

URUK University
جامعة اوروك



***-Third Cycle – Bachelor's Degree (B.Sc.)
Department of Cybersecurity
Engineering Technologies and Cloud
(CSETCC)(Computing
بكالوريوس – قسم هندسة تقنيات الامن
السيبراني والحوسبة السحابية***



Academic Program Description

University Name: University of Uruk

College / Institute: Technical Engineering College

Scientific Department: Department of Cybersecurity Engineering and Cloud Computing Technologies

Academic or Professional Program Name: Bachelor's Degree

Final Degree Certificate: Bachelor's Degree in Cybersecurity Engineering and Cloud Computing Technologies

Study System: Bologna Process (First Stage + Second Stage + Third Stage + Fourth Stage)

Date of Description Preparation: 30/7/2026

Date of Completion: 30/08/2026

Signature:

Head of Department: Prof. Dr. Dina Abdul-Hussein Juma Al-Zubaidi:

Date: 31 / 8 / 2026

Signature:

Academic Assistant Coordinator:

Assist. Prof. Dr. Falah Hamza Aldar

Date: 31/8/2026

Reviewed by

**Quality Assurance and University
Performance Division**

**Name of the Director of the Quality Assurance
and University Performance Division:**

Assist. Prof. Dr. Saadia Hassan Hallous

Date: 31/8/2026

Signature:

Approval of the Dean:

Prof. Dr. Waleed Ameen Al-Jawher

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1. Mission & Vision Statement

Vision Statement

To make the department a leading and effective institution in preparing specialized professionals in Cybersecurity and Cloud Computing, meeting the needs of the Iraqi labor market, and contributing to community service through scientific and technical consultations, secure system design, and the protection of networks and data centers from cyber threats.

Mission Statement

Through advanced educational programs and curricula that highlight the importance of this specialization, the Department of Cybersecurity and Cloud Computing Engineering aims to provide students with an advanced educational, technological, and research environment. It also seeks to equip students with advanced practical and scientific skills to meet the requirements of the labor market, contribute to community service, and enhance digital security.

2. Program Specification

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

Specifications of the Cybersecurity and Cloud Computing Engineering Program

The program aims to provide students with the knowledge and skills required to work in the fields of cybersecurity and cloud computing, with a focus on protecting systems, networks, and data, as well as detecting and responding to cyber threats and attacks.

The program combines theoretical lectures, practical training, and applied laboratory work, while developing students' technical skills in network security, information security, cloud computing, risk analysis, and security incident response.

The program prepares graduates for careers in cybersecurity, network security, cloud systems administration, threat analysis, security operations centers (SOCs), and the management and protection of digital infrastructure.

3. Program Goals

1. Prepare specialized and qualified professionals in Cybersecurity and Cloud Computing.
2. Equip students with the skills to design and protect systems, networks, and data from cyber threats.
3. Develop students' skills in using security assessment, monitoring, and analysis tools, as well as risk assessment techniques.
4. Develop the ability to analyze security incidents and respond effectively to cyber threats.
5. Develop curricula and educational programs in accordance with labor market needs and technological advancements.
6. Promote scientific research and academic collaboration with local and international universities and institutions.
7. Provide technical and academic consultancy in Cybersecurity and Cloud Computing.
8. Prepare graduates capable of serving the community while adhering to professional ethics and quality standards.

4. Student Learning Outcomes

Graduates possess advanced knowledge and skills in Cybersecurity and Cloud Computing, with the ability to design, implement, and protect systems, networks, and data. They are also capable of analyzing cyber threats and attacks, assessing risks, and responding to security incidents. In addition, graduates possess skills in using modern tools and technologies, preparing technical reports, communication, and teamwork, enabling them to meet labor market requirements and keep pace with technological advancements.

Outcome 1

Understanding of allied knowledge

Graduates will demonstrate a comprehensive understanding of fundamental and advanced concepts and knowledge in Cybersecurity and Cloud Computing, while keeping pace with technological developments and labor market requirements.

Outcome 2

Oral and Written Communication

Graduates will communicate effectively and professionally, prepare security reports and presentations, and clearly explain the results of cyber incident and threat analyses both orally and in writing.

Outcome 3

. Graduates will be able to design and implement security solutions to protect systems, networks, and data, and develop applications and solutions using Cybersecurity and Cloud Computing technologies.

Outcome 4

Critical thinking and analytical skills

Graduates will be able to identify and analyze cybersecurity problems and threats, assess risks, and select appropriate solutions using logical and critical thinking.

Outcome 5

Appropriate research tools and techniques

Graduates will be able to use cybersecurity tools and techniques, conduct research and applied studies, and continuously develop their skills in response to ongoing advances in the field.

Outcome 6

Communications and IT skills

Graduates will be able to exchange information with technical teams and effectively use information and communication technologies, the Internet, and cloud computing. They will also be able to read and understand technical documents and evidence in English

Outcome 7

Group/team leadership

Graduates will be able to work effectively within multidisciplinary teams, collaborate in solving cybersecurity problems, assume responsibility, make appropriate decisions, and perform efficiently under pressure.

Outcome 8

Own professional development

Graduates will be able to plan, make decisions, solve problems, and pursue continuous learning and professional development while keeping up with the latest technologies and emerging threats in Cybersecurity and Cloud Computing.

5. Academic Staff

1. Dr. Dhiaa Abdul-Hussein Jumaa Al-Zubaidi

Academic Rank: Professor

Degree: Ph.D.

Specialization: Pattern Recognition

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3. M.M. Enas Abdul-Hussein Khraibet

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4. M.M. Sanaria Jamal Ibrahim

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5. M.M Haider Ali Radhi

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6. Credits, Grading and GPA

Credits

URUK University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 30 hrs. student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors
	C – Good	جيد	70 – 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

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

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

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

7. Curriculum/Modules: (first year)

Semester 1 | 30 ECTS | 1 ECTS =30 hr. (first year)

No.	Module Code	Module Name in English	اسم المادة الدراسية	ECTS	Module Type	Prerequisite Module(s) Code
1	BCYSCE100-S1	Mathematics	الرياضيات	5.00	S	
2	BCYSCE105-S1	Linux Administrator	ادارة لينكس	5.00	C	
3	BCYSCE102-S1	Fundamentals of Programming	اساسيات البرمجة	7.00	C	
4	BCYSCE104-S1	Fundamentals of Electrical Engineering	اساسيات الهندسة الكهربائية	6.00	S	
5	NTU 101	English language	اللغة الانكليزية	2.00	B	
6	BCYSCE103-S1	Introduction to Sociology	مقدمة الى علم الاجتماع	3.00	S	
7	NTU100	Human rights and Democracy	حقوق انسان وديمقراطية	2.00	E	
				30.00		

Semester 2 | 30 ECTS | 1 ECTS = 30 hr.

No.	Module Code	Module Name in English	اسم المادة الدراسية	ECTS	Module Type	Prerequisite Module(s) Code
1	BCYSCE101-S2	Digital Electronics	الالكترونيك الرقمي	7.00	S	
2	BCYSCE106-S2	Introduction to Probability and Statistics	مقدمة الى الاحصاء والرقمية	5.00	S	BCYSCE100-S1
3	BCYSCE107-S2	Object oriented programming	البرمجة الشيئية	7.00	C	BCYSCE102-S1
4	NTU102	Computer	حاسوب	2.00	B	
5	BCYSCE108-S2	Introduction to Cyber security Engineering	اساسيات هندسة الامن السيبراني	7.00	C	
6	NTU103	Arabic Language	لغة عربية	2.00	B	
7	NTU104	Physical Education	رياضة		E	
				30.00		

(second year)

Semester 3 | 30 ECTS | 1 ECTS = 30 hr.

No.	Module Code	Module Name in English	اسم المادة الدراسية	ECTS	Module Type	Prerequisite Module(s) Code
1	BCYSCE200-S1	Computer Electronics	ألكترونيات الحاسوب	4.00	S	
2	BCYSCE205-S1	Discrete Math	الرياضيات المتقطعة	4.00	C	
3	BCYSCE202-S1	Database system	أنظمة قواعد البيانات	4.00	S	
4	BCYSCE204-S1	Python Programming for Cybersecurity	برمجة البايثون للامن السيبراني	5.00	C	
5	BCYSCE203-S1	Operating Systems	نظم تشغيل	4.00	C	
6	NTU203	Bath Party Crimes	جرائم حزب البعث	2.00	B	
7	NTU200	English language	اللغة الانكليزية	2.00	B	NTU 101
8	BCYSCE200-S1	Computer Networks	شبكات الحاسوب	5.00	C	
				30.00		

Semester 4 | 30 ECTS | 1 ECTS = 30 hr.

No.	Module Code	Module Name in English	اسم المادة الدراسية	ECTS	Module Type	Prerequisite Module(s) Code
1	BCYSCE205-S2	Data structures	هياكل بيانات	5.00	S	
2	BCYSCE202-S2	Database security	امنية انظمة قواعد البيانات	6.00	C	BCYSCE202-S1
3	BCYSCE204-S2	Computer Organization and Architectures	تركيب ومعمارية الحاسوب	5.00	S	
4	BCYSCE203-S2	Network Security	امنية شبكات	6.00	C	BCYSCE200-S1
5	NTU202	Arabic Language	لغة عربية	2.00	B	NTU103
6	BCYSCE201-S1	Network Administration and Infrastructure	ادارة الشبكات والاجهزة التحتية	4.00	C	
7	NTU201	Computer	حاسوب	2.00	B	BCYSCE200-S1
				30.00		

(third year)

Semester 5 | 30 ECTS | 1 ECTS = 30 hr.

No.	Module Code	Module Name in English	اسم المادة الدراسية	ECTS	Module Type	Prerequisite Module(s) Code
1	BCYSCE203-S1	Introduction to Cryptography	مقدمة الى التشفير	6.00	C	BCYSCE203-S2, BCYSCE205-S1
2	BCYSCE305-S1	Introduction to Hardware security	مقدمة الى امنية الهاردوير	7.00	C	BCYSCE200-S1, BCYSCE203-S1
3	BCYSCE302-S1	Digital Signal Processing	معالجة الاشارة الرقمية	5.00	S	
4	BCYSCE304-S1	Mobile and wireless networks	الشبكات اللاسلكية والمنتقلة	5.00	C	
5	BCYSCE303-S1	Fundamentals of Cloud computing	اساسيات الحوسبة السحابية	7.00	C	
				30.00		

Semester 6 | 30 ECTS | 1 ECTS = 30 hr.

No.	Module Code	Module Name in English	اسم المادة الدراسية	ECTS	Module Type	Prerequisite Module(s) Code
1	BCYSCE300-S2	Mobile and wireless networks security	أمنية الشبكات اللاسلكية والمنتقلة	5.00	C	BCYSCE304-S1
2	BCYSCE305-S2	Secure software development	تطوير البرمجيات الامنة	5.00	C	BCYSCE102-S1, BCYSCE204-S1, BCYSCE107-S2
3	BCYSCE302-S2	Operating system security	امنية نظم التشغيل	5.00	C	BCYSCE203-S1
4	BCYSCE304-S2	Practicing cybersecurity: Attacks and Countermeasures	ممارسة الأمن السيبراني: الهجمات والتدابير المضادة	5.00	C	BCYSCE203-S2, BCYSCE300-S2, BCYSCE202-S2
5	BCYSCE303-S2	Engineering Analysis	التحليلات الهندسية	4.00	S	
6	BCYSCE301-S2	Cloud Computing security	امنية الحوسبة السحابية	6.00	C	BCYSCE303-S1
				30.00		

(fourth year)

Semester 7| 30 ECTS | 1 ECTS = 30 hr.

No.	Module Code	Module Name in English	اسم المادة الدراسية	ECTS	Module Type	Prerequisite Module(s) Code
1	BCYSCE400-S1	Intrusions Detection and prevention System	انظمة كشف التسلل والوقاية منه	6.00	C	
2	BCYSCE405-S1	Research Methodology	منهجية البحث	3.00	S	
3	BCYSCE402-S1	AI for Cybersecurity Engineering	الذكاء الاصطناعي في الامن السيبراني	6.00	C	
4	BCYSCE404-S1	Practicing cybersecurity: Ethical Hacking and Vulnerability Lab	ممارسة الأمن السيبراني : القرصنة الاخلاقية واختبار الثغرات	6.00	C	BCYSCE304-S2, BCYSCE105-S1
5	BCYSCE403-S1	Cloud Application	تطبيقات الحوسبة السحابية	3.00	C	
6	BCYSCE401-S1	Graduation Project Design	تصميم مشروع التخرج	6.00	C	
				30.0		

Semester 8 | 30 ECTS | 1 ECTS = 30 hr.

No.	Module Code	Module Name in English	اسم المادة الدراسية	ECTS	Module Type	Prerequisite Module(s) Code
1	BCYSCE400-S2	IT Project Management	ادارة مشاريع تكنولوجيا المعلومات	6.00	C	
2	BCYSCE405-S2	Graduation Project Implementation	تنفيذ مشروع التخرج	3.00	C	BCYSCE401-S1
3	BCYSCE402-S2	Digital Forensics	الادلة الرقمية	7.00	C	
4	BCYSCE404-S2	IoT's and Cybersecurity	إنترنت الأشياء والامن السيبراني	7.00	C	
5	BCYSCE403-S2	Reverse Engineering-Malwares Analysis	الهندسة العكسية - تحليل البرامج الخبيثة	7.00	C	BCYSCE400-S1
				30.0		

				240.0		Must be 240 ECTS
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Note: The student should complete 4 weeks of Summer Internships to fulfil the requirements of the Bachelor's degree

Structured SWL (hr/w) type	CL	Class Lecture	Pr	Practical Training	Lect	Online lecture	Note: Columns O, Q and R are programed, protected and should not be edited	
	Lab	Laboratory	Tut	Tutorial	Semn	Seminar		

8. Information contact:

Program manager:

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Program Coordinator:

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First Semester – First Year

Subject	Details
Subject No.	Subject 1
Subject Code	BCYSCE100-S1
Subject Name	Mathematics
ECTS Credits	5
Semester	1
Weekly Hours	1
Lectures / Laboratory / Practical / Exercises	-
Organized Study Load (Hours/Semester)	60
Unorganized Study Load (Hours/Week)	4
Description	This course aims to develop mathematical thinking and problem-solving skills and enhance students' deep understanding of mathematical concepts and their applications in real-life situations. It also contributes to developing mathematical modeling skills and using digital technologies and tools for analysis, visualization, and solving mathematical problems.

Subject	Details
Subject 2	Subject 2
Subject Code	BCYSCE105-S1
Subject Name	Linux Administration
ECTS Credits	5
Semester	1
Weekly Hours	4
Lectures / Laboratory / Practical / Exercises	4
Organized Study Load (Hours/Semester)	60
Unorganized Study Load (Hours/Week)	7
Description	This course aims to introduce students to the fundamentals of Linux system administration and network monitoring, and to develop their skills in writing and executing Shell Scripting programs, retrieving network configurations, and analyzing data packets. It also focuses on applying these skills in the field of cybersecurity , preparing students to design and

Subject	Details
	implement cybersecurity engineering projects using various Linux commands and techniques.

Subject	Details
Subject Number	Subject 3
Subject Code	BCYSCE102-S1
Subject Name	Fundamentals of Programming
ECTS Credits	7
Semester	1
Weekly Hours	4
Lectures / Laboratory / Practical / Exercises	4
Organized Study Load (Hours/Semester)	60
Unorganized Study Load (Hours/Week)	7
Description	This subject aims to introduce students to the fundamentals of programming and develop their skills in writing and executing programs.

Subject	Details
Subject Number	Subject 4
Subject Code	NTU 101
Subject Name	English Language
ECTS Credits	2
Semester	1
Weekly Hours	2
Lectures / Laboratory / Practical / Exercises	-
Organized Study Load (Hours/Semester)	60
Unorganized Study Load (Hours/Week)	4
Description	This subject aims to develop students' English language skills, with a focus on listening, speaking, reading, and writing skills, as well as the correct use of vocabulary and grammar. It also helps students communicate in English in academic and everyday situations, understand texts, and express ideas clearly and effectively.

Subject	Details
Subject Number	Subject 5
Subject Code	BCYSCE103-S1
Subject Name	Introduction to Sociology and Information Security
ECTS Credits	3
Semester	1
Weekly Hours	4
Lectures / Laboratory / Practical / Exercises	-
Organized Study Load (Hours/Semester)	60
Unorganized Study Load (Hours/Week)	67
Description	This subject aims to introduce students to the legal, ethical, and social aspects of cybersecurity, as well as the requirements of cybersecurity policies and regulations in governmental and commercial institutions. It also focuses on understanding the impact of cybersecurity and cybercrime on society, developing institutional policies, and using

Subject	Details
Subject Number	Subject 6
Subject Code	NTU100
Subject Name	Human Rights and Democracy
ECTS Credits	2
Semester	1
Weekly Hours	2
Lectures / Laboratory / Practical / Exercises	-
Organized Study Load (Hours/Semester)	33
Unorganized Study Load (Hours/Week)	17
Description	The subject addresses the fundamental principles underlying human rights, including universality, human dignity, the non-waivability and non-derogability of certain rights, the relationship between freedom and equality, demands for social inclusion, the secular nature of modern law, and the sometimes tense interaction between human rights and democracy.

Subject	Details
Subject Number	Subject 7
Subject Code	BCYSCE104-S1
Subject Name	Fundamentals of Electrical Engineering
ECTS Credits	6
Semester	1
Weekly Hours	4
Lectures / Laboratory / Practical / Exercises	4
Organized Study Load (Hours/Semester)	60
Unorganized Study Load (Hours/Week)	4
Description	This subject aims to introduce students to the fundamentals of electrical circuits, electrical components, Ohm's and Kirchhoff's laws, and methods of electrical network analysis. It also covers alternating current circuits and phasor diagrams, while developing students' skills in analyzing and understanding electrical circuits and their applications.

Second Semester – First Year

Subject	Subject 8
Subject Code	BCYSCE200-S1

Subject	Subject 8
Subject Name	Computer Electronics
ECTS Credits	4
Semester	2
Weekly Hours	5
Lectures/Laboratory/Practical/Exercises	4
Organized Workload (Hours/Semester)	60
Unorganized Workload (Hours/Week)	7
Description	Digital electronics focuses on understanding digital signals, logic gates, and Boolean algebra, as well as designing, implementing, and analyzing digital circuits using tables, Karnaugh maps, and simulation. It also includes circuit fault detection, understanding digital systems, and applying them in real-world fields such as control systems, communications, and data processing.

Subject	Subject 9
Subject Code	BCYSCE205-S1
Subject Name	Discrete Mathematics
ECTS Credits	4
Semester	2
Weekly Hours	4
Lectures/Laboratory/Practical/Exercises	-
Organized Workload (Hours/Semester)	60
Unorganized Workload (Hours/Week)	7
Description	The course aims to develop students' engineering analysis skills through the application of mathematical and statistical concepts, analytical techniques, simulation, modeling, and data analysis. It also focuses on applying engineering principles, understanding error and uncertainty, and effectively communicating results while considering ethical aspects of engineering analysis.

Subject	Subject 10
Subject Code	BCYSCE202-S1
Subject Name	Database Systems
ECTS Credits	4
Semester	2
Weekly Hours	4
Lectures/Laboratory/Practical/Exercises	4

Subject	Subject 10
Organized Workload (Hours/Semester)	78
Unorganized Workload (Hours/Week)	47
Description	The course aims to introduce students to the fundamentals and principles of database systems using SQL, starting from database creation and design to application development and query writing. It also focuses on developing students' skills in implementing database projects and applying them in the field of cybersecurity engineering, using various database methods and techniques.

Subject	Subject 11
Subject Code	BCYSCE204-S1
Subject Name	Python Programming for Cybersecurity
ECTS Credits	5
Semester	2
Weekly Hours	10
Lectures/Laboratory/Practical/Exercises	5
Organized Workload (Hours/Semester)	78
Unorganized Workload (Hours/Week)	72
Description	The course focuses on learning through practice by developing practical scripts using Python and applying them in the field of cybersecurity. It also covers the use of tools such as Visual Studio Code, Git, GitHub, Linux commands,

Subject	Subject 12
Subject Code	BCYSCE203-S1
Subject Name	Operating Systems
ECTS Credits	4
Semester	2
Weekly Hours	4
Lectures/Laboratory/Practical/Exercises	4
Organized Workload (Hours/Semester)	78
Unorganized Workload (Hours/Week)	72
Description	The course covers the fundamental and advanced concepts of operating systems, including operating system structures and types, processes and threads, and memory and file management. It also introduces students to operating system services, computer architecture, parallel

Subject	Subject 12
	processing systems, and the functions of modern operating systems.

Subject	Subject 13
Subject Code	NTU203
Subject Name	Crimes of the Ba'ath Party
ECTS Credits	2
Semester	2
Weekly Hours	1
Lectures/Laboratory/Practical/Exercises	-
Organized Workload (Hours/Semester)	33
Unorganized Workload (Hours/Week)	17
Description	The course addresses the history of the crimes and violations committed by the Ba'ath Party in Iraq and their political, social, and humanitarian impacts on Iraqi society. It also introduces students to the major crimes and violations, documents their consequences, and highlights the lessons learned to promote awareness of human rights and justice.

Third Semester – Second Year

Subject	Subject 14
Subject Code	NTU200
Subject Name	English Language
ECTS Credits	2
Semester	3
Weekly Hours	2
Lectures/Laboratory/Practical/Exercises	-
Organized Workload (Hours/Semester)	60
Unorganized Workload (Hours/Week)	4
Description	The course aims to develop students' English language skills, with a focus on listening, speaking, reading, and writing, as well as the correct use of vocabulary and grammar. It also helps students communicate in English in academic and everyday situations, understand texts, and express ideas clearly and effectively.

Subject	Subject 15
Subject Code	BCYSCE200-S1
Subject Name	Computer Networks
ECTS Credits	5
Semester	3
Weekly Hours	4
Lectures/Laboratory/Practical/Exercises	5
Organized Workload (Hours/Semester)	79
Unorganized Workload (Hours/Week)	46
Description	The course covers the fundamentals of computer networks, including their design and implementation, with a study of the most important network protocols and services. It also develops students' skills in communication, documentation, and teamwork to solve network-related problems.

Subject	Subject 16
Subject Code	BCYSCE203-S1
Subject Name	Introduction to Cryptography
ECTS Credits	6
Semester	3
Weekly Hours	5
Lectures/Laboratory/Practical/Exercises	4
Organized Workload (Hours/Semester)	78
Unorganized Workload (Hours/Week)	72
Description	The course aims to provide an understanding of the fundamentals, algorithms, and protocols of cryptography and their applications in protecting data and communications. It also introduces students to cryptanalysis, key management, and cryptographic standards, with the ability to apply cryptographic techniques in practice.

Subject	Subject 17
Subject Code	BCYSCE305-S1

Subject	Subject 17
Subject Name	Hardware Security
ECTS Credits	7
Semester	3
Weekly Hours	4
Lectures/Laboratory/Practical/Exercises	4
Organized Workload (Hours/Semester)	63
Unorganized Workload (Hours/Week)	37
Description	The course introduces the fundamentals of hardware security and trust in circuits and integrated systems, physical cryptography, and various attacks, including side-channel attacks. It covers PUF and TRNG technologies, intellectual property protection, counterfeit circuits, hardware Trojans, and methods for their detection and protection.

Subject	Subject 18
Subject Code	BCYSCE302-S1
Subject Name	Digital Signal Processing
ECTS Credits	4
Semester	3
Weekly Hours	5
Lectures/Laboratory/Practical/Exercises	4
Organized Workload (Hours/Semester)	48
Unorganized Workload (Hours/Week)	52
Description	The course introduces the fundamentals of hardware security and trust in circuits and integrated systems, physical cryptography, and various attacks, including side-channel attacks. It covers PUF and TRNG technologies, intellectual property protection, counterfeit circuits, hardware Trojans, and methods for their detection and protection.

Subject	Subject 19
Subject Code	BCYSCE304-S1
Subject Name	Mobile Wireless Networks
ECTS Credits	5
Semester	3
Weekly Hours	3
Lectures/Laboratory/Practical/Exercises	4
Organized Workload (Hours/Semester)	64
Unorganized Workload (Hours/Week)	61
Description	The course aims to provide an understanding of the fundamentals of mobile and wireless networks, their threats, protection mechanisms, and the protocols used in them. It develops students' wireless network security skills and introduces the legal and ethical aspects associated with wireless networks.

Subject	Subject 20
Subject Code	BCYSCE303-S1
Subject Name	Fundamentals of Cloud Computing
ECTS Credits	7
Semester	3
Weekly Hours	7
Lectures/Laboratory/Practical/Exercises	4
Organized Workload (Hours/Semester)	64
Unorganized Workload (Hours/Week)	86
Description	The course provides an understanding of the fundamentals of cloud computing, deployment and service models, virtualization concepts, and scalability. It also introduces cloud security and privacy, costs, service providers, and the main advantages and challenges associated with cloud computing.

Second Year – Fourth Semester

subject	Details
Subject	Subject 21
Subject Code	BCYSCE400-S1
Subject Name	Intrusion Detection and Prevention Systems
ECTS Credits	6
Semester	4
Weekly Hours	4
Lectures/Lab/Practical/Exercises	4
Organized Study Load (Hours/Semester)	78
Unorganized Study Load (Hours/Week)	72
Description	Understand the fundamentals, concepts, and types of Intrusion Detection Systems (IDS) and their design, analysis, and application to protect networks and data. Develop practical skills in using tools such as Snort and Suricata and implementing intrusion detection and prevention solutions in secure systems.

Subject	Details
Subject	Subject 22
Subject Code	BCYSCE405-S1
Subject Name	Research Methodology
ECTS Credits	3
Semester	4
Weekly Hours	3
Lectures/Lab/Practical/Exercises	-
Organized Study Load (Hours/Semester)	49
Unorganized Study Load (Hours/Week)	27
Description	Understand the steps and methods of scientific research and develop skills in research design, planning, and data analysis. Recognize and apply the ethical principles of scientific research during the implementation of studies.

Subject	Details
Subject	Subject 23
Subject Code	BCYSCE402-S1
Subject Name	Artificial Intelligence in Cybersecurity
ECTS Credits	6
Semester	4
Weekly Hours	4
Lectures/Lab/Practical/Exercises	4
Organized Study Load (Hours/Semester)	79
Unorganized Study Load (Hours/Week)	7
Description	The subject aims to introduce students to the fundamentals of Artificial Intelligence and its applications in cybersecurity, while developing skills in data collection and preprocessing, feature selection, classification, clustering, and prediction. It also focuses on employing AI techniques to detect threats, protect sensitive data, and solve cybersecurity problems through practical applications.

Field	Details
Subject	Subject 24
Subject Code	BCYSCE404-S1
Subject Name	Cybersecurity Practices
ECTS Credits	6
Semester	4
Weekly Hours	5
Lectures/Lab/Practical/Exercises	4
Organized Study Load (Hours/Semester)	63
Unorganized Study Load (Hours/Week)	113

Description

Ethical hacking is a security practice that aims to test systems through the stages of planning, reconnaissance, scanning, exploitation, and post-exploitation, followed by reporting the findings. This training helps students understand security vulnerabilities, how they can be exploited, and how to mitigate them to enhance system protection.

Subject	Details
Subject	Subject 25

Subject	Details
Subject Code	BCYSCE403-S1
Subject Name	Cloud Computing Applications
ECTS Credits	3
Semester	4
Weekly Hours	4
Lectures/Lab/Practical/Exercises	2
Organized Study Load (Hours/Semester)	79
Unorganized Study Load (Hours/Week)	46
Description	The subject aims to introduce students to cloud computing concepts and the fundamentals of designing, developing, deploying, and managing cloud applications using modern platforms and tools. It also focuses on cloud application security, integration with other systems, performance monitoring, and improving efficiency and reliability.

Subject	Details
Subject	Subject 26
Subject Code	BCYSCE401-S1
Subject Name	Graduation Project Design
ECTS Credits	6
Semester	4
Weekly Hours	6
Lectures/Lab/Practical/Exercises	-
Organized Study Load (Hours/Semester)	34
Unorganized Study Load (Hours/Week)	41
Description	The Graduation Project aims to enable students of Cybersecurity Engineering and Cloud Computing to apply the knowledge and skills acquired throughout their studies by

Subject	Details
	implementing an integrated engineering project within teams. The project focuses on addressing real-world problems while considering engineering, economic, environmental, ethical, security, social, and sustainability standards and constraints.

