

وزارة التعليم العالي والبحث العلمي
جهاز الاشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي

استمارة وصف البرنامج الأكاديمي للكليات والمعاهد للعام الدراسي 2025-2026

الجامعة : العلوم العراقية

الكلية /المعهد : كلية الهندسة

القسم العلمي : هندسة الامن السيبراني

تاريخ ملء الملف : 2026-1-4

تاريخ ملء الملف : 2026-1-4

اللجنة المركزية لضمان الجودة لمسار بولونيا

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اللجنة الفرعية لضمان الجودة لمسار بولونيا

التوقيع: _____ التوقيع: _____ التوقيع: _____
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دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: سيرجاني احمد

التاريخ

التوقيع



Al-Iraqia Science University

جامعة العلوم العراقية



First Cycle – Four Levels – 240 ECTS

Bachelor's Degree (B.Sc.) – Cybersecurity Engineering

الدورة الأولى - بكالوريوس هندسة الامن السيبراني - أربع سنوات - ٢٤٠ وحدة اوروبية



Table of Contents | جدول المحتويات

1. Vision & Mission Statement	بيان الرؤية والرسالة
2. Program Goals	أهداف البرنامج
3. Program Specification Overview	مواصفات البرنامج
4. Program learning outcomes	مخرجات تعلم الطالب على مستوى البرنامج الدراسي
5. Academic Staff	الهيئة التدريسية
6. Credits, Grading and GPA	الاعتمادات والدرجات والمعدل التراكمي
7. Modules	المواد الدراسية
8. Contact	اتصال

1. Vision & Mission Statement

Vision Statement

To be a leading Cybersecurity Engineering program in Iraq and the region, recognized for academic excellence, applied innovation, and impactful research that strengthens the security and resilience of digital systems and critical infrastructure, while preparing highly qualified graduates who contribute to national and global cyber defense.

Mission Statement

The Cybersecurity Engineering Program is committed to delivering rigorous, engineering-driven education and training that integrates foundational computing, secure system design, and modern cybersecurity practices. The program aims to:

- Prepare competent and ethical cybersecurity engineers capable of designing, building, and operating secure digital systems.
- Develop strong analytical and practical skills in threat modeling, vulnerability assessment, secure software and network engineering, digital forensics, and incident response.
- Promote research, innovation, and entrepreneurship to address real-world cybersecurity challenges across government, industry, and critical sectors.
- Strengthen partnerships with stakeholders to align learning outcomes with labor-market needs and international professional standards.
- Foster a culture of integrity, privacy protection, risk management, and lifelong learning to support sustainable digital transformation.

2. Program Goals

- Program Goals
- Ensure graduates master fundamental and advanced concepts in biology aligned with Iraqi higher education standards.
- Develop research capabilities through modern laboratory training and field studies.

- Promote understanding of Iraq's rich biodiversity and environmental conservation needs.
- Prepare students for postgraduate studies and professional careers in life sciences.
- Contribute to sustainable development through applied biological research.

3. Program Specification Overview

Program code:	CEN11005	ECTS	4
Duration:	1 level, 1 Semester	Method of Attendance:	Full Time
This course equips Cybersecurity Engineering students with a solid scientific foundation for understanding the physical principles that underlie electrical and electronic systems used in computing, communications, and security hardware. It begins with essential concepts of physical quantities, units, measurement accuracy, vectors, and dimensional analysis to build disciplined engineering reasoning. The course then covers electric charge and the structure of matter, conservation of charge, and methods of charging bodies. Students study electrostatic forces, electric fields, Coulomb's law, field lines, electric dipoles, and electric potential energy—core topics needed to interpret how devices behave at a fundamental level. The curriculum continues with current electricity, resistance, and Ohm's law, followed by capacitors and their combinations, and an introduction to AC circuit behavior, including inductive and capacitive reactance and basic circuit response. A key component of the course is semiconductors: intrinsic and doped materials, charge carriers, PN junction theory, diode characteristics, and practical diode-based applications such as rectification and voltage regulation. Laboratory activities reinforce safe measurement, component testing, and the connection between theory and real circuits.			

Program code:	CYE11006	ECTS	4
Duration:	1 level, 1 Semester	Method of Attendance:	Full Time
This course is designed as "Biology for Engineers," tailored to the needs of Cybersecurity Engineering students, particularly in the area of biometrics and protection of biological/biometric data. It introduces fundamental biological concepts that help students understand why biometric traits can be unique, measurable, and security-relevant. The course starts with basic biochemistry, water and biomolecules, then moves to cell structure, membranes, and transport processes. Students learn about enzymes, energy transformation, cellular respiration, and photosynthesis, followed by cell division and inheritance principles. A central component is genetics and DNA: chromosome structure, DNA replication, and the flow of information from DNA to proteins through transcription and translation. These foundations are connected to real biometric modalities such as fingerprints, iris/retina patterns, voice characteristics, gait, and behavioral biometrics (e.g., keystroke dynamics). The course also addresses variability, bias, and fairness considerations in biometric systems. In addition, it emphasizes ethics, privacy, consent, and the security implications of collecting, storing, and processing biometric data—highlighting risks such as spoofing, template leakage, misuse, and identity permanence, and discussing engineering approaches to reduce these risks.			

Program code:	CYE11007	ECTS	6
Duration:	1 level, 1 Semester	Method of Attendance:	Full Time
Digital Logic Design is a foundational course that develops the digital thinking required to understand and engineer hardware-based systems, embedded platforms, and low-level computing components that underpin many cybersecurity applications. The course begins with an introduction to digital electronics and how digital representation differs from analog signals. Students learn number systems, base conversions, and binary arithmetic, which are essential for understanding internal data representation and machine-level operations. The course then covers logic gates, truth tables, and Boolean algebra, including key laws and theorems used to model and simplify logic functions. A major emphasis is placed on optimization through Karnaugh maps (K-Maps) to reduce circuit complexity, cost, and error probability. Students design and analyze combinational circuits such as adders/subtractors, multiplexers, decoders/encoders, and comparator structures. The course extends to sequential logic: latches and flip-flops, registers, counters, finite-state concepts, and timing considerations such as propagation delay and clocking behavior. Practical work typically includes simulation, verification, and troubleshooting of circuits, helping students build strong skills in systematic design and testing. The course also supports later cybersecurity topics by strengthening understanding of hardware trust, embedded systems behavior, and the foundations of secure hardware/software interaction.			

Program code:	CEN11004	ECTS	4
Duration:	1 level, 1 Semester	Method of Attendance:	Full Time
Engineering Drawing develops the student's ability to communicate technical ideas precisely through standardized engineering graphics. Although cybersecurity is often viewed as software-centric, cybersecurity engineers increasingly engage with devices, lab environments, embedded systems, and physical infrastructure where accurate technical documentation is essential. This course starts with drawing instruments and correct drafting practices, followed by geometric constructions (lines, circles, tangency, polygons, and curves) that build spatial reasoning and drafting discipline. Students learn technical lettering, line conventions, and dimensioning rules according to recognized standards, enabling drawings that can be interpreted consistently by others. The course then covers orthographic projection—front, top, and side views—to represent three-dimensional objects in two dimensions, and introduces isometric and perspective representations to visualize components more effectively. Sectional views are included to reveal internal features that cannot be seen from external projections, and students may learn the basics of surface development for certain shapes. The course often introduces computer-aided design (CAD) concepts to improve accuracy, speed, and revision capability. By the end, students are able to read and produce complete technical drawings with proper dimensions and conventions—skills valuable for documenting equipment layouts, enclosures, cabling paths, and engineering configurations.			

