

**Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department**



Academic Program and Course Description Guide

**Department of Computer
Engineering Techniques**

2025

Academic Program Description Form

University Name:

Faculty/Institute: Madenat Alelem University College

Scientific Department: Computer Engineering Techniques

Academic or Professional Program Name: BSc in Computer Engineering

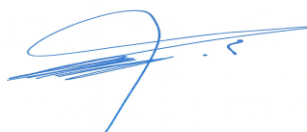
Techniques

Final Certificate Name: BSc in Computer Engineering Techniques

Academic System:

Description Preparation Date: 12-7-2025

File Completion Date: 12-7-2025



Signature:

Head of Department Name:

Date: 12-7-2025



Signature:

Scientific Associate Name:

Date: : 12-7-2025

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:



Signature:



Approval of the Dean

1. Program Vision

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.

2. Program Mission

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.

3. Program Objectives

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 at Level 1, which students must pass to progress to Level 2, and optional field courses in Levels 2, 3, and 4. At Level 4 all students carry out an independent research project.

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 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's best practices.

4. Program Accreditation

NA

5. Other external influences

NA

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Mandatory courses	47	220	92%	Basic
Elective courses	4	20	8%	Optional
Total courses	51	240	100%	–
Summer Training	2	4	Fulfilled	Basic
Other	–	–	–	–

* This can include notes about whether the course is basic or optional.

7. Program Description

Level/Semester	Course Code	Course Name	Credit Hours	
			Theoretical	practical
UGI/One	CET1101	Digital Fundamentals	2	2
UGI/One	CET1102	Electrical Engineering Fundamentals	2	2
UGI/One	CET1103	Mathematics I	3	
UGI/One	CET1104	Engineering Drawing		3
UGI/One	CET1105	Engineering Workshops		4
UGI/One	MTU1002	English Language I	2	
UGI/Two	CET1201	Digital Systems	2	2
UGI/Two	CET1202	Electrical Circuits	2	2
UGI/Two	CET1203	Programming Essentials	2	2
UGI/Two	CET1204	Mathematics II	3	
UGI/Two	MTU1006	Democracy and Human Rights	2	
UGI/Two	MTU1001	Arabic Language	2	
UGI/Two	MTU1004	Computer Fundamentals	1	1
UGII/Three	CET2101	Engineering Mathematics	3	
UGII/Three	CET2102	Object Oriented Programming	3	2
UGII/Three	CET2103	Computer Organization and Applications	2	2
UGII/Three	CET2104	Electronics Fundamentals	2	2
UGII/Three	CET2105	Communication Fundamentals	2	2
UGII/Three	MTU1003	English Language II	2	
UGII/Three	MTU1007	The Crimes of the Baath Regime	2	
UGII/Four	CET2201	Advanced Engineering Mathematics	3	
UGII/Four	CET2202	Python Programming	2	2
UGII/Four	CET2203	Microprocessors	2	2

UGII/Four	CET2204	Analog Communications	2	2
UGII/Four	CET2205	Electronics Circuits	2	2
UGII/Four	CET2206	Instrumentation and Measurement	2	2
UGII/Four	MTU1009	Arabic Language II	2	
UGIII/Five	CET3101	Operating Systems	2	2
UGIII/Five	CET3102	Control Engineering Fundamentals	2	2
UGIII/Five	CET3103	Digital Signal Processing	2	2
UGIII/Five	CET3104	Digital Controllers	2	2
UGIII/Five	CET3105	Digital Communications	2	2
UGIII/Five	CET31XX	Elective	2	2
UGIII/Six	CET3201	Advanced Control Systems	2	2
UGIII/Six	CET3202	Computer Network Fundamentals	2	2
UGIII/Six	CET3203	Database Systems	2	2
UGIII/Six	CET3204	Engineering Analysis	2	2
UGIII/Six	CET3205	Data communications	2	2
UGIII/Six	CET32XX	Elective	2	2
UGIV/Seven	CET4101	Information Theory and Coding	2	2
UGIV/Seven	CET4102	Computer Networks Protocols	2	2
UGIV/Seven	CET4103	Mobile Communications	2	2
UGIV/Seven	CET4104	Engineering Management	2	2
UGIV/Seven	MTU1008	Professional Ethics	2	
UGIV/Seven	CET41XX	Elective	2	2
UGIV/Eight	CET4201	Fiber Optics Communication	2	2
UGIV/Eight	CET4202	Advanced Computer Technology	2	2
UGIV/Eight	CET4203	Network Security & Cybersecurity	2	2
UGIV/Eight	CET4204	Cloud Computing	2	2
UGIV/Eight	CET4205	Project		2
UGIV/Eight	CET42XX	Elective	2	2

8. Expected learning outcomes of the program

Knowledge

Learning Outcomes 1	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.
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Skills

Learning Outcomes 2 & 3	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.
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Ethics

Learning Outcomes 4 & 5	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.
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9. Teaching and Learning Strategies

Teaching and learning strategies emphasize student-centered, competence-based, flexible, and outcome-oriented education, supported by ECTS credits, active learning, formative assessment, and international mobility.