Third Year – Fifth Semester

Subject	Details
Subject	Subject 27
Subject Code	BCYSCE101-S2
Subject Name	Digital Electronics
ECTS Credits	7
Semester	5
Weekly Hours	4
Lectures/Lab/Practical/Exercises	4
Organized Study Load (Hours/Semester)	79
Unorganized Study Load (Hours/Week)	96
Description	Digital electronics involves understanding digital signals, logic gates, Boolean algebra, and the design and implementation of circuits using tools such as truth tables and Karnaugh maps. It also includes circuit testing and troubleshooting, as well as understanding digital systems and their applications in real-world fields such as computers, control systems, and communications.

Subject	Details
Subject	Subject 28
Subject Code	BCYSCE106-S2
Subject Name	Introduction to Statistics and Digitalization
ECTS Credits	5
Semester	5
Weekly Hours	4
Lectures/Lab/Practical/Exercises	4
Organized Study Load (Hours/Semester)	64
Unorganized Study Load (Hours/Week)	61

Subject	Details
Description	The subject aims to enable students to understand fundamental concepts of probability, such as events and random variables, and to recognize probability laws and solve theoretical and practical problems. It also focuses on understanding the concepts of independence and dependence among events and random variables.

Subject	Details
Subject	Subject 29
Subject Code	BCYSCE107-S2
Subject Name	Object-Oriented Programming
ECTS Credits	7
Semester	5
Weekly Hours	2
Lectures/Lab/Practical/Exercises	2
Organized Study Load (Hours/Semester)	79
Unorganized Study Load (Hours/Week)	96
Description	The subject aims to introduce students to the fundamentals and principles of Object-Oriented Programming (OOP) using C++, starting with the development of classes and member functions and progressing to advanced applications. It also develops students' skills through implementing various programs using inheritance and polymorphism, and prepares them to apply different programming patterns in cybersecurity engineering projects.

Subject	Details
Subject	Subject 30
Subject Code	NTU102
Subject Name	Computer Fundamentals
ECTS Credits	2
Semester	5
Weekly Hours	2
Lectures/Lab/Practical/Exercises	1
Organized Study Load (Hours/Semester)	48
Unorganized Study Load (Hours/Week)	52

Subject	Details
Description	The subject introduces students to the fundamentals of computers and their hardware and software components, including their functions and roles in computer operation and data processing. Students also learn about input, output, processing, and storage units and how they interact with one another. The subject includes an introduction to basic computer components, memory and storage units, operating systems, and software, enabling students to acquire the essential knowledge required to use computers and understand how their various systems operate.

Subject	Details
Subject	Subject 31
Subject Code	BCYSCE108-S2
Subject Name	Fundamentals of Cybersecurity Engineering
ECTS Credits	7
Semester	5
Weekly Hours	3
Lectures/Lab/Practical/Exercises	2
Organized Study Load (Hours/Semester)	48
Unorganized Study Load (Hours/Week)	52
Description	The subject covers the fundamental concepts of Cybersecurity Engineering , including cyber threats and attacks and methods for protecting systems, networks, and data. It aims to provide students with the essential knowledge and skills required to understand cybersecurity principles and apply them in various technological environments.

Field	Details
Subject	Subject 32
Subject Code	NTU103
Subject Name	Arabic Language
ECTS Credits	2
Semester	5
Weekly Hours	2
Lectures/Lab/Practical/Exercises	-
Organized Study Load (Hours/Semester)	18

Field	Details
Unorganized Study Load (Hours/Week)	37
Description	The subject aims to enable students to master Modern Standard Arabic in reading, writing, and pronunciation, while using terminology appropriate to their specializations correctly and accurately. It also introduces students to Arabic heritage, including prose and poetry, and provides them with the fundamental grammatical rules required in academic environments to ensure effective communication and appropriate use of language in scientific contexts.

السنة الثالثة – الفصل الدراسي السادس

Subject	Details
Subject	Subject 33
Subject Code	BCYSCE205-S2
Subject Name	Data Structures
ECTS Credits	5
Semester	6
Weekly Hours	4
Lectures/Lab/Practical/Exercises	2
Organized Workload (Hours/Semester)	62
Unorganized Workload (Hours/Week)	63
Description	The course aims to introduce students to the fundamental concepts of data structures, such as arrays, stacks, queues, trees, and graphs, and to analyze the associated algorithms to determine and improve their efficiency. It also focuses on selecting the appropriate data structure for each problem and implementing structures such as linked lists, trees, and graphs to develop efficient programs capable of processing large amounts of data.

Subject	Details
Subject	Subject 34
Subject Code	BCYSCE202-S2
Subject Name	Database Systems Security
ECTS Credits	6

Subject	Details
Semester	6
Weekly Hours	6
Lectures/Lab/Practical/Exercises	3
Organized Workload (Hours/Semester)	78
Unorganized Workload (Hours/Week)	47
Description	The course aims to introduce students to the concepts, principles, and practices of database security, enabling them to design, implement, and manage secure databases and protect sensitive data from unauthorized access, modification, or disclosure. It also covers techniques for implementing and configuring database security systems and methods for securely transmitting and retrieving information. The course enables students to perform database security tasks using modern tools and technologies and understand mechanisms for securing applications and databases, preparing them to implement cybersecurity engineering projects and build secure solutions for data protection.

Subject	Details
Subject	Subject 35
Subject Code	BCYSCE204-S2
Subject Name	Computer Organization and Architecture
ECTS Credits	5
Semester	6
Weekly Hours	5
Lectures/Lab/Practical/Exercises	3
Organized Workload (Hours/Semester)	78
Unorganized Workload (Hours/Week)	47
Description	The course aims to introduce students to the fundamental principles of computer organization, including memory hierarchy, input/output systems, and instruction execution. It explains computer components such as the CPU, memory, and input/output systems and how they interact. It also covers different Instruction Set Architectures (ISAs), comparing their advantages and disadvantages, and enables students to design and analyze computer systems and evaluate their performance using standard benchmarks.

Subject	Details
Subject	Subject 36
Subject Code	BCYSCE203-S2
Subject Name	Network Security
ECTS Credits	6
Semester	6
Weekly Hours	6
Lectures/Lab/Practical/Exercises	3
Organized Workload (Hours/Semester)	79
Unorganized Workload (Hours/Week)	71
Description	The course focuses on information security services and mechanisms in the context of computer networks, covering cryptographic tools such as Message Authentication Codes (MACs), hash functions, digital signatures, and digital certificates. It also addresses topics such as access control, intrusion detection, database security, Internet security, and common related threats.

Subject	Details
Subject	Subject 37
Subject Code	NTU202
Subject Name	Arabic Language
ECTS Credits	2
Semester	6
Weekly Hours	1
Lectures/Lab/Practical/Exercises	-
Organized Workload (Hours/Semester)	18
Unorganized Workload (Hours/Week)	37
Description	The course aims to enable students to master Modern Standard Arabic in reading, writing, and pronunciation, while using terminology related to their specializations correctly and accurately. It also introduces students to Arabic literary heritage, including prose and poetry, and provides them with the basic grammatical rules required in the academic environment to ensure effective communication and appropriate use of the language in scientific contexts.

Subject	Details
Subject	Subject 38
Subject Code	BCYSCE201-S1
Subject Name	Network and Infrastructure Management
ECTS Credits	4
Semester	6
Weekly Hours	4
Lectures/Lab/Practical/Exercises	2
Organized Workload (Hours/Semester)	48
Unorganized Workload (Hours/Week)	52
Description	The course aims to introduce students to the fundamental concepts of systems and network management independently of specific vendors, building on their previous knowledge in this field. It focuses on providing students with networking fundamentals and management best practices, teaching them how to configure, maintain, and develop their skills in IP addressing and the operation of the TCP/IP protocol suite.

Subject	Details
Subject	Subject 39
Subject Code	ATU13067
Subject Name	Computer
ECTS Credits	2
Semester	6
Weekly Hours	2
Lectures/Lab/Practical/Exercises	1
Organized Workload (Hours/Semester)	33
Unorganized Workload (Hours/Week)	67
Description	The Computer course aims to provide students with basic knowledge of computer components, systems, and networks, with a focus on practical concepts that help them understand how computers operate and how they are used in academic and practical fields. It also develops students' skills in dealing with software and hardware, providing them with a strong knowledge base to support their studies in cybersecurity and computer engineering specializations.

Fourth Year – Seventh Semester

Subject	Details
Subject	Subject 40
Subject Code	BCYSCE300-S2
Subject Name	Wireless and Mobile Network Security
ECTS Credits	5
Semester	7
Weekly Hours	5
Lectures/Lab/Practical/Exercises	2
Organized Workload (Hours/Semester)	48
Unorganized Workload (Hours/Week)	52
Description	The course aims to introduce students to the concepts of wireless networks and Wireless Local Area Networks (WLANs), IEEE 802.11 architecture, communication protocols, and the characteristics of wireless and mobile networks. It also covers wireless communication technologies such as Bluetooth and RFID, multiple access techniques including CDMA, TDMA, and FDMA, cellular networks, 4G and 5G technologies, device mobility management, and wireless sensor networks. The course enables students to understand communication and mobility mechanisms in wireless networks, work with modern mobile communication technologies, and analyze the impact of mobility and wireless communication on network protocols and different layers.

Subject	Details
Subject	Subject 41
Subject Code	BCYSCE305-S2
Subject Name	Secure Software Development
ECTS Credits	5
Semester	7
Weekly Hours	5
Lectures/Lab/Practical/Exercises	2

Subject	Details
Organized Workload (Hours/Semester)	63
Unorganized Workload (Hours/Week)	62
Description	The course covers the fundamentals of cybersecurity, with a focus on protecting systems and networks from threats. It also explains prevention and response strategies for cyberattacks and best practices in the field.

Subject	Details
Subject	Subject 42
Subject Code	BCYSCE302-S2
Subject Name	Operating Systems Security
ECTS Credits	5
Semester	7
Weekly Hours	5
Lectures/Lab/Practical/Exercises	2
Organized Workload (Hours/Semester)	64
Unorganized Workload (Hours/Week)	61
Description	The course aims to introduce students to operating system security concepts, from developing security plans and designs to using protection tools and monitoring systems. It focuses on dealing with threats and attacks and responding to security breaches to ensure continuous protection.

Subject	Details
Subject	Subject 43
Subject Code	BCYSCE304-S2
Subject Name	Cybersecurity Practices
ECTS Credits	5
Semester	7

Subject	Details
Weekly Hours	5
Lectures/Lab/Practical/Exercises	2
Organized Workload (Hours/Semester)	93
Unorganized Workload (Hours/Week)	111
Description	The course aims to introduce students to the principles and techniques of penetration testing and ethical hacking and develop their skills in planning and executing penetration testing stages, starting from reconnaissance, information gathering, and scanning through exploitation, post-exploitation, and reporting. It also enables students to identify system vulnerabilities and analyze how they can be safely exploited, while applying appropriate procedures and techniques to detect vulnerabilities, reduce risks, and enhance system security.

Subject	Details
Subject	Subject 44
Subject Code	BCYSCE303-S2
Subject Name	Engineering Analytics
ECTS Credits	4
Semester	7
Weekly Hours	4
Lectures/Lab/Practical/Exercises	2
Organized Workload (Hours/Semester)	63
Unorganized Workload (Hours/Week)	37
Description	The course aims to enable students to understand the mathematical and statistical concepts related to engineering analysis and learn various analytical techniques, in addition to developing skills in modeling, simulation, and data analysis. It focuses on applying engineering principles while understanding sources of error and uncertainty, developing the ability to communicate analytical results effectively to technical and non-technical audiences, and considering ethical aspects of engineering analysis.

Subject	Details
Subject	Subject 45
Subject Code	BCYSCE301-S2
Subject Name	Cloud Computing Security
ECTS Credits	5

Subject	Details
Semester	7
Weekly Hours	5
Lectures/Lab/Practical/Exercises	2
Organized Workload (Hours/Semester)	79
Unorganized Workload (Hours/Week)	46
Description	The course aims to introduce students to the fundamentals of cloud computing, including cloud models, services, and security mechanisms, while providing practical training in designing and developing cloud applications using various tools and frameworks. It focuses on deploying and managing applications through platforms such as AWS, Azure, and GCP, ensuring their security, integrating them with other systems, and monitoring and improving their performance according to best practices.

Fourth Year – Eighth Semester

Subject	Details
Subject No.	46
Subject Code	BCYSCE400-S2
Subject Name	Information Technology Project Management
Number of Units (ECTS)	6
Semester	8
Hours per Week	6
Lectures / Laboratory / Practical / Exercises	3
Structured Workload (Hours/Semester)	62
Unstructured Workload (Hours/Week)	63
Description	The subject aims to provide students with theoretical and practical concepts of project management, with a focus on planning, budgeting, and effective implementation to achieve project objectives efficiently and within the required timeframe. It also seeks to develop students' organizational and leadership skills, introduce them to successful implementation and control methods, enhance their ability to monitor project progress, increase their self-awareness of their roles within a team, and develop the administrative, leadership, and soft skills required across various sectors.

Subject	Details
Subject No.	47
Subject Code	BCYSCE405-S2
Subject Name	Graduation Project Implementation
Number of Units (ECTS)	3
Semester	8
Hours per Week	3
Lectures / Laboratory / Practical / Exercises	-
Structured Workload (Hours/Semester)	43
Unstructured Workload (Hours/Week)	66
Description	The Graduation Project in Cybersecurity Engineering and Cloud Computing aims to enable students to apply the knowledge and skills they have acquired throughout their years of study through practical projects carried out in small teams. These projects are required to integrate engineering standards and real-world constraints, including economic, environmental, security, social, political, and sustainability considerations, thereby enhancing students' ability to address real-world challenges.

Subject	Details
Subject No.	48
Subject Code	BCYSCE402-S2
Subject Name	Digital Forensics
Number of Units (ECTS)	7
Semester	8
Hours per Week	7
Lectures / Laboratory / Practical / Exercises	-
Structured Workload (Hours/Semester)	79

Subject	Details
Unstructured Workload (Hours/Week)	96
Description	The subject aims to introduce students to the fundamentals and importance of digital forensic evidence and develop their ability to conduct forensic investigations on computers and digital systems using scientific and systematic methods. It also enables students to evaluate and use digital forensic tools and software and develop appropriate investigation strategies in accordance with modern and evolving digital technologies.

Subject	Details
Subject No.	49
Subject Code	BCYSCE404-S2
Subject Name	Internet of Things and Cybersecurity
Number of Units (ECTS)	7
Semester	8
Hours per Week	7
Lectures / Laboratory / Practical / Exercises	-
Structured Workload (Hours/Semester)	79
Unstructured Workload (Hours/Week)	96
Description	The subject aims to introduce students to the principles of Internet of Things (IoT) security, with a focus on confidentiality, authentication, and ensuring the availability of devices and systems to authorized users, in addition to risk management and enhancing system resilience. It also enables students to understand security threats associated with the IoT environment and apply appropriate measures to protect devices, data, and systems, ensuring their operational continuity and resilience against attacks and security risks.

Subject	Details
Subject No.	50
Subject Code	BCYSCE403-S2
Subject Name	Reverse Engineering – Malware Analysis
Number of Units (ECTS)	7
Semester	8
Hours per Week	7
Lectures / Laboratory / Practical / Exercises	-
Structured Workload (Hours/Semester)	79
Unstructured Workload (Hours/Week)	96
Description	The subject aims to introduce students to the principles of reverse engineering and its importance in the field of cybersecurity, with an emphasis on mastering related tools and techniques and understanding malware classifications. It also focuses on malware analysis through techniques such as executing malware in an isolated environment, using disassembly tools to understand instructions, and studying anti-reverse-engineering obfuscation techniques. In addition, students will learn the fundamentals of assembly language and apply protection measures against malware.

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	MATHEMATICS		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE100-S1		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	1
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	E-mail
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	Discrete Math (BCYSCE205-S1)	Semester	1

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

1. Enhance Problem-Solving Skills: Develop the ability to analyze and solve mathematical problems using appropriate strategies, techniques, and mathematical reasoning.
2. Foster Mathematical Thinking: Cultivate critical thinking and logical reasoning skills necessary for understanding and applying mathematical concepts and principles.
3. Promote Conceptual Understanding: Develop a deep understanding of mathematical concepts, including algebra, geometry, statistics, and probability, by exploring their properties, relationships, and applications.
4. Cultivate Mathematical Modeling Skills: Apply mathematical concepts and techniques to real-world problems, formulate mathematical models, and interpret and analyze the results.
5. Promote Mathematical Technology Literacy: Utilize technology tools, such as calculators, graphing software, and spreadsheets, to enhance mathematical understanding, visualization, and problem solving.

Module Aims, Learning Outcomes and Indicative Contents

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5. Promote Mathematical Technology Literacy: Utilize technology tools, such as calculators, graphing software, and spreadsheets, to enhance mathematical understanding, visualization, and problem solving.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

1. Lectures and Presentations: Lectures are commonly used to present foundational concepts, theories, and methodologies in engineering analysis.
2. Practical Assignments and Problem-Solving Exercises: Hands-on assignments and problem-solving exercises allow students to apply the concepts learned in class to real-world engineering problems.
3. Case Studies and Real-World Examples: Presenting case studies and real-world examples helps students connect theoretical concepts with practical applications. By analyzing and discussing real-world engineering
4. Group Projects and Collaborative Learning: Group projects encourage collaboration and teamwork among students.

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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	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	4	10% (10)	2,4,6,7	LO #1, #2 and #9
	Assignments	9	10% (10)	1,2,3,4,5,6,7,8,9	LO #1, #4,#5, #6,#7,#8,#9 and #6, #7
	Reading	2	5% (5)	5,7	LO #10, #12,#13
	Report	1	5% (5)	2	LO #5, #8 and #10
	Web Based Learning	4	5% (5)	1,5,8,10	LO #5, #8 ,#9 and #10
	Seminar	1	5% (5)	8	LO #9, #13
	Midterm Exam	2hr	10% (10)	7	LO #1 - #7

المناهج الاسبوعي النظري

	Material Covered
Week 1	Matrix and Determinants - Matrix, properties, and operations - Determinants and properties of determinants
Week 2	Matrix and Determinants - Inverse of square matrix by determinants. - Solving linear System equations using the inverse of the coefficient matrix and Cramer's rule.
Week 3	Review of Functions - Algebraic functions. - Review of natural logarithm, the exponential function, trigonometric functions, inverse trigonometric functions and hyperbolic functions.
Week 4	Derivatives - Derivatives formula and chain rule. - Derivatives of natural logarithm, the exponential function.
Week 5	Derivatives - trigonometric functions , inverse trigonometric functions and hyperbolic functions - Applications of differentiation.
Week 6	Integration - Review of Integration, Indefinite and Definite Integral - Applications of integration.
Week 7	Integration - approximation (trapezoidal rule, Simpson's rule) - Area between curves.

Week 9	Techniques of integration • Partial fractions. • Trigonometric substitutions. • Improper integral.
Week 10	Applications of integration • Volume and solid revolution • Length of plane curves.
Week 11	Vectors • Vectors – The Basics • Vector Arithmetic
Week 12	Vectors • Dot product • Cross product • Applications.
Week 13	Complex numbers • Complex numbers in Cartesian coordinates and polar form. • linear algebra for complex number in polar and Cartesian.
Week 14	Linear Algebra • Euler's formula. • DeMoivre's theorem to find powers and the nth roots of given complex numbers.
Week 15	Review
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Calculus I, Paul Dawkins, 2007.	Yes
Recommended Texts	Advance Engineering Mathematics, Alan Jeffrey, 2002.	Yes
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.				

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Fundamentals of Programming		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar		
Module Code	BCYSCE102-S1				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		1	Semester of Delivery		1
Administering Department		CYSCE	College	TEC	
Module Leader			e-mail	E-mail	
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		20/06/2023	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Object oriented Programming (BCYSCE107-S2)	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Introducing the fundamentals and principles of programming in C++ language. 2. Teaching the concept of Procedure Oriented Programming. 3. Starts from scratch to advance programing by improving the skills of the students through several program implementation and code writing. 4. The students should be able to define programming purposes & the required code lines to perform the needed works. 5. as well as qualifying him to use the different kinds of programming style and program functions in building & executing the projects of cyber security engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the fundamentals of programming in C++ language. 2. Mastering C++ programming tools and techniques, including common integrated development environment (IDE) such as visual studio. 3. Becoming familiar with the C++ concepts such as Variables, assignments, Simple input, Main program and functions. 4. Being competent in common If-statement, Loops, Boolean Expressions & Logical operators. 5. Being able to perform Function call, Parameters, return values. 6. Being able to write C++ codes, Basics of program design & Programming style.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	96	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation				
تقييم المادة الدراسية				
		Time/Number	Weight (Marks)	Week Due
Formative assessment	Quizzes	4	10% (10)	3,6,9,12
	Assignments	8	5% (5)	Every other week
	Projects / Lab.	14	10% (10)	Continuous
	Report	2	5% (5)	7, 14
	Seminar	1	10% (10)	15
Summative assessment	Midterm Exam	2hr	10% (10)	7
	Final Exam	3hr	50% (50)	16
Total assessment			100% (100 Marks)	

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Introduction to C++ (Structure of a program), Flow Chart.
2	Variables, assignments, Simple input, Main program.
3	If-statement If-else, Boolean Expressions & Logical operators.
4	Loops Nested Loops, and program Design.
5	Output formatting.

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
6	Functions, Parameters, return values.
7	Debugger.
8	Lists Methods, Nesting, Slicing, and Comprehension.
9	Strings and String Formatting.
10	Dictionary and Handle Exceptions.
11	Values and references.
12	Basics of program design & Programming style.
13	Pointers (Reference operator, dereference operator, Declaring variables of pointer types, Pointers and arrays, Pointers to pointers, void pointers, and Pointers to functions).
14	Dynamic Memory (Operators new, check if the allocation memory is successful and Operators delete).
15	review/seminar
16	Final Exam.

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Introduction to C++ (Structure of a program), Flow Chart.
2	Variables, assignments, Simple input, Main program.
3	If-statement If-else, Boolean Expressions & Logical operators.
4	Loops Nested Loops, and program Design.
5	Output formatting.

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
6	Functions, Parameters, return values.
7	Debugger.
8	Lists Methods, Nesting, Slicing, and Comprehension.
9	Strings and String Formatting.
10	Dictionary and Handle Exceptions.
11	Values and references.
12	Basics of program design & Programming style.
13	Pointers (Reference operator, dereference operator, Declaring variables of pointer types, Pointers and arrays, Pointers to pointers, void pointers, and Pointers to functions).
14	Dynamic Memory (Operators new, check if the allocation memory is successful and Operators delete).
15	review/seminar
16	Final Exam.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Getting started - Structure of a program- Flow Chart.
Week 2	Lab 2: Variables, assignments, Simple input, Main program - Examples and Problems
Week 3	Lab 3: If-statement If-else, Boolean Expressions & Logical operators - Examples and Problems.
Week 4	Lab 4: Loops Nested Loops, and program Design - Examples and Problems.
Week 5	Lab 5: Loops Nested Loops, and program Design - Examples and Problems.
Week 6	Lab 6: Functions, Parameters, return values - Examples and Problems.
Week 7	Lab 7: Debugger - Examples and Problems.
Week 8	Lab 8: Lists Methods, Nesting, Slicing, and Comprehension - Examples and Problems.
Week 9	Lab 9: Dictionary and Handle Exceptions - Examples and Problems.
Week 10	Lab 10: Pointers - Examples and Problems.
Week 11	Lab 11: Strings and String Formatting - Examples and Problems.
Week 12	Lab 12: Programming style.
Week 13	Lab 13: Values and references.
Week 14	Lab 14: Dynamic Memory - Examples and Problems.

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Linux Administration		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE105-S1		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	1
Administering Department	CYSCE	College	
Module Leader		e-mail	E-mail
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Introduction to Cyber Security Engineering (BCYSCE107-S2)	Semester	2
Co-requisites module		Semester	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Choudhary, H. (2013). C++ Programming-Final Golden Edition. Beginners To Experts Approach Guide-With Easy Learning & Problem Analysis to Program Design & Development.	no
Recommended Texts	2. Farrell, J. (2008). Object-oriented programming using C++. Cengage Learning. 3. Object-Oriented Programming in C++, Fourth Edition.	no
Websites	4. https://www.geeksforgeeks.org/cpp 5. https://www.w3schools.com/cpp	

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 Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Introducing the fundamentals and principles of Linux administration using Linux operating system. 2. starts from scratch to network monitoring applications. 3. Improving the skills of the students through several Linux implementations and scripts writing. 4. The students should be able to understand the uses and purpose of using scripts and retrieve important network settings and packets sending and receiving information. 5. Help the students perform the needed cyber security works as well as qualifying him to use the different kinds of shell scripting style and instructions to build & execute the projects of cyber security engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the fundamentals of Linux administration. 2. Mastering Linux Instructions and commands, including common users administration & Permissions. 3. Becoming familiar with the Linux operating system and its distributions. 4. Being competent in common Networking & Configuring Network Settings and Package Management. 5. Being able to perform Bash Scripting and Execute shell command. 6. Being able to write complete shell scripts to perform I/O Manipulation and I/O Redirections

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Delivery Plan (Weekly Syllabus)	
المناهج الاسبوعى النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
5	Users & Permissions: Users & Groups, Permissions
6	Networking & Package Groups: Package Management.
7	Networking & Package Groups: Configuring Network Settings.
8	Linux Services: Apache, Creating a Basic Website
9	Linux Services: SSH & Telnet
10	Linux Services: FTP, SMB
11	Bash Scripting, Data types and variables, Execute shell command
12	Shell Scripting, Loops function
13	Shell conditions, and arithmetic comparisons
14	I/O Manipulation, I/O Redirections
15	Review
16	Final Exam

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	96	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	175		

Module Evaluation				
تقييم المادة الدراسية				
		Time/Number	Weight (Marks)	Week Due
Formative assessment	Quizzes	4	10% (10)	3,6,9,12
	Assignments	8	5% (5)	Every other week
	Projects / Lab.	14	10% (10)	Continuous
	Report	2	5% (5)	7
Summative assessment	Midterm Exam	2hr	10% (10)	7
	Final Exam	3hr	50% (50)	15
Total assessment			100% (100 Marks)	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Installation of Linux OS.
Week 2	Lab2 : Basic Command 1
Week 3	Lab 3: Visual interface (VI Editor)
Week 4	Lab 4: User Administration and Group Administration
Week 5	Lab5: Permissions and Access control List
Week 6	Lab 6: Change ownership of files and directories and Change group owner of files and directories
Week 7	Lab 7: Partitions and Swap partition (Virtual memory)
Week 8	Lab 8: Disk Quotas and Logical Volume Manager (LVM)
Week 9	Lab 9: Redundant party of independent disks (RPID) and Backup and restore using CPIO Command
Week 10	Lab 10: Backup and restore using TAR and Filter the Archive through BZIP2(-j) and Backup and restore using TAR and Filter the Archive through GZIP2(-z)

Week 11	Lab 11: Redundant party of independent disks (RPID)
Week 12	Lab 12: Backup and restore using CPIO Command
Week 13	Lab 13: Backup and restore using TAR and Filter the Archive through BZIP2(-j)
Week 14	Lab 14: Review
Week 15	Final Exam

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Introduction to Sociology		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	BCYSCE103-S1		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	Semester of Delivery	
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

1. Examining legal and regulatory requirements, ethical issues, and the development of cybersecurity policy for commercial and government organizations.
2. Introduce students to the field of sociology and its central theoretical perspectives from Cybersecurity perspective. Provide students with basic ideas and knowledge in the science of sociology.
3. Help students understand the similarities and differences between different sociological paradigms.
4. provide students with basic ideas and knowledge in the science of sociology and how cybersecurity issues effects society.
5. Introduce student to terminology related to cybersecurity such as Cybercrime and deviance, Globalization.
6. Explore the development of organizational cybersecurity policy that meets an organization's compliance requirements and business goals.
7. Introduce students to new ways of thinking about race, ethnicity, and culture from the perspectives of sociology.
8. Use computational social science techniques to identify, counter, and measure the impact of communication in social cybersecurity.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

1. Understanding the impact of technology on society: Students will be able to analyze the effects of technology on social structures, institutions, and relationships, and identify potential cybersecurity risks associated with technological advancements. Students can explain the sociological significance of social identity groups and the processes that create them; determine the historical and contemporary factors that shape social inequality; and analyze the relationship between social structure and individual agency.
2. Students will be able to define and explain sociological concepts and explain social facts and society-related concepts.
3. Students will be able to effectively engage with and apply their "sociological imagination" to think critically about the social world and what separates sociology from other social science disciplines.
4. Students will be able to construct relevant arguments using data from credible sources and demonstrate familiarity with basic statistical concepts.
5. help students to develop critical thinking skills, understand sociological concepts and theories, and analyze social phenomena from a sociological perspective.
6. Help students to develop communication and research skills, as well as their ability to engage with diverse perspectives and apply sociological concepts to real-world issues.