Program code:	KUS11001	ECTS	5
Duration:	1 level, 1 Semester	Method of Attendance:	Full Time
This course provides a strong foundation in integral calculus as an essential analytical tool for engineering study and practice. It develops the student's ability to model, compute, and interpret integrals, which appear throughout engineering topics such as physics, signals, systems, control, and performance analysis. The course begins with fundamental integration techniques and builds competence with indefinite integrals and the concept of antiderivatives. Students then study definite integrals and their geometric meaning, including applications such as computing areas under curves and accumulated quantities. The curriculum expands to more advanced techniques, including substitution methods, integration by parts, and partial fraction decomposition—tools needed to solve complex rational and composite integrals. Trigonometric integrals and trigonometric substitutions are also introduced, especially for expressions containing radicals and quadratic forms. The course typically includes improper integrals and convergence ideas, helping students handle infinite intervals or integrands with singularities. Applications are emphasized to connect mathematics to engineering needs, such as calculating volumes of revolution and other measurable physical quantities. Throughout, the course stresses structured problem-solving: selecting the right method, executing computations accurately, checking results, and interpreting the meaning of solutions in real contexts. This mathematical maturity supports later cybersecurity engineering studies involving modeling, analysis, and quantitative reasoning..			

Program code:	KUS11002	ECTS	5
Duration:	1 level, 1 Semester	Method of Attendance:	Full Time
Fundamentals of Computer Science 1 provides an organized introduction to computing essentials that Cybersecurity Engineering students need for effective study and professional practice. The course begins with core concepts: what a computer is, how hardware and software interact, and how information is represented and processed. Students learn about major computer components—CPU, memory, storage, and input/output devices—along with common peripheral technologies. The course then covers operating systems and graphical user interfaces, including file management, basic system operations, and practical computing workflows. A strong skills component typically includes productivity tools: word processing for technical reports, spreadsheets for data handling and analysis, and presentations for structured communication of technical ideas. Internet fundamentals are introduced, including browsing, search skills, email, and basic awareness of networking concepts such as local and wide-area networks and online collaboration services. The course often includes introductory programming using Python, focusing on basic syntax, input/output, variables, conditions, loops, and simple data structures to develop algorithmic thinking. Importantly for cybersecurity students, the course incorporates initial cybersecurity and digital ethics awareness—safe user behavior, responsible use of technology, and basic concepts relevant to protecting personal and organizational information in everyday computing environments.			

Program code:	KUS11003	ECTS	2
Duration:	1 level, 1 Semester	Method of Attendance:	Full Time

This course builds legal, ethical, and societal awareness that complements the technical identity of a Cybersecurity Engineering student. Cybersecurity work often intersects with privacy, surveillance, freedom of expression, due process, and the protection of personal data; therefore, understanding human rights concepts strengthens professional responsibility and compliance-minded decision-making. The course introduces the concept, nature, and characteristics of human rights and discusses their historical development, highlighting how modern rights frameworks emerged. It clarifies distinctions between human rights and other categories of rights, and explores the presence of human-rights principles within major religions and cultural traditions. Students examine international and regional human rights instruments, treaties, and declarations, and consider how national legislation and institutions can protect rights through legal guarantees and enforcement mechanisms. The course also addresses accountability: legal consequences, sanctions, and remedies related to rights violations. For cybersecurity students, this context is particularly important when designing or operating systems that process personal information, enable monitoring, support investigations, or implement automated decision-making. By the end, students should be able to connect technical choices to societal impact, evaluate trade-offs between security and rights, and adopt a professional posture that respects human dignity, privacy, and democratic values while meeting legitimate security objectives.

4. Program Learning Outcomes

4.1 Knowledge and Understanding (K)

- K1.** Demonstrate comprehensive understanding of core concepts in cybersecurity engineering, including confidentiality, integrity, availability, authentication, authorization, and non-repudiation.
- K2.** Explain principles of secure software development, operating system security, and secure system architecture.
- K3.** Describe computer networks, protocols, and network security mechanisms (e.g., segmentation, firewalls, IDS/IPS, VPNs).
- K4.** Understand cryptographic fundamentals and practical applications (symmetric/asymmetric cryptography, hashing, key management, PKI).
- K5.** Explain threat landscapes, attacker models, vulnerabilities, and common attack techniques across systems and networks.
- K6.** Understand risk management, security governance, policies, compliance concepts, and the security lifecycle.
- K7.** Recognize digital forensics principles, evidence handling, incident response stages, and security monitoring concepts.
- K8.** Understand ethical, legal, and societal implications of cybersecurity, including privacy and professional responsibilities, within the Iraqi context.

4.2 Intellectual/Cognitive Skills (C)

- C1.** Apply systematic problem-solving and security thinking (threat modeling, attack surface analysis) to cybersecurity challenges.
- C2.** Analyze complex security problems, identify root causes, and propose technically sound mitigations.
- C3.** Design security controls and architectures that balance protection, usability, and performance.
- C4.** Critically evaluate cybersecurity research, technical reports, advisories, and standards-based documentation.
- C5.** Synthesize information from multiple sources (logs, alerts, system behavior, documentation) to form coherent security judgments.
- C6.** Apply quantitative reasoning and basic statistical concepts to interpret security data and trends.
- C7.** Make evidence-based decisions for risk treatment (avoid, mitigate, transfer, accept) in realistic scenarios.
- C8.** Demonstrate creative and adversarial thinking to anticipate attacker behavior and improve defensive strategies.

4.3 Practical and Professional Skills (P)

- P1.** Configure and harden operating systems and network devices using secure baselines and best practices.
- P2.** Use security tools for monitoring, vulnerability assessment, and basic penetration testing in controlled environments.
- P3.** Collect, preserve, and analyze digital evidence while maintaining integrity and proper documentation.
- P4.** Perform incident response tasks: triage, containment, eradication, recovery, and post-incident reporting.
- P5.** Implement secure coding practices, conduct code reviews, and apply common mitigation techniques (input validation, least privilege, secure authentication).
- P6.** Deploy and manage cryptographic solutions appropriately (certificates, secure communication, key handling) in practical scenarios.
- P7.** Produce accurate technical documentation: security reports, risk assessments, and standard operating procedures.
- P8.** Follow professional ethics, legal constraints, and safety procedures when conducting cybersecurity activities.

4.4 General and Transferable Skills (T)

- T1.** Communicate cybersecurity concepts and technical findings effectively in English and Arabic, both orally and in writing.

T2. Work effectively in teams, contribute to collaborative tasks, and demonstrate leadership in project settings.

T3. Use information technology tools and productivity platforms to support secure analysis, documentation, and reporting.

T4. Manage time, priorities, and resources to deliver cybersecurity tasks and projects within constraints.

T5. Present technical results to diverse audiences, including non-specialists, with appropriate clarity and structure.

T6. Search, evaluate, and reference technical sources (standards, advisories, documentation) responsibly and accurately.

T7. Demonstrate self-directed learning and professional development aligned with evolving cybersecurity technologies and threats.

T8. Apply structured problem-solving and critical thinking to real-world cybersecurity and engineering scenarios.

5. Academic Staff

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6. Credits, Grading and GPA

Credits

Al-Iraqia Science 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 25 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:				
Note: Marks with 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. ملاحظة: سيتم تقريب العلامات العشرية التي تزيد أو تقل عن ٠.٥ إلى العلامة الكاملة الأعلى أو الأدنى (على سبيل المثال، سيتم تقريب علامة ٥٤.٥ إلى ٥٥، بينما سيتم تقريب علامة ٥٤.٤ إلى ٥٤). لدى الجامعة سياسة لا تسمح بـ "حالات الرسوب القريبة من النجاح"، لذا فإن التعديل الوحيد للعلامات الممنوحة من قبل المصححين الأصليين سيكون التقريب التلقائي الموضح أعلاه.				

