

Alayen Iraqi University

جامعه العين العراقية



*First Cycle – Bachelor's degree (B.Sc.) – Medical
Instruments Engineering Technology*
Engineering Technical College
Alayen Iraqi University

بكالوريوس - هندسة تقنيات الاجهزة الطبيه (الدورة الأولى) - الكلية التقنية الهندسية- جامعه العين العراقية



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1. Mission & Vision Statement

Vision Statement

Qualifying distinguished and innovative competencies scientifically, with high skill, professional and ethical behavior, capable of keeping pace with developments in the field of medical devices and providing applicable solutions to confront scientific and engineering obstacles and community service.

Mission Statement

Graduating distinguished technical engineers with scientific engineering levels and high efficiency in the fields of medical device engineering technologies by providing an advanced scientific environment and specialized cadres to be able to complete the path of higher education and vocational learning and provide community service within work teams of different specializations

2. Program Specification

Program code:	BSc. – MIET	ECTS	240
Duration:	4 levels, 8 Semesters	Method of Attendance:	Full Time

Medical instrumentation technology program is designed to provide students with the skills to improve themselves by preparing them for a career in medical

instrumentation. Students will learn how to administer and support medical instrumentation technology and design. The curriculum consists of an integrated set of courses in mathematics, medical physics and chemistry, fundamentals of electric and electronic circuits, and medical instrumentations. Students will have the opportunity to know the principles of computer applications and they will be prepared for careers in companies of medical instrumentation dealing with the services, demonstrating general knowledge of medical devices categories and principles of operation. Moreover, the students will learn the various components of medical equipment.

Level 1 exposes students to the fundamentals of MIET, suitable for progression in engineering fundamentals. Program-specific core topics are covered at Level 2 preparing for research-led subject specialist modules at Levels 3 and 4. MIET graduates are therefore trained to appreciate how research informs teaching, according to the University and School Mission statements. At Levels 2, 3 and 4 MIET students understand the subject area and the professional fields of engineering mathematics, anatomy and physiology, electronic circuits, computer programming, medical instrumentations, electrical machines, digital electronics, English language, biomedical signal processing, medical communication systems, biomedical transducers and sensors, control systems, artificial limbs, elective subjects, medical laser systems, power electronics, and professional ethics which can be obtained during the course of study.

The research ethics is developed and fostered from the start via practical, which are either embedded in lecture modules or taught in dedicated practical modules, research seminars and tutorials. There is a compulsory field course in Level 1, which students must pass in order to progress into Level 2, and optional field courses in Levels 2, 3 and 4. At Level 4 all students carry out an independent research project. International years and Industrial placements are also offered and individual needs are discussed with the appropriate tutor and accommodated wherever possible.

Program Objectives .3

- 1- Preparing applied engineers with the ability and skill to deal with different medical devices and keep pace with the advanced generations of new medical devices.
- 2- Providing the student with the skills to install and operate devices and train on the use of medical devices and equipment and perform diagnostic and maintenance work.
- 3- Providing the student with solid scientific knowledge and applied skills to enable him to diagnose malfunctions in electronic systems of diagnostic and therapeutic medical devices.

- 4- Preparing a graduate with extensive and detailed knowledge of the new technologies in the field of medical devices and providing him with sufficient skills to make the necessary updates regarding the technology of engineering medical devices
- 5- Vertical expansion towards creating postgraduate programs in the field of medical devices technology
- 6- The department seeks to achieve the program's objectives in line with achieving international quality standards according to the available capabilities

Student Learning Outcomes .4

Knowledge and understanding of programs and work methods, especially in the field of medical device technology and maintenance.

Knowledge and understanding of on-site supervision for the implementation of work related to the engineering distribution of devices within medical institutions.

Knowledge and understanding of the parts of medical devices and how to solve their problems.

Knowledge and understanding of the electronic circuits of various medical devices and how to design them.

Knowledge and understanding of the various programming languages specific to medical device circuits and how to benefit from them.

Knowledge of the types of digital systems specific to medical devices and how to program it.

Moreover, the capacity for open-minded, interactive communication with non-experts.

Outcome 1

Identification of Complex Relationships

Getting the deep knowledge Graduates will be able to show a thorough understanding of the market's requirements for knowledge, skills, and expertise. They are also aware of how the market and technological advancement are moving. Graduates will be able to illustrate the structure and function of the medical instrumentation components and explain how they interact in another component.

