Middle Technical University
الجامعة التقنية الوسطى

First Cycle – Bachelor's Degree (B.Eng.)
Department of **Computer Engineering Techniques**
Electrical Engineering Technical College
Middle Technical University

بكالوريوس ـ هندسة تقنيات الحاسوب (الدورة الأولى) – الكلية التقنية الهندسية
الكهربائية – الجامعة التقنية الوسطى

Table of Contents

1. Overview

This catalogue is about the courses (modules) given by the program of Computer Techniques Engineering to gain the bachelor's degree. The program delivers (51) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process. The 48 modules are made up of 51 modules that are (basic, core, and support) and 4 elective modules to be selected from a pool of 10 elective modules.

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج تقنيات الحاسوب للحصول على درجة البكالوريوس. يقدم البرنامج (٥١) مادة دراسية ، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

تتألف المواد الدراسية ال ٥١ من ٤٧ مادة دراسية موزعة بين اساسية، أولية، وساندة و ٤ مواد اختيارية يتم اختيارها من ضمن ١٠ مواد اختيارية كلية.

2. Undergraduate Courses 2023-2024

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.

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.

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

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
CET1106	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.			

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.

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.

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
CET1205	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
CET1206	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
CET1207	**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.

Code	Course/Module Title	ECTS	Semester
CET2103	Computer organization & Architecture	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

Code	Course/Module Title	ECTS	Semester
CET2106	**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.

Code	Course/Module Title	ECTS	Semester
CET2107	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.

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

Code	Course/Module Title	ECTS	Semester
CET2202	**Python Programming**	5	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	64	61
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.

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

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

Module25

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	5	4
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 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
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

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.

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.

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.

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.

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.

Code	Course/Module Title	ECTS	Semester
CET3202	**Computer Network Fundamentals**	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	64	86
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 34

Code	Course/Module Title	ECTS	Semester
CET3203	Database Systems	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	64	86
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 35

Code	Course/Module Title	ECTS	Semester
CET3204	Engineering Analysis	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	64	86
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 36

Code	Course/Module Title	ECTS	Semester
CET3205	English Language III	2	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	1	33	17
Description			

The course aims to Provide students with essential information in English language in association with reading, writing and speaking skills, and knowing more English vocabulary and o understand sentences, tenses, and practicing writing.
This module works towards enhancing students' English language competencies along with their technical or professional knowledge and enhancing students' communication skills in English can result in better job opportunities in the future

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.

Code	Course/Module Title	ECTS	Semester
CET4102	**Computer Networks Protocols**	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	64	61
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.

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.

Code	Course/Module Title	ECTS	Semester
CET4104	**Engineering Management**	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	49	51
Description			
Course Objectives: Giving students from engineering majors knowledge about project management concepts and their applications.			

Module 41

Code	Course/Module Title	ECTS	Semester
CET4105	**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 42

Code	Course/Module Title	ECTS	Semester
CET4106	**English Language IV**	2	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	1	33	17
Description			
A balanced syllabus with a strong emphasis on speaking builds confidence and promotes fluency. A solid grammar syllabus, substantial reading practice, plus the best of recent language learning approaches. In addition, it combines an intermediate level of English solid grammar and practice, vocabulary development, and integrated skills with communicative role-plays and personalization. After this course, students can see new language in context, and a range of comprehension tasks, language and vocabulary exercises, and extension activities practice the four skills			

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.

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.

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.

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.

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.

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.

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.

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.

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
CET4107	**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
CET4108	**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
CET4109	**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.

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).

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.

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.			

Contact

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