Calculation of the Cumulative Grade Point Average (CGPA)

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

CGPA of a 4-year B.Sc. degree:

$$\text{CGPA} = \frac{(1\text{st module score} \times \text{module ECTS}) + (2\text{nd module score} \times \text{module ECTS}) + (3\text{rd module score} \times \text{module ECTS}) + \dots + (\text{last module score} \times \text{module ECTS})}{240}$$

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
KUS11001	Mathematics I	63	62	5.00	B	
KUS11002	Fundamental of computer science	63	62	5.00	B	
KUS11003	Democracy and Human Rights	33	17	2.00	B	
CEN11004	Engineering Drawing	48	52	4.00	S	
CEN11005	Physics	63	37	4.00	B	
CYE11006	Biology	33	67	4.00	B	
CYE11007	Digital Logic Design	63	87	6.00	C	

8. Contact

Program Manager:

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امسح الكود للوصول إلى النسخة الإلكترونية

Al-Iraqia Science University جامعة العلوم العراقية



First Cycle – Four Levels – 240 ECTS
Bachelor's Degree (B.Sc.) – Cybersecurity Engineering

الدورة الأولى - بكالوريوس هندسة الامن السيبراني - أربع سنوات - ٢٤٠ وحدة اوروبية



Table of Contents

1. Overview
2. Undergraduate Modules 2023-2024
3. Contact

1. Overview

This catalogue is about the courses (modules) given by the program of Cybersecurity Engineering to gain the Bachelor of Science degree. The 4-year program delivers (40, as an example) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة الامن السيبراني للحصول على درجة بكالوريوس العلوم. يقدم برنامج الأربع سنوات (٤٠) مادة دراسية، على سبيل المثال، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Modules 2025-2026

Module 1

Code	Module Title	ECTS	Semester
KUS11001	Mathematics I	5	1
Class (hr/w)	OLect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
This course provides a strong foundation in integral calculus as an essential analytical tool for engineering study and practice. It develops the student's ability to model, compute, and interpret integrals, which appear throughout engineering topics such as physics, signals, systems, control, and performance analysis. The course begins with fundamental integration techniques and builds competence with indefinite integrals and the concept of antiderivatives. Students then study definite integrals and their geometric meaning, including applications			

such as computing areas under curves and accumulated quantities. The curriculum expands to more advanced techniques, including substitution methods, integration by parts, and partial fraction decomposition—tools needed to solve complex rational and composite integrals. Trigonometric integrals and trigonometric substitutions are also introduced, especially for expressions containing radicals and quadratic forms. The course typically includes improper integrals and convergence ideas, helping students handle infinite intervals or integrands with singularities. Applications are emphasized to connect mathematics to engineering needs, such as calculating volumes of revolution and other measurable physical quantities. Throughout, the course stresses structured problem-solving: selecting the right method, executing computations accurately, checking results, and interpreting the meaning of solutions in real contexts. This mathematical maturity supports later cybersecurity engineering studies involving modeling, analysis, and quantitative reasoning.

Module 2

Code	Module Title	ECTS	Semester
KUS11002	Fundamental of computer science	5	1
Class (hr/w)	OLect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
Fundamentals of Computer Science 1 provides an organized introduction to computing essentials that Cybersecurity Engineering students need for effective study and professional practice. The course begins with core concepts: what a computer is, how hardware and software interact, and how information is represented and processed. Students learn about major computer components—CPU, memory, storage, and input/output devices—along with common peripheral technologies. The course then covers operating systems and graphical user interfaces, including file management, basic system operations, and practical computing workflows. A strong skills component typically includes productivity tools: word processing for technical reports, spreadsheets for data handling and analysis, and presentations for structured communication of technical ideas. Internet fundamentals are introduced, including browsing, search skills, email, and basic awareness of networking concepts such as local and wide-area networks and online collaboration services. The course often includes introductory programming using Python, focusing on basic syntax, input/output, variables, conditions, loops, and simple data structures to develop algorithmic			

thinking. Importantly for cybersecurity students, the course incorporates initial cybersecurity and digital ethics awareness—safe user behavior, responsible use of technology, and basic concepts relevant to protecting personal and organizational information in everyday computing environments.

Module 3

Code	Module Title	ECTS	Semester
KUS11002	Democracy and Human Rights	2	1
Class (hr/w)	OLect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
This course builds legal, ethical, and societal awareness that complements the technical identity of a Cybersecurity Engineering student. Cybersecurity work often intersects with privacy, surveillance, freedom of expression, due process, and the protection of personal data; therefore, understanding human rights concepts strengthens professional responsibility and compliance-minded decision-making. The course introduces the concept, nature, and characteristics of human rights and discusses their historical development, highlighting how modern rights frameworks emerged. It clarifies distinctions between human rights and other categories of rights, and explores the presence of human-rights principles within major religions and cultural traditions. Students examine international and regional human rights instruments, treaties, and declarations, and consider how national legislation and institutions can protect rights through legal guarantees and enforcement mechanisms. The course also addresses accountability: legal consequences, sanctions, and remedies related to rights violations. For cybersecurity students, this context is particularly important when designing or operating systems that process personal information, enable monitoring, support investigations, or implement automated decision-making. By the end, students should be able to connect technical choices to societal impact, evaluate trade-offs between security and rights, and adopt a professional posture that respects human dignity, privacy, and democratic values while meeting legitimate security objectives.			

Module 4

Code	Module Title	ECTS	Semester
CEN11004	Engineering Drawing	4	1
Class (hr/w)	OLect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	2	48	52
Description			
Engineering Drawing develops the student's ability to communicate technical ideas precisely through standardized engineering graphics. Although cybersecurity is often viewed as software-centric, cybersecurity engineers increasingly engage with devices, lab environments, embedded systems, and physical infrastructure where accurate technical documentation is essential. This course starts with drawing instruments and correct drafting practices, followed by geometric constructions (lines, circles, tangency, polygons, and curves) that build spatial reasoning and drafting discipline. Students learn technical lettering, line conventions, and dimensioning rules according to recognized standards, enabling drawings that can be interpreted consistently by others. The course then covers orthographic projection—front, top, and side views—to represent three-dimensional objects in two dimensions, and introduces isometric and perspective representations to visualize components more effectively. Sectional views are included to reveal internal features that cannot be seen from external projections, and students may learn the basics of surface development for certain shapes. The course often introduces computer-aided design (CAD) concepts to improve accuracy, speed, and revision capability. By the end, students are able to read and produce complete technical drawings with proper dimensions and conventions—skills valuable for documenting equipment layouts, enclosures, cabling paths, and engineering configurations			

Module 5

Code	Module Title	ECTS	Semester
CEN11005	Physics	4	1
Class (hr/w)	OLect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
This course equips Cybersecurity Engineering students with a solid scientific foundation for understanding the physical principles that underlie electrical and			

electronic systems used in computing, communications, and security hardware. It begins with essential concepts of physical quantities, units, measurement accuracy, vectors, and dimensional analysis to build disciplined engineering reasoning. The course then covers electric charge and the structure of matter, conservation of charge, and methods of charging bodies. Students study electrostatic forces, electric fields, Coulomb's law, field lines, electric dipoles, and electric potential energy—core topics needed to interpret how devices behave at a fundamental level. The curriculum continues with current electricity, resistance, and Ohm's law, followed by capacitors and their combinations, and an introduction to AC circuit behavior, including inductive and capacitive reactance and basic circuit response. A key component of the course is semiconductors: intrinsic and doped materials, charge carriers, PN junction theory, diode characteristics, and practical diode-based applications such as rectification and voltage regulation. Laboratory activities reinforce safe measurement, component testing, and the connection between theory and real circuits.

Module 6

Code	Module Title	ECTS	Semester
CYE11006	Biology	4	1
Class (hr/w)	OLect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	67
Description			
This course is designed as “Biology for Engineers,” tailored to the needs of Cybersecurity Engineering students, particularly in the area of biometrics and protection of biological/biometric data. It introduces fundamental biological concepts that help students understand why biometric traits can be unique, measurable, and security-relevant. The course starts with basic biochemistry, water and biomolecules, then moves to cell structure, membranes, and transport processes. Students learn about enzymes, energy transformation, cellular respiration, and photosynthesis, followed by cell division and inheritance principles. A central component is genetics and DNA: chromosome structure, DNA replication, and the flow of information from DNA to proteins through transcription and translation. These foundations are connected to real biometric modalities such as fingerprints, iris/retina patterns, voice characteristics, gait, and behavioral biometrics (e.g., keystroke dynamics). The course also addresses variability, bias, and fairness considerations in biometric systems. In addition, it emphasizes ethics, privacy, consent, and the security implications of collecting, storing, and processing biometric data—highlighting risks such as spoofing,			

template leakage, misuse, and identity permanence, and discussing engineering approaches to reduce these risks.

