



Ministry of Higher Education and
Scientific Research - Iraq
University of Baghdad
College of Engineering
Department of Water Resources
Engineering



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	ARABIC LANGUAGE		Module Delivery
Module Type	BASIC		Theory
Module Code	UOBE110		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	
Administering Department	Water Resources	College	Engineering
Module Leader	Eman Hussein	e-mail	Eman.h.m@coeng.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MA
Module Tutor	None	e-mail	None
Peer Reviewer Name	Eman Hussien	e-mail	Eman.h.m@coeng.uobaghdad.edu.iq
Review Committee Approval	17/6/2023	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

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. العمل على النهوض باللغة العربية والمحافظة عليها من الخطأ.2. أن يكتسب الطالب القدرة على استعمال اللغة استعمالاً صحيحاً في الاتصال بالأخرين عن طريق التحدث والكتابة والاستماع والقراءة، مما ييسر لهم أمورهم ويعينهم على قضاء حوائجهم ومصالحهم.3. أن يكتسب الطلبة القدرة على التعبير عن أنفسهم وما يقع تحت حواسهم نطقاً وكتابةً.4. أن يتزود الطالب بثروة لغوية عن طريق تزويدهم ببعض الألفاظ والتراكيب .5. مساعدة الطلبة على تمييز الأغلاط اللغوية الشائعة وإرشادهم الى تصويبها.6. تنمية الميل إلى القراءة والمطالعة لدى الطلبة.7. التعرف على مواطن الجمال في اللغة العربية وآدابها.8. أن يكتسب الطالب مهارات الاتصال بالتراث العربي وتحقيق التكامل بينه وبين مجالات الثقافة المختلفة.9. توظيف قواعد اللغة في القراءة والكتابة (من خلال تدريبات مرتبطة بالموضوعات المقترحة) .
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1- حب الطالب للغة العربية والاعتزاز بها.2- تدريب الطلبة على سلامة النطق وحسن الإلقاء والتعبير بنبرات صوتية واضحة ، و تزويدهم بكثير من الألفاظ والتراكيب والجمل والأساليب التي تنمي ثروتهم اللغوية وتزيد ثقافتهم.3- تدريب الطلبة على كتابة الكلمات بصورة صحيحة ، وتثبيت صورها في أذهانهم، والقدرة على استعادة تلك الصور عند الكتابة.4- تمكن الطلبة من معرفة أكثر من خمسين خطأ شائعاً ومعرفة تصويبها.5- معرفة الطلبة طريقة التفريق بين أنواع الهمزة الأولية والمتوسطة والمنتهية والقدرة على كتابتها بالشكل الصحيح دون الوقوع في الخطأ.6- تقويم أسنة الطلبة، ووقايتهم من الخطأ، وتكوين عادات لغوية سليمة تمكنهم من استعمال الألفاظ والجمل بصورة صحيحة لا تذهب بجمال الكلام وعذوبته.

<p>Indicative Contents المحتويات الإرشادية</p>	<p>نشأة اللغة العربية درس بيان أهمية اللغة العربية بصورة عامة وأهميتها لطلاب غير الاختصاص أقسام الكلام والمعرب والمبني من الأسماء والأفعال الأغلاط اللغوية همزة القطع والوصل رسم الهمزة المتوسطة والمتطرفة الحروف التي تزداد في الكتابة علامات الترقيم في اللغة العربية العدد ، قواعد كتابة العدد المبتدأ والخبر أنواع الجموع وما يلحق بها. قصيدة لشاعر قديم قصيدة لشاعر حديث أن وإن والفرق بينهما كتابة الظاء والضاد والتاء المربوطة والهاء</p>
<p>Learning and Teaching Strategies استراتيجيات التعلم والتعليم</p>	
<p>Strategies</p>	<ol style="list-style-type: none"> 1) Lectures. 2) Tutorials. 3) Homework and Assignments. 4) Tests and Exams. 5) In-Class Questions and Discussions. 6) Extracurricular Activities. 7) Seminars. 8) In- and Out-Class oral conversations.

