

**بكالوريوس تقنيات الهندسة الكهربائية**

Bachelor's degree in Electrical Engineering Techniques



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1. **Vision and Mission Statement**

**Vision:**

The vision of the Department of Electrical Engineering Techniques is to be a distinguished global center for the education and training of students, graduates, and specialized professionals in the fields of Electrical And Electronics technologies, and to be a pioneer in research and development in this field.

**Mission:**

The Department of Electrical Engineering Techniques trains its students on the development and maintenance of Electrical and Electronics devices, power system transmission and distribution, Motor drives system modern control of electrical and electronic devices and systems The department tries to improve its students' skills and provide them with the necessary knowledge to keep up with the latest advancements in this field.

The department offers courses in areas such as fundamentals of electrical circuits, control and automation, engineering design, industrial design, advanced manufacturing, and other related fields. The dpartment help the student and encourage them to in all electrical Field Technologies.

 **Graduate Objectives**

The field of Electrical Engineering Techniques is considered one of the modern disciplines that revolves around the design, development, and maintenance of medical devices and equipment used in diagnosis, treatment, monitoring, and analysis in healthcare. It is one of the most important departments that provides technical support to medical institutions and healthcare centers. Among the main objectives of the medical instrumentation engineering techniques department are:

1. Designing and developing modern medical devices and tools that help improve the quality of healthcare and provide optimal diagnosis and treatment for patients.
2. Training and qualifying medical technicians and providing them with the necessary skills and knowledge to deal with modern medical devices, maintain and operate them properly.
3. The Collaborating with physicians and healthcare institutions to provide the necessary technical support for operating medical devices correctly and effectively.
4. Continuous research and development in the field of medical instrumentation engineering techniques, improving the performance, efficiency, and overall safety of medical devices.
5. Compliance with health and technical standards and regulations applied in the medical process, ensuring patient safety and treatment effectiveness.
6. **General objectives of the department:**
7. Conducting scientific research in several biomedical fields, with an emphasis on applied research, to keep up with scientific and technological growth.
8. Reaching out to the community by offering scientific courses in areas of specialty as well as continuing education courses will help building and construction employees at all levels.
9. Providing engineering consulting for various medical engineering.
10. Continuing communication with graduates contributes to their continuous growth and provides input to the department in developing curriculum to suit the job market.
11. **Scientific and practical description:**
* Electrical engineers develop new technologies and create designs for the medical sector.
* Create medical devices, tools, and software to operate biomedical equipment that enhenhancesth the running of the medical sector and the quality and efficacy of patient treatment.
* Designing and building biomedical technology, including devices, tools, and software that may be used to diagnose and treat medical issues as well as artificial internal organs and body parts.
* Installing and setting up biomedical hardware and software.
* assessing the reliability, efficacy, and safety of biomedical devices, tools, and software.
* Maintaining and fixing biomedical machinery and apparatus as necessary.
* Provide assistance with technology as required.
* Maintaining current service records for all devices and machinery used in biomedicine.
* teaching medical professionals how to handle biomedical tools and equipment safely and efficiently.
* investigating novel technologies, materials, and engineering applications in biological systems and processes.
* composing reports and papers outlining procedures, guidelines, and maintenance and repair standards for biomedical machinery and software.
* Educating others about the area of biomedical engineering through writing, instruction, or consultancy.
1. **Program Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| Program code | BCE | ECTS | 240 |
| Duration | 4 levels, 8 Semesters | Method of Attendance | Full Time |

The Medical instrumentation Techniques Engineering Program Specification outlines the knowledge and skills required for individuals who are interested in pursuing a career in the Installing, calibarating and Maintinance of medical instruments. The program focuses on developing technical expertise in the areas of Medical Device sector, new medicla techniques, hospital management, and Medical devices maintenance. The program typically includes a mix of classroom lectures, practical training, and on-site field experience. Courses may cover topics such as installing, clibrating and maintinance for MRI, CT scan, labrotary devices, Elictrical cardio graph devices, Etc..

The The program also emphasizes the development of technical skills such as lectrical circuit designing , computer-aided design (CAD), microcontroler programing, estimating, medicalproject management. Graduates of the program are expected to have the skills necessary to work as Medical insrument engineerer, Team leader of medical engineering team, Medical devices inspectors, estimators, and other technical roles in the Medical engineering sector.

Some key components of the Medical instrumentation Techniques Engineering program specification may include:

1. **Program Aims and Objectives:**

 Preparing technical engineers with the ability to research the technical fields of electrical power engineering.

1. **Learning Outcomes:** A list of the specific skills, knowledge, and competencies that students are expected to acquire through the program.
2. **Course Structure:** Details on the specific courses that make up the program, including their content, delivery methods, and any prerequisites or co-requisites.
3. **Assessment Methods:** Information on how student performance will be evaluated, including the types of assessments used (e.g. exams, essays, practical assignments) and the weighting of each assessment.
4. **Resources:** An outline of the facilities, equipment, and other resources required to deliver the program effectively.