Module 7

Code	Module Title	ECTS	Semester
CYE11007	Digital Logic Design	6	1
Class (hr/w)	OLect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	87
Description			
Digital Logic Design is a foundational course that develops the digital thinking required to understand and engineer hardware-based systems, embedded platforms, and low-level computing components that underpin many cybersecurity applications. The course begins with an introduction to digital electronics and how digital representation differs from analog signals. Students learn number systems, base conversions, and binary arithmetic, which are essential for understanding internal data representation and machine-level operations. The course then covers logic gates, truth tables, and Boolean algebra, including key laws and theorems used to model and simplify logic functions. A major emphasis is placed on optimization through Karnaugh maps (K-Maps) to reduce circuit complexity, cost, and error probability. Students design and analyze combinational circuits such as adders/subtractors, multiplexers, decoders/encoders, and comparator structures. The course extends to sequential logic: latches and flip-flops, registers, counters, finite-state concepts, and timing considerations such as propagation delay and clocking behavior. Practical work typically includes simulation, verification, and troubleshooting of circuits, helping students build strong skills in systematic design and testing. The course also supports later cybersecurity topics by strengthening understanding of hardware trust, embedded systems behavior, and the foundations of secure hardware/software interaction.			

3. Contact

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امسح الكود للوصول إلى النسخة الإلكترونية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Physics		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CEN11005		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	Semester of Delivery	1
Administering Department	Cybersecurity	College	Engineering
Module Leader	Mohammed Hameed Abdulhasan	e-mail	m.hameed.hassen97@baghdadcollege.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules	
العلاقة مع المواد الدراسية الأخرى	
Prerequisite module	None
Semester	

Co-requisites module	None	Semester	
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Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	- To introduce the fundamental concepts and branches of physics, including physical quantities, units, vectors, and the nature of electric charge, fields, and forces. - To explain the structure of atoms, types of matter, and the behavior of electric charge, emphasizing Coulomb's law, electric dipoles, and electric potential energy. - To develop understanding of basic electrical principles, including Ohm's law, resistance, capacitance, inductance, and the behavior of AC circuits - To introduce the physics of semiconductors, including atomic configuration, carrier concentration, doping, and the distinction between intrinsic and extrinsic materials. - To describe the formation and operation of PN junctions and semiconductor diodes under forward and reverse bias.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Explain the fundamental concepts and branches of physics, including physical quantities, units, vectors, and the nature of electric charge, fields, and atomic structure. Apply the principles of electric charge interactions, including charging by induction and friction, Coulomb's law, and electric field analysis using field lines and dipole concepts. Analyze basic DC and AC circuits by applying Ohm's law and the concepts of resistance, capacitance, and inductance, including series and parallel connections. Calculate inductive and capacitive reactances (X_L and X_C) and evaluate circuit behavior under different electrical conditions. Describe the atomic structure, electronic configuration, and carrier behavior in intrinsic and extrinsic semiconductors, including the effects of doping. Explain the formation, biasing, and characteristics of PN junctions and semiconductor diodes, including Zener behavior and VI characteristics. Design and test diode-based and semiconductor circuits such as rectifiers, voltage regulators.
Indicative Contents المحتويات الإرشادية	- Introduction to Physics and Physical Quantities Branches of physics, fundamental quantities, units, and vectors. Measurement systems and dimensional analysis. [3 hrs] - Electric Charge and Structure of Matter Electric charge, structure of atoms, and types of matter. Conservation of charge, charging by induction and friction. [3 hrs]

	• Electric Forces and Fields Electric forces on uncharged objects, Coulomb's law, and the concept of the electric field. Electric field due to a point charge and representation using field lines. [4 hrs] • Electric Dipoles and Potential Energy Electric dipole concepts, forces and moments on dipoles, and electric potential energy in electrostatic systems. [3 hrs] • Current, Resistance, and Capacitance Ohm's law, electrical resistance, and capacitance. Capacitors in series and parallel connections. Introduction to RC circuits and their behavior. [5 hrs] • Inductance and AC Circuits Principles of inductance, inductive reactance (X_L), capacitive reactance (X_C), and basic AC circuit analysis. [5 hrs] • Physics of Semiconductors Atomic structure, electronic configuration, energy bands in solids, and types of materials (conductors, insulators, semiconductors). [4 hrs] • Carrier Concentration and Doping Intrinsic and extrinsic semiconductors, carrier generation and recombination, N-type and P-type semiconductors, and doping effects. [5 hrs] • PN Junction Theory Formation of depletion region, junction potential, and VI characteristics under forward and reverse bias conditions. [5 hrs] • Semiconductor Diodes Operating principles, actual diode characteristics, Zener region, and temperature effects. [7 hrs] • Diode Applications Load-line analysis, rectifier circuits (half-wave and full-wave). [8 hrs] • Laboratory Applications Practical experiments involving diode and transistor circuits, measurements, analysis, and verification of theoretical concepts. [8 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Lectures: Present key concepts from basic physics to semiconductor theory using visuals, simulations, and real-world examples. • Tutorials: Reinforce understanding through problem-solving on electric fields, circuits, and semiconductor behavior. • Laboratory Work: Conduct hands-on experiments on electrical circuits, PN junctions, and diode characteristics. • Active Learning: Encourage participation through discussions, demonstrations, and short in-class activities. • Independent Study: Support self-learning using textbooks, online resources, and preparatory review before exams.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1-3 / LO #4-6
	Assignments	2	10% (10)	4, 12	LO # 1-3 / LO #9-11
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	All
Summative assessment	Midterm Exam	1 hr	10% (10)	8	LO # 1-6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Branches of physics, Fundamental quantities, Units, and vectors
Week 2	Electric charge, electric field, electric charge and structure of atoms, types of matter, charge is conserved, charging by induction and friction
Week 3	Electric forces on uncharged objects, Coulomb's law
Week 4	Electric field, electric field on a point charge, electric field lines
Week 5	Electric dipole, forces, moments and electric potential energy
Week 6	Ohm's Law, resistance and capacitance,

Week 7	capacitor in series and parallel, inductive CCT,
Week 8	inductive resistance XL, capacitive reactance XC
Week 9	Mid exam
Week 10	Semiconductors, Some Definitions ,The electronic configuration in atoms
Week 11	Carrier Concentration in Intrinsic Semiconductor ,Doping
Week 12	Intrinsic Semiconductors &Extrinsic Semiconductors, N - type Semiconductors , P - type Semiconductors
Week 13	PN Junction: Formation of Depletion layer, Junction Potential, Forward Biased PN junction, Reverse biased PN junction.
Week 14	Semiconductor Diodes: Diode Operating Conditions, Actual Diode Characteristics, Zener Region
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1, 2	Ohm's Law and Non Ohmic materials
Week 3,4	Electrical resonance phenomenon
Week 5,6	Generating electricity using field magnetic
Week 7,8	Calculating the electrical forces and Distance between electrical charges
Week 9,10	P.N junction diode
Week 11,12	Experience Diode properties
Week 13,14	Using a silicon transistor as a circuit switch