Outcome 2

Oral and Written Communication

Graduates will be able to formally communicate the medical device troubleshooting results using oral and written communication skills.

Outcome 3

Laboratory and Field Studies

Graduates will be able to perform laboratory experiments and field studies, by using scientific equipment and computer technology while observing appropriate safety protocols.

Outcome 4

Scientific Knowledge

Graduates will be able to demonstrate a balanced concept of how scientific knowledge develops, including the historical development of foundational theories and laws and the nature of science.

Outcome 5

Data Analyses

Graduates will be able to demonstrate scientific quantitative skills, such as the ability to conduct simple and complex data analyses.

Outcome 6

Critical Thinking

Graduates will be able to use critical-thinking and problem-solving skills to develop a research project and/or paper.

Outcome 7

Group/team leadership

Graduates will be self-motivated, cooperate effectively with other professionals in different disciplines, backgrounds, and interests to solve problems, work lucidly in confusing situations under pressure, and demonstrate knowledge of and commitment to following safety procedures for themselves and others.

Academic Staff .5

Prof. Dr.Mohammed Ghazi Molhem| Ph.D. in Computer Engineering
Email: Mohammed.Ghazi@alayen.edu.iq
Mobile no.: +9647863527359

Assist. Prof. Dr Akram mohamad hatem.| Ph.D. in Rradiation physics
Email: Akram.mohamad@alayen.edu.iq
Mobile no.: +963938599177

Assist. Prof. Dr Ahmed Abubaker Muhamed Taher| Ph.D. Lase application in physics
Email: Ahmed.AbuBakr@alayen.edu.iq
Mobile no.: + 96878433458

Mobile no.: +201553297262

Assist. Prof. Dr abdelhady ali hasan| Ph.D. in Photoelectronics

Email: abdelhady.ali@alayen.edu.iq

Mobile no.: +20 01010612391

Lecturer Maryam Ahmed Akram| MSc. In Civil Engineering |

Email: maryam9a3@gmail.com

Mobile no.:+964 7813512385

Lecturer| MSc. In Computer Engineering/Information Technology

Email: adian.Latif@alayen.edu.iq

Mobile no.:+964 7812599579

Lecturer Hossam Shamkhi Jabr| MSc. In Artificial Intelligence Computers |

Email: Hossam.Shamkhi@alayen.edu.iq

Mobile no.:+964 7826448910

Lecturer Maysaa Aziz Mahdi Jarat| MSc. In Structural engineering|

Email: Masaaaziz97@utq.edu.iq

Mobile no.:+964 7871458455

Lecturer Zahraa Mohsen Ghaithan| MSc. In Computer Systems Technologies |

Email: Zahraa.Mohsen@alayen.edu.iq

Mobile no.:+964 7816506726

Assist Lecturer Zeina Haider Abboud | BSc . In Biological Engineering

Email: Zeina.Hayder@alayen.edu.iq

Mobile no.:+964 751 687 4360

Assist Lecturer Sara Mohammed Qassem| BSc . In Computer Science

Email: Sara.Mohammed@alayen.edu.iq

Mobile no.:+964 7801734176

Assist Lecturer Uhood Jawad Kadhim | Bsc. In Biomedical Engineering

Email: Uhood.Jawad@alayen.edu.iq

Mobile no.:+964 7821509381

Assist Lecturer Noor Mohammed Badri | B.Sc. In Biomedical Engineering
 Email: Noor.Mohammad@alayer.edu.iq
 Mobile no.:+964 7831136027

Assist Lecturer :Zaid Ali Talip| MSc: In Medical Device Engineering|
 Email:
 zaidalsaffy@gmail.com
 Mobile no: +964 07711756466

Teaching Assistant: Adyan Ali Jalil : B.Sc. in Medical Device Engineering
 Email: adyanali102@gmail.com
 Mobile no: +964 773 205 0860

Credits, Grading and GPA .6

Credits

Al Ayen University – Medical Technical College – Department of Medical Instrumentation Engineering Techniques 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 hr. of 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 جدًا	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:

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

Curriculum/Modules .7

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MIET1101	Fundamentals of Electrical Engineering DC	79	71	6.00	C	
MTU1004	Computer Principles	49	26	3.00	B	
MIET1103	Differential Mathematics	78	47	5.00	S	
EETC102	Engineering Drawing	63	62	5.00	S	
MTU1006	Democracy and Human Rights	33	17	2.00	B	
MTU1002	English Language I	33	17	2.00	B	
MIET1107	Medical Chemistry	94	81	7.00	S	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MIET1201	Fundamentals of Electrical Engineering (AC)	79	71	6.00	C	
MIET1202	Medical Physics	64	61	5.00	S	
MIET1203	Mechanics	48	52	4.00	S	
MIET1204	Integral Mathematics	78	47	5.00	S	
EETC101	Engineering Workshops	63	62	5.00	S	
MIET1206	Computer Programming and Applications I	49	26	3.00	S	

MTU1001	Arabic Language	33	17	2.00	B	
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Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MIET2101	Laboratory Medical Instrumentation I	94	81	7.00	C	
MIET2102	Electronics Circuits I	79	46	5.00	C	
MIET2103	Digital Electronics	79	46	5.00	C	
MIET2104	Engineering Mathematics	63	37	4.00	S	
MIET2105	Anatomy & Physiology	64	36	4.00	S	
MTU1007	The crimes of the Ba'ath Regime in Iraq	33	17	2.00	B	
MTU1005	Computer Applications	49	26	3.00	B	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MIET2201	Laboratory Medical Instrumentation II	94	81	7.00	C	
MIET2202	Electronics Circuits II	79	71	6.00	C	
MIET2203	Electrical Machines	79	46	5.00	C	
MIET2204	Clinical Chemistry Instrumentation	64	61	5.00	C	
MIET2205	Biomedical Transducers and Sensors	64	61	5.00	C	
MTU1003	English Language II	33	17	2.00	B	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MIET3101	Medical Diagnostic Instrumentation I	79	96	7.00	7.00	
MIET3102	Microprocessor	94	56	6.00	6.00	
MIET3103	Electromagnetic Fields	79	46	5.00	5.00	
MIET3104	Signals and Systems	64	61	5.00	5.00	
MIET3105	Computer Programming and Applications II	64	36	4.00	4.00	

MIET3106	Project Management	48	27	3.00	3.00	
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Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MIET3201	Medical Diagnostic Instrumentation II	79	96	7.00	C	
MIET3202	Medical Electronic Systems	79	71	6.00	C	
MIET3203	Medical Communication Systems	64	61	5.00	C	
MIET3204	Power Electronics	79	46	5.00	C	
MIET3205	Project I	33	42	3.00	S	
MIET3206	Advanced Computer Programming	79	21	4.00	S	

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MIET4101	Medical Therapeutic Instrumentation I	79	96	7.00	C	
MIET4102	Medical Laser Systems	79	46	5.00	C	
MIET4103	Control Systems	79	46	5.00	C	
MIET4104	Biomedical Signal Processing	64	36	4.00	C	
MIET4105	Project II	48	77	5.00	C	
MIET41XX	Elective I	64	36	4.00	E	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MIET4201	Medical Therapeutic Instrumentation II	79	96	7.00	C	
MIET4202	Engineering of Radiation Instrumentation	79	71	6.00	C	
MIET4203	Artificial Limbs and Robotics	94	56	6.00	C	
MIET42XX	Elective II	64	36	4.00	E	
MIET42XX	Elective III	64	36	4.00	E	
MTU1008	Professional Ethics	48	27	3.00	B	

8- Contact .8

Program Manager:

- Mohammed Ghazi Molhem | Ph.D in PhD in Computer Engineering | Assistant Prof.
Email: Mohammed.Ghazi@alayen.edu.iq
Mobile No.: +963-0988894752, +963-7863527359

Program Coordinator:

- Ahmed Abubaker Mohamed | Ph.D. Lase applications in physics Engineering | Assistant Professor.
Email: Ahmed.AbuBakr@alayen.edu.iq
Mobile no.: +96878433458, +964786899718

Department Coordinator:

- Maryam Ahmed Akram | Msc. In structural engineering | Lecturer
Email: maryam.ahmed@alayen.edu.iq
Mobile no.: :(+964) 07813512385
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