10. Evaluation methods

Credits:

Madenat Alelem University College 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:

Group	Grade	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - 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

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
AP, Dr. Amir Almarsoomi	Electronics & Communications Engineering	Electronics & Communications Engineering			√	
Lecturer, Dr. Matai N. Saeed	Electronics & Communications Engineering	Electronics & Communications Engineering			√	
Lecturer Saad T. Y. Alfalahi	Electrical Engineering	Power Systems Engineering			√	
Assist. Lect. Reyam M. Sabree	Electrical Engineering	Electronics & Communications Engineering			√	

Assist. Lect. Mustafa F. Sahan	Computer Science	Computer Science			√	
Lecturer, Dr. Asaad H. Sahar	Electronics & Communications Engineering	Electronics & Communications Engineering				√
Lecturer, Dr. Amie K. Aljumaily	Electronics & Communications Engineering	Electronics & Communications Engineering				√
Lecturer, Dr. Aws H. Kurdy	Electronics & Communications Engineering	Electronics & Communications Engineering				√

Professional Development

Mentoring new faculty members

In the Bologna Process framework, mentoring of new, visiting, full-time, and part-time faculty at both the institutional and departmental levels typically follow structured and student-centered principles aligned with quality assurance and continuous improvement.

Professional development of faculty members

Mentoring within Bologna Process programs combines institutional training on pedagogy and policy with departmental peer mentorship focused on curriculum and assessment alignment. The process ensures that all faculty—new, visiting, full-time, and part-time—adopt student-centered, competence-based, and outcome-oriented teaching practices consistent with the European Higher Education Area.

12. Acceptance Criterion

The regulations governing admission to colleges or institutes are primarily based on the student's grade point average (GPA). However, it is recommended that the student's personal preference also be taken into consideration. While it may not always be feasible to accommodate such preferences at the college level, it is at least advisable to account for them when assigning students to specific departments. This is particularly important, as the choice of department significantly influences the student's future academic and professional trajectory.

13. The most important sources of information about the program

- Prescribed textbooks (official curriculum references).
- Books authored by the faculty members of the department.
- Local and international research publications and periodicals.

14. Program Development Plan

- Curriculum updates shall be undertaken in accordance with the standards of the knowledge environment.
- Reading and analyzing external scientific sources and authored textbooks.
- Preparing reports and research papers related to the course content at the conclusion of each academic subject.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2			B1	B2	B3	B4	C1	C2	C3	C4
UGI/One	CET1101	Digital Fundamentals	Basic	√	√			√	√	√	√	√	√	√	√
UGI/One	CET1102	Electrical Engineering Fundamentals	Basic	√	√			√	√	√	√	√	√	√	√
UGI/One	CET1103	Mathematics I	Basic	√	√			√	√	√	√	√	√	√	√
UGI/One	CET1104	Engineering Drawing	Basic	√	√			√	√	√	√	√	√	√	√
UGI/One	CET1105	Engineering Workshops	Basic	√	√			√	√	√	√	√	√	√	√
UGI/One	MTU1002	English Language I	Basic	√	√			√	√	√	√	√	√	√	√
UGI/Two	CET1201	Digital Systems	Basic	√	√			√	√	√	√	√	√	√	√
UGI/Two	CET1202	Electrical Circuits	Basic	√	√			√	√	√	√	√	√	√	√

UGI/Two	CET1203	Programming Essentials	Basic	√			√	√	√	√	√	√	√	√	√
UGI/Two	CET1204	Mathematics II	Basic	√			√	√	√	√	√	√	√	√	√
UGI/Two	MTU1006	Democracy and Human Rights	Basic												
UGI/Two	MTU1001	Arabic Language	Basic												
UGI/Two	MTU1004	Computer Fundamentals	Basic	√			√	√	√	√	√	√	√	√	√
UGII/Three	CET2101	Engineering Mathematics	Basic	√			√	√	√	√	√	√	√	√	√
UGII/Three	CET2102	Object Oriented Programming	Basic	√			√	√	√	√	√	√	√	√	√
UGII/Three	CET2103	Computer Organization and Applications	Basic	√			√	√	√	√	√	√	√	√	√
UGII/Three	CET2104	Electronics Fundamentals	Basic	√			√	√	√	√	√	√	√	√	√