Learning and Teaching Resources				
مصادر التعلم والتدريس				
	Text			Available in the Library?
Required Texts	1. Unix And Linux®System Administration Handbook. Fourth Edition, Evi Nemeth Garth Snyder,Trent R. Hein and Ben Whaley			yes
Recommended Texts	1. Modern Linux Administratio (2016) by Sam R. Alapati. 2. LINUX SYSTEM ADMINISTRATION by Tom Adelstein and Bill Lubanovic			yes
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 Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

1. Examining legal and regulatory requirements, ethical issues, and the development of cybersecurity policy for commercial and government organizations.
2. Introduce students to the field of sociology and its central theoretical perspectives from Cybersecurity perspective. Provide students with basic ideas and knowledge in the science of sociology.
3. Help students understand the similarities and differences between different sociological paradigms.
4. provide students with basic ideas and knowledge in the science of sociology and how cybersecurity issues effects society.
5. Introduce student to terminology related to cybersecurity such as Cybercrime and deviance, Globalization.
6. Explore the development of organizational cybersecurity policy that meets an organization's compliance requirements and business goals.
7. Introduce students to new ways of thinking about race, ethnicity, and culture from the perspectives of sociology.
8. Use computational social science techniques to identify, counter, and measure the impact of communication in social cybersecurity.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

1. Understanding the impact of technology on society: Students will be able to analyze the effects of technology on social structures, institutions, and relationships, and identify potential cybersecurity risks associated with technological advancements. Students can explain the sociological significance of social identity groups and the processes that create them; determine the historical and contemporary factors that shape social inequality; and analyze the relationship between social structure and individual agency.
2. Students will be able to define and explain sociological concepts and explain social facts and society-related concepts.
3. Students will be able to effectively engage with and apply their "sociological imagination" to think critically about the social world and what separates sociology from other social science disciplines.
4. Students will be able to construct relevant arguments using data from credible sources and demonstrate familiarity with basic statistical concepts.
5. help students to develop critical thinking skills, understand sociological concepts and theories, and analyze social phenomena from a sociological perspective.
6. Help students to develop communication and research skills, as well as their ability to engage with diverse perspectives and apply sociological concepts to real-world issues.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive learning and by considering types of simple case study discussions involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	67	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	200		

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	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
1	Introduction to Sociology and Cybersecurity: - Overview of the course - Introduction to sociology and cybersecurity - The importance of cybersecurity in modern society
2	Cybersecurity Fundamentals. - Cybersecurity basics - Cyber threats and vulnerabilities - Cybersecurity best practices
3	Sociology Fundamentals. - Introduction to sociology. - Social structures and institutions. - Social norms and values.
4	Cybersecurity and Society - The impact of cybersecurity on society. - Social and cultural factors that influence cybersecurity practices. - Privacy and security policy. - social, political, legal, criminological, and economic dimensions of cybersecurity through a social science framework
5	Cybercrime and Deviance - Types of cybercrime. - Theories of deviance and cybercrime. - The impact of cybercrime on society.
6	Cybersecurity and Social Change - Cybersecurity and social change - The role of technology in social change - Cybersecurity and activism
7	Cybersecurity and Globalization. - Cybersecurity and globalization - The impact of globalization on cybersecurity - Cybersecurity and international relations
8	Cybersecurity and Ethics - Ethical issues in cybersecurity - Cybersecurity and social responsibility - Cybersecurity and the future of society
9	Introduction to Cyberbullying - Definition of cyberbullying - Types of cyberbullying - How cyberbullying differs from traditional bullying
10	Effects of Cyberbullying. - Emotional and psychological impact on victims - Impact on academic performance - Legal and social consequences
11	Responding to Cyberbullying. - How to identify cyberbullying. - Legal and ethical considerations

	• Reporting cyberbullying incidents. • Supporting victims of cyberbullying.	
12	Human-factors and Cyber security social factors that contribute to cyber ,Human-factors approach to understanding cybersecurity threats incidents	
13	Risks and cybersecurity incidents The political and legal mechanisms that are developed to control the behaviors of those who create risks and cybersecurity incidents.	
14		
15	Review and Student Presentation	
16	Final Exam	
Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Introduction to Sociology" by George Ritzer.	Yes
Recommended Texts	1. "Cybersecurity and Cyberwar: What Everyone Needs to Know" by P.W. Singer and Allan Friedman 3. "The Cybersecurity Canon: Must-Read Books" by Palo Alto Networks	No
Websites		

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Fundamentals of Electrical Engineering		Module Delivery
Module Type	Core		✓ Theory ✓ Lecture ✓ Lab ✓ Tutorial ✓ Practical ✓ Seminar
Module Code	BCYSCE104-S1		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	1
Administering Department	Cyber Security and Cloud Computing Techniques Engineering	College	TEC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	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 Objectives أهداف المادة الدراسية	1. To learn the basics of electrical elements (Symbols and Abbreviations, Units, Electric Circuit and Direct Current). 2. Study Ohm's law 3. To learn Kirchhoff's Laws 4. Network Analysis Methods 5. Study The Alternating Current Network 6. Phase Diagram
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Define Ohm's law. 5. Explain the two Kirchhoff's laws used in circuit analysis. 6. Use different Network Analysis Methods to analyze and solve the electrical circuits 7. Discuss the various properties of resistors, capacitors, and inductors. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Introduction to electrical circuits</u> Symbols And Abbreviations, Units, Electric Circuit & It's Element. The Direct Current Network. Ohm's law, Series Circuits, Parallel Circuits, Series-Parallel Circuits, Open and Short Circuits, Source Transformation Conversion Of Delta to Star Connection And Vice Versa [15 hrs] <u>Part B - Kirchhoff's Laws</u> How to use in Network Analysis. [5 hrs] <u>Part C - Network Analysis Methods</u> Loop (mesh) Current Method. Superposition Method. Thevenin's Theorem Norton's Theorem

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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	6	4, 5, 6, 8, 11 and 12	LO #4, #5, #6, #7, #8 and #9

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Symbols And Abbreviations, Units, Electric Circuit & It's Element. The Direct Current Network.
Week 2	Ohm's law, Series Circuits, Parallel Circuits, Series-Parallel Circuits, Open and Short Circuits, Source Transformation
Week 3	Conversion Of Delta to Star Connection And Vice Versa
Week 4	Kirchhoff's Laws How to use in Network Analysis..
Week 5	Loop (mesh) Current Method.
Week 6	Superposition Method.
Week 7	Thevenin's Theorem
Week 8	Norton's Theorem
Week 9	Maximum Power Transfer Theorem
Week 10	Nodal Voltage Method
Week 11	Types of Alternating Waveforms, Generation of Alternating Current, and Definitions related to Alternating Waveforms. The Mean Values of Current and Voltage the Effective Vales of Current and Voltage
Week 12	Circuit Elements in the Phase Domain The Vector Diagram
Week 13	Series Ac Circuits and Parallel Ac Circuits
Week 14	Using Kirchhoff's laws to solve AC circuits
Week 15	Preparatory week before the final Exam
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Basic information
Week 2	Color of resistance
Week 3	Ohm's law and resister in series and parallel
Week 4	Star and delta connection
Week 5	Kirchhoff's law
Week 6	Superposition theorem
Week 7	Thevenin's Theorem
Week 8	Maximum Power Transfer
Week 9	Norton's Theorem
Week 10	Operating of Oscilloscope (CRO)
Week 11	Utilization of Oscilloscope
Week 12	The Sine wave
Week 13	Application of AC signal
Week 14	Time constant

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electric Circuits, by: James W. Nilsson and Susan A. Riedel Pearson Education Limited 10th edition 2015	Yes
Recommended Texts	FUNDAMENTALS OF ELECTRICAL ENGINEERING, by: Giorgio Rizzoni, McGraw-Hill, 1st edition, 2009.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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 Information

معلومات المادة الدراسية

Module Title	Introduction to Probability and Statistics			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	BCYSCE106-S2				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		1	Semester of Delivery		2
Administering Department		CYSCE	College	TEC	
Module Leader			e-mail	E-mail	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name			e-mail	E-mail	
Scientific Committee Approval Date		20/06/2023	Version Number		1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	MATHEMATICS (BCYSCE100-S1)	Semester	1
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Understand the basic concepts: Students should be able to define and understand key concepts in probability, such as events, outcomes, sample space, probability, and random variables. 2. Comprehend probability laws: Students should become familiar with the laws and rules of probability. 3. Solve probability problems: Students should be able to solve probability problems using both theoretical calculations and practical applications, such as calculating probabilities of events, determining expected values, and understanding the law of large numbers. 4. Understand independence and dependence: Students should learn the concepts of independence and dependence between events and random variables, and how they affect probability calculations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the basic concepts and terminology used in probability and statistics. 2. Comprehend the fundamental principles of probability theory, including probability axioms, random variables, and probability distributions. 3. Analyze and interpret data using descriptive statistics, including measures of central tendency (mean, median, mode) and variability (variance, standard deviation). 4. Understand the concept of sampling and its importance in statistical inference. 5. Apply basic regression analysis techniques to examine relationships between variables. 6. Understand the limitations and assumptions associated with various statistical methods. 7. Use statistical software or programming languages to analyze and visualize data.

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	1. Understanding the problem: Begin by reading and understanding the problem statement carefully and identifying key information, variables, and what is required. 2. Define the problem in probabilistic terms: Determine how the problem can be translated into a probabilistic framework. 3. Use appropriate probability models: Determine the appropriate probability model or distribution that best represents the problem at hand. 4. Break down complex problems: If a problem seems complex, it should be broken down into smaller, easier-to-handle parts.

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Statistics - An overview of the role of statistics in science. - types of statistics (descriptive and inferential).
Week 2	Introduction to Statistics - data presentation. (arithmetical mean, median, mode).
Week 3	Introduction to Statistics exploring Univariate Data, types of data.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5 ,8 and 10	LO #1, #2 and #10, #11
	Assignments	5	10% (10)	2,4,8,9,10	LO #3, #4 and #6, #7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	1	5% (5)	13	LO #5, #8 and #10
	Seminar	1	5% (5)	10	LO #7, #9 and #13
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

	mean and median, standard Deviation and Variance.
Week 4	Introduction to Statistics - range, IQR and Finding Outliers. - graphs and Describing Distributions. - Overview of software security and defense practices
Week 5	Introduction to Probability - Introduction to Probability. - Counting Techniques. - combinations and Permutations
Week 6	Introduction to Probability - sets and Venn Diagrams. - basic probability models. - general probability rules.
Week 7	probabilistic models - Introduction to discrete distributions. - random variables. - binomial distributions.
Week 8	probabilistic models - geometric distributions. - continuous distributions. - density curves.
Week 9	probabilistic models - Introduction to Suricata. - Installation and configuration of Suricata. - Rulesets, and signatures. - Understanding the rules and rule management

Week 11	Axioms of probability - Scatter plots, the least squares regression line, residuals, nonlinear models. - relations in categorical data, Samples and experiments: sampling, designing experiments. - simulating experiments, estimation: margins of error and estimates.
Week 12	Confidence Interval - confidence interval for a proportion, confidence interval for the difference of two proportions. - confidence interval for a mean, confidence interval for the difference of two means.
Week 13	Axioms of probability - Tests of significance, inference for the mean of a population. - sample proportions. - inference for a population proportion.
Week 14	Comparing Two Means, comparing two proportions, goodness of fit test and two-way tables, inference for regression, confidence intervals, test for slope of regression lines.
Week 15	Review
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to R
Week 2	Lab 2: Data structures in R programming (Vectors, Matrices, Array)
Week 3	Lab 3: Data structures in R programming (Lists, Data Frame, Factor)
Week 4	Lab 4: Data type
Week 5	Lab 5: R-decision making, R-loops, loop control statements
Week 6	Lab 6: Functions in R.
Week 7	Lab 7: R-Operators (Arithmetic operators, Relational operators, Logical operators, Assignment Operator
Week 8	Lab 8: Graphics
Week 9	Lab 9: Importing and Exporting Data.
Week 10	Lab 10: Distribution types
Week 11	Lab 11: Package Building

Week 12	Lab 12: Advanced package Building
Week 13	Lab 13: Data Manipulation
Week 14	Lab 14: Data Transformation
Week 15	Lab 15: Review and presentation
Week 16	Final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Freund, J. E. (2012). <i>Introduction to probability</i> . Courier Corporation.	Yes
Recommended Texts	Pishro-Nik, H. (2016). <i>Introduction to probability, statistics, and random processes</i> .	Yes
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.

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Introduction to Sociology		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE 108-S2		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	Semester of Delivery	1
Administering Department	CYSCE	College	TEC
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

79

96

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	1. Examining legal and regulatory requirements, ethical issues, and the development of cybersecurity policy for commercial and government organizations. 2. Introduce students to the field of sociology and its central theoretical perspectives from Cybersecurity perspective. Provide students with basic ideas and knowledge in the science of sociology. 3. Help students understand the similarities and differences between different sociological paradigms. 4. provide students with basic ideas and knowledge in the science of sociology and how cybersecurity issues effects society. 5. Introduce student to terminology related to cybersecurity such as Cybercrime and deviance, Globalization. 6. Explore the development of organizational cybersecurity policy that meets an organization's compliance requirements and business goals.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Describe the fundamental concepts and principles of cybersecurity. Students should be able to explain the basic terminology, models, and frameworks used in cybersecurity, such as confidentiality, integrity, availability, risk management, and threat modeling. 2. Identify common cybersecurity threats and attacks. Students should be able to recognize the most common types of cyber threats and attacks, such as malware, phishing, social engineering, and denial-of-service, and understand their impact on individuals, organizations, and society. 3. Apply cybersecurity best practices and tools. Students should be able to apply basic cybersecurity best practices and tools to protect their own devices and data, such as strong passwords, encryption, firewalls, and antivirus software. 4. Analyze cybersecurity incidents and breaches. Students should be able to analyze real-world cybersecurity incidents and breaches, such as data breaches, ransomware attacks, and cyber espionage, and understand their causes, consequences, and mitigation strategies. 5. Evaluate ethical and legal issues in cybersecurity. Students should be able to evaluate ethical and legal issues related to cybersecurity, such as privacy, surveillance, intellectual property, and cybercrime, and understand their implications for individuals, organizations, and society. 6.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to Cybersecurity (4 HOURS) Cybersecurity Fundamentals (6HOURS) Cybersecurity Operations (4 HOURS)

	Cybersecurity Ethics and Law (4 HOURS) Incident Response and Recovery. (4 HOURS) Threat Analysis Mode . (4 HOURS) Introduction to Security Policy (4 HOURS) Disaster Recovery and Business Continuity (4 HOURS) Security policy management and maintenance (4 HOURS)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)					
الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعاً					
Structured SWL (h/sem)		79	Structured SWL (h/w)		5
الحمل الدراسي المنتظم للطلاب خلال الفصل			الحمل الدراسي المنتظم للطلاب أسبوعياً		
Unstructured SWL (h/sem)		96	Unstructured SWL (h/w)		6
الحمل الدراسي غير المنتظم للطلاب خلال الفصل			الحمل الدراسي غير المنتظم للطلاب أسبوعياً		
Total SWL (h/sem)		175			
الحمل الدراسي الكلي للطلاب خلال الفصل					
Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 8, and 10	LO #1, #2, #5 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	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)**KEY LEARNING OUTCOMES OF THE COURSE UNIT**

المنهاج الاسبوعي النظري

	Material Covered
Week 1	1. Introduction to Cybersecurity • Definition of cybersecurity • Importance of cybersecurity • Cybersecurity threats and attacks • Cybersecurity best practices
Week 2	Introduction to Cybersecurity • Cybersecurity threats and attacks • Cybersecurity best practices
Week 3	Cybersecurity Fundamentals • Security models and frameworks • Risk management
Week 4	Cybersecurity Fundamentals • Security policies and procedures • Security controls and countermeasures
Week 5	Cybersecurity Operations • Incident response and management • Security monitoring and analysis • Vulnerability assessment and management • Penetration testing and ethical hacking
Week 6	Cybersecurity Ethics and Law • Ethical and legal issues in cybersecurity • Cybercrime and cyber law
Week 7	Cybersecurity Ethics and Law • Cybersecurity regulations and standards • Cybersecurity career paths and opportunities
Week 8	Incident Response and Recovery. • Incident Response and Recovery • Incident response planning
Week 9	Incident Response and Recovery • Incident detection and analysis • Incident containment and eradication
Week 10	Incident Response and Recovery • Business continuity and disaster recovery
Week 11	Threat Analysis Mode • , Categorization of threats. • Analysis of threats.
Week 12	Introduction to Security Policy • Overview of security policy development and implementation

	• Why security policy is important. • Risk assessment and analysis • Hands-on exercises in developing security policies
Week 13	Disaster Recovery and Business Continuity
	Security Policy Implementation • Best practices for implementing security policies. • Developing and implementing security protocols. • Incident response planning. • Hands-on exercises in implementing security policies.
Week 14	Security policy management and maintenance • Security policy auditing and compliance • Security policy training and awareness
Week 15	Review and Presentation
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Network Security Monitoring Software
Week 2	Lab 2: Vulnerability Assessment Software
Week 3	Lab 3: Packet Sniffer Software
Week 4	Lab 4: Encryption Tools
Week 5	Lab 5: Web Vulnerability Scanning Tools
Week 6	Lab 6: Penetration Testing Tools
Week 7	Lab 7: Antivirus Software
Week 8	Lab 8: Network Intrusion Detection Tools
Week 9	Lab 9: Keylogger Software
Week 10	Lab 10: Threat Intelligence Enrichment Tools
Week 11	Lab 11: Threat Identification in the Network
Week 12	Lab 12: Packet Sniffing Tools
Week 13	Lab 13: Network Security Monitoring Software
Week 14	Lab 14: Vulnerability Assessment Software
Week 15	Review and Students presentation
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Introduction to Computer Networks and Cybersecurity by Chwan-Hwa (John) Wu and J. David Irwin, 2013	Yes
Recommended Texts	1. Guide to Cyber Security for Beginners 2. Cybersecurity Essentials by Charles J. Brooks and Christopher Grow	No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Human rights and Democracy		Module Delivery	
Module Type	SUPPLEMENT		✓ Theory ✓ Lecture Lab Tutorial Practical ✓ Seminar	
Module Code	BCYSCE109-S2			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	1	Semester of Delivery		2
Administering Department	DEPARTMENT OF CYBERSECURITY AND CLOUD COMPUTING TECHNIQUES ENGINEERING		College	
Module Leader	Dr. Eesha I. Mohammed		e-mail	-
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor	None		e-mail	None
Peer Reviewer Name		None	e-mail	None
Review Committee Approval		21/06/2023	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 Objectives أهداف المادة الدراسية	تهدف الديمقراطية وحقوق الإنسان للحفاظ على كرامة الفرد وحقوقه الأساسية وتعزيزها كما تحقيق العدالة الاجتماعية وتشجيع التنمية الاقتصادية والاجتماعية للمجتمع وتماسكه فضلاً عن توطيد الأمن الوطني وإرساء مناخ موات للسلام الدولي وذلك لأن حقوق الإنسان والديمقراطية مرجعاً أساسياً للجميع لحماية حقوق الإنسان؛ وهي توفر بيئة لحماية حقوق الإنسان وإعمالها إعمالاً فعلياً. واليوم، بعد مضي فترة على تحقيق الديمقراطية في مختلف أنحاء العالم، يبدو أن العديد من النظم الديمقراطية تتراجع. ويظهر أن بعض الحكومات تعتمد إضعاف إجراء عمليات تحقق مستقلة بشأن سلطاتها، والقضاء على أي نقد، وتفكيك الرقابة الديمقراطية وضمان حكمها لمدة طويلة، مع أثر سلبي على حقوق الشعب.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1 - فهم ومعرفة وأدراك حقوقه التي أقرها الله له وللإنسان جميعاً وبالتالي فهي هبة وليس مكسب من أحد ولا يحق لأي شخص انتزاعها. 2- يعبر الطالب بأسلوبه الخاص عن هذه الحقوق ويدافع عنها. 3- تحليل الظواهر واعطاء التفسيرات لما يحدث امامه من انتهاك لحقوق الإنسان وحرياته من خلال تحديد اوجه

	النقص او الثغرات الموجودة في ضوء المعلومات المتوفرة لديه 4- فهم اهم النظم السياسية والتي تعد ضمانه لحقوق الانسان وحرياته السياسية ومحاولة تطبيقه على ارض الواقع الا وهو النظام الديمقراطي.
Indicative Contents المحتويات الإرشادية	حقوق الانسان في التاريخ المعاصر والحديث: الاعتراف الدولي بحقوق الانسان منذ الحرب العالمية الاولى وعصبة الامم المتحدة (4 ساعات) حقوق الانسان، تعريفها، اهدافها وحقوق الانسان في الحضارات القديمة وخصوصا حضارة وادي الرافدين (6 ساعات) ضمانات واحترام وحماية حقوق الانسان على الصعيد الدولي: - دور الأمم المتحدة ووكالاتها المتخصصة في توفير الضمانات - دور المنظمات الاقليمية (الجامعة العربية، الاتحاد الأوروبي، الاتحاد الافريقي، منظمة الدول الأمريكية، منظمة آسيان) دور المنظمات الدولية الاقليمية غير الحكومية والرأي العام في احترام وحماية حقوق الانسان (12 ساعة) المشاكل والمعوقات ونقاشات الطلبة (6 ساعات)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- استراتيجية التفكير حسب قدرة الطالب
- 2-استراتيجية مهارة التفكير العالية
- 3-استراتيجية التفكير الناقد في التعلم
- 4-العصف الذهني

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	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	0	0	Continuous	All
	Projects / Lab.	0	0		
	Report	4	10% (10)		
Summative assessment	Midterm Exam	2 hr	20% (20)	7	LO # 1-7
	Final Exam	3 hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	حقوق الانسان، تعريفها، اهدافها حقوق الانسان في الحضارات القديمة وخصوصا حضارة وادي الرافدين
Week 2	حقوق الانسان في الشرائع السماوية مع التركيز على حقوق الانسان في الاسلام . مناقشة هل الشرائع السماوية ممكن ان تكون حماية ومتابعة للامن السبيري وتاثيراته على الانسان
Week 3	حقوق الانسان في التاريخ المعاصر والحديث : الاعتراف الدولي بحقوق الانسان منذ الحرب العالمية الاولى وعصبة الامم المتحدة
Week 4	الاعتراف الاقليمي بحقوق الانسان : الاتفاقية الاوربية لحقوق الانسان 1950 ، الاتفاقية الامريكية لحقوق الانسان 1969 ، الميثاق الافريقي لحقوق الانسان 1981 ، الميثاق العربي لحقوق الانسان 1994
Week 5	حقوق الانسان في التاريخ المعاصر والحديث : الاعتراف الدولي بحقوق الانسان منذ الحرب العالمية الاولى وعصبة الامم المتحدة
Week 6	حقوق الانسان في الدساتير العراقية بين النظرية والواقع حقوق الانسان العراقي في الفضاء السبيري
Week 7	حقوق الانسان الاقتصادية والاجتماعية والثقافية وحقوق الانسان المدنية والسياسية . تاثير الامن السبيري على هذه الحقوق
Week 8	حقوق الانسان الحديثة : الحقائق في التنمية ، الحق في البيئة النظيفة ، الحق في التضامن ، الحق في الدين
Week 9	ضمانات احترام وحماية حقوق الانسان على الصعيد الوطني ، الضمانات في الدستور والقوانين الضمانات في الرقابة الدستورية ، الضمانات في حرية الصحافة والرأي العام ، دور المنظمات غير الحكومية في احترام وحماية حقوق الانسان. الضمانات الدستورية المتعلقة في الامن السبيري وتاثيرها على الفرد والمجتمع
Week 10	ضمانات واحترام وحماية حقوق الانسان على الصعيد الدولي : - دور الأمم المتحدة ووكالاتها المتخصصة في توفير الضمانات - دور المنظمات الاقليمية (الجامعة العربية ، الاتحاد الأوربي ، الاتحاد الافريقي ، منظمة الدول الأمريكية ، منظمة آسيان) دور المنظمات الدولية الاقليمية غير الحكومية والرأي العام في احترام وحماية حقوق الانسان دور المنظمات الدولية والاقليمية غير الحكومية في الامن السبيري الوطني والعالمي ضمانات وحقوق وحماية الانسان في الفضاء السبيري مصطلح الديمقراطية، نشأته، دلالته، تاريخ الديمقراطية. علاقة الديمقراطية بالامن السبيري وتاثيرها على الامن السبيري
Week 11	الاسلام والديمقراطية ومساوئ الحكم الاستبدادي .
Week 12	الانتقادات الموجهة للديمقراطية، ومحاسن النظام الديمقراطي.
Week 13	الأنظمة الديمقراطية في العالم/ الديمقراطية في العالم الثالث/ المشاكل التي تواجه البلدان العربية في التحول الديمقراطي
Week 14	مراجعة وعروض تقديمية
Week 15	الامتحان النهائي

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	حقوق الانسان والديمقراطية – المفاهيم والمرتكزات للدكتور سماح مهدي العلياوي والدكتور سلمان كاظم البهادلي	Yes
Recommended Texts	الديمقراطية وحقوق الانسان في الاسلام للدكتور راشد الغنوشي	No
Websites	https://www.neelwafurat.com https://studies.aljazeera.net	

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Digital Electronics		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE101-S2		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level		Semester of Delivery	2
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	Computer Electronics BCYSCE200-S1	Semester	
	Computer Organization and Architectures BCYSCE204-S2		

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

1. Understanding the principles of digital electronics: This includes understanding the properties of digital signals, logic gates, Boolean algebra, and other fundamental concepts.
2. Designing digital circuits: This involves designing and analyzing digital circuits using various tools and techniques such as truth tables, Karnaugh maps, and circuit simulation software.
3. Implementing digital circuits: This includes building digital circuits using electronic components such as logic gates, flip-flops, and counters.
4. Troubleshooting digital circuits: This involves identifying and diagnosing problems in digital circuits using various diagnostic tools and techniques.
5. Understanding digital systems: This includes understanding how digital circuits are combined to create digital systems such as computers, microcontrollers, and other digital devices.
6. Applying digital electronics to real-world problems: This involves using digital electronics to solve real-world problems such as designing control systems, communication systems, and data processing systems.

Module Learning Outcomes

مخرجات التعلم للمادة
الدراسية

1. Students should be able to describe the basics of digital electronics, including binary arithmetic, logic gates, Boolean algebra, and digital circuits.
2. Analyzing and designing digital circuits: Students should be able to analyze and design combinational and sequential digital circuits using various tools and techniques, including truth tables, Karnaugh maps, and state diagrams.
3. Understanding the operation of digital devices: Students should be able to explain the operation of digital devices such as flip-flops, counters, registers, and memory devices.
4. Applying digital electronics to real-world problems: Students should be able to apply their knowledge of digital electronics to solve real-world problems, such as designing a digital system to control a traffic light or implementing a digital filter for audio signal processing.
5. Understanding the limitations of digital electronics: Students should be able to identify the limitations of digital electronics, such as timing constraints, noise, and power consumption, and suggest appropriate solutions.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- 1-Boolean Algebra: This is a mathematical system that allows digital signals to be represented and manipulated using a set of logical operations such as AND, OR, and NOT. Boolean algebra can be used to simplify complex digital circuits and to derive expressions for the output of a circuit.
- 2-Karnaugh Maps: Karnaugh maps are graphical tools that can be used to simplify Boolean expressions and to derive the minimal sum of products (MSP) or product of sums (POS) expressions for a digital circuit.