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Neamen, D. A. (2012). <i>Semiconductor Physics and Devices: Basic Principles</i> , 4th Edition, McGraw-Hill Education.	yes
Recommended Texts	Boylestad, R. L., & Nashelsky, L. (2020). <i>Electronic Devices and Circuit Theory</i> , 12th Edition, Pearson Education.	yes
Websites	- All About Circuits: https://www.allaboutcircuits.com - Electronics Tutorials: https://www.electronics-tutorials.ws	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biology		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CYE11006		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level		Semester of Delivery	
Administering Department	Cybersecurity	College	Engineering
Module Leader	Mustafa Bashar Hatem	e-mail	mustafa_92@baghdadcollege.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This module aims to : 1-To understand life, chemistry and water continued: biological molecules, 2-To recognize cells and membranes 3-To identify Energy, Enzymes and Biological reactions, cellular respiration, photosynthesis 4-To understand cell division: mitosis and miosis: Mendel, Genes and inheritance, genes, chromosomes and human genetics 5-To understand DNA structure, Replication and Organization. From DNA to protein Biotechnology and cell processes and transport (Passive and active)
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Explain fundamental biological concepts and relate them to cybersecurity and biometric systems. 2. Describe cellular structures and their relevance to biological data used in modern authentication technologies. 3. Interpret the structure and function of DNA and genetic information as they apply to identity verification and biometric uniqueness. 4. Analyze the role of proteins, enzymes, and biological molecules in biometric sensing and recognition technologies. 5. Explain major physiological systems (nervous, muscular, sensory) and their connection to biometric signal generation and data acquisition. 6. Compare different human biometric modalities (fingerprint, iris, retina, voice, gait, etc.) based on biological structure and variability. 7. Evaluate human biological diversity and population genetics and discuss their implications for fairness, accuracy, and bias in biometric systems. 8. Assess privacy, ethical, and security issues associated with the collection,

	storage, and processing of biological and biometric data. 9. Identify and describe biometric devices, sensors, and technologies based on underlying biological principles. 10. Integrate biological knowledge with cybersecurity concepts to analyze real-world biometric security case studies.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: A- <u>Introduction to Biology</u> Concepts: Life, Chemistry and water, Life, Chemistry and water continued: Biological Molecules, Cells and Membranes, Energy, Enzymes and Biological reactions continued, Cellular respiration, Photosynthesis, Cell division: Mitosis and Meiosis: Mendel, Genes and inheritance [20 hrs] B- Genes and DNA Genes, chromosomes and Human Genetics, DNA structure, Replication and Organization, From DNA to protein Biotechnology, Cell processes I- Transport (Passive and active) [10 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures: Interactive lectures will provide theoretical knowledge on optical mineralogy concepts, techniques, and applications. 2. Laboratory Sessions: Hands-on laboratory sessions will allow students to practice using polarized light microscopy and develop skills in mineral identification and interpretation. 3. Case Studies: Analysis of real-world examples and case studies will help students understand the practical applications of optical mineralogy. 4. Independent Research Projects: Students will be encouraged to undertake independent research projects using optical

	mineralogy techniques to gain practical experience and develop research skills. 5. Group Discussions: Group discussions and peer-to-peer learning will foster collaboration and deeper understanding of optical mineralogy concepts. 6. Assessments: Assessments, including quizzes, laboratory reports, and a final examination, will evaluate students' understanding of theoretical knowledge and their ability to apply optical mineralogy techniques
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Student Workload (SWL)			
الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4,10	LO #1- #3 and #4 - #9
	Assignments	2	20% (20)	Continuous	LO #5 and #12
	Projects / Lab.	----	----	-----	-----
	Report	1	10% (10)	13	All
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO #1 - #6
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Biology in the Context of Cybersecurity
Week 2	Cells: Structure, Function, and Relevance to Biometric Systems
Week 3	DNA and Genetic Information: Basics for Biometric Identification
Week 4	Proteins and Enzymes: Biological Molecules in Security Applications
Week 5	Human Physiology Overview: Nervous and Muscular Systems
Week 6	Sensory Systems and Data Acquisition: Vision, Fingerprint, and Voice
Week 7	Skin and Fingerprints: Structure, Formation, and Uniqueness
Week 8	Iris and Retina: Eye Anatomy and Biometric Recognition
Week 9	Voice and Speech: Vocal Anatomy for Voice Authentication
Week 10	Behavioral Biometrics: Gait, Keystroke Dynamics, and Patterns
Week 11	Human Variation and Population Genetics: Implications for Security
Week 12	Biological Data Privacy and Ethics: Storing and Protecting Biometric Data
Week 13	Introduction to Biometric Devices and Sensors
Week 14	Case Studies in Biometric Security Systems
Week 15	Revision and Integration: From Biology to Cybersecurity Applications

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	•
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Johnson, A. T. (2018). <i>Biology for engineers</i> . CRC Press.	no
Recommended Texts	Jain, A. K., Ross, A. A., Nandakumar, K., & Swearingen, T. (2024). Fingerprint recognition. In <i>Introduction to Biometrics</i> (pp. 75-117). Cham: Springer International Publishing.	no
Websites		

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: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Drawing		Module Delivery
Module Type	S		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar
Module Code	CEN11004		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level		Semester of Delivery	
Administering Department	Cybersecurity	College	College of Engineering
Module Leader	Haider Albdulkazdhem Farhan	e-mail	Haider_Farhan89@baghdadcollege.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Msc.
Module Tutor		e-mail	
Peer Reviewer Name	/	e-mail	/
Scientific Committee Approval Date		Version Number	1

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	The module aims to develop students' ability to communicate technical ideas through graphical representation. It covers the fundamentals of engineering drawing, use of instruments, geometric constructions, orthographic and isometric projections, sectional views, and dimensioning. Students will learn to interpret and create machine and assembly drawings following BIS/ISO standards and gain introductory skills in computer-aided drafting (CAD). The course enhances visualization, accuracy, and understanding of engineering components and systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify and correctly use engineering drawing tools to create accurate geometric constructions and basic shapes. 2. Apply fundamental drafting techniques to draw lines, circles, tangents, polygons, and divided segments with precision. 3. Use engineering scales and dimensioning standards to add measurements, annotations, and proportional enlargements/reductions. 4. Explain and apply the principles of orthographic projection to produce front, top, and side views of engineering objects. 5. Construct isometric and oblique 3D drawings using 30° and 45° projection angles to visualize objects in three dimensions. 6. Generate or infer missing views by deriving the third projection from two given orthographic projections. 7. Produce complete, accurate technical drawings that meet engineering standards and demonstrate the ability to communicate design ideas effectively.
Indicative Contents المحتويات الإرشادية	1. Introduction to Engineering Drawing [8hrs] • Importance and applications of engineering drawing • Drawing instruments, materials, and sheet layouts • BIS/ISO standards, lines, lettering, and dimensioning 2. Geometric Constructions [7hrs] • Basic geometrical figures • Tangents, polygons, and curves (ellipse, parabola, hyperbola) 3. Orthographic Projection [10hrs] • Principles of projection • Projection of points, lines, planes, and solids

	• Conversion of pictorial to orthographic views
	4. Sectioning of Solids and Development of Surfaces [8hrs] • Types of sectional views • Development of lateral surfaces for solids
	5. Isometric and Perspective Projection [8hrs] • Isometric scales, isometric views, and projections • Perspective projection of simple objects
	6. Dimensioning and Conventional Representations [4hrs] • Dimensioning standards and techniques • Symbols for materials, threads, welds, and surface finish

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Conducting practical examinations. 2- Short tests. 3- Weekly exercises.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1- #5 and #5-#10
	Assignments	10	20% (20)	Continuous	All
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	0	0% (0)		
	Midterm Exam	1hr	10% (10)	7	LO #1 - #6

Summative assessment	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Learn about drawing tools and the concept of drawing
Week 2	Use tools to draw shapes
Week 3	Executing and drawing lines, tangents, circles and drawing polygons.
Week 4	Draw and divide straight lines and draw tangent lines and polygons.
Week 5	learns the dimensional mode in drawing and the knowledge of the scale and the way to reduce and zoom in
Week 6	Writing different types of dimensions
Week 7	Learn the concept of projection and recognize the three levels of projection
Week 8	learns to draw the three projections and how to get out the flip chart
Week 9	Exam
Week 10	Draw the 3D geometric perspective on two 30- and 45-angle lines
Week 11	Draw the 3D geometric perspective on two 30- and 45-angle lines
Week 12	Training in drawing a three-dimensional engineering perspective
Week 13	Training in drawing a three-dimensional engineering perspective
Week 14	The conclusion of the third projection from two known projections
Week 15	Evaluate the students