Overall, a Electrical Engineering Technique Program Specification serves as a guide for educators and institutions to develop and deliver a comprehensive curriculum that prepares students for a occupation in the Electrical electronic engineering sector.

1. **Program Goals**

The program goals of medical instrumentation technical engineering typically include:

1. Strengthening the technical aspect of its graduates by increasing practical units and inconsistently theoretical units.
2. Qualifying graduates in accordance with the requirements of the labor market.
3. Keeping pace with modernity and global development in programs and study plans, and focusing on the practical aspect.
4. Work to enhance performance standards to ensure the application of international standards in the field of electrical engineering techniques.
5. **Student Learning Outcomes**
	1. A Electrical Engineering Techniques program's unique goals and objectives may have an impact on the learning results of its students. But some typical learning results could be:
	2. **Knowledge of medical materials and methods:** Students should be able to demonstrate a strong understanding of Electrical and Electronics materials and methods, including their properties, advantages, and limitations.
	3. **Knowledge of Electrical and Electronic devices:** Students should be able to demonstrate a strong understanding of using ,design, devolpment and maintenance of medical devices.
	4. **Proficiency in construction software:** Students should be able to use various software applications commonly used in the Electrical Engineering , such as assembly, C++ language, Matlab software, and Arduino software language.
	5. **Electrical transmission and generation part.** Students should be able to plan, organize, and manage medical projects, including hospital requirments.
	6. **Communication and teamwork:** Students should be able to effectively communicate with medical staff, clients, patients and end user of medical devices, in addition to working collaboratively in a team environment.
6. **Safety and sustainability:** Students should be responsive of safety especially when working with high voltage. in the medical sectors, such as the hazards of high electrical voltage, and potential hazards on a job site,such as, contacts with patients, and the spread of viruses, contagious disease, and risks of some medical devices like a x-ray.

Overall, the student learning outcomes of a building and construction technical engineering program should prepare graduates for careers in the construction industry by providing them with the necessary knowledge, skills, and competencies to succeed.

**8. Academic Staff**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
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**9.Credits, Grading and GPA**

**Credits** in the Building and Construction Techniques Engineering Department are 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 student workloads, 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 |
| **Group** | **Grade** | **Marks %** | **Definition** |
| Success Group (50 - 100) | Excellent | 90 - 100 | Outstanding Performance |
| Very Good | 80 - 89 | Above average with some errors |
| Good | 70 - 79 | Sound work with notable errors |
| Satisfactory | 60 - 69 | Fair but with major shortcomings |
| Sufficient | 50 - 59 | Work meets minimum criteria |
| Fail Group (0 – 49) | FX – Fail | (45-49) | More work required but credit awarded |
| F – Fail | (0-44) | Considerable amount of work required |
| NB 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 Grade Point Average (GPA)**

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

 GPA of 4-year B.Sc. degrees:

**GPA** = [ (1st module score x ECTS) + (2nd module score x ECTS) + ……] / 240

1. **Curriculum/Modules**

**Level 1 Smester 1**

|  |
| --- |
| **Level 1 – First semester** |
| **CODE** | **TITLE** | **T** | **P** | **C** | **ECTS** | **Bologna Content** | **Electrical Engineering Techniques** |
| **EET100** | **DC ELECTRICAL CIRCUITS** | **4** | **2** | **6** | **8** |  |
| **EET101** | **DIGITAL TECHNOLOGIES** | **4** | **2** | **4** | **6** |
| **EET102** | **ENGINEERING DRAWING** | **0** | **4** | **0** | **6** |
| **EET103** | **MATHEMATICS** | **6** | **0** | **6** | **6** |
| **NTU100** | **Human right and democracy** | **2** | **0** | **2** | **2** |
| **NTU101** | **ARABIC LANGUAGE** | **2** | **0** | **2** | **2** |
| ***T:Theoritical, P:Practical, C:Credit*** | **18** | **8** | **20** | **30** |

**Level 1 Semester 2**

| **Level 1 – Second Semester** |
| --- |
| **CODE** | **TITLE** | **T** | **P** | **C** | **ECTS** | **Bologna Content** | **Electrical Engineering Techniques****Electrical Engineering Techniques** |
| **EET104** | **ENGINEERING MECHANICS** | **4** | **0** | **4** | **6** |  |
| **EET105** | **Engineering work shope** | **0** | **4** | **2** | **6** |
| **NTU103** | **ENGLISH LANGUAGE**  | **2** | **0** | **2** | **2****Electrical Engineering Techniques** |
| **EET106** | **AC ELECTRICAL CIRCUITS** | **4** | **3** | **5** | **8** |
| **EET107** | **PHYSICS** | **3** | **2** | **4** | **6** |
| **NTU102** | **COMPUTER**  | **2** | **2** | **3** | **2** |
| ***T:Theoritical, P:Practical, C:Credit*** | **13** | **11** | **20** | **30** |