3-Combinational Logic Design: Combinational logic circuits are digital circuits whose outputs depend only on the current input values. Strategies for designing combinational logic circuits include Boolean algebra, Karnaugh maps, and the use of standard logic gates.

4-Sequential Logic Design: Sequential logic circuits are digital circuits whose outputs depend on both the current input values and the previous state of the circuit. Strategies for

5-designing sequential logic circuits include state diagrams, state tables, and the use of flip-flops and registers.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	96	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due
Formative assessment	Quizzes	6	10% (10)	3,5,7,9,10,13
	Assignments	10	10% (5)	2 ,4,5,6,7,8,9,10,11,13
	Projects / Lab.	15	10% (5)	Continuous
	Report	15	10% (5)	Continuous

Summative assessment	Midterm Exam	2hr	10% (10)	7
	Final Exam	3hr	50% (50)	15
Total assessment			100% (100 Marks)	

Delivery Plan (Weekly Syllabus)	
المناهج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	● Introduction to system numbers and Logic Law ● Logic gates AND, OR, NOT, NAND ● Logic gates NOR, XOR, XNOR.
2	● logic simplification using Boolean functions ● logic simplification using DE Morgan's theorem
3	● Karnaugh maps definition: Karnaugh maps of 2-variables and 3-variables ● Karnaugh maps of 4-variables and 5-variables
4	● Sum of Product (SOP) definition: logic circuit design using SOP ● Product of Sum (POS) definition: logic circuit design using POS
5	● Adder digital circuit design and Application with examples, parallel binary adder and Application with examples ● Parallel binary adder circuit design and Application with examples ● Subtractor digital circuit design and Application with examples
6	● Multiplier digital circuit design and Application with examples ● Divider digital circuit design and Application with examples
7	● Decoder definition and Types: Decoder digital circuit design and Application with examples ● Encoder definition and Types: Encoder digital circuit design and Application with examples
8	● Multiplexer definition and Types, Multiplexer digital circuit design and Application with examples ● Demultiplexer definition and Types: Demultiplexer digital circuit design and Application with examples.
9	● Comparator definition and Types: Comparator digital circuit design and Application with examples ● Code conversion definition and Types: Code conversion digital circuit design and Application with examples
10	● Flip-flops definition and Types: Flip-flops digital circuit design and Application with examples. (SR latch, D latch)-Edge triggered and conversion from one type to another) ● Flip-flops definition and Types: Flip-flops digital circuit design and Application with examples. (T-latch, and J-K F.F)-Edge triggered and conversion from one type to another)
11	● Counters (asynchronous, synchronous, decade, up/down, cascade, counter decoding)
12	● Asynchronous Counters Design and Application ● Synchronous Counters Design and Application
13	● Shift-registers: serial in and serial out registers Design and Application ● Shift-registers: serial in and parallel out Design and Application.
14	● Timer: Definition, 555 Timer Design and Application

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week 1	Lab 1: Connect different logic gates AND, OR, NOT, NAND, NOR
Week 2	Lab 2: EX-OR gate and EX-NOR gates, Design AND & OR and NOT gates by using NAND and NOR gates.
Week 3	Lab3: De-Morgan's theorems.
Week 4	Lab 4: Designing a combinational logic circuit (SOP) and (POS), The realization of the Boolean equation.
Week 5	Lab 5: Half binary Adder.
Week 6	Lab 6: Full binary Adder.
Week 7	Lab 7: Half binary subtractor.
Week 8	Lab 8: Full binary subtractor ,2'S complement Adder-subtractor
Week 9	Lab 9: Design Binary comparator.
Week 10	Lab 10: Decoders digital circuit.
Week 11	Lab 11: Encoders digital circuit.
Week 12	Lab 12: Digital Multiplexer.
Week 13	Lab 13: Demultiplexer digital circuit.
Week 14	Lab 14: J-K flip flop.
Week 15	review
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Digital Fundamentals ELEVENTH EDITION Thomas L. Floyd	Yes
Recommended Texts	"Digital Design" by M. Morris Mano and Michael Ciletti Fundamentals of Digital Logic and Microcontrollers" by M. Rafiquzzaman	yes
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

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Object Oriented Programming		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE107-S2		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	2
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Fundamentals of Programming (BCYSCE102-S1)	Semester	1
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Introduction to OOP and its application. 2. OOP vs Procedure Oriented Programming. 3. Starts from building Classes and member function to advance implementation of OOP programing. 4. Improving the skills of the students through several OOP program implementation and code writing. 5. The students should be able to Identify the OOP uses and purpose of using classes and derived classes, inheritance and polymorphism & the required code lines to perform the needed works 6. as well as qualifying him to use the different kinds of programming style and program functions in building & executing the projects of cyber security engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the fundamentals of OOP programming. 2. Mastering OOP programming tools and techniques, including common class inheritance techniques such as multi-level inheritance. 3. Becoming familiar with the OOP concepts such as abstraction, constructor, destructor, <i>this</i> pointer and virtual function. 4. Being competent in common file Input/output with Streams techniques, such as File Stream Class Hierarchy, Opening and Closing files, Read/Write from File. 5. Being able to perform Templates: Function Template, Overloading Function Template, Overloading with Functions. 6. Being able to write Exception Handling: Error Handling, Exception Handling Constructs (try, catch, throw).

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	96	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	175		

Module Evaluation				
تقييم المادة الدراسية				
		Time/Number	Weight (Marks)	Week Due
Formative assessment	Quizzes	4	10% (10)	3,6,9,12
	Assignments	8	5% (5)	Every other week
	Projects / Lab.	14	10% (10)	Continuous
	Report	2	5% (5)	7, 14
	Seminar	1	10% (10)	15
Summative assessment	Midterm Exam	2hr	10% (10)	7
	Final Exam	3hr	50% (50)	15
Total assessment			100% (100 Marks)	

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Delivery Plan (Weekly Syllabus)	
المتاهج الاسبوعى النظرى	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Issues with Procedure Oriented Programming
2	Basic of Object-Oriented Programming (OOP)
3	Procedure Oriented versus Object Oriented Programming
4	Concept of Object-Oriented Programming: Object, Class, Abstraction, Encapsulation, Inheritance, Polymorphism
5	Objects and Classes: C++ Classes, Access Specifiers, Objects and the Member Access, Defining Member Function, Constructor: Default Constructor, Parameterized Constructor, Copy Constructor
6	Destructors, Object as Function Arguments and Return Type, Array of Objects, Pointer to Objects and Member Access, Dynamic Memory Allocation for Objects and Object Array.
7	this Pointer static Data Member and static Function, Constant Member Functions and Constant Objects, Friend Function and Friend Classes
8	Operator Overloading, Overloadable Operators, Syntax of Operator Overloading, Rules of Operator Overloading, Unary Operator Overloading, Binary Operator Overloading, Operator Overloading with Member and Non-Member Functions, Data Conversion: Basic – User Defined and User Defined – User Defined, Explicit Constructors
9	Inheritance: Base and Derived Class, protected Access Specifier, Derived Class Declaration, Member Function Overriding, Forms of Inheritance: single, multiple, multilevel, hierarchical, hybrid, multipath, Multipath Inheritance and Virtual Base Class, Constructor Invocation in Single and Multiple Inheritances, Destructor in Single and Multiple Inheritances
10	Polymorphism and Dynamic Binding: Need of Virtual Function, Pointer to Derived Class, Definition of Virtual Functions, Array of Pointers to Base Class, Pure Virtual functions and Abstract Class, Virtual Destructor, reinterpret cast Operator, Run-Time Type Information, dynamic cast Operator, typed Operator
11	Stream Computation for Console and File Input /Output : Stream Class Hierarchy for Console Input /Output, Testing Stream Errors, Unformatted Input /Output, Formatted Input /Output with iOS Member functions and Flags, Formatting with Manipulators, Stream Operator Overloading
12	File Input/output with Streams, File Stream Class Hierarchy, Opening and Closing files, Read/Write from File, File Access Pointers and their Manipulators, Sequential and Random Access to File, Testing Errors during File Operations
13	Templates: Function Template, Overloading Function Template, Overloading with Functions, Overloading with other Template, Class Template, Function Definition of Class Template, On-Template Type, Arguments, Default Arguments with Class Template, Derived Class Template, Introduction to Standard Template Library, Containers, Algorithms, Iterators
14	Exception Handling: Error Handling, Exception Handling Constructs (try, catch, throw), Advantage over Conventional Error Handling, Multiple Exception Handling, Rethrowing Exception, Catching All Exceptions, Exception with Arguments, Exceptions Specification for Function, Handling Uncaught and Unexpected Exceptions.
15	Review/ preparation for final exam
16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Getting started - Object-Oriented Programming.
Week 2	Lab 2: Object, Class, Abstraction, Encapsulation, Inheritance, Polymorphism - Examples and Problems
Week 3	Lab 3: Destructors - Examples and Problems.
Week 4	Lab 4: Virtual Destructor
Week 5	Lab 5 : Operator Overloading - Examples and Problems.
Week 6	Lab 6: Inheritance - Examples and Problems.
Week 7	Lab 7: Polymorphism and Dynamic Binding - Examples and Problems.
Week 8	Lab 8: Stream Computation for Console and File Input /Output - Examples and Problems.
Week 9	Lab 9: Templates - Examples and Problems.
Week 10	Lab 10: Exception Handling - Examples and Problems.
Week 11	Lab 11: Debugging - Examples and Problems.
Week 12	Lab 12: Containers, Algorithms, Iterators - Examples and Problems.
Week 13	Lab 13. Conventional Error Handling - Examples and Problems
Week 14	Lab 14: Dynamic Memory - Examples and Problems.
Week 15	Lab 15: review/preparation for final exam
Week 16	Final Exam

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	ADVANCED ENGLISH SKILLS-I			Module Delivery
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE301-S1			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	3	Semester of Delivery		1
Administering Department	CYSCE	College	TEC	
Module Leader		e-mail	E-mail	
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0	

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

	Text	Available in the Library?
Required Texts	1. Choudhary, H. (2013). C++ Programming-Final Golden Edition. Beginners To Experts Approach Guide-With Easy Learning & Problem Analysis to Program Design & Development.	no
Recommended Texts	2. Farrell, J. (2008). Object-oriented programming using C++. Cengage Learning. 3. Object-Oriented Programming in C++, Fourth Edition.	no
Websites	4. https://www.geeksforgeeks.org/object-oriented-programming-in-cpp/ 5. https://www.w3schools.com/cpp	

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.

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	ADVANCED ENGLISH SKILLS-I		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE301-S1		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	3	Semester of Delivery	1
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	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 Objectives أهداف المادة الدراسية	1. Identify advanced level of grammar structure. 2. Criticize and interpret the advanced level of reading passages. 3. Develop listening skills. 4. Develop the ability to expand their vocabulary through multiple methods. 5. Compose an essay by developing content, using specific grammatical structures and giving thematically related examples about the given topic.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand and use common everyday expressions and simple sentences. 2. Advanced Proficiency: Understand and actively participate in complex discussions. 3. Demonstrate grammatical accuracy and fluency in both spoken and written English. 4. Develop specialized vocabulary, terminology, and communication strategies relevant to the chosen field. 5. Understand and produce professional documents, presentations, and reports in English. 6. Engage in effective communication within professional contexts.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	42	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the Course Goals, Assignments, Schedule, Criteria, Policies
Week 2	Unit 1: The Way We Are Talking about the dysfunctional families, telling and writing a story about an unusual person from the past with Narrative Tenses.
Week 3	Managing conversation: Agreeing, Disagreeing and Partially Agreeing
Week 4	Unit 2: Wild World Listening conversations and reading a text about animals and their characteristics and human's attitudes to animals.
Week 5	Managing conversations on similarities and differences between humans and chimpanzees with using a wide range of Verbs of Senses and Articles.
Week 6	Unit 3: On the Money Listening to people talking about how they spend money and writing a web article called 'How to be rich'
Week 7	Reading an article about money trends, giving and responding to opinions about money issues with the use of Future Forms.
Week 8	MID-TERM EXAM
Week 9	Reading and analyzing movie review; Hobbits and Other Creatures Studying on Adjective Clauses with Prepositions.
Week 10	Unit 4: Through The Ages Giving a talk about the uses of and history of plastic. The Passive Structure.

Week 11	Using Compound Nouns and Possessive's Writing a paragraph about advantages and disadvantages of internet.
Week 12	Unit 5: Island Hopping Managing conversations using Discourse Markers.
Week 13	Listening of an interview about a survival TV show Reading the text 'An Unexplained Mystery' Studying on Past Deduction and Speculation.
Week 14	Talking about utopian and dystopian stories, films and games. Listening a conversation about dystopian fiction as a study of Pronouns and Substitution and Writing a paragraph comparing science fiction and reality.
Week 15	Review
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	McCarthy, M., McCarten, J., & Sandiford, H. (2014). Touchstone series. Cambridge: Cambridge University Press.	Yes
Recommended Texts	Soars, L., & Soars, J. (2000). New Headway: Advanced. Student's Book/Liz and John Soars. Oxford University Press.	Yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Introduction to cryptography		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE300-S1		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	
Administering Department	CYSCE	College	TEC 1
Module Leader		e-mail	E-mail
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Understanding Cryptographic Concepts 2. Learning Cryptographic Algorithms 3. Exploring Cryptographic Protocols 4. Understanding Cryptanalysis Techniques 5. Knowledge of Cryptographic Applications 6. Familiarity with Key Management and Distribution 7. Awareness of Cryptographic Standards and Regulations 8. Practical Skills in Cryptographic Implementation
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students should acquire a fundamental understanding of what cryptography is and its role in securing information 2. Students should become familiar with various cryptographic algorithms used in practice, such as symmetric encryption (e.g., AES, DES) and asymmetric encryption. 3. Students should gain knowledge about cryptographic protocols used for secure communication 4. Students should learn about practical cryptographic tools and techniques used in real-world scenarios 5. Students should develop an understanding of basic cryptanalysis techniques 6. Students should explore various applications of cryptography beyond traditional encryption 7. Practical Skills: Depending on the nature of the course, students may also gain hands-on experience with implementing cryptographic algorithms, using cryptographic libraries or tools

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Lectures and Presentations: Lectures and presentations are often used to deliver theoretical concepts, principles, and foundational knowledge related to computer networking. 2. Hands-on Lab Sessions: Practical lab sessions are essential for allowing students to apply theoretical knowledge and gain hands-on experience in configuring, troubleshooting, and managing computer networks. 3. Group Projects and Collaborative Learning: Group projects and collaborative learning activities promote teamwork, communication, and the exchange of ideas among students.
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	4. Online Discussion Forums: Online discussion forums or platforms provide an opportunity for students to engage in asynchronous discussions, ask questions, and share knowledge and resources related to computer networking. 5. Simulations and Virtual Environments: Network simulation tools and virtual environments can be used to create simulated network scenarios, allowing students to experiment and practice without the need for physical equipment. 6. Continuous Learning Resources: Providing additional resources, such as textbooks, online tutorials, reference materials, and interactive learning modules, supports students' independent learning and exploration of advanced networking topics beyond the scope of the module.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعاً

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	3, 5, 10, 12	LO #2, #5 and #10, #11
	Assignments	4	10% (10)	2, 4, 8, 12	LO #3, #4 and #6, #7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #6
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

WEEK	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Overview of cryptography: • what is a cipher? Introduction • symmetric ciphers model: plaintext, encryption algorithm, secret key, cipher text, decryption algorithm, a model of conventional encryption. • cryptanalysis, security against chosen plaintext attacks (cpa).
2	Block ciphers: • how to use a block cipher: pseudo random permutations (PRP) • pseudo random functions (PRF) • basic modes of operation: counter mode and CBC. • Iterated even-MANSOUR ciphers and the AES block cipher, arithmetic modulo primes and finite cyclic groups.
3	Block ciphers: • mono alphabetic substitution • ciphers shift ciphers • Caesar cipher • the affine cipher • Playfair cipher • polyalphabetic ciphers Vigenère cipher • the transposition cipher, one time pad cipher.
4	El Gamal public key encryption semantically secure El Gamal encryption; CCA security
5	public key encryption using a trapdoor function
6	Message integrity: • definition and applications CBC-MAC and PMAC.
7	Digital signatures: • definitions and applications: how to sign using RSA. • hash-based signatures; • certificates, certificate transparency, certificate revocation.
8	Collision resistant hashing: • MERKLE-DAMGARD and DAVIES-MEYER; • macs from collision resistance; case studies: SHA and Hmac.
9	Symmetric-key algorithms • DES—the data encryption standard, hers -16 round FEISTEL system, cryptanalysis of a symmetric key algorithms

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
10	Public-key algorithms • -RSA • - other public-key algorithms
11	Identification protocols password protocols • salts; • one-time passwords (s/key and SECUR-ID); • challenge response authentication.
12	Authentication protocols • -authentication based on a shared secret key, • -establishing a shared key: the DIFFIE -HELLMAN key exchange, -authentication using a key distribution center, -authentication using KERBEROS, - authentication using public-key cryptography,
13	Authenticated key exchange and SSL/TLS session setup
14	Cryptography in the age of quantum computers; • GROVER'S algorithm and symmetric crypto; • SHOR'S algorithm and public key crypto; • post-quantum crypto: signatures and key exchange
15	Review
16	Final Exam
	Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر
	Material Covered
1	Lab 1: Shift ciphers - Caesar cipher- the affine cipher
2	Lab 2: - Playfair cipher- ciphers Vigenère cipher
3	Lab 3: CBC-MAC and PMAC.
4	Lab 4: El Gamal.
5	Lab 5: MERKLE-DAMGARD and DAVIES-MEYER
6	Lab 6: SHA and HMAC
7	Lab 7: DES.
8	Lab 8: RSA.
9	Lab 9: SSL/TLS session
10	Lab 10: DIFFIE -HELLMAN
11	Lab 11: one-time passwords (s/key and SECUR-ID).

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
12	Lab 12: KERBEROS.
13	Lab 13: GROVER'S and SHOR'S algorithms
14	Lab 14: Review 1
15	Lab 14: Review 2
16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Cryptography and Network Security: Principles and Practice, William Stallings , Jan 1, 1900 2. Cryptography and Network Security: Principles and Practice, Global Edition, Douglas R. Stinson , Nov 1, 2005 3. Workbook for ICD-10-CM/PCS Coding: Theory and Practice, 2018 Edition, Karla R. Lovaasen RHIA CCS CCS-P Aug 25, 2017	Yes
Recommended Texts	Cryptography & Network Security (McGraw-Hill Forouzan Networking) 1st Edition, Behrouz A. Forouzan	Yes
Websites		

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Digital Signal Processing		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	BCYSCE302-S1			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	3	Semester of Delivery		2
Administering Department	CYSCE	College	TEC	
Module Leader		e-mail	E-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	20/06/2023	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Digital electronics BCYSCE101-S2	Semester	
Co-requisites module	AI for cypersecurity engineering BCYSCE402-S1	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1-Understanding the basic principles of DSP: Students should be familiar with the fundamental concepts of DSP, including sampling, quantization, filtering, and .spectral analysis 2-Developing theoretical knowledge: Students should understand the . mathematical foundations of DSP, including the Fourier transform, z-transform, .and digital filter design 3-Applying DSP techniques: Students should be able to apply DSP techniques to . analyze and process digital signals for a range of applications, such as audio and .image processing, telecommunications, and control systems 4-Practical implementation: Students should be able to implement DSP . algorithms using software tools such as MATLAB, and be familiar with common DSP hardware platforms
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Understanding of DSP fundamentals: Students should be able to demonstrate an understanding of the fundamental concepts and principles of DSP, including sampling, quantization, filtering, and spectral analysis. 2- Students should be able to apply mathematical techniques such as the Fourier transform, z-transform, and digital filter design to analyze and solve problems related to DSP. 3- Students should be able to analyze and interpret the results of DSP algorithms and experiments, and apply critical thinking skills to evaluate the effectiveness and limitations of different techniques.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

1. Start with the basics: Before diving into DSP, it's important to have a strong foundation in mathematics, particularly in calculus, linear algebra, and Fourier analysis. These concepts form the building blocks of DSP and will help you understand the fundamental principles.
2. Learn the theory: DSP is based on mathematical principles and concepts. Therefore, it is important to have a clear understanding of the theory behind signal processing. You can start by studying books, online courses, or attending lectures on signal processing theory.
3. Practice with real-world examples: DSP is widely used in many applications, such as audio processing, image processing, and control systems. Practicing with real-world examples can help you understand how DSP is applied in different fields.
4. Use software tools: There are many software tools available for DSP, such as MATLAB, Octave, and Python. These tools can help you implement and test different signal processing algorithms.

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا (SWL) Student Workload

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	3
100			
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Introduction to Continuous-time and Discrete-time signals and systems.
2	Numerical Integral compared to Integral with limits in Continuous-Time Signals.
3	Converting Continuous-time signals to discrete- time signals – sampling calculation and finding the number of samples in discrete-time signals.
4	Unit-Step and Unit-Impulse Functions in Continuous and Discrete versions.
5	Discrete-Time Signal Transformations: Time –Reversal, Time – Scaling, Time –Shifting
6	Discrete-Time Signal Amplitude Transformation: Amplitude – Reversal, Amplitude – Scaling, Amplitude – Shifting.
7	Plotting Discrete –time signal with both Time and Amplitude Transformations, Signals Periodic in n Signals Periodic in Ω
8	Discrete –Time Systems Interconnected System: Definition, Types of Interconnected Systems and their mathematical Models
9	Properties of Discrete-Time Systems: System with Memory, Causality, Time –Invariant System, Inverse of Systems, Time Invariance, Stability, Linearity
10	Impulse Representation of Discrete-time Signals, Calculating the Total impulse response in interconnected systems, Convolution of Discrete-Time Systems with impulse response

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
11	Convolution of Discrete-Time Systems for definite discrete-time signals, Properties of Discrete-time systems with convolution
12	Discrete-Time Fourier Transform and Linear Time Invariant Systems, Discrete-Time Fourier Transform for periodic Functions
13	Decomposition in time Fast Fourier Transform Algorithm, Decomposition in Fequency Fast Fourier Transform
14	Digital Filters: Properties, Averaging filter. Recursive smoother
15	review
16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week 1	Lab 1: Getting started with MATLAB.
Week 2	Lab 2: Continuous-time and Discrete-time signals.
Week 3	Lab 3: Numerical Integral.
Week 4	Lab 4: Converting Signals.
Week 5	Lab 5: Signal Transformation and Plotting
Week 6	Lab 6: Impulse representation
Week 7	Lab 7: Convolution.
Week 8	Lab 8: Fourier Transform.
Week 9	Lab 9: Fast Fourier Transform part 1.
Week 10	Lab 10: Fast Fourier Transform part 2
Week 11	Lab 11: Recursive smoother.
Week 12	Lab 12: Averaging filter.
Week 13	Lab 13: Recursive smoother.
Week 14	Lab 14: Review
Week 15	presentation
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	BASIC digital signal processing (GB Lockhart & BMG Cheetham Digital signal processing (Alan V. Oppenheim)	Yes
Recommended Texts		
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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Fundamentals of Cloud Computing		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE303-S1		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	1
Administering Department	CYSCE	College	TEC
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Cloud computing security BCYSCCET301-S2e	Semester	
Co-requisites module	Cloud application BCYSCCET403-S1	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Understanding the basic concepts and components of cloud computing, such as virtualization, scalability, and on-demand self-service. 2. Familiarizing with various deployment models of cloud computing, such as public, private, and hybrid clouds, and their advantages and disadvantages. 3. Exploring the different service models of cloud computing, such as Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS), and when to use each of them. 4. Understanding the security, privacy, and compliance issues related to cloud computing and the measures taken to mitigate them. 5. Understanding the economic and business aspects of cloud computing, such as cost-benefit analysis, pricing models, and vendor lock-in. 6. Familiarizing with the different cloud providers and their specific features and services.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Explain the basic concepts and components of cloud computing, 2-Differentiate between various deployment models of cloud computing, such as public, private, and hybrid clouds, and identify their advantages and disadvantages. 3- Compare and contrast the features and services of different cloud providers and select the appropriate provider for a given scenario. 4- Evaluate the key trends and latest developments in cloud computing, such as serverless computing, edge computing, and multi-cloud strategies, and identify their potential applications in various industries.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1-Starting with the basics: Cloud computing can be a complex topic, so it's important to start with the basics. This includes understanding the key concepts and terminology, such as virtualization, scalability, elasticity, and service models. 2. Hands-on experience: One of the most effective ways to learn cloud computing is through hands-on experience. This can involve setting up and using cloud services, experimenting with different configurations, and troubleshooting issues. 3-Establishing cloud security and compliance: Cloud security and compliance are critical considerations when deploying cloud solutions. Establishing the appropriate security measures and compliance standards can help you protect your data and meet regulatory requirements.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	4	10% (10)	5 ,8,10,13	LO #1, #2 and #10, #11
	Assignments	7	10% (10)	2 ,4,5,8,9,11,12	LO #3, #4 and #6, #7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	14	10% (10)	Continuous	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Difference between Circuit Theory and Field Theory
Week 2	Basics of Network Elements
Week 3	Resistance and Resistivity, Ohm's Law and Inductance, Capacitance
Week 4	Review of Kirchhoff's Laws, Circuit Analysis - Nodal and Mesh
Week 5	Linearity and Superposition, Source Transformations, Thévenin and Norton Equivalents
Week 6	Review of Inductor and Capacitor as Circuit Elements, Source-free RL and RC Circuits, Transient Response
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Sinusoidal Forcing, Complex Forcing, Phasors, and Complex Impedance, Sinusoidal Steady State

	Response
Week 9	Nodal and Mesh Revisited, Average Power, RMS, Introduction to Polyphase Circuits
Week 10	Mutual Inductance, Linear and Ideal Transformers, Circuits with Mutual Inductance
Week 11	Frequency Response of Series/Parallel Resonances, High-Q Circuits
Week 12	Complex Frequency, s-Plane, Poles and Zeros, Response Function, Bode Plots
Week 13	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 14	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 15	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week 1	Lab 1: Getting Started
Week 2	Lab 2: Virtual Machine concept
Week 3	Lab 3: Cloud Computing Framework
Week 4	Lab 4: Configuration of Virtual Machine.
Week 5	Lab 5: virtual block to virtual machines
Week 6	Lab 6: Hadoop Concept
Week 7	Lab 7: Installation and configuration with Hadoop
Week 8	Lab 8: Cloud Computing Services - Software as a Service (SaaS) - Case study.
Week 9	Lab 9: Cloud Computing Services - Infrastructure as a Service (IaaS) - Case study.
Week 10	Lab 10: Cloud Computing Services - Platform as a Service (PaaS) Case study.
Week 11	Lab 11: Virtualization
Week 12	Lab 12: Case Study: Software Defined Networks (SDN) Software Defined Storage (SDS)
Week 13	Lab 13: Case Study: Software Defined Storage (SDS)
Week 14	Lab 14: Project and Presentation
Week15	review
Week16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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	Mobile and Wireless Networks		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE304-S1		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	2
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Understanding Mobile and Wireless Network Architectures 2. Learning Wireless Communication Technologies 3. Exploring Mobile Network Protocols 4. Understanding Mobile IP and Mobile Routing 5. Learning Mobile Application Development 6. Practical skills are essential in understanding mobile and wireless networks.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding of Wireless Communication Technologies 2. Knowledge of Mobile Network Architectures 3. Proficiency in Mobile IP and Mobile Routing 4. Familiarity with Network Protocols and Standards 5. Proficiency in Mobile Application Development 6. Practical Skills in Configuring and Managing Mobile and Wireless Networks 7. Effective Communication and Collaboration

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

1. Lectures and Presentations: Lectures and presentations are often used to deliver theoretical concepts, principles, and foundational knowledge related to computer networking.
2. Hands-on Lab Sessions: Practical lab sessions are essential for allowing students to apply theoretical knowledge and gain hands-on experience in configuring, troubleshooting, and managing computer networks.
3. Group Projects and Collaborative Learning: Group projects and collaborative learning activities promote teamwork, communication, and the exchange of ideas among students.
4. Online Discussion Forums: Online discussion forums or platforms provide an opportunity for students to engage in asynchronous discussions, ask

questions, and share knowledge and resources related to computer networking.