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Learn about drawing tools and the concept of drawing
Week 2	Use tools to draw shapes
Week 3	Executing and drawing lines, tangents, circles and drawing polygons.
Week 4	Draw and divide straight lines and draw tangent lines and polygons.
Week 5	learns the dimensional mode in drawing and the knowledge of the scale and the way to reduce and zoom in

Week 6	Writing different types of dimensions
Week 7	Learn the concept of projection and recognize the three levels of projection
Week 8	learns to draw the three projections and how to get out the flip chart
Week 9	Exam
Week 10	Draw the 3D geometric perspective on two 30- and 45-angle lines
Week 11	Draw the 3D geometric perspective on two 30- and 45-angle lines
Week 12	Training in drawing a three-dimensional engineering perspective
Week 13	Training in drawing a three-dimensional engineering perspective
Week 14	The conclusion of the third projection from two known projections
Week 15	Evaluate the students

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Reddy, V. K. (2008). <i>Textbook of engineering drawing: Part 1</i>. Bs publications. - Shah, M. B., & Rana, B. C. (2009). <i>Engineering Drawing</i>. Pearson Education India. - practice problems for engineering drawing	Yes
Recommended Texts	- Technical drawing & Solidworks -Engineering Drawing -practice problems for engineering drawing	No
Websites		

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: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Digital Logic Design		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CYE11007		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level		Semester of Delivery	
Administering Department	Cybersecurity	College	Engineering
Module Leader	Asst. Lect. Saif Saad Alamshani	e-mail	saifalamshani@baghdadcollege.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This module aims to introduce students to the fundamental principles and applications of digital electronics as a foundation for intelligent and robotic systems. It focuses on understanding logic circuits, number systems, and digital components used in computing, control, and embedded applications. Students will gain the ability to design, analyze, and implement digital systems that interface with sensors, actuators, and microcontrollers used in AI and robotics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Differentiate between analog and digital systems and explain their roles in modern technologies such as AI and robotics. 2. Perform number conversions and binary arithmetic operations across different numeral systems (binary, octal, decimal, hexadecimal). 3. Identify and analyze the functions of basic logic gates and construct truth tables for simple digital circuits. 4. Apply Boolean algebra laws and theorems to simplify and optimize digital circuit designs. 5. Design and minimize combinational logic circuits using Karnaugh maps (K-Maps) and implement basic circuits such as adders, subtractors, multiplexers, and decoders. 6. Construct and evaluate sequential logic circuits using various flip-flops, counters, and shift registers to perform timing and memory functions. 7. Integrate combinational and sequential circuit concepts to design control systems for practical applications in robotics and automation.
Indicative Contents المحتويات الإرشادية	1. Introduction to Digital Electronics [4hrs] • Basic principles, design methods, and relevance to intelligent and robotic systems. 2. Analog vs. Digital Signals [4hrs] • Characteristics, distinctions, and applications in modern electronic systems.

	3. Number Systems and Binary Arithmetic [8hrs] • Binary, decimal, hexadecimal systems; conversions and arithmetic operations. 4. Logic Gates and Boolean Algebra [8hrs] • Logic functions, truth tables, Boolean expressions, and algebraic simplification. 5. Karnaugh Maps for Logic Optimization [4hrs] • Techniques for circuit minimization and simplification. 6. Combinational Logic Circuits [9hrs] • Adders, subtractors, encoders, decoders, multiplexers, and related components. 7. Sequential Logic Circuits [9hrs] • Flip-flops, registers, counters, timing circuits, and state-based design. 8. Circuit Implementation and Testing [7hrs] • Use of simulation tools and laboratory exercises for validation and troubleshooting. 9. Interfacing and Applications in Robotics [7hrs] • Integration with sensors, actuators, and microcontrollers for robotic control and AI-driven decision systems.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures: Interactive lectures will provide theoretical knowledge on optical mineralogy concepts, techniques, and applications.

	- Laboratory Sessions: Hands-on laboratory sessions will allow students to practice using polarized light microscopy and develop skills in mineral identification and interpretation. - Case Studies: Analysis of real-world examples and case studies will help students understand the practical applications of optical mineralogy. - Independent Research Projects: Students will be encouraged to undertake independent research projects using optical mineralogy techniques to gain practical experience and develop research skills. - Group Discussions: Group discussions and peer-to-peer learning will foster collaboration and deeper understanding of optical mineralogy concepts. - Assessments: Assessments, including quizzes, laboratory reports, and a final examination, will evaluate students' understanding of theoretical knowledge and their ability to apply optical mineralogy techniques
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome

Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1- #4 and #6-#9
	Assignments	2	10% (10)	Continuous	LO #5 and #10
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	All
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Digital and Analog Systems • Difference between analog and digital signals. • Role of digital systems in AI and robotics.
Week 2	Number Systems and Binary Arithmetic • Binary, octal, decimal, and hexadecimal systems. • Number conversions and binary operations.
Week 3	Logic Gates and Truth Tables • Basic logic operations (AND, OR, NOT, NAND, NOR, XOR, XNOR). • Circuit representation and practical examples.
Week 4	Boolean Algebra • Laws and theorems of Boolean algebra. • Simplifying digital circuits using Boolean expressions.
Week 5	Karnaugh Map (K-Map) Simplification • Logic function minimization using K-Maps. • Designing optimized logic circuits.
Week 6	Combinational Logic Circuits – Part 1 • Half and full adders, subtractors. • Basic combinational circuit design.
Week 7	Mid-term Exam
Week 8	Combinational Logic Circuits – Part 2 • Multiplexers, demultiplexers, encoders, and decoders.
	Practical Applications of Combinational Logic • Designing control and decision circuits. • Real-world examples in robotics and AI.
Week 9	Introduction to Sequential Logic Circuits • Basic concepts of memory and timing. • Introduction to latches and flip-flops.

Week 11	Flip-Flop Types and Applications • SR, JK, D, and T flip-flops. • Edge-triggering and clock behavior. •
Week 12	Sequential Circuits Design • Using flip-flops to design counters and registers. • Timing diagrams and sequence generation. •
Week 13	Counters and Shift Registers • Asynchronous and synchronous counters. • Shift register operation and applications. •
Week 14	Sequential Circuits – Applications • Implementing control logic using sequential circuits. • Case studies in robotics and automation. •
Week 15	Review and Final Exam Preparation • Comprehensive course review and practical revision. •

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	• Introduction to the Digital Laboratory Familiarization with lab equipment (breadboard, power supply, logic probes); safety instructions and introduction to digital signals.
Week 2	• Number Systems and Logic Levels Practice binary-to-decimal conversion and verify digital HIGH/LOW levels using simple LED circuits.
Week 3	• Logic Gates – Basic Operations

	Build and test basic logic gates (AND, OR, NOT, NAND, NOR) using ICs; verify truth tables.
Week 4	Logic Gates – Combined Circuits Construct compound logic expressions; analyze and test outputs using logic probes or simulation.
Week 5	Boolean Algebra and Simplification Apply Boolean simplification on given circuits and implement simplified versions using hardware or simulation software (e.g., Logisim).
Week 6	Karnaugh Map Practice Simplify logic functions using K-map methods and compare complexity before and after reduction.
Week 7	Midterm Lab Evaluation Assessment on experiments from Weeks 1–6 (circuit building, analysis, and documentation).
Week 8	Combinational Logic Circuits – Adders/Subtractors Design and implement half adder and full adder/subtractor circuits; verify functionality.
Week 9	Combinational Circuits – MUX and DEMUX Build multiplexer and demultiplexer circuits and explore their data-routing applications.
Week 10	Encoders and Decoders Construct simple encoder and decoder circuits and test their operation using binary inputs.
Week 11	Introduction to Sequential Logic Observe latch and flip-flop behavior using LEDs; understand SR, D, and JK flip-flops.
Week 12	Flip-Flop Timing and Triggering Explore clock signals and triggering (edge vs. level); measure response using oscilloscopes or simulation.
Week 13	Counters Design and test asynchronous and synchronous counters using flip-flops or IC counters.
Week 14	Shift Registers Implement and test serial-in/serial-out and parallel-in/parallel-out shift registers.
Week 15	Final Lab Assessment and Demonstration