Level 2 Semester 1

|  |
| --- |
| **Level 2 – First semester** |
| **CODE** | **TITLE** | **T** | **P** | **C** | **ECTS** | **Bologna Content** | **Electrical Engineering Techniques** |
| **EET200** | **DC Generators** | **3** | **2** | **4** | **5** |  |
| **EET201** | **Electronic Essentials** | **3** | **2** | **4** | **5** |
| **EET202** | **Electrical Circuit Analysis** | **2** | **2** | **3** | **5** |
| **EET203** | **Sensors** | **2** | **2** | **3** | **5** |
| **EET204** | **Applied Mathematics** | **4** | **0** | **4** | **5** |
| **NTU201** | **Computer**  | **2** | **2** | **3** | **3** |
| **NTU200** | **Crimes of the baath regim in iraq** | **2** | **0** | **2** | **2** |
| ***T:Theoritical, P:Practical, C:Credit*** | **18** | **10** | **23** | **30** |

Level 2 Semester 2

|  |
| --- |
| **Level 2 – Second semester** |
| **CODE** | **TITLE** | **T** | **P** | **C** | **ECTS** | **Bologna Content** | **Electrical Engineering Techniques** |
| **EET206** | DC Motors | **3** | **2** | **4** | **6** |  |
| **EET207** | comunications | **2** | **2** | **3** | **6** |
| **EET208** | power Circuits and transformers | **4** | **2** | **3** | **8** |
| **EET209** | Instruments and Measurements | **3** | **2** | **4** | **6** |
| **EET210** | **Arabic language** | **2** | **0** | **2** | **2** |
| **EET211** | English Language  | **2** | **0** | **2** | **2** |
| ***T:Theoritical, P:Practical, C:Credit*** | **16** | **8** | **18** | **30** |

Level 3 Semester 1

|  |
| --- |
| **Level 3 – First semester** |
| **CODE** | **TITLE** | **T** | **P** | **C** | **ECTS** | **Bologna Content** | **Electrical Engineering Techniques** |
| **EET300** | **Principles of Power Engineering** | **2** | **2** | **3** | **5** |  |
| **EET301** | **DC Power Conversions** | **2** | **2** | **3** | **5** |
| **EET302** | **Electrical Transformers and Induction Machines** | **2** | **3** | **3** | **5** |
| **EET303** | **Electromagnetic Fields** | **4** | **2** | **5** | **5** |
| **EET304** | **Microprocessor** | **2** | **2** | **3** | **5** |
| **EET305** | **Numerical Analysis** | **4** | **0** | **4** | **5** |
| ***T:Theoritical, P:Practical, C:Credit*** | **16** | **11** | **21** | **30** |

Level 3 Semester 2

|  |
| --- |
| **Level 3 – Second semester** |
| **CODE** | **TITLE** | **T** | **P** | **C** | **ECTS** | **Bologna Content** | **Electrical Engineering Techniques** |
| **EET306** | Advanced Power Engineering | **2** | **2** | **3** | **5** |  |
| **EET307** | AC Power Conversions | **2** | **2** | **3** | **5** |
| **EET308** | Synchronous and Special Machines | **3** | **3** | **4** | **6** |
| **EET309** | Digital Controllers | **2** | **2** | **3** | **6** |
| **EET310** | English Language (Advanced) | **2** | **0** | **2** | **3** |
| **EET311** | Elective 1 | **3** | **2** | **4** | **5** |
| ***T:Theoritical, P:Practical, C:Credit*** | **14** | **11** | **19** | **30** |

Level 4 Semester 1

|  |
| --- |
| **Level 4 – First semester** |
| **CODE** | **TITLE** | **T** | **P** | **C** | **ECTS** | **Bologna Content** | **Electrical Engineering Techniques** |
| **EET400** | **Transmission and Distribution Systems** | **4** | **2** | **5** | **5** |  |
| **EET401** | **Electric Machine Drives** | **4** | **2** | **5** | **5** |
| **EET402** | **Power System Analysis** | **4** | **2** | **5** | **5** |
| **EET403** | **Electric Power Generation Stations** | **3** | **2** | **4** | **5** |
| **EET404** | **Control System Analysis** | **3** | **2** | **4** | **5** |
| **EET405** | **Project 1** | **-** | **2** | **3** | **5** |
| ***T:Theoritical, P:Practical, C:Credit*** | **18** | **12** | **26** | **30** |

Level 4 Semester 2

|  |
| --- |
| **Level 4 – Second semester** |
| **CODE** | **TITLE** | **T** | **P** | **C** | **ECTS** | **Bologna Content** | **Electrical Engineering Techniques** |
| **EET406** | **Professional Ethics** | **2** | **-** | **2** | **3** |  |
| **EET407** | **Power System Protection** | **2** | **2** | **3** | **6** |
| **EET408** | **Stability of Power System** | **2** | **2** | **3** | **6** |
| **EET409** | **High Voltage Techniques** | **3** | **2** | **4** | **5** |
| **EET410** | **Project 2** | **-** | **2** | **1** | **5** |
| **EET405** | **Elective** | **2** | **2** | **3** | **5** |
| ***T:Theoritical, P:Practical, C:Credit*** | **11** | **10** | **16** | **30** |