5. Simulations and Virtual Environments: Network simulation tools and virtual environments can be used to create simulated network scenarios, allowing students to experiment and practice without the need for physical equipment.
6. Continuous Learning Resources: Providing additional resources, such as textbooks, online tutorials, reference materials, and interactive learning modules, supports students' independent learning and exploration of advanced networking topics beyond the scope of the module.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	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	6	10% (10)	3, 5, 10, 12	LO #2, #5 and #10, #11
	Assignments	2	10% (10)	2, 4, 8, 12	LO #3, #4 and #6, #7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #6

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Wireless local area networks
2	Fundamental concepts of wireless networks
3	Wireless LANs The 802.11 Architecture, The 802.11 MAC Protocol, The IEEE 802.11 Frame, Mobility in the Same IP Subnet, Advanced Features in 802.11
4	Wireless and Mobile Networks Introduction, Wireless Links and Network Characteristics, CDMA
5	Mobile device communications and characteristics - Components of a digital communications system - Digital Signaling - Spread Spectrum Signals - Multi-User Communication Access Techniques - CDMA, TDMA, FDMA, SDMA, PDMA
6	Bluetooth
7	RFIDs
8	Cellular Networks: 4G and 5G, An Overview of Cellular Network Architecture, 4G: LTE, 5G
9	Mobility Management: Principles, Device mobility: a network-layer perspective, Home Networks and Roaming on Visited Networks, Direct and Indirect Routing to/from a Mobile Device
10	Mobility Management Mobility Management in Practice, Mobility Management in 4G/5G Networks, Mobile IP
11	Wireless and Mobility: Impact on Higher-Layer Protocols
12	Wireless sensor networks

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
13	Telecommunication architectures and protocols for wireless sensor network
14	Issues in ad-hoc and sensor networks including power management, coverage, topology, and location discovery
15	Review
16	Final Exam
	Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر
	Material Covered
1	Lab 1: Getting Started
2	Lab2: Introduction to packet tracer
3	Lab 3: Setting up Wireless Network
4	Lab 4: Wireless networks Example 1
5	Lab 5: Wireless networks Example 2
6	Lab 6: Establishing a 4G & 5G mobile network
7	Lab 7: Wireless and Mobile Networks
8	Lab 8: Bluetooth
9	Lab 9: RFIDs
10	Lab 10: Wireless sensor networks
11	Lab 11: Creating Ad-Hok Network
12	Lab 12: Home Networks and Roaming
13	Lab 13: Communication Access Techniques
14	Lab 14: location discovery
15	Lab 15: Review
16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Computer Networking: A Top-Down Approach, 8th edition" by James Krose and Keith Ross. 2. Wireless and Mobile Network Architectures by Yi-Bing Lin and Imrich Chlamtac 3. Wireless Networks and Mobile Computing by Asoke K. Talukder and Roopa R. Yavagal 4. Wireless and Mobile Network Security by Hakima Chaouchi	Yes
Websites	https://www.youtube.com/playlist?list=PL8z1B2A0yYsEOSDpZ1cVg3TpwJxxUxtGE	

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.

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Introduction to Hardware security		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	BCYSCE305-S1		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	
Administering Department	CYSCE	College	TEC
Module Leader	Name	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	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 Objectives أهداف المادة الدراسية	To learn Fundamentals of hardware security and trust for integrated circuits and systems, cryptographic hardware, invasive and non-invasive attacks, side-channel attacks, physically unclonable functions (PUFs), true random number generation (TRNG), watermarking of Intellectual Property (IP) blocks, counterfeit ICs, hardware Trojans in electronic circuits (IP cores and ICs).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Describe in-depth a trustworthy security system for hardware and its constituent components. 2. Develop a security system for hardware. 3. Understand the topics of digital and analog hardware. 4. Understand physical attacks and tamper resistance. 5. Gain knowledge of the reverse engineering of embedded microcontroller devices. 6. Understand how to teach FPGA security to electrical engineering students. 7. Understand the foundational course for Information Technology, including hardware technology
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to hardware security Users & Permissions Security Based on PUFs and TRNGs Linux Services Physical Attacks and Fault Injection Attacks PCB Security Hardware Trojans Physical unclonable functions VLSI Testing

Delivery Plan (Weekly Syllabus)

KEY LEARNING OUTCOMES

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to hardware security, Emerging applications and the new threats, Basics of VLSI Design
Week 2	Security Based on PUFs and TRNGs, Hardware Metering, Watermarking of HW Ips
Week 3	Physical Attacks and Fault Injection Attacks
Week 4	PCB Security, Basics of PCB Security
Week 5	Side Channel Attacks and Countermeasures
Week 6	Hardware Trojans: IC Trust (Taxonomy and Detection
Week 7	Hardware Trojans: IP Trust (Detection) + Design for Hardware Trust
Week 8	Counterfeit Detection and Avoidance
Week 9	Protecting against Scan-based Side Channel Attacks
Week 10	Physical unclonable functions: design principles and applications;
Week 11	Physical unclonable functions: Random Number Generators: design principles and applications Design and Evaluate PUFs and Random Number Generators
Week 12	Side Channel Attacks and Countermeasures: Overview; Fault attacks and countermeasures; Power attacks and countermeasures, Design a fault attack and evaluate a countermeasure, Countermeasures for Embedded Microcontrollers
Week 13	VLSI Testing is a portal for hackers: attacks
Week 14	VLSI Testing is a portal for hackers: countermeasures
Week 15	Review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Agilent VEE and PSPICE
Week 2	Lab 2: Thévenin's / Norton's Theorem and Kirchhoff's Laws
Week 3	Lab 3: First-Order Transient Responses
Week 4	Lab 4: Second-Order Transient Responses
Week 5	Lab 5: Frequency Response of RC Circuits
Week 6	Lab 6: Frequency Response of RLC Circuits
Week 7	Lab 7: Filters

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to Hardware Security and Trust by Mohammad Tehranipoor and Cliff Wan.	Yes
Recommended Texts		No
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Analysis		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	BCYSCE303-S2		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	3	Semester of Delivery	2
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	E-mail
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Math (BCYSCE100-S1) Discrete Math (BCYSCE205-S1)	Semester	1
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Understanding of mathematical and statistical concepts relevant to engineering analysis. 2. Learning Analytical Techniques: Students should learn various analytical techniques used in engineering analysis. 3. Familiarity with Simulation and Modeling: Students should gain knowledge and skills in developing engineering models and simulations. 4. Proficiency in Data Analysis: Students should learn how to collect, organize, and analyze data relevant to engineering problems. 5. Application of Engineering Principles: Students should be able to apply engineering principles. 6. Awareness of Error and Uncertainty: Students should develop an understanding of the sources of error and uncertainty in engineering analysis. 7. Effective Communication of Analysis Results: Students should be able to effectively communicate their analysis results to technical and non-technical audiences. 8. Ethical Considerations: Students should be aware of the ethical considerations in engineering analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the fundamentals of Engineering Analysis including terminology and processes. 2. Proficiency in Numerical Methods and Computational Techniques. 3. Understanding of Uncertainty and Error Analysis in engineering. 4. Ability to Interpret and Communicate Analysis Results in the context of engineering problems. 5. Critical Thinking and Problem-Solving Skills and the ability to approach engineering problems analytically.

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Fourier transform • Introduction to Fourier transform • Definition and properties
Week 2	Fourier transform • theorems

Week 3	Z-transform • Introduction to Z-transform • Definition and properties
Week 4	Z-transform • Theorems • applications
Week 5	Numerical computations • Introduction to numerical computations. • bisection method.
Week 6	Numerical computations • false position method • Newton-Raphson method
Week 7	solution of algebraic and transcendental equations
Week 8	solution of linear simultaneous equations • Introduction to the solution of linear simultaneous equations • Direct methods
Week 9	Direct methods • Gauss elimination • Gauss Jordan
Week 10	Iterative method • Introduction to Iterative method • Jacobi's • Gauss-seidel iteration
Week 11	Solution of nonlinear equation • Introduction to the solution of nonlinear equation. • Newton-Raphson method.
Week 12	Numerical solution of ordinary differential equation • Introduction to Numerical solution of ordinary differential equation. • Picard's method. • Euler's method.

	• Introduction to Matrices • Matrix operations • related matrices
Week 14	solution of a linear system of equations • Introduction to solution of a linear system of equations. • linear transformations • Cayley-Hamilton theorem
Week 15	Review
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Getting Started
Week 2	Lab 2: Exploring MATLAB environment
Week 3	Lab 3: Introduction to MATLAB
Week 4	Lab 4: Exploring Fourier transform in MATLAB
Week 5	Lab 5: Fourier transform Applications in solving Engineering problem
Week 6	Lab 6: Exploring Z-transform
Week 7	Lab 7: Z-transform Application in solving Engineering problem
Week 8	Lab 8: solving Engineering problem using Gauss elimination
Week 9	Lab 9: solving Engineering problem using Gauss Jordan.
Week 10	Lab 10: solving Engineering problem using Jacobi's
Week 11	Lab 11: Solving equation using Gauss-seidel iteration
Week 12	Lab 12: Matrixes in MATLAB
Week 13	Lab 13: Matrixes operation in MATLAB
Week 14	Lab 14: Cayley-Hamilton theorem
Week 15	Lab 15: Review and presentation
Week 16	Final Exam

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Wireless and Mobile Network security			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	BCYSCE300-S2				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		3	Semester of Delivery		2
Administering Department		CYSCE	College	TEC	
Module Leader			e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor	None		e-mail	None	
Peer Reviewer Name		Name	e-mail	None	
Scientific Committee Approval Date		20/06/2023	Version Number		1.0

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Understanding the concepts of mobile and wireless networks. 2. Understanding the security threats and attacks in mobile and wireless networks. 3. Understanding the security mechanisms and protocols in mobile and wireless networks. 4. Developing skills in mobile and wireless network security. 5. Understanding the legal and ethical issues in mobile and wireless network security.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Communicating mobile and wireless network security concepts: Students should be able to communicate mobile and wireless network security concepts effectively through written reports, presentations, and other forms of communication. 2. Identifying security threats and attacks in mobile and wireless networks: Students should be able to identify and describe the various types of security threats and attacks that can occur in mobile and wireless networks, such as eavesdropping, man-in-the-middle attacks, denial-of-service attacks, and malware attacks. 3. Understanding security mechanisms and protocols in mobile and wireless networks: Students should be able to describe the security mechanisms and protocols used to protect mobile and wireless networks, such as encryption, authentication, access control, and firewalls. 4. Applying security principles to mobile and wireless network design: Students should be able to design and implement secure mobile and wireless networks, and understand how to identify and mitigate security threats and attacks. 5. Understanding legal and ethical issues in mobile and wireless network security: Students should be able to demonstrate an understanding of the legal and ethical issues related to mobile and wireless network security, such as privacy, data protection, and intellectual property rights.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	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 #6
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

	Delivery Plan (Weekly Syllabus)
	المناهج الأسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Introduction to Wireless Networks • Overview of wireless networks • Wireless network architecture • Wireless network protocols • Wireless network security threats
2	Introduction to Wireless and Mobile Networks • Overview of wireless and mobile networks • Security challenges in wireless and mobile networks • Security goals and requirements for wireless and mobile networks
3	Wireless Network Security Mechanisms • Security mechanisms in wireless networks • Cryptography in wireless networks • Authentication and access control in wireless networks • Security protocols in wireless networks
4	Wireless Network Security Protocols • Wi-Fi security protocols (WEP, WPA, WPA2) • Security mechanisms for wireless ad hoc networks
5	Mobile Network Security • Mobile network architecture • Mobile network protocols • Mobile network security threats • Mobile network security mechanisms
6	Mobile Network Security Protocols • GSM security protocols. • GSM security threats
7	Mobile Network Security Protocols • 3G and 4G security protocols • 3G and 4G security threats
8	Midterm Exam
9	Mobile Network Security Protocols • LTE security protocols. • LTE security threats. • LTE Security tools.
10	Mobile Device Security • Mobile device security threats

	Delivery Plan (Weekly Syllabus)
	المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
	• Mobile device management (MDM) • Mobile application security
11	Bluetooth Security • Bluetooth security protocols • Bluetooth security threats.
12	Bluetooth Security • Bluetooth security mechanisms • Bluetooth security tools
13	WiMAX Security • WiMAX security mechanisms • WiMAX security tools
14	RFID Security • RFID security protocols. • RFID security threats. • RFID security mechanisms. • RFID security tools
15	Review and Student presentation
16	Final Exam

	Delivery Plan (Weekly Lab. Syllabus)
	المنهاج الاسبوعي للمختبر
	Material Covered
1	Lab 1: Getting started
2	Lab 2: Wi-Fi security protocols (WEP)
3	Lab 3: Wi-Fi security protocols (WPA).
4	Lab 4: Wi-Fi security protocols (WPA2) - Case 1
5	Lab 5: Wi-Fi security protocols (WPA2) - Case 2
6	Lab 6: GSM.
7	Lab 7: 3G
8	Lab 8: 4G
9	Lab 9 : 5 G
10	Lab 10: WiMAX.
11	Lab 11: Bluetooth
12	Lab 12: RFID.
13	Lab 13: LTE.
14	Lab 14: Review and Student presentation1.
15	Lab 14: Review and Student presentation2.
16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Wireless Network Security: A Beginner's Guide" by Tyler Wrightson.	Yes
Recommended Texts	"Computer Networking: A Top-Down Approach" by James F. Kurose and Keith W. Ross.	Yes
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.

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Electrical Circuits		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE301-S2		
ECTS Credits	8		
SWL (hr/sem)	175		
Module Level	3	Semester of Delivery	6
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	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 Objectives أهداف المادة الدراسية	1. Cloud Security: Understand the importance of security in cloud computing and learn about various security measures and best practices for protecting cloud-based systems and data. 2. Cloud Storage and Networking: Explore cloud storage solutions and networking concepts relevant to cloud computing. Learn about data management, data backup, and network connectivity in the cloud. 3. Cloud Migration and Integration: Gain knowledge of strategies and techniques for migrating existing systems and applications to the cloud. Understand how to integrate cloud-based services with on-premises infrastructure. 4. Cloud Management and Monitoring: Learn about cloud management tools and techniques for provisioning, monitoring, and optimizing cloud resources. Understand how to manage performance, scalability, and cost in the cloud. 5. Cloud Service Providers: Familiarize yourself with major cloud service providers like Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP). Understand their offerings, features, and pricing models. 6. Emerging Trends and Future Directions: Stay up to date with the latest trends and advancements in cloud computing. Explore emerging technologies and concepts shaping the future of cloud computing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the identity and access management practices of both cloud providers and consumers. 2. Understand how to protect data-at-rest, data-in-transit, and data-in-use within a cloud environment. 3. Understand standard cloud security network designs and architecture models. 4. Identify different cloud delivery models. 5. Evaluate security features offered by public cloud providers. 6. Build cloud infrastructure with security in mind. 7. Understand cloud computing models, security, and privacy. 8. Make sense of different cloud-based services 9. Understand and analyze risk in the cloud. 10. Interact with Azure and AWS environments using a secure approach
Indicative Contents المحتويات الإرشادية	Introduction to Cloud Computing Foundations of Cloud Security Cloud Computing Security Fundamentals Cloud Infrastructure Security Cloud Data Security

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Lectures: In-depth presentations by instructors covering theoretical concepts and practical examples.
	2. Tutorials: Interactive sessions to reinforce understanding through problem-solving and discussions.
	3. Practical Exercises: Hands-on activities and lab sessions to gain practical experience in using cloud computing technologies.
	4. Case Studies: Analysis of real-world cloud computing implementations and scenarios.
	5. Group Projects: Collaborative projects to design and develop cloud-based solutions.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	109	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	91	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	200		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Cloud Computing Overview of Cloud Computing Cloud Computing Architecture Cloud Service Models.
Week 2	Foundations of Cloud Security Introduction to Cloud Security Cloud Security Architecture Cloud Security Controls Cloud Security Compliance and Regulations Cloud Security Risk Management
Week 3	Cloud Computing Security Fundamentals Cloud Computing Security Threats and Attacks Cloud Computing Security Controls
Week 4	Cloud Computing Security Fundamentals Cloud Computing Security Standards and Regulations Cloud Computing Security Best Practices
Week 5	Cloud Infrastructure Security Cloud Infrastructure Security Architecture Cloud Infrastructure Security Controls
Week 6	Cloud Infrastructure Security Cloud Infrastructure Security Best Practices Cloud Infrastructure Security Management
Week 7	Cloud Data Security

	Cloud Data Security Architecture Cloud Data Security Controls
Week 8	Cloud Data Security Cloud Data Security Best Practices Cloud Data Security Management
Week 9	Cloud Application Security Cloud Application Security Best Practices Cloud Application Security Management
Week 10	Cloud Application Security Cloud Application Security Best Practices Cloud Application Security Management
Week 11	Cloud Security Operations and Management Cloud Security Operations Cloud Security Management
Week 12	Cloud Security Operations and Management Cloud Security Incident Response Cloud Security Auditing and Compliance
Week 13	Cloud Secure server configuration and integrated access management
Week 14	Cloud Security Operations Cloud Security Incident Response Cloud Security Monitoring and Logging Cloud Security Automation Cloud Security Assessment and Auditing Cloud Security Governance
Week 15	Advanced Cloud Security Cloud Security Threats and Vulnerabilities Cloud Security Best Practices Cloud Security Strategy and Planning Cloud Security Tools and Technologies Cloud Security Case Studies
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
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Week 1	Lab 1: Introduction to Cloud Platforms - Setting up accounts on major cloud platforms (e.g., AWS, Azure, GCP) - Navigating the cloud platform interfaces Deploying a basic virtual machine instance
Week 2	Lab 2: Virtualization and Containerization - Creating and managing virtual machines using hypervisors (e.g., VirtualBox) - Exploring containerization with Docker Building and running containers locally
Week 3	Lab 3: Cloud Storage - Setting up and configuring cloud storage services (e.g., Amazon S3, Azure Blob Storage) - Uploading and downloading files from cloud storage Implementing data replication and backup strategies
Week 4	Lab 4: Networking in the Cloud - Configuring virtual networks and subnets - Creating security groups and access control rules Establishing VPN connections between on-premises and cloud environments
Week 5	Lab 5: Serverless Computing - Deploying serverless functions using AWS Lambda or Azure Functions - Integrating serverless functions with other cloud services (e.g., S3, API Gateway) Monitoring and troubleshooting serverless applications.
Week 6	Lab 6: Cloud Database Management - Creating and managing relational databases (e.g., Amazon RDS, Azure SQL Database) - Exploring NoSQL databases (e.g., DynamoDB, Cosmos DB) Performing data backups and restores
Week 7	Lab 7: Infrastructure as Code Introduction to Infrastructure as Code (IaC) tools like Terraform or AWS CloudFormation Writing IaC templates to provision cloud resources.
Week 8	Lab 8: Infrastructure as Code Automating resource deployment and updates
Week 9	Lab 9: Cloud Security and Identity Management - Configuring identity and access management (IAM) policies - Implementing multi-factor authentication (MFA) for cloud accounts Enforcing security best practices and monitoring for security breaches
Week 10	Lab 10: Load Balancing and Auto Scaling - Configuring load balancers for distributing traffic (e.g., AWS ELB, Azure Load Balancer) - Setting up auto scaling to dynamically adjust resources based on demand Testing load balancing and auto scaling scenarios
Week 11	Lab 11: Continuous Integration and Deployment (CI/CD) Implementing a CI/CD pipeline using tools like Jenkins or AWS CodePipeline Automating the build, test, and deployment of cloud-based applications Integrating version control systems (e.g., Git) with CI/CD processes

Week 11	Lab 11: Continuous Integration and Deployment (CI/CD) Implementing a CI/CD pipeline using tools like Jenkins or AWS CodePipeline Automating the build, test, and deployment of cloud-based applications Integrating version control systems (e.g., Git) with CI/CD processes
Week 12	Lab 12: Cloud Monitoring and Logging - Implementing monitoring and logging services (e.g., AWS CloudWatch, Azure Monitor) - Configuring alerts and notifications for resource monitoring Analyzing logs and performance metrics for troubleshooting
Week 13	Lab 13: Cloud Cost Optimization

	- Monitoring and analyzing cloud costs using cost management tools (e.g., AWS Cost Explorer, Azure Cost Management) - Implementing cost optimization techniques (e.g., rightsizing, scheduling) Estimating and optimizing cloud resource usage for cost-efficiency
Week 14	Cloud Cost Optimization Estimating and optimizing cloud resource usage for cost-efficiency
Week 15	Review and Student presentation
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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 Information					
معلومات المادة الدراسية					
Module Title	Operating Systems Security		Module Delivery		
Module Type	Core		Theory ☑ Lecture ☑ Lab Tutorial Practical ☑ Seminar		
Module Code	BCYSCE302-S2				
ECTS Credits	5				
SWL (hr/sem)	150				
Module Level		3	Semester of Delivery		6
Administering Department		CYSCE	College	TEC	
Module Leader		-	e-mail	-	
Module Leader's Acad. Title		Lecture	Module Leader's Qualification		
Module Tutor			e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2023	Version Number		1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To introduce students to a broad range of operating system security topics including system security plans, security design, security threats and risks, system and application security tools, implementation of security plan, system monitoring and audit logs and resolution of any security breach.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the main concepts of advanced operating systems, including parallel processing systems. 2. Acquire a basic understanding of operating systems, including their role, types, and batch systems. 3. Describe the services an operating system provides to users, processes, and other systems, and discuss the various ways of structuring an operating system. 4. Acquire the basic operating system concepts such as processes and threads. 5. Understand the fundamental concepts of operating systems, including OS structures, processes/threads, memory management, and file systems. 6. Gain a general understanding of the structure of modern computers, the purpose, structure, and functions of operating systems, and illustrate key OS concepts.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Protection system. (15hrs) system security principles. (10hrs) Classical and Modern approaches to system security. (10hrs) Access control. (6hrs) System vulnerabilities. (15hrs) System Memory protection. (6hrs) System Auditing. (10hrs) system security plans. (8hrs)

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Assignments	4	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Seminar	3	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	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Protection systems
Week 2	Foundational system security principles
Week 3	Classic approaches to system security
Week 4	System vulnerabilities, Real-world vulnerabilities (buffer overflow), Threats and exploits (gaining remote shell)
Week 5	Access control overview, Mandatory access control in common OS , in research and commercial operating systems
Week 6	Address space randomization
Week 7	Memory protection and Virtual machine introspection (VMI)
Week 8	system security plans, Backup and restore

Week 9	Auditing and Protection systems
Week 10	Malware overview, detection and analysis, and malware immunization
Week 11	File system management and utilities
Week 12	Mail facility, Pipes, redirection, and filters
Week 13	Hardware and software constructs that protect modern operating systems
Week 14	Personal and public privacy and security, Technologies for privacy and security in operating systems
Week 15	Review and Student presentation
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Getting Started.
Week 2	Lab2: secure Process Scheduling
Week 3	Lab 3: secure Building of a Simple Operating System - bootstrapping
Week 4	Lab 4: secure Building of a Simple Operating System - memory management
Week 5	Lab5: Building a Simple Operating System - process management
Week 6	Lab 6: Virtualization (run an operating system as a guest on another operating system).
Week 7	Lab 7: Resource exhaustion (How an operating system behaves under resource exhaustion).
Week 8	Lab 8: System vulnerabilities-buffer overflow
Week 9	Lab 9: System vulnerabilities- Threats and exploits (gaining remote shell)
Week 10	Lab 10: system security plans, Backup and restore
Week 11	Lab 11: Auditing and Protection systems, and Log files
Week 12	Lab 12: Rootkit Detection - detecting and removing a rootkit from a system
Week 13	Lab 13: Exploring Firewall Configuration.
Week 14	Lab 14: configuring a firewall to block unauthorized access to a system
Week 15	Review and Student presentation
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Operating System Concepts by Abraham Silber Schatz, Greg Gagne, and Peter B. Galvin 2. Guide to Operating Systems by Greg Tomsho.	No

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Secure Software development		Module Delivery	
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	BCYSCE305-S2			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	4	Semester of Delivery		8
Administering Department	CYSCE	College	TEC	
Module Leader	Name	e-mail		
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023	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 Objectives أهداف المادة الدراسية	1. To teach students how to develop software that is secure and resistant to cyber-attacks. 2. To provide students with an understanding of the legal and regulatory requirements for secure software development
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identifying security risks: Students will learn how to identify, categorize, and prioritize the information and other resources used by software systems and to develop security requirements for the processes that access the data 2. Performing software security evaluations: Students will learn to perform software security evaluations, establish security requirements, and develop guidelines for security that are applied during the software design, operations, and maintenance processes. 3. Creating secure software: Students will learn design and development techniques used to avoid the most common software errors by using defensive coding techniques, managing resources securely, and creating secure interaction between components. 4. Preventing vulnerabilities: The emphasis in the course is the design and development of software that prevents many vulnerabilities from occurring in the first place. 5. Understanding security principles: Students will learn the principles of secure software development, including specifying program behavior, the classes of well-known defects, how they manifest themselves, and how to avoid them. 6. Applying security early in the software lifecycle: Students will recognize the benefits of designing security early in software and learn how to create security early in the software's lifecycle. 7. Writing secure code: Students will apply what they learn in the course by writing secure code. 8. Fluency in programming languages: Students should have fluency, not just familiarity, in at least one high-level programming language C++ or Java
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Secure coding principles 2. Software vulnerabilities 3. Software security requirements 4. secure coding standards security testing of software

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	1	10% (10)	10	LO #5, #7
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #11
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction, Software assurance definition, Properties of secure software, Abstraction: comparison of languages and approaches (object oriented, dynamic, functional, logical)

Week 2	Issues and challenges in the Software Development Life Cycle (SDLC); Secure languages & design; Modern development models
Week 3	Secure coding principles & practices and the API generation, Code reviews , Static analysis , Defensive coding , Secure coding standards
Week 4	Static & dynamic code checking
Week 5	properties of secure software
Week 6	Causes of vulnerabilities, Root causes of software vulnerabilities, Software vulnerabilities: Zero days, Design, Implementation, and Environment vulnerabilities, CVE, CVSS, NVD
Week 7	Seven pernicious kingdoms, compare severity of software vulnerabilities based on CVSS score,
Week 8	software vulnerability as design, implementation, or environmental
Week 9	Software security requirements, SQUARE model, prioritize software security requirements.
Week 10	Security in the software lifecycle, SDLC models, Maturity models, BSIMM , OpenSAMM , NIST SSDF different phases of security enhanced software lifecycle models
Week 11	gap analysis using BSIMM and OpenSAMM models
Week 12	relevant secure coding standards
Week 13	static analysis tools for application security testing
Week 14	Software security testing, different types of fuzzing techniques for black box security testing of software
Week 15	Review and Student presentation.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Getting Started
Week 2	Lab 2: Introduction to SeCodEd .
Week 3	Lab 3: Configuration and setting up of SeCodED framework.
Week 4	Lab 4: platform exploration
Week 5	Lab 5: Vulnerabilities Database
Week 6	Lab 6: Concept of Static Analysis
Week 7	Lab 7: Concept of Dynamic Analysis
Week 8	Lab 8: static analysis tools
Week 9	Lab 9: Dynamic vulnerability scanning tools
Week 10	Lab 10: Concept of Code Review
Week 11	Lab 11: Manual Code Review
Week 12	Lab 12: Automatic Code Review

Week 13	Lab 13: other open-source tools and platforms OWASP Labware
Week 14	Lab 14: other open-source tools and platforms SMSD Labware
Week 15	Lab 15: Project and Presentation
Week 15	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Secure Software Development: A Security Programmer's Guide by Grembi Jason.	Yes
Recommended Texts		No
Websites		

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية						
Module Title	Database System		Module Delivery			
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar			
Module Code	BCYSCE202-S1					
ECTS Credits	5					
SWL (hr/sem)	125					
Module Level	2	Semester of Delivery		3		
Administering Department	CYSCE	College	TEC			
Module Leader		e-mail	E-mail			
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification				
Module Tutor		e-mail				
Peer Reviewer Name		e-mail				
Scientific Committee Approval Date	20/06/2023	Version Number	1.0			