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Floyd, T.L., 2011. Digital fundamentals, 10/e. Pearson Education India.	yes
Recommended Texts	1. Shiva, S.G. ed., 2018. Introduction to logic design. CRC Press.FLOYD, Thomas L., and David BUCHLA. 2. Nixon, M.S., 2015. Digital Electronics: A Primer-Introductory Logic Circuit Design (Vol. 1). World Scientific Publishing Company.	yes
Websites	https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/	

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: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Human rights		Module Delivery	
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	KUS11003			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	1	Semester of Delivery		2
Administering Department	Cyber security Engineering	College	Engineering	
Module Leader	Marwa Jasim Aboode		e-mail	marwajaj94@baghdadcollege.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date			Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. تعريف الطلاب بمفهوم حقوق الإنسان وطبيعتها. 2. فهم التطور التاريخي لحقوق الإنسان عبر العصور. 3. التمييز بين حقوق الإنسان والحقوق الأخرى. 4. دراسة حقوق الإنسان في الديانات السماوية وتأثيرها على المجتمع. 5. التعرف على الحقوق الإنسانية في المواثيق والمعاهدات الدولية. 6. فهم دور التشريعات الوطنية في حماية حقوق الإنسان. 7. دراسة أنواع حقوق الإنسان: الشخصية، الاجتماعية، الثقافية، والاقتصادية. 8. التعرف على الضمانات الدولية والإقليمية والوطنية لحقوق الإنسان. 9. فهم الجزاءات والعقوبات المترتبة على المساس بحقوق الإنسان.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. تعريف حقوق الإنسان وتحديد خصائصها الأساسية. 2. شرح التطور التاريخي لحقوق الإنسان. 3. التمييز بين حقوق الإنسان والحقوق الأخرى في المجتمع. 4. توضيح موقف حقوق الإنسان في الديانات السماوية. 5. وصف الحقوق الإنسانية في المواثيق الدولية والمعاهدات. 6. تحليل التشريعات الوطنية لحماية الحقوق الإنسانية. 7. تصنيف حقوق الإنسان إلى شخصية، اجتماعية، ثقافية، واقتصادية. 8. التعرف على الضمانات الدولية والإقليمية والوطنية لحقوق الإنسان. 9. تفسير الجزاءات القانونية عند انتهاك حقوق الإنسان.
Indicative Contents المحتويات الإرشادية	1. مدخل إلى حقوق الإنسان – التعريف والطبيعة (3 ساعات) • مفهوم حقوق الإنسان • طبيعتها ومصادرها • تمييزها عن غيرها من الحقوق القانونية والاجتماعية 2. التطور التاريخي لحقوق الإنسان (3 ساعات) • الجذور التاريخية عبر الحضارات القديمة • التحولات الفكرية والسياسية الكبرى • نشوء المنظور الحديث لحقوق الإنسان 3. حقوق الإنسان في الديانات السماوية والمواثيق الدولية (4 ساعات) • نظرة الديانات السماوية لحقوق الإنسان

	• القيم الأخلاقية والدينية للحفاظ على الكرامة الإنسانية • الإعلان العالمي لحقوق الإنسان • العهد الدولي للحقوق المدنية والسياسية والعهد الدولي للحقوق الاقتصادية والاجتماعية والثقافية
	4. حقوق الإنسان في التشريعات الداخلية (3 ساعات) • مكانة حقوق الإنسان في الدساتير الوطنية • القوانين المتعلقة بحماية الحقوق والحريات • دور المؤسسات التشريعية والتنفيذية والقضائية
	5. أنواع حقوق الإنسان (الشخصية، الاجتماعية، الثقافية، الاقتصادية) – (8 ساعات) • الحقوق الشخصية: الحق في الحياة، الحرية، الخصوصية، الأمن • الحقوق الاجتماعية: الصحة، العمل، السكن، الضمان الاجتماعي • الحقوق الثقافية: التعليم، اللغة، الهوية الثقافية • الحقوق الاقتصادية: الملكية، التنمية، تكافؤ الفرص
	6. الضمانات الدولية والإقليمية لحقوق الإنسان (4 ساعات) • دور الأمم المتحدة ومجلس حقوق الإنسان • آليات الرقابة الدولية وحماية الحقوق • الأنظمة الإقليمية (الجامعة العربية، الاتحاد الأوروبي، الاتحاد الأفريقي)
	7. الضمانات الوطنية لحماية حقوق الإنسان (3 ساعات) • المؤسسات الوطنية (المحاكم، مفوضيات حقوق الإنسان) • آليات الشكاوى والتحقيق • الرقابة الإدارية والقضائية ودورها في حماية الحقوق
	8. الانتهاكات والجزاءات المتعلقة بحقوق الإنسان (2 ساعتان) • أشكال انتهاكات حقوق الإنسان • المسؤولية القانونية للأفراد والدول • الجزاءات والإجراءات المتخذة ضد الانتهاكات

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

نعمد في هذا الجانب إلى ما يلي:

- 1- المحاضرة
- 2- المناقشة
- 3- الصف المقلوب
- 4- دراسة الحالة

Strategies

Student Workload (SWL)

الحمل الدراسي للطلاب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	1-5 / 6-9
	Assignments	2	20% (20)	4, 12	LO # 3, 4, / 6 - 11
	Projects / tutorial.	0	0	/	/
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	تعريف وطبيعة حقوق الإنسان

Week 2	التطور التاريخي لحقوق الإنسان
Week 3	مميزات حقوق الإنسان عن غيرها من الحقوق
Week 4	حقوق الإنسان في الديانات السماوية
Week 5	حقوق الإنسان في المواثيق الدولية
Week 6	حقوق الإنسان في التشريعات الداخلية
Week 7	حقوق الإنسان الشخصية
Week 8	حقوق الإنسان الاجتماعية
Week 9	حقوق الإنسان الثقافية
Week 10	حقوق الإنسان الاقتصادية
Week 11	ضمانات حقوق الإنسان الدولية
Week 12	ضمانات حقوق الإنسان الإقليمية
Week 13	ضمانات حقوق الإنسان الداخلية (الوطنية)
Week 14	الجزاء المترتبة على المساس بحقوق الإنسان
Week 15	مراجعة عامة

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	كتاب/ حقوق الانسان (تطورها، مضامينها، حمايتها) د. رياض عزيز هادي.	Yes
Recommended Texts	كتاب/ حقوق الانسان د. حميد حنون.	No
Websites	https://www.noor-book.com/ https://www.un.org/ar/about-us/universal-declaration-of-human-rights https://ar.wikipedia.org/wiki/	

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: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Fundamentals of Computer Science		Module Delivery
Module Type	B		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	KUS11002		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	Department of Cybersecurity	College	College of Engineering
Module Leader	Saif Saad Alamshani	e-mail	saifalamshani@baghdadcollege.edu.iq
Module Leader's Acad. Title	Assist. Lect.	Module Leader's Qualification	MSc
Module Tutor		e-mail	
Peer Reviewer Name	/	e-mail	/
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents
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أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Introduce students to basic computer concepts including hardware, software, and data representation. 2. Provide understanding of the operating system and graphical user interface operations. 3. Develop basic word processing, spreadsheet, and presentation software skills. 4. Introduce the fundamentals of Internet, web browsing, and electronic communication. 5. Provide knowledge of cloud computing and modern digital collaboration tools. 6. Provide knowledge of programming using python language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand computer hardware components and their functions. 2. Operate common operating systems and navigate through graphical user interfaces. 3. Create and edit documents using word processing software. 4. Design and manage spreadsheets using formulas and functions. 5. Develop and present professional presentations using presentation software. 6. Access and utilize the Internet effectively using web browsers and search engines. 7. Communicate through email and collaborate using cloud-based services. 8. Apply basic cybersecurity and digital ethics principles in computer usage. 9. Program basic codes and make GUIs.
Indicative Contents المحتويات الإرشادية	• Introduction to Computer Concepts Basic definitions, components of a computer, hardware and software overview.[4hrs] • Computer Components CPU, memory, storage devices, input/output units, and peripheral components.[6hrs] • Operating Systems and GUI Types of operating systems, basic commands, and file management operations.[6hrs] • Word Processing Software Creating, formatting, and editing documents using Microsoft Word.[6hrs] • Spreadsheet Software Data entry, formulas, charts, and functions using Microsoft Excel.[7hrs] • Presentation Software Slide design, themes, transitions, and multimedia using PowerPoint.[5hrs] • Internet and Web Browsers LAN/WAN basics, web browsing, search engines, and data access.[4hrs] • Communication Tools Email systems, online collaboration, and cloud-based communication. [3hrs] • Cloud Computing and Services Google Workspace, Office 365, and cloud storage usage. [3hrs] • Introduction to Python Programming Installing Python and PyCharm, basic syntax, and simple program execution. [6hrs]

