Baghdad College of Economic Sciences University
كلية بغداد للعلوم الاقتصادية الجامعة

First Cycle – Bachelor's Degree (B.Eng.) Department of
Computer Engineering Techniques
Baghdad College of Economic Sciences University

Table of Contents | جدول المحتويات

1.   Mission & Vision Statement

Vision Statement

To produce highly qualified and motivated graduates through a rigorous curriculum of theory and emphasize the technical application that develops the ability to solve problems, build systems, and develop and implement computer driven solutions, individually and in teams.

Mission Statement

Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety and cultural, societal, and environmental concerns.

2.   Program Specification

Program code:	CET	ECTS	240
Duration:	4 levels, 8 Semesters	Method of Attendance:	Full Time

The Computer Engineering Techniques program is designed to provide students with the skills to improve themselves by preparing them for a career in the digital sector. Students will learn how to administer and support the computing infrastructure of an organization. The curriculum consists of an integrated set of courses that builds a solid theoretical foundation for the students. Once the foundation is established, the program develops domain-specific skills in the fields of digital and analog system design, database development and administration, mobile communications, networking, artificial intelligence, and programming. In its entirety, the program aims to prepare the students for careers in companies where they will be involved with the design, implementation, and operation of computer systems. Moreover, the students will be provided with a knowledge of Internet technologies sufficient for the design and management of network information systems.

Level 1 builds a solid foundation for the student in mathematics and computer essentials, suitable for progression to all program modules. Program-specific core topics are covered at Level 2 preparing for application-specific led modules at levels 3 and 4.

At Levels 2, 3, and 4 IT students cover designing and administering complex network systems, database systems, and designing security solutions related to cyber-security. Students acquire programming skills in Python and C ++, the basics of routing and switching, designing IT networks and wide area network technologies in addition to mobile networks and information theory. Eventually, IT graduates will gain knowledge, skills, and competencies that are industry-oriented and market-driven.

The research ethos is developed and fostered from the start via practical's, 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.

3.   Program Goal

Computer Engineering Techniques is a field that involves the application of engineering and technological principles to the design, development, and maintenance of computer hardware, software, and network systems. To be successful in this field, professionals need to possess specific competencies. Below are some of the essential competencies for the Department of computer engineering techniques:

1. **Programming Skills:** Proficiency in programming languages is essential for computer technology engineers to have expertise in programming languages such as C++, Matlab, and Python. They should be able to develop, test, and maintain programs that meet the needs of users.
2. **Mathematical Skills:** They should be skilled in mathematical concepts such as algebra, trigonometry, and calculus, as they play a vital role in the design, development, and testing of computer components and systems.
3. **Knowledge of Computer Hardware Skills:** Specialists should have a solid knowledge of computer hardware, including processors, memory, storage, and other essential components, and this is covered in computer organization, Microprocessors, and advanced computer architecture subjects.
4. **Networking Skills:** Professionals should be able to design, configure, troubleshoot, and maintain computer networks and their protocols of operation besides the security of the network and the Internet in general.
5. **Communication Systems Skills:** Proficiency in different types of communication systems: analog, digital, and mobile communication give the computer technology engineer a solid foundation for his field of operation in the future.
6. **System Design and Troubleshooting Skills:** Specialists should have the skills to design and implement systems and also to identify and diagnose system malfunctions before applying corrective action and this is covered through many subjects such as instruments and measurement, control systems, real-time systems, microcontrollers, and other.
7. **Problem-Solving Skills:** In this field, professionals are expected to have excellent problem-solving skills, as they are responsible for identifying and assessing complex problems and designing effective solutions, and this is mostly covered in subjects like project management and information theory besides engineering analysis.

8. **Electrical and Electronics Skills:** Solid foundation skills in electrical and electronics circuits and systems, their design and implementation are also crucial.
9. **Database Management Skills:** Knowledge of database structure, queries, and management is essential to ensure the optimum working of software applications.
10. **Research and Development Skills**: Specialists must be up to date on technological trends and keep themselves informed about emerging technologies and industry best practices.

In summary, Computer Engineering Techniques Specialist include hardware and software configuration, programming skills, networking and security knowledge, troubleshooting, database management, collaboration, communication, time management, custom solutions designing, and research and development. Overall, possessing these competencies equips Computer Engineering Techniques Specialist Professionals with the requisite skills to design, implement and maintain computer systems and networks effectively.

Student Learning Outcomes

The Department of Computer Engineering Technique requires professionals to possess generic competencies in addition to the technical skills and knowledge required to perform their roles effectively. Below are some of the generic competencies required by the Department of Computer Engineering Techniques:

Analytical Thinking: The ability to identify and analyze complex problems and provide practical solutions is essential for professionals in this field.

Continuous Learning: Keeping up to date with new technologies, tools, and techniques is crucial for professionals to remain competitive.

Adaptability: Being able to adapt and navigate changes is essential as the technology landscape is ever-changing.

Creativity: The ability to think creatively and innovate helps to develop new solutions and products.

Teamwork: Professionals must be able to work collaboratively with colleagues, clients, and other stakeholders to achieve the desired results.

Communication Skills: Effective communication skills are essential to understanding and articulating technical issues to colleagues, clients, and other stakeholders in a clear and concise manner.

