and Internships:

The college actively collaborates with industry partners to provide students with opportunities for internships, cooperative education programs, and industry-driven projects. These collaborations enhance students' practical knowledge, expose them to real-world engineering challenges, and foster connections with potential employers.

Student Support and Development:

The college is committed to supporting the personal and professional development of its students. Academic advisors provide guidance and support in academic planning, course selection, and career development. The college also offers workshops, seminars, and professional development activities to enhance students' soft skills, leadership abilities, and job readiness.

Continuous Program Improvement:

The Electrical Engineering College regularly assesses and evaluates the program to ensure its alignment with industry trends and emerging technologies. Feedback from students, alumni, employers, and faculty is gathered and used to improve curriculum content, teaching methodologies, and laboratory facilities.

By adhering to this program specification, the Electrical Engineering College aims to produce well-rounded graduates who are equipped with the knowledge, skills, and ethical values necessary to excel as electrical engineers. The program prepares students for successful careers in various industries and instills in them a commitment to lifelong learning, innovation, and societal impact.

3. Program Goals

The Electrical Engineering Techniques program aims to achieve the following goals:

- **Rigorous Technical Education:** Provide students with a comprehensive and rigorous education in electrical engineering principles, theories, and practices. Develop a strong foundation in mathematics, physics, and engineering sciences to enable students to analyze and solve complex engineering problems.
- **Breadth and Depth of Knowledge:** Offer a curriculum that covers a broad range of electrical engineering disciplines, including circuits and systems, electronics, power and energy systems, control systems, communications, and signal processing. Provide opportunities for students to specialize in areas of their interest through elective courses and research opportunities.
- **Hands-on Experience and Laboratory Skills:** Foster practical skills through hands-on laboratory experiences, design projects, and simulations. Develop proficiency in using state-of-the-art equipment, software tools, and computer-aided design (CAD) techniques to design, build, and test electrical systems and devices.
- **Critical Thinking and Problem Solving:** Cultivate students' critical thinking abilities, problem-solving skills, and the ability to apply engineering principles to real-world challenges. Encourage innovative and creative thinking to develop novel solutions and approaches to engineering problems.

- **Research and Innovation:** Encourage students to engage in research activities and develop a passion for innovation. Provide opportunities for undergraduate research projects, participation in research labs, and collaboration with faculty members on cutting-edge research in electrical engineering.
- **Ethical and Professional Responsibility:** Instill ethical values, social responsibility, and professional integrity in students. Emphasize the importance of adhering to ethical standards, considering the societal impact of engineering work, and practicing engineering in a responsible and sustainable manner.
- **Effective Communication and Teamwork:** Foster effective communication skills, teamwork, and leadership abilities. Provide opportunities for students to work in multidisciplinary teams, collaborate on projects, and effectively communicate their ideas and findings.
- **Lifelong Learning and Adaptability:** Promote a culture of continuous learning and professional development. Prepare students to adapt to evolving technologies, industry trends, and societal needs in electrical engineering throughout their careers.

4. Student Learning Outcomes

➤ **Outcome 1 (Technical Knowledge and Skills)**

Demonstrate a deep understanding of electrical engineering principles, theories, and concepts. Apply mathematical and scientific knowledge to analyze and solve complex engineering problems in areas such as circuits and systems, electronics, power and energy, control systems, and communications.

➤ **Outcome 2 (Design and Problem-Solving Abilities)**

Apply engineering principles and techniques to design electrical systems, components, and devices that meet specified requirements. Develop the ability to identify, formulate, and solve engineering problems, considering technical, economic, environmental, and societal constraints.

➤ **Outcome 3 (Laboratory and Experimental Skills)**

Demonstrate proficiency in using laboratory equipment, tools, and software to conduct experiments, measurements, and simulations. Analyze and interpret experimental data and communicate findings effectively.

➤ **Outcome 4 (Technical Communication)**

Communicate technical ideas and concepts effectively through oral presentations, technical reports, and documentation. Demonstrate the ability to explain complex engineering concepts to both technical and non-technical audiences.

➤ **Outcome 5 (Teamwork and Collaboration)**

Work effectively as a member of a team in multidisciplinary settings. Collaborate with peers to solve engineering problems, manage projects, and contribute to group projects.