	• Python Programming Structures Variables, conditions, loops, lists, and basic functions. [6hrs] • Basic Cybersecurity Concepts [2hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lecture Discussion Practical Experience Clarification and Ask Questions reflect on what you have learned Research and reports

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المناهج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Computer Concepts – Definition of computer, hardware, software, and data representation.
Week 2	Computer Components – CPU, memory, storage, input/output devices, and peripherals.
Week 3	Operating Systems and GUI – Types of operating systems, desktop environment, and file management.
Week 4	Word Processing Software – Creating, formatting, and editing documents using Microsoft Word.
Week 5	Spreadsheet Software – Data entry, formulas, charts, and data analysis using Microsoft Excel.
Week 6	Presentation Software – Slide design, themes, transitions, and multimedia using PowerPoint.
Week 7	Internet and Web Browsers – LAN/WAN basics, search engines, and safe browsing.
Week 8	Communication Tools – Email systems, online collaboration, and digital communication ethics.
Week 9	Cloud Computing and Services – Google Workspace, Office 365, and cloud storage applications.
Week 10	Introduction to Python Programming – Installing Python and PyCharm, understanding syntax and variables.
Week 11	Python Programming Basics – Data types, input/output, and simple calculations.
Week 12	Python Control Structures – Conditional statements and loops.
Week 13	Python Data Structures – Lists, strings, and basic operations.
Week 14	Basic Cybersecurity Concepts – Introduction to Cybersecurity, applications in daily life, and examples in Python.
Week 15	Review and Final Preparation – Revision of all topics before final exam.

Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	EXP 1: Exploring Computer Hardware and Operating Systems
Week 2	EXP 2: Troubleshooting and System Utilities
Week 3	EXP 3: Using Microsoft Word – Document Creation and Formatting
Week 4	EXP 4: Using Microsoft Excel – Data Entry, Formulas, and Charts
Week 5	EXP 5: Using Microsoft PowerPoint – Slide Design and Presentation
Week 6	EXP 6: Installing Python and Setting Up PyCharm Environment
Week 7	EXP 7: Python Basics – Variables, Data Types, and Input/Output
Week 8	EXP 8: Conditional Statements – if, else, and nested if
Week 9	EXP 9: Loops – for and while structures
Week 10	EXP 10: Lists and Strings – Basic Operations and Manipulation
Week 11	EXP 11: Functions – Definition, Parameters, and Return Values
Week 12	EXP 12: Simple Networking and Internet Use
Week 13	EXP 13: File Handling in Python – Read and Write Operations
Week 14	EXP 14: Mini Project – Creating a Simple Calculator or Grade Sheet using Python and Excel
Week 15	EXP 15: Final Practical Assessment – Review of Word, Excel, and Python Applications

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Brookshear, J. Glenn, Dennis Brylow, and S. Manasa. "Computer science: An overview." (2009).	Yes
Recommended Texts	Patterson, David A., and John L. Hennessy. Computer organization and design ARM edition: the hardware software interface. Morgan kaufmann, 2016. Petzold, Charles. Code: The hidden language of computer hardware and software. Microsoft Press, 2000.	No
Websites	Computer Science YouTube Channels: Channels like "Computerphile," "Computer Science," and "MIT Open Courseware."	

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: Marks 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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Mathematics		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	KUS11001			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	first	Semester of Delivery		1
Administering Department	Cybersecurity	College	Engineering	
Module Leader	Saad Adnan Zabin		e-mail	saadadnan2025@baghdadcollege.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date			Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To provide a solid foundation in the principles and methods of integral calculus. 2. To develop students' ability to compute indefinite and definite integrals of various functions. 3. To introduce advanced integration techniques and demonstrate their practical uses. 4. To enhance logical and analytical reasoning in mathematical problem solving. 5. To apply integration to real-life problems in geometry, physics, and related fields. 6. To encourage accuracy, clarity, and systematic approaches in mathematical computation. 7. To prepare students for further studies that require calculus-based analysis and modeling.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Apply substitution and completing-the-square methods to evaluate complex algebraic integrals. 2. Compute and interpret definite integrals to determine the area under curves and other geometric applications. 3. Analyze improper integrals and determine their convergence or divergence. 4. Integrate algebraic, trigonometric, exponential, and logarithmic functions using appropriate techniques. 5. Utilize integration by parts and partial fraction decomposition to simplify and solve advanced integrals. 6. Implement trigonometric substitution and other special methods to evaluate complex integrals involving radicals and trigonometric expressions. 7. Apply integration techniques to solve real-world problems such as finding volumes of revolution and physical applications in engineering and science.
Indicative Contents المحتويات الإرشادية	1. Fundamental Integration Techniques [10 hrs] • Introduction to integration, basic algebraic integrals, substitution methods, and completing the square. 2. Definite Integrals and Applications [8hrs] • Evaluation of definite integrals and computation of areas under curves.

	3. Improper Integrals and Convergence Tests [6hrs] • Integrals over infinite intervals and functions with discontinuities. 4. Integration by Parts [8hrs] • Concepts, examples, and advanced-level applications. 5. Integration of Special Functions [8hrs] • Exponential, logarithmic, and algebraic functions. 6. Trigonometric Integration Techniques [8hrs] • Simple and advanced trigonometric integrals, trigonometric substitution methods. 7. Partial Fraction Decomposition [6hrs] • Techniques for decomposing rational functions and integrating their components. 8. Applications of Integration [6hrs] • Volumes of revolution and additional problem-solving applications using integral calculus.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures: Providing students with basic mathematical concepts and their practical applications. 2. Forming discussion groups during lectures to discuss mathematics topics and solve practical problems. 3. Giving students homework that requires self-explanations in different ways. 4. Solving problems relevant with mathematical subject.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5-10	Lec. #2,#4,#6,#8
	Assignments	2	20% (20)	3-12	Lec. #1,#2 #3,#5,#7,#9,#11
	Projects	0	0	0	/
	Reports	1	10% (10)	13	All
Summative assessment	Midterm Exam	1hr	10% (10)	7	Lec. #1-#6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Completing the Square & Substitution Methods
Week 2	Definite Integrals & Area Under Curves
Week 3	Improper Integrals & Convergence
Week 4	Indefinite Integrals of Algebraic Functions
Week 5	Integration by Parts – Advanced Problems
Week 6	Integration by Parts – Concepts and Examples
Week 7	Integration of Advanced Trigonometric Functions

Week 8	Integration of Exponential Functions
Week 9	Integration of Logarithmic Functions
Week 10	Integration of Simple Trigonometric Functions
Week 11	Introduction to Integration & Basic Algebraic Integrals
Week 12	Partial Fraction Decomposition
Week 13	Revision and Problem-Solving
Week 14	Trigonometric Substitution Techniques
Week 15	Volumes of Revolution & Applications

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Thomas' calculus 11 ed. 2004	yes
Recommended Texts	1. Calculus 9 th edition, Anton	yes
Websites	https://mediasace.utah.edu/media/t/0_2eoc2ksc	

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مخطط الدرجات

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