Project Management: Competence in project management is essential, including planning, organization, and resource allocation.

Time Management: The ability to manage time is crucial to ensure project milestones are met.

Leadership: Professionals must be able to motivate and lead teams to achieve project objectives.

Custom Solutions Designing: The ability to design, develop, and maintain custom software applications and solutions, catering to end-user business requirements.

In conclusion, professionals in the Department of Computer Engineering Techniques must possess both technical and generic competencies to excel in their roles. Analytical thinking, continuous learning, adaptability, creativity, teamwork, communication skills, project management, time management, leadership, and customer service are among the essential generic competencies required. These competencies help to enhance competence and promote good performance in the department of computer engineering techniques.

4. Academic Staff

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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.				

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:

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

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6. Curriculum/Modules

Semester 1 | 30 ECTS credits | 1 ECTS = 25 hrs

No.	Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
1	CET1101	Digital Fundamentals	64	86	6.00	C	
2	CET1102	Electrical Engineering Fundamentals	64	86	6.00	C	
3	CET1103	Mathematics I	48	77	5.00	S	
4	CET1104	Engineering Drawing	48	77	5.00	S	
5	CET1105	Engineering Workshops	64	86	6.00	S	
6	CET1106	English Language I	33	17	2.00	B	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

No.	Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
1	CET1201	Digital Systems	64	86	6.00	C	CET1101
2	CET1202	Electrical Circuits	64	86	6.00	C	CET1102
3	CET1203	Programming Essentials	64	86	6.00	C	
4	CET1204	Mathematics II	48	77	5.00	S	CET1103
5	CET1205	Democracy and Human Rights	33	17	2.00	B	
6	CET1206	Arabic Language	33	17	2.00	B	
7	CET1207	Computer Fundamentals	34	41	3.00	S	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

No.	Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
1	CET2101	Engineering Mathematics	48	77	5.00	S	CET1204
2	CET2102	Object Oriented Programming	79	71	6.00	S	
3	CET2103	Computer Organization & Architecture	64	61	5.00	C	CET1207
4	CET2104	Electronics Fundamentals	64	61	5.00	C	CET1202
5	CET2105	Communication Fundamentals	64	61	5.00	C	
6	CET2106	English Language II	33	17	2.00	B	
7	CET2107	The Crimes of the Baath Regime	33	17	2.00	B	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

No.	Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
1	CET2201	Advanced Engineering Mathematics	48	77	5.00	S	CET2101
2	CET2202	Python Programming	64	61	5.00	S	
3	CET2203	Microprocessors	64	61	5.00	C	CET2103
4	CET2204	Analog Communications	64	61	5.00	C	CET2105
5	CET2205	Electronics Circuits	64	61	5.00	C	CET2104
6	CET2206	Instrumentation and Measurement	64	61	5.00	C	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

No.	Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
1	CET3101	Operating Systems	64	61	5.00	C	
2	CET3102	Control Engineering Fundamentals	64	61	5.00	C	
3	CET3103	Digital Signal Processing	64	61	5.00	C	
4	CET3104	Digital Controllers	64	61	5.00	C	
5	CET3105	Digital Communications	64	61	5.00	C	CET2105
6	CET31XX	Elective	64	61	5.00	E	

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

No.	Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
1	CET3201	Advanced Control Systems	64	61	5.00	C	CET3102
2	CET3202	Computer Network Fundamentals	64	86	6.00	C	
3	CET3203	Database Systems	64	86	6.00	C	
4	CET3204	Engineering Analysis	64	86	6.00	C	
5	CET3205	English Language III	33	17	2.00	B	
6	CET32XX	Elective	64	61	5.00	E	

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

No.	Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
1	CET4101	Information Theory and Coding	64	86	6.00	C	
2	CET4102	Computer Networks Protocols	64	61	5.00	C	CET3202
3	CET4103	Mobile Communications	64	86	6.00	C	CET3105
4	CET4104	Engineering Management	49	51	4.00	S	
5	CET4105	Professional Ethics	33	17	2.00	B	
6	CET4106	English Language IV	33	17	2.00	B	
7	CET41XX	Elective	64	61	5.00	E	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

No.	Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
1	CET4201	Fiber Optics Communication	64	61	5.00	C	
2	CET4202	Advanced Computer Technology	64	61	5.00	C	
3	CET4203	Network Security & Cybersecurity	64	61	5.00	C	
4	CET4204	Cloud Computing	64	61	5.00	C	
5	CET4205	Project	62	63	5.00	C	
6	CET42XX	Elective	64	61	5.00	E	

Elective Subjects:

Semester	No.	Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
5		CET3106	Real-Time Systems	64	61	5.00	E	
		CET3107	Parallel Computing	64	61	5.00	E	
6		CET3206	Digital Image Processing	64	61	5.00	E	
		CET3207	IoT Fundamentals	64	61	5.00	E	
7		CET4107	Artificial Intelligence	64	61	5.00	E	
		CET4108	Web Design	64	61	5.00	E	
		CET4109	Distributed Computing & Systems	64	61	5.00	E	
8		CET4206	Reconfigurable Computing Systems	64	61	5.00	E	
		CET4207	Wireless Sensor Networks	64	61	5.00	E	
		CET4208	Optimization Algorithms	64	61	5.00	E	