UGII/Three	CET2105	Communication Fundamentals	Basic	√			√	√	√	√	√	√	√	√	√
UGII/Three	MTU1003	English Language II	Basic												
UGII/Three	MTU1007	The Crimes of the Baath Regime	Basic												
UGII/Four	CET2201	Advanced Engineering Mathematics	√	√			√	√	√	√	√	√	√	√	√
UGII/Four	CET2202	Python Programming	Basic	√			√	√	√	√	√	√	√	√	√
UGII/Four	CET2203	Microprocessors	Basic	√			√	√	√	√	√	√	√	√	√
UGII/Four	CET2204	Analog Communications	Basic	√			√	√	√	√	√	√	√	√	√
UGII/Four	CET2205	Electronics Circuits	Basic	√			√	√	√	√	√	√	√	√	√
UGII/Four	CET2206	Instrumentation and Measurement	Basic	√			√	√	√	√	√	√	√	√	√

UGII/Four	MTU1009	Arabic Language II	Basic												
UGIII/Five	CET3101	Operating Systems	Basic	√			√	√	√	√	√	√	√	√	√
UGIII/Five	CET3102	Control Engineering Fundamentals	Basic	√			√	√	√	√	√	√	√	√	√
UGIII/Five	CET3103	Digital Signal Processing	Basic	√			√	√	√	√	√	√	√	√	√
UGIII/Five	CET3104	Digital Controllers	Basic	√			√	√	√	√	√	√	√	√	√
UGIII/Five	CET3105	Digital Communications	Basic	√			√	√	√	√	√	√	√	√	√
UGIII/Five	CET31XX	Elective	Optional	√			√	√	√	√	√	√	√	√	√
UGIII/Six	CET3201	Advanced Control Systems	Basic	√			√	√	√	√	√	√	√	√	√
UGIII/Six	CET3202	Computer Network Fundamentals	Basic	√			√	√	√	√	√	√	√	√	√

UGIII/Six	CET3203	Database Systems	Basic	√			√	√	√	√	√	√	√	√	√
UGIII/Six	CET3204	Engineering Analysis	Basic	√			√	√	√	√	√	√	√	√	√
UGIII/Six	CET3205	Data communications	Basic	√			√	√	√	√	√	√	√	√	√
UGIII/Six	CET32XX	Elective	Optional	√			√	√	√	√	√	√	√	√	√
UGIV/Seven	CET4101	Information Theory and Coding	Basic	√			√	√	√	√	√	√	√	√	√
UGIV/Seven	CET4102	Computer Networks Protocols	Basic	√			√	√	√	√	√	√	√	√	√
UGIV/Seven	CET4103	Mobile Communications	Basic	√			√	√	√	√	√	√	√	√	√
UGIV/Seven	CET4104	Engineering Management	Basic	√			√	√	√	√	√	√	√	√	√
UGIV/Seven	MTU1008	Professional Ethics	Basic												

UGIV/Seven	CET41XX	Elective	Optional	√			√	√	√	√	√	√	√	√	√
UGIV/Eight	CET4201	Fiber Optics Communication	Basic	√			√	√	√	√	√	√	√	√	√
UGIV/Eight	CET4202	Advanced Computer Technology	Basic	√			√	√	√	√	√	√	√	√	√
UGIV/Eight	CET4203	Network Security & Cybersecurity	Basic	√			√	√	√	√	√	√	√	√	√
UGIV/Eight	CET4204	Cloud Computing	Basic	√			√	√	√	√	√	√	√	√	√
UGIV/Eight	CET4205	Project	Basic	√			√	√	√	√	√	√	√	√	√
UGIV/Eight	CET42XX	Elective	Optional	√			√	√	√	√	√	√	√	√	√

- Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

Course Description Form

Module 1

Code	Course/Module Title	ECTS	Semester
CET1101	Digital Fundamentals	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
This course learns students the basics of digital electronics, it learns the numbering system, kinds of gates and how to use each kind in designing circuits, methods for minimizing the expressions for digital circuits to get the simplest design (Boolean, DE-Morgan, and Karnaugh map), the binary arithmetic operation and combinational logic circuit which used to design the digital systems.			

Module 2

Code	Course/Module Title	ECTS	Semester
CET1102	Electrical Engineering Fundamentals	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
This Course Specification prepares the student to be able to realize basic parameters in electrical engineering and how to link these parameters. It also makes him capable of solving electrical circuits using different DC theorems.			