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To learn the fundamental concepts of database systems. 2. To learn data models (ER, relational, and others); query languages (relational algebra, SQL, and others). 3. To learn implementation techniques of database management systems 4. The students should be able to understand the uses and purpose of using Database application and database settings, send and retrieve important information and data through SQL queries. 5. Help the students perform the needed cyber security database works as well as qualifying him to use the different kinds of database tools and instructions to build & execute the projects of cyber security engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the fundamentals of database system. 2. Mastering SQL Queried and commands, including common input/output application and data manipulation. 3. Becoming familiar with the Linux operating system and its distributions. 4. Being competent in common Networking & Configuring Network Settings and Package Management. 5. Being able to perform Bash Scripting and Execute shell command. 6. Being able to write complete shell scripts to perform I/O Manipulation and I/O Redirections

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due
Formative assessment	Quizzes	2	10% (10)	6, 14
	Assignments	1	10% (10)	14
	Projects / Lab.	14	10% (10)	Continuous
	Report	1	10% (10)	10
Summative assessment	Midterm Exam	2hr	10% (10)	7
	Final Exam	3hr	50% (50)	15
Total assessment			100% (100 Marks)	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Introduction to the Relational Model: Introduce class and overview of course topics
2	SQL Language: Introduction to SQL; Intermediate SQL, Advanced SQL
3	Formal Relational Query Languages: Relational Algebra; Tuple Relational Calculus; Domain Relational Calculus
4	Database Design: The Entity-Relationship Approach; ER Design; Reduction to Relational Model
5	Relational Database Design: Functional Dependency; Multivalued Dependency; Normal Forms
6	Application Design: Web Architectures
7	Storage and File Structure: Physical Storage; Record Organization
8	Indexing and Hashing; Ordered Indices; Hashed Indices
9	Indexing and Hashing; Bitmap Indices
10	Query Processing & Optimization: Query Processing
11	Query Processing & Optimization: Query Optimization
12	Transactions & Concurrency Control: ACID Properties; Transaction Management
13	Recovery System & Database System Architectures: Locks; Deadlocks; Snapshot Isolation
14	Student Presentations: Presentations and reviews
15	Review/preparation for final exam
16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1: Getting started.
Week 2	Lab 2: Introducing Database framework
Week 3	Lab 3 : Basic of SQL Language- 1
Week 4	Lab 4: Basic of SQL Language -2
Week 5	Lab 5: Basic of SQL Language -3
Week 6	Lab 6: Formal Relational Query Languages
Week 7	Lab 7: Storage and File Structure: Physical Storage
Week 8	Lab 8: Storage and File Structure: Record Organization
Week 9	Lab 9: Ordered Indices

Week 10	Lab 10: Hashed Indices
Week 11	Lab 11: Locks
Week 12	Lab 12: Deadlocks
Week 13	Lab 13: Snapshot Isolation
Week 14	Review
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Beginning SQL Server 2008 Express for Developers From Novice to Professional. By Robin Dewson, 2008	yes
Recommended Texts	Learning SQL Master SQL Fundamentals By Alan Beaulieu - 2009	yes
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	Discrete Mathematics		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	BCYSCE205-S1		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	Semester of Delivery	1
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Understanding Fundamental Concepts: The primary objective of studying discrete mathematics is to develop a solid understanding of fundamental concepts and structures in discrete mathematics. 2. Developing Problem-Solving Skills: Discrete mathematics aims to cultivate problem-solving skills. 3. Enhancing Mathematical Reasoning: Discrete mathematics promotes the development of mathematical reasoning skills. 4. Applying Mathematics to Real-World Situations: Discrete mathematics aims to enable students to apply mathematical concepts and techniques to real-world problems. 5. Promoting Mathematical Communication: Discrete mathematics aims to improve students' ability to communicate mathematical ideas effectively.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Problem-Solving Skills: Discrete mathematics helps develop problem-solving skills by exposing students to a wide range of mathematical problems and teaching them techniques to approach and solve them. 2. Logical Reasoning: Discrete mathematics emphasizes logical reasoning and critical thinking. Students learn how to construct logical arguments, analyze logical statements, and use deductive and inductive reasoning to prove mathematical theorems and solve problems. 3. Mathematical Modeling: Discrete mathematics provides a foundation for mathematical modeling, where real-world problems are represented and solved using mathematical structures such as graphs, networks, and algorithms. 4. Algorithmic Thinking: Discrete mathematics introduces students to algorithmic thinking.

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	3
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	5	10% (10)	2,4,6,8,10	LO #1, #2 and #10, #11
	Assignments	6	10% (10)	1,2,3,4,5,6,	LO #3, #4 and #6, #7
	Reading	4	10% (10)	3,5,8,10	LO #3, #4
	Report	3	10% (10)	2,9,11	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Discrete Mathematics - Introduction to Discrete Mathematics - Sets and Relations - Functions.
Week 2	Introduction to Discrete Mathematics - introduction to Discrete Mathematics: Propositional Logic - Predicate Logic.
Week 3	Combinatorics

	- Counting Principles - Permutations and Combinations.
Week 4	Combinatorics - Binomial Coefficients - Inclusion-Exclusion Principle
Week 5	Graph Theory - Basic Concepts - Trees
Week 6	Graph Theory - Connectivity Cycles - Euler
Week 7	Graph Theory - Hamilton Paths - Cycles.
Week 8	Number Theory - Divisibility - Modular Arithmetic, Greatest Common Divisor - Least Common Multiple, RSA Cryptography from Math perspective
Week 9	Euclidean algorithm, Chinese remainder theorem.
Week 10	Fermat's little theorem.
Week 11	Discrete Probability, Sample Spaces and Events, Probability Axioms.
Week 12	Conditional Probability, Bayes' Theorem.
Week 13	Algorithms and Complexity, Algorithm Analysis.
Week 14	Big-O Notation: Sorting and Searching Algorithms, NP-Completeness.
Week 15	Review
Week 16	Final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<i>Discrete Mathematics</i> by Richard Johnson Baugh., 8thEd.	Yes
Recommended Texts	Rosen, K. H. (2007). <i>Discrete mathematics and its applications</i> . The McGraw Hill Companies,.	Yes
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	Computer Electronics		Module Delivery			
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar			
Module Code	BCYSCE200-S1					
ECTS Credits	5					
SWL (hr/sem)	125					
Module Level	2	Semester of Delivery	1			
Administering Department	CYSCE	College	TEC.			
Module Leader		e-mail				
Module Leader's Acad. Title		Module Leader's Qualification				
Module Tutor	None	e-mail	None			
Peer Reviewer Name	Name	e-mail	None			
Scientific Committee Approval Date	20/06/2023	Version Number	1.0			

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Understanding the fundamental principles of electronic devices and circuits. 2. Learning about digital electronics and microprocessors. 3. Developing skills in circuit design and analysis. 4. Learning about the practical applications of computer electronics. Overall, the objectives of a module in computer electronics are to provide students with a foundational knowledge of electronic devices and systems, as well as the skills and tools necessary to design, analyze, and implement electronic circuits and systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the principles of electronic devices and circuits: Students should be able to demonstrate a basic understanding of the behavior and operation of electronic components such as resistors, capacitors, diodes, and transistors, as well as the design and analysis of electronic circuits. 2. Applying principles of digital electronics: Students should be able to apply the principles of digital logic and the design and operation of digital circuits, as well as the use of microprocessors and microcontrollers in electronic systems. 3. Working effectively in a team: Students should be able to work effectively in a team to design and implement electronic circuits and systems. 4. Applying knowledge to practical applications: Students should be able to apply their knowledge and skills to practical applications of computer electronics.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The learning and teaching strategies for a course in computer electronics will depend on a variety of factors, including the level of study, course objectives, and student needs. However, some common learning and teaching strategies for computer electronics may include: 1. Lectures: Lectures are a common teaching strategy for introducing students to new concepts and theories in computer electronics. Lectures may be delivered in person or online, and may include multimedia such as slides and videos. 2. Laboratory sessions: Laboratory sessions provide students with hands-on experience in designing, building, and testing electronic circuits and systems. These sessions may be conducted in a physical laboratory or through online simulation tools. 3. Group projects: Group projects are a common teaching strategy for developing students' teamwork skills and providing them with practical experience in designing and implementing electronic circuits and systems. Projects may involve designing and building electronic circuits, or developing software for controlling electronic systems. 4. Online resources: Online resources such as interactive simulations, virtual labs, and video tutorials can be used to supplement lectures and provide students with additional opportunities to practice and apply their knowledge. 5. Assignments and assessments: Assignments and assessments such as quizzes, exams, and design projects can be used to evaluate students' understanding of the
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Student Workload (SWL)					
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا					
Structured SWL (h/sem)		78	Structured SWL (h/w)		5
الحمل الدراسي المنتظم للطلاب خلال الفصل			الحمل الدراسي المنتظم للطلاب أسبوعيا		
Unstructured SWL (h/sem)		47	Unstructured SWL (h/w)		3
الحمل الدراسي غير المنتظم للطلاب خلال الفصل			الحمل الدراسي غير المنتظم للطلاب أسبوعيا		
Total SWL (h/sem)		125			
الحمل الدراسي الكلي للطلاب خلال الفصل					
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 #6
Summative assessment	Midterm Exam	2hr	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	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Introduction to electronic devices - Physics of material, atoms. - electrons and energy bands. - types of material (insulators, conductors, and semiconductors). - N-type and P-type semiconductor. - Diodes(forward bias, reverse bias, V-I characteristics)
2	Applications of diodes

WEEK	Delivery Plan (Weekly Syllabus)
	المنهاج الاسبوعي النظري KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
	• Half-wave rectifier. • average value. • r.m.s. value. • capacitor filter. • ripple voltage
3	Applications of diodes • Full-wave rectifier. • Diode limiters. • Clampers and Voltage Doubler.
4	Applications of diodes • Other types of diodes
5	Bipolar junction transistor BJT • BJT biasing. • cutoff. • Saturation. • operating point.
6	Bipolar junction transistor BJT • Applications • Amplifiers
7	Bipolar junction transistor BJT, • Frequency response
8	Midterm Exam
9	Bipolar junction transistor BJT. • Operational amplifier OPAMP
10	Field Effect Transistors (FET) • JFET. • MOSFET
11	Field Effect Transistors (FET) • MOSFET Biasing
12	Field Effect Transistors (FET) • Introduction to VLSI
13	Field Effect Transistors (FET) • NMOS. • PMOS.

	Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر
	Material Covered
1	Lab1: Diode characteristics
2	Lab2: Half-wave rectifiers and with filter
3	Lab3: Full-wave rectifiers and with filter
4	Lab4: Zener diode characteristics and regulators
5	Lab5: BJT Characteristics
6	Lab6: Transistor Biasing (part 1)
7	Lab7: Transistor Biasing (part 2)
8	Lab8: BJT Amplifier and Frequency response
9	Lab9: Inverting and Non-inverting OPAMPs
10	Lab10: Analogue Comparator (OPAMP)
11	Lab11: FET Biasing
12	Lab12: CMOS Invertor
13	Lab13: Nand Gate
14	Lab14:Nor Gate
15	Review and Student presentation
16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	"Electronic Devices Conventional Current Version " by FLOYD	Yes
Recommended Texts	"Electronics for computer Technology " by Terrell, David	No
Websites		

Module Information			
معلومات المادة الدراسية			
Module Title	Network infrastructure and Administration Lab		Module Delivery
Module Type	Supported		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	BCYSCE201-S2		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	Semester of Delivery	
Administering Department	CYSCE	College	TEC.
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	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 Objectives أهداف المادة الدراسية	Introducing students to fundamental, vendor-independent system and networking administration concepts. Building on students' existing knowledge of networks and systems administration. Providing students with knowledge of network basics and administration, including scope, goals, and best practices. Teaching students how to configure, maintain, and Helping students develop skills in IP addressing, TCP/IP operation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Configure and manage network infrastructure devices, including routers, switches, firewalls, and wireless access points. - Troubleshoot network problems using appropriate tools and techniques. - Build multiple host and network architectures, given business requirements and constraints; configure operating systems, network-specific services, routing, switching, and remote access solutions. - Apply networking skills related to server operating systems, directory services, and administrative network. - Configure and manage network Cables and connectors, including twisted pair, Coaxial cables, optical fiber cables. - Configure and manage Different types of Antennas.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Cabling and Connectivity. Testing equipment. Connectivity devices – Repeater Connectivity devices – Modems Connectivity devices – Switches Connectivity devices – Routers Connectivity devices – Wireless Access point Antennas

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	3
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, #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	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Cabling and Connectivity: Explain the key differences between cables and connector types.
Week 2	copper; 10Base2; 10BaseT. fiber – glass / plastic; multi-modal single-mode. connectors; RJ45; BNC; Straight Tip (ST); Subscriber Connector (SC); Local Connector (LC).
Week 3	Cabling and Connectivity: Describe the key features of Cat1-6 cables. identify Cat1-4 cable as older types of cable. describe the main features of Cat5, 5A, 6, 6A; (capacity; maximum distance; (network application (10BaseT; 100Base-TX; 1000Base-T; 10GBase-T)).
Week 4	Cabling and Connectivity: Explain the different antenna types. directional; omni directional; point-to-point; point-to-multipoint; mobile.
Week 5	Identify testing equipment used with wired and wireless networks. Wired; multimeter; wire map tester; cable testers; tone generator and probe; loopback plug. Wireless; wireless locator / Wi-Fi analyzer; wireless heat maps.

Week 6	Repeater building component blocks, how to install, configure, and maintenance, Security configuration on repeater.
Week 7	Modems, function, types, building component blocks, how to install, configure, and maintenance Modems, Security configuration on Modems.
Week 8	Hub, function, types, building component block, how to install, configure, and maintenance Hubs, Security configuration on Hubs.
Week 9	Bridge, function, types, building component blocks, how to install, configure, and maintenance Bridges, Security configuration on Bridges.
Week 10	switches, function, types, how to install, configure, and maintenance switches, internal components, connectors, ports, and hardware specifications, Security configuration on Switches.
Week 11	Firewalls, function, types, how to install, configure, and maintenance Firewalls, internal components, connectors, ports, and hardware specifications, Security configuration on Firewalls
Week 12	wireless access points, function, types, how to install, configure, and maintenance wireless access points, internal components, connectors, ports, and hardware specifications, Security configuration on wireless access points.
Week 13	routers, function, types, how to install, configure, and maintenance routers, The router chassis, internal components, connectors, ports, and hardware specifications, Security configuration on Routers.
Week 14	Configure routers using the CLI, Configuring static routes.
Week 15	Configuring router interfaces with IPv4 addresses, configuring clients with IPv4 addresses using DHCP.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Connectivity Cables
Week 2	Lab2: Connectivity devices -Modem -Repeater
Week 3	Lab 3: Network Configuration -IP address
Week 4	Lab 4: Package management (RPM Command)
Week 5	Lab 5: Package management (YUM Command)
Week 6	Lab 6: DHCP Server
Week 7	Lab7: FTP Server
Week 8	Lab 8: YUM Server

Week 9	Lab 9: NFS Server
Week 10	Lab 10: DNS Sever
Week 11	Lab 11: POST FIX Mail Server
Week 12	Lab 12: Apache Web server
Week 13	Lab 13: Authentication on Apache Web server
Week 14	Lab 14: WEBMIN Administration
Week 15	Final Project

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Linux Network Administrator's Guide: Infrastructure, Services, and Security by Tony Bautts , Terry Dawson, et al.	Yes
Recommended Texts		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	Operating Systems		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☒ Seminar	
Module Code	BCYSCCTE307-S1			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	2	Semester of Delivery		
Administering Department	CYSCE	College	TEC	
Module Leader			e-mail	E-mail
Module Leader's Acad. Title	Lecture	Module Leader's Qualification		
Module Tutor	Name (if available)	e-mail	E-mail	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023	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 Objectives

أهداف المادة الدراسية

1. To study, learn, and understand the main concepts of advanced operating systems, including parallel processing systems.
2. To gain a basic understanding of operating systems, including their role, types, and batch systems
3. To describe the services an operating system provides to users, processes, and other systems, and to discuss the various ways of structuring an operating system.
4. To acquire the basic operating system concepts such as processes and threads.
5. To understand the fundamental concepts of operating systems, including OS structures, processes/threads, memory management, and file systems.
6. To gain a general understanding of the structure of modern computers, the purpose, structure, and functions of operating systems, and to illustrate key OS concepts.

Module Learning Outcomes

مخرجات التعلم للمادة
الدراسية

1. Understand the main concepts of advanced operating systems, including parallel processing systems.
2. Acquire a basic understanding of operating systems, including their role, types, and batch systems.
3. Describe the services an operating system provides to users, processes, and other systems, and discuss the various ways of structuring an operating system.
4. Acquire the basic operating system concepts such as processes and threads.
5. Understand the fundamental concepts of operating systems, including OS structures, processes/threads, memory management, and file systems.
6. Gain a general understanding of the structure of modern computers, the purpose, structure, and functions of operating systems, and illustrate key OS concepts.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	200		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the operating system
Week 2	Types of operating systems (Windows, Linux, MacOS, Unix)
Week 3	Process management and scheduling
Week 4	Processes and Threads (address spaces, system calls, scheduling)
Week 5	Threads and concurrency
Week 6	Memory management
Week 7	File systems and storage management
Week 8	Input/Output (I/O) management
Week 9	Synchronization (algorithms and structures like locks, semaphores, and monitors)
Week 10	Virtual Memory (paging, page tables, eviction, segmentation)
Week 11	File Systems (the file abstraction, directory structures)
Week 12	File Systems (disk I/O)
Week 13	Virtualization and cloud computing
Week 14	The preparatory week before the Final Exam
Week 15	Final Exam
Week 16	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Getting Started.
Week 2	Lab2: Process Scheduling Simulation
Week 3	Lab 3: Building a Simple Operating System - bootstrapping
Week 4	Lab 4: Building a Simple Operating System - memory management

Week 5	Lab5: Building a Simple Operating System - process management
Week 6	Lab 6: File System Implementation - FAT or EXT.
Week 7	Lab 7: File System Implementation – EXT.
Week 8	Lab 8: Virtual Memory Simulation - virtual memory management - page replacement algorithms.
Week 9	Lab 9: Kernel Debugging -Linux
Week 10	Lab 10: Kernel Debugging - Windows
Week 11	Lab 11: Concurrency Control - synchronization primitives, semaphores
Week 12	Lab 12: Concurrency Control - synchronization primitives, monitors
Week 13	Lab 13: Device Driver Development - keyboard or mouse driver
Week 14	Review
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Abraham Silberschatz-"Operating System Concepts", 9 th Edition,	No
Recommended Texts	William Stalling "Operating System- Internals and Design Principles", 7 th Edition.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/opreating system	

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Programming Python for Cybersecurity		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	BCYSCE204-S1		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	1
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Python is an advantageous programming language for cybersecurity because it can perform many cybersecurity functions, including malware analysis, scanning, and penetration testing. It is user-friendly and has an elegant simplicity, making it the perfect language choice for many cybersecurity professionals. Using Python's base programming, developers can do any of the following without using any other third-party tools: Web server fingerprinting, Simulation of attacks, Port scanning, Website cloning, Load generation and testing of a website, Creating intrusion detection and prevention systems, Wireless network scanning, Transmission of traffic in the network and Accessing mail server.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamentals of Python programming. 2. Develop custom Python scripts to automate cybersecurity tasks. 3. Apply Python to meet objectives through the cybersecurity attack lifecycle. 4. Automate common cyberattack and defense activities with Python. 5. Use Python for monitoring and defense activities.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This course is designed with a learn by doing approach that focuses on creation of fully functional scripts. Instead of being stuck learning the details of the programming or scripting language to create the "optimal" solution, we focus on "what works" instead. Once complete, we can then extend what we have to build bigger and better solutions. We will introduce the basic concepts of Python and how it can be used to facilitate cybersecurity initiatives. Additionally, we will introduce other tools such as Microsoft Visual Studio Code, Git and GitHub, various Linux commands, and Postman.
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Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview of the course format and learning objectives Why Python is one of the most in-demand skills among cybersecurity recruits. Introduction to Python syntax and data types
Week 2	Automating Cybersecurity Tasks with Python Using Python to automate common cyberattack and defense activities. Writing custom Python scripts to automate cybersecurity tasks. Applying Python to meet objectives through the cybersecurity attack lifecycle. Using Python to monitor and detect security threats
Week 3	Advanced Python Concepts for Cybersecurity Advanced Python syntax and data structures Object-oriented programming in Python

	Using Python libraries for cybersecurity tasks Debugging and error handling in Python
Week 4	Python for Network Security Using Python to analyze network traffic. Writing Python scripts to detect and prevent network attacks. Using Python to secure network infrastructure
Week 5	Python for Web Security Using Python to analyze web traffic. Writing Python scripts to detect and prevent web attacks. Using Python to secure web applications
Week 6	Human security: identity management; personal awareness, understanding and compliance; human behavioral factors; personal data privacy and security. Automating Cybersecurity Tasks with Python Using Python to automate common cyberattack and defense activities. Applying Python to meet objectives through the cybersecurity attack lifecycle Developing custom Python scripts to automate cybersecurity tasks
Week 7	Mid-term Exam + Python Libraries for Cybersecurity Overview of Python libraries commonly used in cybersecurity, such as Scapy, Nmap, and Requests Using Python libraries to perform network scanning and reconnaissance. Using Python libraries to analyze network traffic and detect anomalies
Week 8	advanced Topics in Python for Cybersecurity Persistence, privilege escalation, and evasion techniques Active defense techniques using Python. Best practices for secure coding in Python
Week 9	Python libraries for cybersecurity
Week 10	Python for Pre-ATT&CK Introduction to Pre-ATT&CK Using Python for Pre-ATT&CK
Week 11	Python for ATT&CK Introduction to ATT&CK Using Python for ATT&CK

Week 12	Python for Monitoring Introduction to monitoring Using Python for monitoring
Week 13	Other forms of Overflow Attacks

	Ethical Issues
Week 14	Python for Defense Introduction to defense activities
Week 15	Using Python for defense activities
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Getting Started- Introduction to Python for cybersecurity.
Week 2	Lab 2: Installing Python and setting up the development environment.
Week 3	Lab 3: Python for PRE-ATT&CK
Week 4	Lab 4: Python for monitoring
Week 5	Lab 5: Cryptography in Python -Creaser
Week 6	Lab 6: Cyber security threats
Week 7	Lab7: Cyber security attacks
Week 8	Lab 8: Network security libraries in Python
Week 9	Lab 9: Automating cybersecurity tasks with Python
Week 10	Lab 10: Cybersecurity attack and defense activities with Python
Week 11	Lab 11: Developing custom Python scripts to automate cybersecurity tasks
Week 12	Lab 12: MITRE ATT&CK and Shield cybersecurity use cases drawn from Python code
Week 13-15	Lab 13 -15: Persistence, privilege escalation, and evasion in Python

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Python for Cybersecurity Using Python for Cyber Offense and Defense By Howard E. Poston · 2022	Yes
Websites	https://www.youtube.com/watch?v=4pe1fn3Gus0 https://www.youtube.com/c/googlecareercertificates	

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Database Security		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE202-S2		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	4
Administering Department	CYSCE	College	TEC.
Module Leader	-	e-mail	E-mail
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor		e-mail	-
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Database Security (BCYSCE202-S1)	Semester	1
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To learn the basic understanding of database security concepts, principles, and practices. 2. To learn design, implement, and manage secure databases. 3. To learn how to protect sensitive data from unauthorized access, modification, and disclosure. 4. To learn implementation techniques of database security systems 5. The students should be able to understand the uses and purpose of using secure database application and database settings, send and retrieve secured information. 6. Help the students perform the needed cyber security database works as well as qualifying him to use the different kinds of database security tools and instructions to build & execute the projects of cyber security engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the fundamentals of database security system and concepts. 2. Mastering of secure database design and management. 3. Becoming familiar with protecting sensitive data. 4. Being competent in common users authorized accessing and prevent data. 5. Being able to perform database security settings through encryption and Data protection. 6. Being able to write complete code to securely connect the database tools and avoid database software vulnerabilities for cyber security application programs.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due
Formative assessment	Quizzes	4	10% (10)	2,6,10,14
	Assignments	5	10% (10)	2 ,6,8,10,12
	Projects / Lab.	14	10% (10)	Continuous
	Seminar	1	10% (10)	14
Summative assessment	Midterm Exam	2hr	10% (10)	7
	Final Exam	3hr	50% (50)	15
Total assessment			100% (100 Marks)	

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
2	Introduction to Database Security: Overview of database security concepts and principles, Threats and vulnerabilities to database security, Legal and ethical issues in database security
3	Access Control and Authentication: User authentication and authorization, Role-based access control (RBAC), 3. Database privileges and permissions
4	Encryption and Data Protection: Cryptography and encryption algorithms, Data masking and obfuscation, Secure data transmission and storage
5	Auditing and Compliance: Database auditing and monitoring, Compliance regulations and standards, Incident response and disaster recovery
6	Database Security Best Practices: Secure coding practices for database applications, Database security testing and assessment, Emerging trends and technologies in database security
7	Virtual Private Database
8	Buffer overflows attacks and Query optimization
9	How the Virtual Private Database Works
10	Database injection attacks, Cross-site scripting (XSS) attacks, Privilege escalation attacks,
11	Encryption with Oracle
12	SQL/NoSQL Injection attacks, Testing input variables for SQL injection
13	Database Software Vulnerabilities: Deployment failures: Broken databases, Database inconsistencies, Misconfigurations
14	Database Software Vulnerabilities: Carelessness or misuse, Weaknesses in computational logic
15	Review/preparation for final exam
16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Getting started with Database Tools.
Week 2	Lab 2: Database Legal and ethical issues.
Week 3	Lab 3: Database Threats and vulnerabilities.
Week 4	Lab 4: Role-based access control.
Week 5	Lab 5: Database masking and obfuscation.