➤ **Outcome 6 (Ethical and Professional Responsibility)**

Understand and adhere to ethical standards and professional codes of conduct in engineering practice. Recognize the social, environmental, and economic impact of engineering solutions and make informed decisions considering these factors.

➤ **Outcome 7 (Lifelong Learning and Professional Development)**

Recognize the importance of lifelong learning and engage in professional development activities to stay updated with advances in electrical engineering. Demonstrate the ability to learn independently, adapt to new technologies, and engage in self-directed learning.

➤ **Outcome 8 (Research and Innovation)**

Demonstrate an appreciation for research and innovation in electrical engineering. Engage in research projects, explore new ideas, and contribute to advancements in the field through creativity and critical thinking

5. Credits, Grading and GPA

Credits

Middle Technical University 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 30 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.				

6. 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
EET1101	DC Electrical Circuits	94	106	8	C	LRM
EET1102	Digital Technologies	94	56	6	C	LRM
EET1103	Arabic Language	32	18	2	B	None
EET1104	Differential Mathematics	93	57	6	S	LRM
EET1105	Engineering Workshops	63	87	6	S	None
EET1106	Human Rights and Democracy	32	18	2	B	LRM

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
EET1201	Engineering Mechanics	64	86	6	B	None
EET1202	English Language (Beginner)	33	17	2	B	None
EET1203	Engineering Drawing	63	62	5	B	None
EET1204	AC Electrical Circuits	94	106	8	C	LRM
EET1205	Integral Mathematics	93	57	6	S	LRM
EET1206	Computer Principles	49	26	3	S	LRM

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
EET2101	DC Generators	94	56	6	C	LRM
EET2102	Electronic Essentials	79	46	5	C	LRM
EET2103	Electrical Circuit Analysis	79	46	5	C	LRM
EET2104	Sensors	64	36	4	C	LRM
EET2105	Applied Mathematics	78	47	5	S	LRM
EET2106	Computer Applications	49	26	3	S	LRM
EET2107	Baath Party Crimes of the Ba'ath regime in Iraq	32	18	2	B	None

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
EET2201	DC Motors	94	56	6	C	LRM
EET2202	Electronic Circuits	79	46	5	C	LRM
EET2203	Advanced Electrical Circuits Analysis	79	46	5	C	LRM
EET2204	Instruments and Measurements	79	71	6	C	LRM
EET2205	Engineering Analysis	78	72	6	B	LRM
EET2206	English Language (Intermediate)	33	17	2	B	None

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
EET3101	Principles of Power Engineering	109	41	6	C	LRM
EET3102	DC Power Conversions	79	46	5	C	LRM
EET3103	Electrical Transformers and Induction Machines	79	46	5	C	LRM
EET3104	Electromagnetic Fields	48	77	5	C	LRM

EET3105	Microprocessor	79	46	5	C	LRM
EET3106	Numerical Analysis	63	37	4	B	LRM

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
EET3201	Advanced Power Engineering	109	66	7	C	LRM
EET3202	AC Power Conversions	94	56	6	C	LRM
EET3203	Synchronous and Special Machines	79	46	5	C	LRM
EET3204	Digital Controllers	109	66	7	C	LRM
EET32XX	Elective 1	79	46	5	E	LRM

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
EET4101	Transmission and Distribution Systems	79	46	5	C	LRM
EET4102	Electric Machine Drives	79	46	5	C	LRM
EET4103	Power Systems Analysis	79	46	5	C	LRM
EET4104	Electric Power Generation Stations	79	46	5	C	LRM
EET4105	Control Systems Analysis	79	46	5	C	LRM
EET4106	Project 1	93	32	5	C	LRM

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
EET4201	Professional Ethics	48	27	3	S	None
EET4202	Power System Protection	79	46	5	C	LRM
EET4203	Stability of Power Systems	79	46	5	C	LRM
EET4204	High Voltage Techniques	94	81	7	C	LRM
EET4205	Project 2	93	32	5	C	LRM
EET42XX	Elective 2	79	46	5	E	LRM

Elective Modules

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
EET3206	Communication Systems	79	46	5	E	LRM
EET3207	Digital Signal Processing	79	46	5	E	LRM
EET4206	Modeling and Simulation	79	46	5	E	LRM
EET4207	Modern Control Systems	79	46	5	E	LRM
EET4208	Sustainable Energy	79	46	5	E	LRM
EET4209	Industrial Management	79	46	5	E	LRM