Module 3

Code	Course/Module Title	ECTS	Semester
CET1103	Mathematics-I	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	77
Description			
This course is oriented towards providing the 1st year students with the required mathematical preliminaries needed to achieve a full grasp of the knowledge included in the engineering and technical application of their specialization. Furthermore, it is a prerequisite to the course Mathematics II			

Module 4

Code	Course/Module Title	ECTS	Semester
CET1104	Engineering Drawing	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
-	3	48	77
Description			
The objective of the course is to provide students with knowledge of engineering disciplines about drawing concepts using the computer program (AUTOCAD).			

Module 5

Code	Course/Module Title	ECTS	Semester
CET1105	Workshops	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
-	4	64	86
Description			
In this course the students are going to learn the basics of electrical establishments and using different measuring devices, how to use irons, types of soldering, how to use absorbent soldering irons, Electronic components such as resistors, capacitors, inductance, transformers, transistor, and diodes.			

Module 6

Code	Course/Module Title	ECTS	Semester
MTU1002	English Language I	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	1	33	17
Description			
This course builds solid grammar and works on the vocabulary development of the student. It aims to prepare the student to be more expressive in the English language.			

Module 7

Code	Course/Module Title	ECTS	Semester
CET1201	Digital Systems	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			

In this course, the student will learn how to design digital systems by studying the kinds of temporary storage (flip-flops), and how to use them in designing the different types of counters (asynchronous and synchronous counter beside the design of shift registers which is important in applications of storage and transfer data in digital systems, it also aims to study the convertors that used to translate the signals from analogue to digital form or from digital to analogue form so the students acquire the skill to design different kinds of digital systems.

Module 8

Code	Course/Module Title	ECTS	Semester
CET1202	Electrical Circuits	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
This Course Specification prepares the student to be able to realize basic parameters in electrical engineering and how to link these parameters. It also makes him capable of solving electrical circuits using different AC theorems. Moreover, it goes into configuring 3-phase circuits, vectors, phase, and total powers and having the student be capable of linking electricity to magnetism.			

Module 9

Code	Course/Module Title	ECTS	Semester
CET1203	Programming Essentials	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
Programming skills open you up to careers in almost any industry and are required if you want to continue to more advanced and higher-paying software development and engineering roles. This course is a great place to start learning programming, no prior programming knowledge is required. You'll learn these core skills: - Think logically – how to analyze a problem and translate it for a computer to process. - Design, develop, and model real-life problems in your programs. - Understand a programmer's work in the software development process.			

Module 10

Code	Course/Module Title	ECTS	Semester
CET1204	Mathematics-II	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	77
Description			
This course is oriented towards providing the 1st year students with the required mathematical preliminaries needed to achieve a full grasp of the knowledge included in the engineering and technical application of their specialization. Furthermore, it is a prerequisite to the course Engineering Mathematics.			

Module 11

Code	Course/Module Title	ECTS	Semester
MTU1006	Democracy and Human Rights	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
The lesson aims to teach the student and familiarize him with topics related to human rights, public freedoms, and democracy, history, types and practices, as well as international conventions and national constitutions related to them, and election mechanisms and methods.			

Module 12

Code	Course/Module Title	ECTS	Semester
MTU1001	Arabic Language	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
This course aims to teach the students the proper use of the Arabic language in their formal communication, especially written as they become members of a working body whether in the private or public sector. Clear and concise communicable language is a must in any work environment and this course delivers on the clarity component.			

Module 13

Code	Course/Module Title	ECTS	Semester
MTU1004	Computer fundamentals	3	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	1	34	41
Description			
In this course, the student learns and understand computer system work and computer organization and architecture for computer and learn hardware and software computer system with understand computer network and the web technologies			

Module 14

Code	Course/Module Title	ECTS	Semester
CET2101	Engineering Mathematics	5	3

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	77
Description			
The course is oriented towards providing the 2nd year students with the necessary background material to perform mathematical analysis embedded in the engineering and technical application of their specialization. Furthermore, it is a prerequisite to the course advanced applied mathematics.			

Module 15

Code	Course/Module Title	ECTS	Semester
CET2102	Object Oriented Programming	6	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	79	71
Description			
Design and implement classes and objects to represent real-world entities. Create and manipulate objects through inheritance, polymorphism, and encapsulation. Analyze and solve problems using object-oriented design principles and patterns. Utilize C++ libraries and frameworks to develop robust and scalable applications. Implement data abstraction and encapsulation for secure and efficient code. Plan and execute testing strategies to ensure the functionality and reliability of programs. Collaborate with peers to develop object-oriented solutions to complex programming challenges. Apply exception-handling techniques to handle errors and enhance program robustness. Utilize debugging tools to identify and fix program errors. Evaluate and optimize program performance through code analysis and profiling.			