Week 6	Lab 6: Implementing Virtual Private Database.
Week 7	Lab 7: Buffer overflows attacks in Database.
Week 8	Lab 8: Injection attacks in Database.
Week 9	Lab 9: Cross-site scripting (XSS) attacks in Database.
Week 10	Lab 10: Protection against misuse in Database.
Week 11	Lab 11: Protection against damage in Database.
Week 12	Lab 12: Database Vulnerabilities – Misconfigurations.
Week 13	Lab 13: Database Vulnerabilities
Week 14	Lab 14: Deployment failures and Broken databases.
Week 15	Lab 15: Review/Preparation for final exam
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Database Security 1st Edition (2011) by Melissa Zgola	yes
Recommended Texts	1. Pfleeger, C. P. & Pfleeger, S. L. (2018). Security in Computing. Publisher: Pearson India	no
Websites		

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Computer Networks		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	BCYSCE200-S2			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		
Administering Department		CYSCE	College	TEC
Module Leader			e-mail	E-mail
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	20/06/2023		Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

1. Knowledge of Network Fundamentals.
2. Ability to Design and Implement Networks.
3. Understanding of Network Protocols and Services.
4. Effective Communication and Collaboration: Students should be able to effectively communicate and collaborate with others in the context of computer networks. This includes clear and concise documentation, presenting technical information, and working in teams to solve network-related problems.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

1. Understanding Network Fundamentals.
2. Exploring Network Protocols and Services: The module typically covers various network protocols and services, such as Ethernet, TCP/IP, DHCP , DNS, HTTP and FTP. Students learn how these protocols enable communication and data transfer across networks.
3. Configure network devices
4. Design and plan network architectures

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

1. Lectures and Presentations: Lectures and presentations are often used to deliver theoretical concepts, principles, and foundational knowledge related to computer networking.
2. Hands-on Lab Sessions: Practical lab sessions are essential for allowing students to apply theoretical knowledge and gain hands-on experience in configuring, troubleshooting, and managing computer networks.
3. Group Projects and Collaborative Learning: Group projects and collaborative learning activities promote teamwork, communication, and the exchange of ideas among students.
4. Online Discussion Forums: Online discussion forums or platforms provide an opportunity for students to engage in asynchronous discussions, ask questions, and share knowledge and resources related to computer networking.
5. Simulations and Virtual Environments: Network simulation tools and virtual environments can be used to create simulated network scenarios, allowing students to experiment and practice without the need for physical equipment.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	3, 5, 10, 12	LO #2, #5 and #10, #11
	Assignments	5	10% (10)	2, 4, 8, 12	LO #3, #4 and #6, #7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #6
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Computer Networking: A Top-Down Approach, 8th edition" by James Krose and Keith Ross.	Yes
Recommended Texts	Data Communications and Networking: Forouzan, Behrouz A.	Yes
Websites	https://www.youtube.com/playlist?list=PL4lvPhAsvnPtkIJ3uV-pazx7XQ1God5OT	

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Computer Networks and the Internet • What Is the Internet • A Nuts-and-Bolts Description • A Services Description • What Is a Protocol? • The Network Edge, Access Networks , Physical Media, The Network Core, Packet Switching, Circuit Switching, A Network of Networks, Delay, Loss, and Throughput in Packet-Switched Networks
2	Computer Networks and the Internet • Overview of Delay in Packet-Switched Networks, Queuing Delay and Packet Los, End-to-End Delay ,Throughput in Computer Networks • Protocol Layers and Their Service Models, Layered Architecture, Encapsulation, Networks Under Attack

	Delivery Plan (Weekly Syllabus) المناهج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
3	Application Layer - Principles of Network Applications - Network Application Architectures - Processes Communicating - Transport Services Available to Applications - Transport Services Provided by the Internet - Application-Layer Protocols - Network Applications
4	Application Layer - The Web and HTTP , Overview of HTTP , Non-Persistent and Persistent Connections , HTTP Message Format - User-Server Interaction: Cookies , Web Caching, DNS—The Internet’s Directory Service , Services Provided by DNS , Overview of How DNS Works , DNS Records and Messages
5	Application Layer - Peer-to-Peer Applications , P2P File Distribution - Video Streaming and Content Distribution Networks , Internet Video , HTTP Streaming and DASH , Content Distribution Networks - Case Studies: Netflix, YouTube, and Kankan - Socket Programming: Creating Network Applications ,Socket Programming with UDP , Socket Programming with TCP
6	Transport Layer Introduction and Transport-Layer Services - Relationship Between Transport and Network Layers - Overview of the Transport Layer in the Internet , Multiplexing and Demultiplexing
7	Transport Layer Introduction and Transport-Layer Services - Connectionless Transport: UDP , UDP Segment Structure , UDP Checksum - Principles of Reliable Data Transfer , Building a Reliable Data Transfer Protocol , Pipelined Reliable Data Transfer Protocols , Go-Back-N (GBN) , Selective Repeat (SR)
8	Transport Layer Introduction and Transport-Layer Services - Connection-Oriented Transport: TCP - The TCP Connection - TCP Segment Structure - Round-Trip Time Estimation and Timeout - Reliable Data Transfer - Flow Control

	Delivery Plan (Weekly Syllabus) المناهج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
	TCP Connection Management , Principles of Congestion Control , The Causes and the Costs of Congestion , Approaches to Congestion Control , TCP Congestion Control , Classic TCP congestion Control , Network-Assisted Explicit Congestion Notification and Delay-based Congestion Control , Fairness , Evolution of transport-layer functionality
9	The Network Layer: - Overview of Network Layer , Forwarding and Routing: The Network Data and Control Planes - Network Service Models , What's Inside a Router? , Input Port Processing and Destination-Based Forwarding , Switching , Output Port Processing , Where Does Queuing Occur? , Packet Scheduling
10	The Network Layer: - The Internet Protocol (IP): IPv4, Addressing, IPv6, and More - IPv4 Datagram Format , IPv4 Addressing - Network Address Translation (NAT) ,
11	The Network Layer: IPv6 4.4 Generalized Forwarding and SDN , Match , Action , OpenFlow Examples of Match-plus-action in Action, Middleboxes
12	The Network Layer: - Control Plane Introduction - Routing Algorithms - The Link-State (LS) Routing Algorithm - The Distance-Vector (DV) Routing Algorithm - Intra-AS Routing in the Internet: OSPF - Routing Among the ISPs: BGP - The Role of BGP , Advertising BGP Route Information , Determining the Best Routes , IP-Anycast , Routing Policy , Putting the Pieces Together: Obtaining Internet Presence
13	The Network Layer: - The SDN Control Plane: SDN Controller and SDN Control Applications - OpenFlow Protocol - Data and Control Plane Interaction: An Example , SDN: Past and Future - ICMP: The Internet Control Message Protocol , Network Management, SNMP, and NETCONF/YANG ,The Network Management Framework - The Simple Network Management Protocol (SNMP) and the Management Information Base (MIB) , NETCONF and YANG

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
14	The Link Layer and LANs - Virtual Local Area Networks (VLANs) , Link Virtualization: A Network as a Link Layer - Multiprotocol Label Switching (MPLS) , Data Center Networking , Data Center Architectures - Trends in Data Center Networking, Retrospective: A Day in the Life of a Web Page Request - Getting Started: DHCP, UDP, IP, and Ethernet , Still Getting Started: DNS and ARP , Still - Getting Started: Intra-Domain Routing to the DNS Server - Web Client-Server Interaction: TCP and HTTP
15	The Link Layer and LANs - Introduction to the Link Layer - The Services Provided by the Link Layer - Where Is the Link Layer Implemented? , Error-Detection and -Correction Techniques , Parity Checks , Check summing Methods , Cyclic Redundancy Check (CRC) - Multiple Access Links and Protocols , Channel Partitioning Protocols , Random Access Protocols , Taking-Turns Protocols - DOCSIS: The Link-Layer Protocol for Cable Internet Access , Switched Local Area Networks , Link-Layer Addressing and ARP , Ethernet , Link-Layer Switches
16	Final Exam

	Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر
	Material Covered
1	Lab 1: Getting Started
2	Lab 2: Introduction to Wireshark
3	Lab 3: Setting Up Network
4	Lab 4: Wireshark_DHCP
5	Lab 5: Wireshark_DNS
6	Lab 6: Wireshark_Ethernet_ARP
7	Lab7: Wireshark_HTTP
8	Lab 8: Wireshark_ICMP
9	Lab 9: Wireshark IP
10	Lab 10: Wireshark NAT
11	Lab 11: Wireshark_SSL
12	Lab 12: Wireshark_TCP

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Cybersecurity Professional ethics		Module Delivery
Module Type	Basic		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	BCYSCE201-S2		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	1	Semester of Delivery	
Administering Department	CYSCE	College	TEC
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	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 Objectives أهداف المادة الدراسية	1. To provide students with an understanding of ethical issues and dilemmas that arise in the field of cybersecurity. 2. To develop critical ethical reasoning skills in addition to skills vital for cybersecurity professionals. 3. To engage students in open dialogue and debate within a safe and respectful environment.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the important ethical issues in cybersecurity. 2. Recognize that cybersecurity is intimately entangled with ethics. 3. Emphasize the social and ethical aspects of the work of cybersecurity, rather than the potential for technical fixes. 4. Develop ethical reasoning and professional conduct skills. 5. Understand how to overcome common psychological and contextual impediments for taking ethical action. 6. Adopt strategies for taking ethical action that have been developed in different sectors and areas. Practice as a competent professional in Cybersecurity or enrolled in an appropriate graduate program. 7. Demonstrate leadership by positive influence on others. 8. Understand the social and ethical aspects of the work of cybersecurity. 9. Recognize and analyze ethical issues in cybersecurity. 10. Apply ethical theories to cybersecurity situations. 11. Identify technical quandaries that have ethical implications. 12. Develop solutions to ethical issues in cybersecurity. 13. Apply rules and regulations to cybersecurity situations.
Indicative Contents المحتويات الإرشادية	The concept of cybersecurity ethics (6hrs) The ethical issues related to cybersecurity and privacy. (2hrs) Ethical issues related to cybersecurity and society. (2hrs) Cybersecurity and national Business. (3hrs) Cybersecurity and national intellectual property. (3hrs) Ethical issues related to cybersecurity and national law enforcement. (3hrs) Cybersecurity and the national legal system (2hrs) The ethical issues related to Data breaches and data protection. (2hrs) Cybersecurity and International Business. (2hrs) Cybersecurity and international intellectual property (3hrs) Ethical issues related to cybersecurity and national international law enforcement (3hrs)

Student Workload (SWL)					
الحمل الدراسي للطالب محسوب ل ١٥ اسبوعا					
Structured SWL (h/sem)		33	Structured SWL (h/w)		2
الحمل الدراسي المنتظم للطالب خلال الفصل			الحمل الدراسي المنتظم للطالب أسبوعيا		
Unstructured SWL (h/sem)		42	Unstructured SWL (h/w)		3
الحمل الدراسي غير المنتظم للطالب خلال الفصل			الحمل الدراسي غير المنتظم للطالب أسبوعيا		
Total SWL (h/sem)		75			
الحمل الدراسي الكلي للطالب خلال الفصل					
Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #3, #4 and #9, #11
	Assignments	2	10% (10)	2 and 12	LO #2, #7 and #13, #7
	Projects / Lab.	-	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

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

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Cybersecurity Ethics: An Introduction - Mary Manjikian	Yes
Recommended Texts	Cyberethics: Morality and Law in Cyberspace: Morality and Law in Cyberspace 7th Edition, by Richard A. Spinello	No
Websites		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The concept of cybersecurity ethics, Introduction to cybersecurity ethics, Ethical theories and principles, Ethical decision-making frameworks.
Week 2	The ethical issues related to cybersecurity and privacy, Privacy and surveillance, Data breaches and data protection, Cyberstalking, and cyberbullying.
Week 3	Ethical issues related to cybersecurity and society, Cybercrime, and cyberterrorism, Cyberwarfare and cyberconflict, Cybersecurity and human rights
Week 4	Cybersecurity and Business, the ethical issues related to cybersecurity and business, Cybersecurity, and corporate responsibility.
Week 5	Cybersecurity and intellectual property, Cybersecurity, and the global economy
Week 6	Ethical issues related to cybersecurity and law enforcement from national perspective, Cybersecurity, and national law enforcement,
Week 7	Cybersecurity and the legal system, Cybersecurity and the criminal justice system, what ethical frameworks can guide cybersecurity practice
Week 8	What are the important ethical issues in cybersecurity? Common ethical challenges for cybersecurity professionals, What are cybersecurity professionals' obligations to the public
Week 9	The ethical issues related to cybersecurity and privacy, Privacy and surveillance in national sectors.
Week 10	The ethical issues related to Data breaches and data protection, Cyberstalking, and cyberbullying.
Week 11	Ethical issues related to cybersecurity and society, Cybercrime, and cyberterrorism
Week 12	Ethical issues related to Cyberwarfare and cyberconflict, Cybersecurity and human rights.
Week 13	Cybersecurity and Business, the ethical issues related to cybersecurity and business, Cybersecurity and corporate responsibility
Week 14	Cybersecurity and International Business, the International ethical issues related to cybersecurity and international business, Cybersecurity, and corporate responsibility. Cybersecurity and international intellectual property, Cybersecurity, and the global economy.
Week 15	Review and Student Presentation.
Week 16	The final Exam

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Network Security		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE203-S2		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Network infrastructure and administration (BCYSCE 201-S1)	Semester	1

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This course examines information security services and mechanisms in a network context. Cryptographic tools such as message authentication codes, hash functions, digital signatures, and digital certificates are covered. Also, the course includes other topics such as access control, intrusion detection, database security, Internet security, and common threats on them.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Use basic cryptographic techniques in software and system design 2. Apply security methods for authentication, access control, intrusion detection, and prevention 3. Identify and mitigate security vulnerabilities in existing systems 4. Evaluate the security risks of systems and perform security audits 5. Identify and critique the ethical and legal issues in system security 6. Work efficiently in a team

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- Provide students with opportunities to engage in realistic scenarios and apply their knowledge to solve security challenges. By actively participating in simulated attacks, vulnerability assessments, and defensive strategies, students can gain practical experience and develop problem-solving skills. 2- The integration of case studies and real-world examples. Network security is a constantly evolving field and learning from real-life incidents and breaches can help students understand the implications of security vulnerabilities and the importance of proactive measures. Analyzing case studies can enhance critical thinking abilities, risk assessment, and decision-making skills in the context of network security. 3- The context of network security should encompass hands-on experiences, real-world examples, collaboration, interactive methods, and industry involvement. By incorporating these strategies, educators can empower students to develop the knowledge, skills, and mindset necessary to navigate the complex and ever-changing landscape of network security.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	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	6	10% (10)	5 and 12	LO #1 and #3
	Assignments	4	10% (10)	3 and 10	LO #1 and #2
	Projects / Lab.	1	10% (10)	Continuous	All
	Report/ Seminar	1	10% (10)	4 and 13	LO #4 and #6
Summative assessment	Midterm Exam	2hr	10% (10)	7	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Security Overview
Week 2	Security Overview Wrap-up Cryptographic Tools
Week 3	Security Overview Wrap-up Cryptographic Tools
Week 4	User Authentication
Week 5	Authorization and Access Control
Week 6	Database Security

Week 7	Mid-term Exam + Denial of Service Attacks.
Week 8	Intrusion Detection
Week 9	Firewall and Intrusion Prevention.
Week 10	Internet Security Protocols and Standards (IPSec and Oakley).
Week 11	Internet Security Protocols and Standards (SSL / TLS; S/MIME), Internet Authentication (Kerberos, X.509)
Week 12	Stack Overflow Buffer Overflow
Week 13	Other forms of Overflow Attacks Ethical Issues
Week 14	Wireless Network Security
Week 15	Project presentations.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introducing Network Security.
Week 2	Lab 2: IP and ICMP Attacks Lab
Week 3	Lab 3: Linux Firewall Exploration Lab
Week 4	Lab 4: Web Security lab
Week 5	Lab 5: TCP Attacks Lab Packet Sniffing
Week 6	Lab 6: Social media forensics
Week 7	Lab 7: TCP Attacks Lab Packet Spoofing
Week 8	Lab 8: Intelligence gathering
Week 9	Lab 9: VLAN
Week 10	Lab 10: VPN
Week 11	Lab 11: DNS protocol attacks
Week 12	Lab 12: Detecting Data leaks using Internet Border Patrol
Week 13-15	Report and presentation

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	William Stallings and Lawrie Brown. Computer Security: Principles and Practice (4th Edition). 2017. Pearson, ISBN 9780134794105	Yes
Websites	https://seedsecuritylabs.org/Labs_16.04/Networking/	

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

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Organization and Architectures		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE204-S2		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	CYSCE	College	TEC
Module Leader	Lubab H.Samy	e-mail	E-mail
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Digital electronics BCYSCE101-S2	Semester	
Co-requisites module	Computer Electronics BCYSCE200-S1	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

1. Understanding the basic principles of computer organization: Students should be able to describe the fundamental concepts of computer organization such as memory hierarchy, input/output systems, and instruction execution.

2. Understanding the organization of computer systems: Students should be able to explain the organization of computer systems, including the CPU, memory, and I/O subsystems, and understand their interconnections and interactions.

3. Understanding the various instruction set architectures: Students should be able to compare and contrast different instruction set architectures (ISAs) and understand their trade-offs in terms of performance, complexity, and ease of programming.

4. Designing and analyzing computer systems: Students should be able to design and analyze computer systems based on their knowledge of computer organization and architecture principles and evaluate their performance using benchmarks.

5. Understanding the impact of emerging technologies: Students should be able to understand the impact of emerging technologies on computer architectures, such as the use of parallelism, virtualization, and cloud computing, and their implications for computer system design.

Overall, the module objectives of Computer Organization and Architectures aim to provide students with a solid foundation in the principles of computer organization and architecture, as well as the ability to apply this knowledge to practical engineering problems.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

1. Understanding computer system organization: Students should be able to describe the organization of a computer system, including the CPU, memory, and I/O subsystems, and understand their interactions and trade-offs.

2. Understanding the instruction set architecture: Students should be able to compare and contrast different instruction set architectures (ISAs) and understand their impact on performance, power consumption, and ease of programming.

3. Understanding memory hierarchy: Students should be able to explain the concept of memory hierarchy and its impact on computer system performance, including cache memory, virtual memory, and secondary storage.

4. Understanding I/O systems: Students should be able to describe the principles of I/O systems, including device controllers, interrupt handling, and DMA.

5. Designing and analyzing computer systems: Students should be able to design and analyze computer systems based on their knowledge of computer organization and architecture principles, and evaluate their performance using benchmarks.

6. Understanding emerging technologies: Students should be able to understand the impact of emerging technologies on computer architectures, such as multicore processors, GPU computing, and cloud computing.

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Internal Architecture of 8086/8088, Register Organization, Pin Descriptions of 8086/8088
2	Physical Memory Organization, Timing diagrams, and General Bus Operations
3	Addressing Capability, Minimum Mode 8086 System and Timings, Maximum Mode 8086 System and Timings, 8086/8088 Instruction Set: Arithmetic and logical instructions Shift instructions, Rotate instructions, Control Flow instructions, LOOPS instructions, String instructions
4	The 8284-clock generator and 8288 Bus Controller
5	Memory interfacing: Types of semiconductor memories. The internal structure of ROMs and RAMs, Memory Address Decoding, EPROM and static RAM interfacing (examples), Memory expansion (in word and size)

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
6	I/O interfacing: I/O bus cycles, Memory mapped I/O, Isolated mapped I/O, I/O instructions and data transfers, I/O Port Address Decoding, I/O interfacing examples (LEDs and switches)
7	PIO 8255 [Programmable Input-Output Port]: Modes of Operation of 8255
8	Interfacing Analog to Digital Data Converters, Interfacing Digital to Analog Converters
9	keyboard and 7-segment display Interfacing
10	Interrupts and stack operations: Stack Structure of 8086/88, Basic Interrupt Processing
11	Interrupt Cycle of 8086/8088, Interrupt Vector Table, Interrupt Instructions: BOUND, INTO, INT, INT 3, and IRET, Hardware Interrupts, Expanding the Interrupt Structure (examples)
12	8259A Programmable Interrupt Controller (pin diagram and internal structure)
13	Connecting a Single 8259A ; Cascading Multiple 8259As
14	Direct memory access: Basic DMA Operation, The 8237 DMA Controller, Pin Definitions and internal structure
15	review
16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week 1	Lab 1: Introduction to Proteus simulator for digital systems
Week 2	Lab 2: Microprocessor interfacing Circuit Design in Proteus (Leds and Switches)
Week 3	Lab 3: Introduction to Memory Type and Organization
Week 4	Lab 4: SRAM interfacing
Week 5	Lab 5: ROM interfacing
Week 6	Lab 6: Expanding ROM and RAM
Week 7	Lab 7: Interfacing LEDs and switches to the microprocessor
Week 8	Lab 8: Interfacing Keyboard to the microprocessor
Week 9	Lab 9: Interfacing 7-segment display to the microprocessor
Week 10	Lab 10: Programmable Interrupt Controller
Week 11	Lab 11: Microprocessor Interrupts Design
Week 12	Lab 12: Interfacing ADC to the microprocessor

Week 13	Lab 13: Interfacing DAC to the microprocessor
Week 14	Review
Week 15	presentation
Week16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	8085 Microprocessor by Ramesh Goankar 8086 Microprocessor by John Uffenbeck. - Fundamentals of Microprocessors and Microcontrollers by B Ram	Yes
Recommended Texts		
Websites		

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	DATA STRUCTURE		Module Delivery
Module Type	CORE	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar	
Module Code	BCYSCCTE104-S2		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	1
Administering Department	DEPARTMENT OF CYBER SECURITY AND CLOUD COMPUTING TECHNIQUES ENGINEERING		College
Module Leader	Shaima Miqdad Mohamed Najeeb		e-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	None	e-mail	None
Peer Reviewer Name	None	e-mail	None
Review Committee Approval	21/06/2023	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 Objectives أهداف المادة الدراسية	1. Understanding the basic concepts of Data structures such as arrays, stacks, queues, trees, graphs, and so on. for building blocks of algorithms and programs.. 2. Analyzing the algorithms that are used to manipulate data. By analyzing algorithms, we can determine their efficiency and optimize them to make them faster and more efficient. 3. Choosing the right data structure is essential for developing efficient programs. The study of data structures helps in choosing the right data structure for a particular problem. 4. The study of data structures helps in implementing data structures such as linked lists, trees, and graphs. By implementing data structures, we can create efficient programs that can handle large amounts of data.
Module Learning Outcomes	1. Understanding the fundamental concepts of data structures. 2. Analyzing the performance of algorithms

مخرجات التعلم للمادة الدراسية	3. Choosing appropriate data structures. 4. Implementing data structures. 5. Designing algorithms. 6. Applying data structures to real-world problems
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: - Part A – Introduction to data structures: Overview of data structures, their types, and applications. .[8 hrs] - Part B- Arrays and Linked lists:: One-dimensional and multi-dimensional arrays, array operations, and applications. Linked lists: Singly linked lists, doubly linked lists, circular linked lists, and their operations.[12hrs] - Part C -: Stacks and Queues Array-based and linked-list based implementation of stacks and queues, their operations, and applications.. [12 hrs] - Part D - Trees: Binary trees, binary search trees, AVL trees, red-black trees, and their operations. [14 hrs] - Part E – Graphs: Graph representation, graph traversal algorithms, shortest path algorithms, and minimum spanning tree algorithms..[10 hrs] - Revision problem classes [4 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be used in Data structure courses to introduce the concepts of data structures and explain the theoretical aspects of algorithms that operate on data structures, provide hands-on exercises to help students implement data structures and algorithms using programming languages such as C++, Java, or Python, provide practice problems to help students improve their problem-solving skills and prepare for exams and assess students' understanding of data structures and algorithms through quizzes, exams, programming assignments, and group projects..
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.2
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	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	4	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	14	10% (10)	1-14	LO#1-LO14
	Midterm Exam	1 hr	10% (10)	7	LO # 1-7

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Data Structure
Week 2	Algorithm Analysis
Week 3	Encapsulation, Inheritance
Week 4	Polymorphism, Generics
Week 5	Interfaces, Iterators
Week 6	Abstract Classes
Week 7	Maps and Sets, Linked Lists
Week 8	Recursion, Recursive Backtracking
Week 9	Searching and Simple Sorts, Fast Sorting
Week 10	Stacks and Queues
Week 11	Trees and Binary Search Trees, Red-Black Trees, and Huffman Code Trees
Week 12	Graphs and Hash tables, Heaps and Tries
Week 13	Dynamic Programming and Functional Programming
Week 14	Future trends in Data structure for Cyber security engineering Application
Week 15	Review
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Implementation of searching and sorting techniques.
Week 2	Lab2: Implementation of list using array and linked list.
Week 3	Lab 3: Implementation of push and pop operation on stack
Week 4	Lab 4: Implementation of polish notation and its conversion
Week 5	Lab5: Solve the problems using iteration/recursion
Week 6	Lab 6: Implementation of Maps and Sets.
Week 7	Lab 7: Implementation of Linked Lists.
Week 8	Lab 8: Recursion removal using stack
Week 9	Lab 9: Insertion /deletion operation on various queue
Week 10	Lab 10: Implementation of priority queue for process scheduling
Week 11	Lab 11: Storing data as a tree structure and implementation of various traversal techniques (part1).
Week 12	Lab 12: Storing data as graph structure and implementation of various traversal techniques (part2).
Week 13	Lab 13: Finding the shortest path in a graph.(part1)
Week 14	Lab 14: Finding the shortest path in a graph.(part2)
Week 15	Review
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- Data Structures And Algorithms Made Easy by Narasimha Karumanch (Author)	YES
Recommended Texts	data structure, algorithm and application in c++ by Sartaj sahani	No
Websites	https://opendatastructures.org/	

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB 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.

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Intrusions detection		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE400-S1		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	4	Semester of Delivery	
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	E-mail
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To learn the basic understanding of network Intrusion detection systems concepts, principles, and practices. 2. To learn the basic techniques and methodologies for designing and analyzing Intrusions detection system. 3. To learn different types of intrusion detection systems. 4. To learn hands-on experience with both Snort and Suricata intrusion detection and prevention 5. To learn how to protect sensitive data from unauthorized access and outside intruders. 6. To learn Intrusions detection implementation techniques for secure systems. 7. The students should be able to understand the uses and purpose of using Intrusions detection systems. 8. Help the students perform the needed cyber security works as well as qualifying him to use the different kinds of Intrusions detection tools and instructions to build & execute the projects of cyber security engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the fundamentals of Intrusions detection systems. 2. Mastering of Snort and Suricata intrusion detection and prevention. 3. Becoming familiar with protecting sensitive data. 4. Being competent in common users authorized accessing and prevent data. 5. Being able to perform defensive techniques and security tools and settings to provide data protection.

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation				
تقييم المادة الدراسية				
		Time/Number	Weight (Marks)	Week Due
Formative assessment	Quizzes	4	10% (10)	2,6,10,14
	Assignments	5	10% (10)	2 ,6,8,10,12
	Projects / Lab.	14	10% (10)	Continuous
	Report	1	10% (10)	10
Summative assessment	Midterm Exam	2hr	10% (10)	7
	Final Exam	3hr	50% (50)	15
Total assessment			100% (100 Marks)	

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Introduction to Network Intrusion Detection System: Overview of network intrusion detection systems, Types of intrusion detection systems. Network traffic analysis

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
2	Snort Intrusion detection system: Introduction to Snort, Installation and configuration of Snort, Snort Rulesets, and signatures, Understanding the rules and rule management
3	Snort Intrusion detection system: Creating custom rules for Snort, Packet analysis using Snort, Analysis of alerts generated by Snort, Threat hunting with Snort.
4	Suricata Intrusion detection system: Introduction to Suricata, Installation and configuration of Suricata, Rulesets, and signatures, Understanding the rules and rule management
5	Suricata Intrusion detection system: Creating custom rules for Suricata, Packet analysis using Suricata, Analysis of alerts generated by Suricata, Threat hunting with Suricata.
6	Differences between Snort and Suricata: Architecture, Protocol detection, performance, Customization options.
7	Differences between Snort and Suricata: Compatibility, User-friendliness, features, Third-party integrations.
8	Defensive Techniques and Tools: Firewall technologies, Virtual Private Networks (VPNs)
9	Defensive Techniques and Tools: Intrusion Prevention Systems (IPS)
10	Offensive Techniques and Tools: Port Scanning, vulnerability scanning, Exploitation technique.
11	Network Traffic Analysis Packet capture analysis, Protocol analysis
12	Automated and manual response to attacks.
13	Incident handling and Legal and organizational issues of intrusion detection
14	Incident handling of incident response system
15	Review
16	Final Exam

	Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر
	Material Covered
Week 1	Lab 1: Getting started with Snort
Week 2	Lab 2: Installation and Configuration of SNORT according to different organization requirements

Week 3	Lab 3: Exploring Snort Rulesets and Managing Snort Rulesets
Week 4	Lab 4: Creating new rulesets and Packet Analysis using Snort
Week 5	Lab 5: Generated Alerts and analysis.
Week 6	Lab 6: Local and Global threat hunting with snort
Week 7	Lab 7: Getting started with Suricata Installation and configuration
Week 8	Lab 8: Exploring and Manage Suricata Rulesets
Week 9	Lab 9: Creating new rulesets
Week 10	Lab 10: Local and Global threat hunting with Suricata
Week 11	Lab 11: Snort and Suricata as Intrusion prevention system
Week 12	Lab 12: offensive and Defensive in Network
Week 13	Lab 13: Incident handling of intrusion detection
Week 14	Lab 14: Incident handling of incident response system
Week 15	Review
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Intrusion Detection with SNORT Book by Jack Koziol (2003)	no
Recommended Texts	1. Network Intrusion Detection, book, by Stephen Northcutt, Judy Novak (2002)	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
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	F – Fail	راسب	(0-44)	Considerable amount of work required

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Artificial Intelligence for Cybersecurity		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	BCYSCE402-S1			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	4	Semester of Delivery	7	
Administering Department	CYSCE	College	TEC	
Module Leader		e-mail	E-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	20/06/2023	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	1. Practicing Cybersecurity: Ethical Hacking and Vulnerability Lab (BCYSCE404-S1) 2. Intrusions detection (BCYSCE400-S1)	Semester	7

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To learn the basic understanding of AI systems concepts, principles, and practices. 2. To learn the basic techniques and methodologies for designing and analyzing AI systems for cyber security. 3. To learn different types of AI application on cyber security. 4. To learn hands-on experience machine learning and prediction. 5. To learn how to use AI system to protect sensitive data from unauthorized access and outside intruders. 6. To learn cyber security problems and how to solve them using AI implementation techniques. 7. The students should be able to understand the uses and purpose of data collection and preprocessing. 8. Help the students perform feature selection and data reduction using classification and clustering techniques.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the fundamentals of AI systems. 2. Mastering of machine learning application such as classification, clustering and prediction. 3. Becoming familiar with Weka software to implement machine learning algorithms and prediction. 4. Being competent in common data analyzing and preprocessing using SPSS software. 5. Being able to perform AI techniques and Neural Networks application for data security and protection.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due
Formative assessment	Quizzes	4	10% (10)	2,6,10,14
	Assignments	5	10% (10)	2 ,6,8,10,12
	Projects / Lab.	14	10% (10)	Continuous
	Seminar	1	10% (10)	10
Summative assessment	Midterm Exam	2hr	10% (10)	7
	Final Exam	3hr	50% (50)	15
Total assessment			100% (100 Marks)	

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Introduction: What is Machine Learning? Difference between: Inference vs. Prediction, Supervised vs. Unsupervised Learning Problems, Regression vs. Classification
2	Data: Types, Data processing, cleaning, visualization, and exploratory analysis
3	Data set collection and feature extraction
4	Cyber Security problems that can be solved using Machine learning: Malware Analysis, Intrusion Detection, Spam detection, Phishing detection, Financial Fraud detection, Denial of Service Detection

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
5	Estimation Theory, Hypothesis testing
6	Linear Regression (uni- and multi-variate) and Logistic Regression
7	Basic Classification Techniques
8	Spectral Embedding, Manifold detection, and Anomaly Detection
9	Decision Trees and Random Forest
10	Ensemble learning: Bagging and Boosting Ensemble Classifiers i.e. Using Multiple Classifications to Improve Prediction Accuracy The Bootstrap Method Using the Bootstrap to Produce a Bagged Classifier An Alternative Ensemble Classifier AdaBoost and Other Boosting Methods
11	Support Vector Machines (SVM) The Support Vector Classifier Computing the SVM for Classification The SVM as a Penalization Method
12	Clustering Methods K-means Clustering Hierarchical Clustering
13	Neural Networks
14	Neural Networks
15	Review/preparation for final exam
16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Getting started with Weka
Week 2	Lab 2: Data preprocessing
Week 3	Lab 3: Features extractions
Week 4	Lab 4: Regression -1 (Linear)
Week 5	Lab 5: Regression -2. (Logistic)
Week 6	Lab 6: Classifications -1 (ZeroR and OneR)
Week 7	Lab 7: Classifications -2 (Naive Bayes)

Week 8	Lab 8: Classifications-3 (Decision Trees and Random Forest)
Week 9	Lab 9: Ensembles learning (Bagging)
Week 10	Lab 10: Ensembles learning (Boosting)
Week 11	Lab 11: Clustering -1 (K-mean)
Week 12	Lab 12: Clustering -2 (Hierarchical)
Week 13	Lab 13: Neural Networks -1
Week 14	Lab 14: Neural Networks -2
Week 15	Lab 15: Review/preparation for final exam
Week 16	Final Project Exam

Learning and Teaching Resources				
مصادر التعلم والتدريس				
	Text		Available in the Library?	
Required Texts	1. Data Mining and Machine Learning in Cybersecurity, April 2011 by Sumeet Dua, Xian Du		no	
Recommended Texts	1. Mastering Machine Learning for Penetration Testing, (2018) By Chiheb Chebbi		no	
Websites	https://www.youtube.com/watch?v=oGlnXoYnjNQ https://www.youtube.com/watch?v=HkpxBy2dIMM			
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.				