Module 16

Code	Course/Module Title	ECTS	Semester
CET2103	Computer Organization and Applications	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
In this course, the student learns the basic concepts in the field of computers system. The students study a comprehensive function description, organization, and the design of the various sections for any computer system in general. Also, make the students able to encode simple programs using assembly language.			

Module 17

Code	Course/Module Title	ECTS	Semester
CET2104	Electronics Fundamentals	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)

2	2	64	61
Description			
This course provides students with an understanding of types of materials according to their conductivity, and particularly the semiconductor materials, their physics, energy levels, internal structure, classification, Aspects of electrical conductivity. The course goes through the fundamental concepts of semiconductor diodes, Zener region. In addition to covering the diode applications of rectifiers, clippers, and clampers. It also goes into the BJT transistor and its modeling and analysis.			

Module 18

Code	Course/Module Title	ECTS	Semester
CET2105	Communication Fundamentals	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course teaches students the basic of communication systems and signals their components and the types of signals in communications and how to analyze these signals from the time domain to the frequency domain vice versa using series and Fourier transforms. Also, this course makes the students create types of passive filters and active filters used in the communication system and how to design these filters			

Module 19

Code	Course/Module Title	ECTS	Semester
MTU1003	English Language II	2	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	1	33	17
Description			
This course combines solid grammar and practice, vocabulary development, and integrated skills with communicative role-plays and personalization. Authentic material from a variety of sources enables students to see a new language in context, and a range of comprehension tasks, language and vocabulary exercises, and extension activities practice the four skills. 'Everyday English' and 'Spoken grammar' sections practice real-world speaking skills, and a writing section for each unit at the back of the book provides models for students to analyze and imitate.			

Module 20

Code	Course/Module Title	ECTS	Semester
MTU1007	The Crimes of the Baath Regime	2	3

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
In this course, It provides an explanation of the violations to which individuals were exposed under the Baath regime, an explanation of the impact of that regime's behavior on Iraqi society, and the negative effects resulting from the Baath regime assuming power from 1968 to 2003.			

Module 21

Code	Course/Module Title	ECTS	Semester
CET2201	Advanced Engineering Mathematics	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	77
Description			
The course is oriented towards providing the 2nd year students with advanced material to perform complicated engineering and technical application mathematical analysis of their specialization			

Module 22

Code	Course/Module Title	ECTS	Semester
CET2202	Python Programming	4	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	36
Description			
Design and implement Python programs to solve a variety of computational problems. Utilize Python libraries and modules to streamline development and enhance functionality. Analyze and manipulate data using Python's built-in data structures and libraries. Create interactive and user-friendly graphical user interfaces (GUIs) using Python frameworks. Develop web applications and APIs using Python frameworks like Django or Flask. Apply object-oriented programming concepts in Python to design and implement reusable code. Implement error-handling and exception-handling techniques to ensure program reliability. Collaborate with peers to develop and debug Python programs through pair programming and code reviews. Utilize Python's extensive standard library and third-party packages for efficient and effective programming. Deploy and maintain Python applications on various platforms and environments.			

Module 23

Code	Course/Module Title	ECTS	Semester
CET2203	Microprocessors	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)

2	2	64	61
Description			
In this course, the students learn in depth the architecture of a computer system designed based on specific microprocessors. It gives the students the knowledge of operational attributes, structural design, and interfacing of such specific processor computer system components. Also, it makes the students able to encode programs using the specific processor instruction set. Moreover, the students learn to solve problems encountered in the hardware and software of the microprocessor			

Module 24

Code	Course/Module Title	ECTS	Semester
CET2204	Analog Communications	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
The course aims to enable students to learn analog communications, analog modulation types, and demodulating signals with amplitude, frequency, and phase modulation. Analyze the noise in communication systems AM systems & Noise in FM Systems. Also, this course makes the students design a transmission line in communications and the Smith Chart application in communication systems			

Module 25

Code	Course/Module Title	ECTS	Semester
CET2205	Electronics Circuits	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course introduces the student to the applications of transistors and their various roles in electronics circuits. It provides a solid foundation for the theoretical side.			

Module 26

Code	Course/Module Title	ECTS	Semester
CET2206	Instrumentation and Measurement	4	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	36
Description			

In this course, the student can acquire the basic knowledge of measurement principles and their application in electrical engineering. Students will be learned about Electrical Measuring Instruments and Units. The students will be able to effectively employ electrical and electronic instruments for Measuring different electrical quantities like current, voltage, power, energy, power factor, frequency, etc. Select and use suitable sensors and transducers for measurements of different non-electrical quantities

Module 27

Code	Course/Module Title	ECTS	Semester
MTU1009	Arabic Language II	2	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
Teach the students the proper use of the Arabic language in their formal communication, especially written as they become members of a working body whether in the private or public sector. Clear and concise communicable language is a must in any work environment and this course delivers on the clarity component.			

Module 28

Code	Course/Module Title	ECTS	Semester
CET3101	Operating Systems	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course is designed to provide students with a foundational understanding of operating systems, the distinction between kernel and user modes, the concepts of application program interfaces, and the methods and implementations of interrupts. Schedulers, policies, processes, threads, memory management, virtual memory, protection, access control, and authentication are introduced to the students. Students are instructed in system calls for industry-standard prevalent operating systems			

Module 29

Code	Course/Module Title	ECTS	Semester
CET3102	Control Engineering Fundamentals	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			

the Control Engineering Fundamentals course aims to equip students with a robust comprehension of fundamental control system principles, mathematical modeling techniques, system analysis, design methodologies, and practical applications pertinent to the field of control engineering.

Module 30

Code	Course/Module Title	ECTS	Semester
CET3103	Digital Signal Processing	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course introduces the processing of discrete-time (DT) signals. Fundamental principles of DT systems and signals, in both time and Fourier domains, are presented. These are followed by modern applications of digital signal processing in electronic, computer and information engineering. Throughout the course, the focus is on developing techniques and algorithms for solving discrete-time convolution, difference equations, the z-transform, and the discrete Fourier transform. Designing of both recursive and non-recursive digital filters.			

Module 31

Code	Course/Module Title	ECTS	Semester
CET3104	Digital Controllers	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
The course aims to provide students with information and prepare them to be able to know the types of Microcontrollers and its architecture as well as the difference between the microcontroller and microprocessor. It also enables the students to deal with the internal parts of the Microcontroller and gets them into programming the PIC Microcontrollers. Moreover, it goes into connecting the Microcontrollers with peripherals to input and output the information. The course also has the students know the PLC controller with its internal architecture and have the students to program the PLC with the Peripherals devices.			

Module 32

Code	Course/Module Title	ECTS	Semester
CET3105	Digital Communications	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course introduces the student to a field of study that focuses on the transmission and reception of information			

using digital signals. It encompasses various technologies and techniques used to efficiently transmit and process data over different communication channels.

The course covers the understanding of key concepts such as modulation, encoding, multiplexing, error detection and correction, and signal processing. Modulation techniques for digital data, such as amplitude shift keying (ASK), frequency shift keying (FSK), and phase shift keying (PSK), are used to convert digital data into analog signals suitable for transmission over various media.

Module 33

Code	Course/Module Title	ECTS	Semester
CET3201	Advanced Control Engineering	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
the Advanced Control Engineering course aims to provide students with an extensive grasp of stability analysis techniques applicable to control systems, as well as the ability to optimize control systems to achieve enhanced stability performance.			

Module 34

Code	Course/Module Title	ECTS	Semester
CET3202	Computer Network Fundamentals	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course introduces data and information communication and networking over computer networks and covers fundamental topics to enable a seamless exchange of data between any two points in the world by enabling students to design and build networks. This exchange of data takes place over a computer network.			

Module 35

Code	Course/Module Title	ECTS	Semester
CET3203	Database Systems	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course presents the fundamental concepts of database design and use. It provides a study of data models, data description languages, and query facilities including relational algebra and SQL, data normalization, transactions, and their properties, physical data organization and indexing, security issues, and object databases. It also looks at the new trends in databases			

Module 36

Code	Course/Module Title	ECTS	Semester
CET3204	Engineering Analysis	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course can utilize different mathematical techniques in environmental engineering, as well as Applying statistical theories, mathematical theories, and laws in solving engineering problems. • It also provides engineering students with advanced analytical techniques that can be used for their future research.			

Module 37

Code	Course/Module Title	ECTS	Semester
CET3205	Data communications	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	1	64	61
Description			
The course covers the understanding of key concepts such as modulation, encoding, multiplexing, error detection and correction, and signal processing. Modulation techniques for digital data, Differential Phase Shift Keying (DPSK); Quadrature Phase Shift Keying (QPSK); Offset QPSK (OQPSK); $\pi/4$ QPSK; Quadrature Amplitude Modulation (QAM); M-Ary Frequency Shift Keying (M-Ary FSK); Minimum Shift Keying (MSK); Gaussian Minimum Shift Keying (GMSK). And Advantages and Disadvantages; Pseudo Noise Sequence (PN Sequence) Generation and Properties; Direct Sequence Spread Spectrum; Frequency Hopping Spread Spectrum (SFH, FFH).			