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Graduate project Design		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	BCYSCE403-S2		
ECTS Credits	3		
SWL (hr/sem)	1		
Module Level	4	Semester of Delivery	
Administering Department	CYSCE	College	TEC
Module Leader	Name	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Students of the Cybersecurity and Cloud Computing Engineering gain experience in basic design in their last year of study through the graduation project. Students can work anywhere in teams ranging in number from three to five students, with an average of three students per team. In addition, students are allowed to form their teams and select their graduation projects, which must be approved by the academic staff member who delivers the course. The main purpose of the project graduation course is to encourage the students to apply the knowledge they have acquired during their study. The projects need to integrate engineering criteria and realistic constraints, such as economic, environmental, moral, security, social, political, and sustainability-related considerations.

Module Learning Outcomes

مخرجات التعلم للمادة
الدراسية

1. Protect and defend computer systems and networks from cybersecurity attacks: This includes characterizing privacy, legal, and ethical issues of information security, identifying vulnerabilities critical to the information assets of an organization, and defining the security controls sufficient to provide a required level of confidentiality, integrity, and availability in an organization's computer systems and networks.
2. Diagnose and investigate cybersecurity events or crimes related to computer systems and digital evidence: This involves diagnosing attacks on an organization's computer systems and networks, proposing solutions including development, modification, and execution of incident response plans, and applying critical thinking and problem-solving skills to detect current and future attacks on an organization's computer systems and networks.
3. Effectively communicate in a professional setting to address information security issues: This includes communication orally and in writing, proposed information.
4. Secure a computer-based system, process, component, or program to meet business needs: This involves analyzing a problem and identifying and defining the security risks and requirements appropriate to its solution, applying mathematical foundations, algorithmic principles, cryptography, and computing theory in the modeling and design of security solutions for software or system architecture, and applying design and development principles in the construction of secure software systems of varying complexity.
5. Analyze, categorize, and assess the threats, vulnerabilities, and risks of an enterprise network and endpoints, as well as design and implement security solutions: This involves understanding the threats, vulnerabilities, and risks of an enterprise network and endpoints, and designing and implementing security solutions to mitigate them.
6. Engage in a highly collaborative process of idea generation, information sharing, and feedback that replicates key aspects of cybersecurity work: This includes engaging in a collaborative process of idea generation, information sharing, and feedback that replicates key aspects of cybersecurity work, and applying cybersecurity principles to real-world problems.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Filed survey for certain problems associated with Iraqi cybersecurity space. (8hrs) Project Selection and Proposal as a result from Identifying problems need solve through the filed study survey. (2hrs) Literature Review and Background Research(6hrs) Searching for suitable solution(s) (2hrs) Project Planning and Design (8hrs) Final design proposal defense(2hrs)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- Promote student involvement through encourage students to be active participants in the project design process. - Create interdependence: Structure the project so that students are dependent on one another. For example, ensure that projects are sufficiently complex that students must draw on one another's knowledge and skills. - Assign projects that are relevant and meaningful to students. - Project-based learning is a teaching method in which students learn by actively engaging in real-world, meaningful, and personal projects. With this teaching strategy, students gain knowledge and skills over an extended period. - Backward course design is essential for project-based learning because it provides a planning framework that works back from the module's overall objectives, course, or project and creates a series of lessons built to help achieve these goals. - cooperative learning: Cooperative learning is a teaching strategy in which students work together in small groups to achieve a common goal. This strategy can help students develop teamwork and communication skills. - Provide continual feedback: Provide feedback to students throughout the project to help them improve their understanding and performance. - experiential learning

Delivery Plan (Weekly Syllabus)		
المنهاج الاسبوعي النظري		
	Material Covered	
Week 1,2,3,4	Filed survey for certain problems associated with Iraqi cybersecurity space. (8hrs)	
Week 5	Project Selection and Proposal as a result from Identifying problems need solve through the filed study survey. (2hrs)	
Week 6,7,8,9	Literature Review and Background Research(8hrs)	
Week 10,11	Searching for suitable solution(s) (2hrs)	
Week 12,13,14,15	Project Planning and Design (8hrs)	
Week 16	Preparatory week before the final design proposal defense(2hrs)	
Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	By Subject	Yes
Recommended Texts		No
Websites		

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Cloud Application		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE 403-S2		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	1
Administering Department	CYSCE	College	TEC
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
		125	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Cloud basics: Understanding what the cloud is and why it's important. Principles for Cloud Application Development, Cloud Application Design Scalability Reliability, and availability
Week 2	Cloud service providers: Learning about prominent cloud service providers like AWS, Google, IBM, and Microsoft, and the services they offer.
Week 3	Cloud adoption: Understanding cloud trends and practices, including Hybrid Multiclouds, Microservices, Serverless, DevOps, Cloud Native, and Application Modernization.
Week 4	The basics of developing cloud applications.
Week 5	cloud-native application development
Week 6	microservices, and containerization.
Week 7	Cloud application deployment and management, Cloud application software, upgrades, resiliency, and evolution
Week 8	Cloud service providers: AWS, Google, IBM, and Microsoft, and the services offered.
Week 9	Cloud data management, data storage, data processing, and data analytics. Cloud Resource Management and Scheduling: Policies and mechanisms for resource management, resource bundling, combinatorial, fair queuing, start time fair queuing, borrowed virtual time, cloud scheduling subject to deadlines, scheduling map reduce applications subject to deadlines,

	resource management and application scaling
Week 10	different types of cloud databases, such as relational, NoSQL, and NewSQL databases
Week 11	Cloud Service Management, the basics of cloud service management, service-level agreements (SLAs), service management frameworks, and service monitoring and reporting
Week 12	Cloud Case Studies and Real-world Applications: real-world examples of cloud applications and their implementation. The challenges faced during the implementation of cloud applications and the strategies used to overcome them.
Week 13	Applications of cloud computing: Healthcare, energy systems, transportation, manufacturing
Week 14	Applications of cloud computing: education, government, mobile communication, application development
Week 15	review
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Getting Started
Week 2	Lab 2: Cloud Computing Basics Lab
Week 3	Lab 3: Cloud Infrastructure Lab
Week 4	Lab 4: Cloud Security Lab.
Week 5	Lab 5: Cloud Storage Lab
Week 6	Lab 6: Cloud Networking Lab
Week 7	Lab 7: Cloud Application Development Lab
Week 8	Lab 8: Cloud Deployment Lab
Week 9	Lab 9: Cloud Migration Lab
Week 10	Lab 10: Cloud Monitoring and Management Lab
Week 11	Lab 11: Exploring Cloud Cost Optimization Lab
Week 12	Lab 12: Cloud Cost Optimization Lab case study 1.
Week 13	Lab 13: Cloud Cost Optimization Lab case study 2.
Week 14	Lab 14: Project and Presentation
Week 15	review
Week 16	Final Exam

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Practicing cybersecurity: Ethical Hacking and Vulnerability Lab		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	BCYSCE404-S1		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	4	Semester of Delivery	8
Administering Department	CYSCE	College	TEC
Module Leader	Name	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	BCYSCE200-S2, BCYSCE203-S2 BCYSCE300-S1 BCYSCE300-S2 BCYSCE304-S1	Semester	
Co-requisites module	None	Semester	

Student Workload (SWL)					
الحمل الدراسي للطالب محسوب ل 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		112	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا		7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل		175			
Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	4	10% (10)	2 ,4,6and 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	2hr	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, software installation, Pre-engagement, scoping.
Week 2	Ethical requirements and legal issues.
Week 3	Penetration test report structure and components.
Week 4	Vulnerability Analysis Methods, Foot printing and Reconnaissance
Week 5	Scanning and Sniffing Networks, Scanning using Nmap
Week 6	System Hacking: NetBIOS and NFS, Windows passwords, hashes, Linux passwords, hashes with salt, Searching Linux, and Windows file systems
Week 7	Session Hijacking, TCP, UDP, connections, SSL, and TLS encryption.
Week 8	Malware Threats
Week 9	Hacking Web Servers and Hacking Web Applications: File transfer protocol: ftp, http, Telnet, DNS, Web Reconnaissance.
Week 10	Hacking Wireless Networks and Hacking Mobile Platforms
Week 11	Metasploit exploitation framework

Week 12	Cryptography weaknesses
Week 13	Evading IDS, Firewalls, and Honeypots, and Use of netcat and pivoting
Week 14	Lock picking, master keys, and oracle hacks
Week 15	Review and Student Presentation
Week 16	Preparatory week before the final Exam
Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Getting started lab environment
Week 2	Lab 2: System Hacking
Week 3	Lab 3: Scanning and Sniffing
Week 4	Lab 4: Session Hijacking: TCP, UDP, SSL, and TLS.
Week 5	Lab 5: Hacking Web Servers and Applications: ftp, http, Telnet, DNS.
Week 6	Lab 6: Wireless Networks Vulnerability Analysis
Week 7	Lab 7: Mobile Platforms Vulnerability Analysis - IOS
Week 8	Lab 8: Mobile Platforms Vulnerability Analysis - Android
Week 9	Lab 9: Malwares threat Vulnerability Analysis
Week 10	Lab 10: Metasploit Framework
Week 11	Lab 11: Metasploit exploitation
Week 12	Lab 12: Pent testing with Metasploit
Week 13	Lab 13: Working with Active Exploits in Metasploit
Week 14	Lab 14: Working with Passive Exploits in Metasploit
Week 15	Review and Student presentation
Week 16	Final Exam

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Research Methodology		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	BCYSCE405-S1			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	4	Semester of Delivery		1
Administering Department	CYSCE	College	TEC	
Module Leader		e-mail		
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification		
Module Tutor	None	e-mail	None	
Peer Reviewer Name	Name	e-mail	None	
Scientific Committee Approval Date	20/06/2023	Version Number	1.0	

Student Workload (SWL)					
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا					
Structured SWL (h/sem)	49	Structured SWL (h/w)	3		
الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا			
Unstructured SWL (h/sem)	26	Unstructured SWL (h/w)	2		
الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا			
Total SWL (h/sem)	75				
الحمل الدراسي الكلي للطلاب خلال الفصل					
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 #6
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment	100% (100 Marks)				

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Introduction to Research Methodology • Basic concepts employed in quantitative and qualitative research • Research ethics • Research design
2	Research Methods • Survey research • Experimental research • Action research • Case study research
3	Data Collection and Analysis • Data collection methods • Data analysis techniques • Statistical analysis
4	Reporting Research Findings • Communicating research findings to experts and the general population • Writing research reports • Presenting research findings
5	Writing Process • Understanding the writing process. • Analyzing the audience and purpose. • Developing a writing plan. • Drafting and revising. • Editing and proofreading.

6	Technical Writing Style • Writing with clarity and conciseness • Using plain language
7	Technical Writing Style • Writing for a global audience • Using visuals to enhance understanding.

Delivery Plan (Weekly Syllabus)	
المناهج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
8	Technical Writing Genres • Writing technical reports • Writing proposals
9	Technical Writing Genres • Writing instructions and manuals • Writing scientific papers • Writing for the web
10	Midterm Exam
11	Technical Writing Skills • Constructing a logical outline of a technical document • Writing with awareness of expository techniques such as definition, classification, and comparison
12	Technical Writing Skills • Using appropriate tone and style • Using correct grammar, punctuation, and mechanics • Citing sources and avoiding plagiarism
13	Scientific and Technical Writing • Introduction to the essential elements of scientific and technical writing • Practice in the forms and discourses of scientific and technical writing • Developing skills in writing technical reports, proposals, and scientific papers

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Textbook: Research Methods: A Process of Inquiry by Anthony M. Graziano and Michael L. Raulin	Yes
Recommended Texts	Research articles and case studies.	Yes
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.

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Reverse Engineering- Malwares Analysis		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	BCYSCE403-S2		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	4	Semester of Delivery	
Administering Department	CYSCE	College	TEC
Module Leader	Name	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	96	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

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	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Reverse Engineering - Definition and importance of reverse engineering - Types of reverse engineering Legal and ethical considerations.
Week 2	Assembly Language and Disassembly - Introduction to assembly language - Basic instructions and syntax - Disassembly tools and techniques Hands-on exercises using IDA Pro and Binary Ninja.
Week 3	Tools and Techniques for Reverse Engineering - Debugging and tracing - Dynamic and static analysis

	• Malware analysis tools and techniques • Hands-on exercises using OllyDbg, WinDbg, and Ghidra
Week 4	Introduction to malware analysis • Overview of reverse engineering techniques • Overview of software security and defense practices
Week 5	Reverse Engineering Techniques • Static analysis • Dynamic analysis • Code obfuscation techniques • Anti-debugging techniques • Anti-disassembly techniques
Week 6	Malware Analysis Tools • IDA Pro • OllyDbg • WinDbg • Sysinternals Suite • Wireshark

Week 6	Malware Analysis Tools • IDA Pro • OllyDbg • WinDbg • Sysinternals Suite • Wireshark
Week 7	Malware Analysis Methodology • Malware classification • Malware behavior analysis • Malware signature creation • Malware removal and prevention
Week 8	Introduction to Reverse Engineering and Malware Analysis • Overview of Reverse Engineering and Malware Analysis • Types of Malware

	• Malware Analysis Process • Malware Analysis Tools
Week 9	Tools and Techniques for Malware Analysis • Debuggers • Disassemblers • Decompiles • Hex Editors • Memory Analysis Tools
Week 10	Static Analysis Techniques • File Analysis • Strings Analysis • PE Header Analysis • Import/Export Table Analysis
Week 11	Dynamic Analysis Techniques • Debugging Techniques • Memory Analysis • Network Analysis • System Call Tracing
Week 13	Reverse Engineering Malware Code
	• Assembly Language Basics Reverse Engineering Techniques.
Week 14	Reverse Engineering Malware Code • Code Obfuscation Techniques • Anti-Debugging Techniques
Week 15	Final Exam
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Getting Started
Week 2	Lab 2: Setting up a virtual machine for malware analysis
Week 3	Lab 3: Exploring common types of reverse engineering
Week 4	Lab 4: Basic Assembly commands for reverse engineering 1.
Week 5	Lab 5: Basic Assembly commands for reverse engineering -2.
Week 6	Lab 6: Debugging and tracing.
Week 7	Lab7: Dynamic analysis
Week 8	Lab 8: Static analysis
Week 9	Lab 9: Malwares Analysis using IDA Pro.
Week 10	Lab 10: Malwares Analysis using WinDbg.
Week 11	Lab 11: Malwares Analysis using Sysinternals Suite.
Week 12	Lab 12: Malwares Analysis using Wireshark.
Week 13	Lab 13: Code Obfuscation
Week 14	Lab14: Memory Analysis Tools
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Malware Analysis and Detection Engineering: A Comprehensive Approach to Detect and Analyze Modern Malware by Abhijit Mahanta and Anoop Saldanha Sep 23, 2020.	Yes
Recommended Texts		No

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	IT Project Management		Module Delivery
Module Type	Supported		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE400-S2		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	
Administering Department	CYSCE	College	TEC
Module Leader	Name	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Total assessment		100% (100 Marks)	
Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري			
	Material Covered		
Week 1	Orientation and course preview		
Week 2	Work and grading methodology , Introduction to Project Management, Project Management as a Process		
Week 3	What is a Project? The Project Environment & Information Management systems, Essential Elements • Kinds of Projects (IT, Datacenters, Server Rooms, Cloud Computing Centers)		
Week 4	The pillars Constraints , The Project Management Cycle, Project Management Processes (Core & Supportive), Project Management Roles & Cultural Differences, Project Management Skills		
Week 5	Project Organizational Structures		
Week 6	Project Management Methodologies : An overview of existing Project Management Methodologies, Types of Project Management Methodologies from general perspective and from Cybersecurity Engineering prospective.		
Week 7	PMI's PMBOK , Prince2 and how it could be applied in cybersecurity Engineering field. Limitations and challenges facing applying these methodologies in cybersecurity.		
Week 8	Agile / Scrum and Others and how it could be applied in cybersecurity Engineering field. Limitations and challenges facing applying these methodologies in cybersecurity.		
Week 9	Adaptive (Agile) Projects , Business ideas, Product (operations) vs. Project		
Week 10	Scrum & Agile Management , The process, Roles o Phases, Results validation		
Week 11	Risk Management , Introduction to Risk Assessment, Contingency planning, A model for adaptative Project management . Example must be related to cybersecurity risks and cybersecurity incidents		
Week 12	Project Monitoring and Control : Building a suitable Monitoring & Control System.		
Week 13	Project Monitoring and Control : Mastering conflict, On collaborative behavior, The role of communication, Troubleshooting (common practices)		

Week 14	Useful Implementation Tools, an overview of useful techniques and tools used in Project Management
Week 15	Review and Student presentation.
Week 16	Preparatory week before the final Exam
Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Getting Started
Week 2	Lab 2: Introduction to Open-source software for teaching project management OpenProject, DotProject+, ProjectLibre, TaskJuggler, Redmine, Odoo, Tuleap
Week 3	Lab 3: Configuration and setting up of DotProject+ framework.
Week 4	Lab 4: Platforms exploration
Week 5	Lab 5: Project initiating and planning using DotProject+
Week 6	Lab 6: Gantt charts using OpenProject
Week 7	Lab 7: Time tracking using OpenProject
Week 8	Lab 8: Issue tracking using OpenProject
Week 9	Lab 9: Resource allocation using ProjectLibre
Week 10	Lab 10: Task tracking using ProjectLibre
Week 11	Lab 11: Track project progress using TaskJuggler
Week 12	Lab 12: Agile project management using Redmine
Week 13	Lab 13: Compare and Contrast different project management software
Week 14	Lab 14: Project and Presentation
Week 15	Lab 15: Compare and Contrast different project management software
Week 15	Final Exam

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

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Introduction to Digital Forensics		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☒ Seminar
Module Code	BCYSCE402-S2		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	4	Semester of Delivery	2
Administering Department	CYSCE	College	TEC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #3, #5 and #10, #14
	Assignments	4	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	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction: Understanding the Digital Forensics Profession and Investigations.
Week 2	Data acquisition: the process of collecting data from various sources such as computers, mobile devices, and cloud storage.
Week 3	Digital forensics tools: different tools and techniques used in digital forensics investigations.
Week 4	Network forensics: This involves investigating network traffic to identify potential security breaches or cyber attacks
Week 5	Mobile and wireless device forensics: how to extract data from mobile devices such as smartphones and tablets.
Week 6	Mobile and wireless device forensics: File present in SIM card. External memory dump and evidence in memory card. Mobile evidence extraction process.

Week 7	Mid-term Exam + Data Acquisition methods- physical, file system, logical and Manual Acquisition. Mobile investigation tool kit.
Week 8	Cloud forensics: investigating data stored in cloud environments such as Google Drive or Dropbox.
Week 9	Social media forensics investigates social media accounts and messages. Source for social media evidence, Types of Data Available on Social Networking sites.
Week 10	Social media forensics investigates different evidence collection methods from social networking sites, intelligence gathering from social media, Tools and techniques for intelligence gathering, indirect method, direct method with login, direct method without login.
Week 11	Cyber laws: the legal aspects of cybercrime investigations, including laws related to digital evidence and privacy.
Week 12	Digital evidence controls the importance of maintaining the integrity of digital evidence throughout an investigation.
Week 13	Recovering Graphics Files. Computer Forensics Analysis and Validation.
Week 14	Virtual Machine and Cloud Forensics.
Week 15	Email Investigations. Report Writing for Tech Investigations. Expert Testimony in Tech Investigations. Ethics for the Investigator and Expert Witness.
Week 16	Preparatory week before the final Exam

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Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introducing Digital Forensics tools.
Week 2	Lab 2: Network forensics.
Week 3	Lab 3: Mobile and wireless device forensics.
Week 4	Lab 4: Extracting GPS Data from Mobile Devices
Week 5	Lab 5: Recovering Deleted Data from Mobile Devices
Week 6	Lab 6: Social media forensics
Week 7	Lab 7: Intelligence gathering

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?

Required Texts	Casey, E. (2011). Digital Evidence and Computer Crime: Forensic Science, Computers, and the Internet. Academic Press; 3 edition. ISBN 978-0123742681.	Yes
Recommended Texts	Ho, A. T. S. and Li, S (2015). Handbook of Digital Forensics of Multimedia Data and Devices. Wiley-IEEE Press. ISBN 978-1118640500	No
Websites	https://www.guru99.com/computer-forensics-tools.html	

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Cybersecurity for IoTs			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	BCYSCE404-S2				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	4	Semester of Delivery		2	
Administering Department	CYSCE	College	TEC		
Module Leader			e-mail		
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification			
Module Tutor	None	e-mail	None		
Peer Reviewer Name	Name	e-mail	None		
Scientific Committee Approval Date	20/06/2023	Version Number	1.0		

Student Workload (SWL)					
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا					
Structured SWL (h/sem)	79	Structured SWL (h/w)	5		
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا			
Unstructured SWL (h/sem)	96	Unstructured SWL (h/w)	6		
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا			
Total SWL (h/sem)	175				
الحمل الدراسي الكلي للطالب خلال الفصل					
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 #6
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment	100% (100 Marks)				

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
1	Introduction to IoTs • Definition and characteristics of IoTs • what is the IoT and why is it important? • Elements of an IoT ecosystem. • Technology drivers, Business drivers. • Trends and implications. • Overview of Governance.
2	IoT architecture and protocols • Protocol Standardization for IoT – Efforts – M2M. • WSN Protocols
3	IoT architecture and protocols • SCADA. • RFID Protocols
4	IoT architecture and protocols • Issues with IoT Standardization • Unified Data Standards • Protocols • IEEE802.15.4 • BACNet Protocol • Modbus • KNX • Zigbee • Network layer • APS layer
5	IOT ARCHITECTURE • IoT Open-source architecture (OIC)- OIC Architecture & Design principles • IoT Devices and deployment models • IoTivity: An Open source IoT stack • Overview • IoTivity stack architecture • Resource model and Abstraction

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
WEEK	KEY LEARNING OUTCOMES OF THE COURSE UNIT (On successful completion of this course unit, students/learners will or will be able to)
	• WoT Portals and Business Intelligence
7	IOT APPLICATIONS • IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications. • Study of existing IoT platforms /middleware,
8	Midterm Exam
9	Security Risks in IoTs • Threats and vulnerabilities in IoTs. • Attack vectors and techniques
10	Security Mechanisms for IoTs • Authentication and authorization. • Encryption and decryption. • Access control and firewalls.
11	IoT Security Standards and Regulations • IoT security standards and best practices. • Legal and ethical issues in IoT security
12	IoT Security Implementation • Designing and implementing secure IoT systems
13	IoT Security Implementation • Testing and evaluating IoT security
14	Case Studies and Projects • Real-world examples of IoT security breaches
15	Group projects to design and implement secure IoT systems
16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المناهج الاسبوعى للمختبر	
Material Covered	
1	Lab1: Connecting Devices to Build IoT and Simulating IoT Devices.
2	Lab 2: Identify Pillars of the IoT System.
3	Lab 3 : Securing Cloud Services in the IoT and Working with IFTTT and Google Accounts.
4	Lab 4: Threat Modeling: - at the IoT Device Layer, at the IoT Communication Layer, at the IoT Application Layer.
5	Lab 5: Threat Modeling to Assess Risk in an IoT System.
6	Lab 6: Evaluate Recent IoT Attacks.
7	Lab 7: Evaluate the IoT Security Risk in various sectors: Industry, healthcare, ecosystem.
8	Lab 8: Investigate Vulnerability Assessment Tools.
9	Lab 9: Web of Things Application Vulnerability and UPnP Vulnerabilities.
10	Lab 10: Hacking MQTT.
11	Lab 11: Sniffing Bluetooth with the Raspberry Pi.
12	Lab 12: Port Scanning an IoT Device.
13	Lab 13: Challenge Passwords with Kali Tools.
14	Lab 14: Compromise IoT Device Hardware, Compromise IoT Device Firmware.
15	Review and Student presentation
16	Final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Internet of Things: A Hands-On Approach" by Arshdeep Bahga and Vijay Madisetti	Yes
Recommended Texts	"Practical Internet of Things Security" by Brian Russell, Drew Van Duren, and John R. Vacca	Yes
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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Graduate project Implementation		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	BCYSCE405-S2		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	4	Semester of Delivery	
Administering Department	CYSCE	College	TEC
Module Leader	Name	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	34	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	66	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus)		
المنهاج الاسبوعي النظري		
	Material Covered	
Week 1,2,3,4	Experimental Work	
Week 5	Data Analysis and Interpretation	
Week 6,7,8,9	Documentation and Reporting	
Week 10,11	Presentation and Demonstration	
Week 12,13,14,15	Project Evaluation and Reflection	
Week 16	Preparatory week before the final design proposal defense	
Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	By Subject	Yes
Recommended Texts		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.				