Module 38

Code	Course/Module Title	ECTS	Semester
CET4101	Information Theory and Coding	6	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
The course aims to introduce to the students the concepts of the amount of information, entropy, channel capacity, source coding (data compression), error-detection and error-correction codes, block coding, convolutional coding, and other related algorithms and techniques.			

Module39

Code	Course/Module Title	ECTS	Semester
CET4102	Computer Networks Protocols	6	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
This course will provide the students with a comprehensive overview of advanced topics in network protocols and networked systems. It will examine a wide range of topics, e.g., routing, congestion control, network architectures, data center networks, network virtualization, software-defined networking, and programmable networks, with an emphasis on core networking concepts and principles.			

Module40

Code	Course/Module Title	ECTS	Semester
CET4103	Mobile Communications	6	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	86
Description			
This course aims to guide the student in the world of mobile communications by first going through the evolution of mobile communications and getting familiar with the types of Wireless communication systems, Cellular radio, and personal communication. Then it delves into the Cellular systems and the concepts of frequency reuse, S/I ratio consideration and calculation for Minimum Co-channel and adjacent interference, Handoff strategies, System-cell splitting & Cell sectorization. Free Space Propagation loss equation Path-loss, Link budget design, and Multiple Access Techniques which when combined form a solid foundation for the student to pursue a career in the telecom sector.			

Module 41

Code	Course/Module Title	ECTS	Semester
CET4104	Engineering Management	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
Course Objectives: Giving students from engineering majors knowledge about project management concepts and their applications.			

Module 42

Code	Course/Module Title	ECTS	Semester
MTU1008	Professional Ethics	3	7

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
This course introduces the engineer to the best practices of the engineering profession. The ethical code to be followed in the workplace. It also throws the moral component in the decision-making process which moves the needle from a purely technical form to a moral-technical form.			

Module 43

Code	Course/Module Title	ECTS	Semester
CET4201	Fiber Optics communication	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
In this course, the student can acquire the basic knowledge of fiber optics communication principles and their application. Students will be learned about high-speed single mode and low-speed multimode fiber, step and graded refractive index profiles, different dispersion mechanisms and their effect on high-speed links, the advantage of coherent (LASER) light sources over incoherent (LED) sources for the long haul, high-speed links, photodetectors.			

Module 44

Code	Course/Module Title	ECTS	Semester
CET4202	Advanced Computer Technology	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
the course aims to provide students with information and prepare them to be able to: understand the μP and its architecture and the addressing modes. getting familiar with the following concepts: paging mechanism, segment translation, page translation, cache memory, cache organization, fully associative, direct mapped, and set associative. in addition, the course delves into the cache memory used for 80386 as well as direct maps, two-way set associative, intel's Pentium and its features, Pentium pro, out-of-order execution, other Pentium processors, and core processor.			

Module 45

Code	Course/Module Title	ECTS	Semester
CET4203	Network Security & Cybersecurity	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61

Description
This course will provide students with foundational knowledge and skills in managing cybersecurity risks and threats at an organizational level. Students will learn the nature and magnitude of current cyber threats; case studies in threat prevention and incident handling; strategies for organizational risk management of cyber threats; organizational mechanisms policies and procedures for minimizing the risks and costs associated with breaches; current trends and developments in threats and mitigation; resources identifying new threats and approaches to mitigation.

Module 46

Code	Course/Module Title	ECTS	Semester
CET4204	Cloud Computing	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
The course will introduce this domain and cover the topics of cloud infrastructures, virtualization, software-defined networks and storage, cloud storage, and programming models. As an introduction, we will discuss the motivating factors, benefits, and challenges of the cloud, as well as service models, service level agreements (SLAs), security, example cloud service providers, and use-cases. The course also provides hands-on experience through projects utilizing public cloud infrastructures (Amazon Web Services (AWS) and Microsoft Azure as well as other open-source projects like Proxmox.			

Module 47

Code	Course/Module Title	ECTS	Semester
CET4205	Project	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
	4	62	63
Description			
The project enables the student to demonstrate his ability in building, implementing, and programming a system (hardware, software, or both) where he reflects his analytical thinking and the acquired technical skills as well as the theoretical foundation in getting the project done.			

Module 48

Code	Course/Module Title	ECTS	Semester
CET3106	Real-Time Systems	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course covers the theoretical and practical concepts for systems and introduces the component of time in the			

output. Thus, it introduces the students to a new paradigm of concepts where the signal must be dealt with in a scoped time. Hence various hardware designs, components and circuits are introduced to facilitate such operation.

Module 49

Code	Course/Module Title	ECTS	Semester
CET3107	Parallel Computing	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course is to familiarize students with the fundamental concepts, techniques, and tools of parallel computing. Participation in this course will enable you to better use parallel computing in your application area. The students in this course will understand how parallel computing has now become universal, from multicore computing on-chip to large-scale cluster computing, Grid computing, and Cloud computing.			

Module 50

Code	Course/Module Title	ECTS	Semester
CET3206	Digital Image Processing	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
The students will learn the material by implementing and investigating image-processing algorithms in MATLAB. With the emphasis being on the general principles of image processing. Digital image processing is the use of algorithms and mathematical models to process and analyze digital images. Digital image processing aims to enhance image quality, extract meaningful information from images, and automate image-based tasks.			

Module 51

Code	Course/Module Title	ECTS	Semester
CET3207	IoT Fundamentals	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
The Internet of Things is a course that deals with the study of how devices are connected and how it helps to stay connected over the Internet. The course teaches individuals how the Internet of Things is helpful in our daily lives and how to stay connected over the Internet. The students will understand how the IoT is bridging the gap between operational and information technology systems.			

Module 52

Code	Course/Module Title	ECTS	Semester
CET4105	Artificial Intelligence	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course aims to make the student able to identify the fundamentals of artificial intelligence networks and their types. Furthermore, to know the difference between artificial neural networks and biological neural networks. Moreover, to study the types of training algorithms			

Module 53

Code	Course/Module Title	ECTS	Semester
CET4106	Web Design	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course introduces students to the principles and practices of web architecture and design. Students will learn the essential concepts, tools, and techniques required to create modern and user-friendly websites. The course covers topics such as HTML, CSS, JavaScript, responsive design, user experience (UX) design, and web graphics. Through hands-on projects and assignments, students will develop the skills necessary to design and implement effective web interfaces.			

Module 54

Code	Course/Module Title	ECTS	Semester
CET4107	Distributed Computing & Systems	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course covers general introductory concepts in the design and implementation of distributed systems, covering all the major branches such as Cloud Computing, Grid Computing, Cluster Computing, Supercomputing, and Many-core Computing. The topics that are within the scope of this course are: scheduling in multiprocessors, memory hierarchies, synchronization, concurrency control, fault tolerance, data-parallel programming models, scalability studies, distributed memory message passing systems, shared memory programming models, tasks, fundamental parallel algorithms, parallel programming exercises, parallel algorithm design techniques, interconnection topologies, heterogeneity, load balancing, memory consistency model, asynchronous computation, Amdahl's Law.			

Module 55

Code	Course/Module Title	ECTS	Semester
CET4206	Reconfigurable Computing Systems	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course is designed to offer an introduction to the principles of modern Reconfigurable Computing Systems (RCS). The emphasis is on understanding the concepts of architecture reconfigurability, programmable logic devices, and adaptation of the RCS architecture to the task algorithm and data structure. The course covers the hardware basics of the modern RCS – fine and coarse-grained programmable logic devices: Field Programmable Gate Arrays (FPGA) and Coarse-Grained Reconfigurable Arrays (CGRA).			

Module 56

Code	Course/Module Title	ECTS	Semester
CET4207	Wireless Sensor Networks	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
Understand the fundamentals of wireless sensor networks and their applications. Explore the components and architecture of wireless sensor networks. Learn about different types of wireless sensors and their characteristics. Design and configure wireless sensor networks for data collection and monitoring. Study the protocols and algorithms used in wireless sensor networks for efficient communication. Gain practical experience in deploying and configuring wireless sensor nodes. Analyze and interpret data collected from wireless sensor networks using appropriate tools. Investigate energy-efficient techniques for prolonging the lifespan of wireless sensor networks. Collaborate with peers to develop projects that utilize wireless sensor networks. Explore emerging trends and advancements in wireless sensor networks and their potential applications.			

Module 57

Code	Course/Module Title	ECTS	Semester
CET4208	Optimization Algorithms	5	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	64	61
Description			
This course aims to teach the students the basics of optimization algorithms, as well as the most important concepts on which optimization algorithms are based. In addition, teaching the students the most important optimization algorithms will focus on genetic algorithms and their applications.			