<p>Student Workload (SWL) الحمل الدراسي للطلاب</p>			
<p>Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل</p>	33	<p>Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا</p>	2
<p>Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل</p>	17	<p>Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا</p>	1.1
<p>Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل</p>			50

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	نشأة اللغة العربية
Week 2	درس بيان أهمية اللغة العربية بصورة عامة وأهميتها لطلاب غير الاختصاص
Week 3	أقسام الكلام والمعرب والمبني من الأسماء والأفعال
Week 4	همزة القطع والوصل
Week 5	رسم الهمزة المتوسطة والمتطرفة
Week 6	الأغلاط اللغوية الشائعة
Week 7	علامات الترقيم
Week 8	الحروف التي تزداد في الكتابة
Week 9	العدد، قواعد كتابة العدد
Week 10	أنواع الجموع وما يلحق بها
Week 11	ان المفتوحة والمكسورة
Week 12	المبتدأ والخبر
Week 13	قصيدة لشاعر قديم
Week 14	قصيدة لشاعر حديث
Week 15	كتابة الظاء والضاد والتاء المربوطة والهاء
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

Required Texts	مصطفى التوني، الهمزة في اللغة العربية دراسة لغوية. سعد بن علي بن محمد ، الفرق بين الضاد والطاء. اللغة العربية العامة لاقسام غير الاختصاص .عبد القادر أمين	Yes
Recommended Texts	يوسف عطا الطريفي الواضح في الاملاء وعلامات الترقيم محمد العدناني ،معجم الاغلاط اللغوية	No
Websites		

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.



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	AUTOCAD		Module Delivery
Module Type	BASIC		<input type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	GE105		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	1 1	Semester of Delivery	2
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Raed Fouad Abbas		e-mail: rabbas@coeng.uobaghdad.edu.iq
Module Leader's Acad. Title	Assist. Lect.		Module Leader's Qualification: M.Sc.
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

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. To provide students with intermediate to advanced skills in 2D drawing and drafting.2. To improve their imagination skills.3. Enhance students' creativity and innovation.4. Improve students' productivity and efficiency5. Prepare students to get familiar with AutoCAD basic commands, essential function, and be able to deal with advanced ones.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1. Student will be able to use the program's basic and essential 2D commands.2. Get familiar with AutoCAD user interface.3. Be able to create and modify drawings.4. Be able to deal with drawing properties.5. Be able to make and deal with Isomeric drawing.6. Be able to draw and deal with projections.7. Creating dimensions and annotations.8. Draw waveforms and shapes that related to his study (applications).
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Introduction and getting started: (AutoCAD user interface, Navigation tools, Understanding Co-ordinate system, Limits and display units, saving settings as drawing template, Practice Question, Getting Familiar with AutoCAD) [3 hrs.]</p> <p>Creating Drawings: (Making lines, making lines using polar coordinates, Circle, Arcs, Ellipses, Rectangle, Polygons, Introduction to polyline and spline, Construction line and ray, Practice Question and examples) [6 hrs.]</p> <p>Modifying Drawing: (Making selection sets, Move and Copy command, rotate command, offset command, Mirror and Scale, Trim and extend, Erase, Explode and overkill, stretch command, Break and Join, Fillet and chamfer, Practice Question and examples) [6 hrs.]</p> <p>Status bar toggles: (Grid and Snap, Polar and Ortho mode, Dynamic input, Simple object snaps, more object snaps, more status bar options, Practice Question and examples). [3 hrs.]</p>

Drawing Tools: (Rectangular array, Polar array, Path array, Divide and measure, using multifunction grips, align command, Finding Distance, Radius, angle and coordinates, Finding area, Centerline and center mark tools, Region and Boolean operations, Practice Question and examples). [6 hrs.]

Drawing properties: (Assigning object color and Linetype, assigning lineweight and transparency, checking object properties, modifying properties using CHPROP command, Model space viewports, Creating named views, Practice Question and examples). [3 hrs.]

Hatch and gradient: (Creating basic hatches, set origin and Associative hatch, using advance hatch features, Boundary and wipeout features, creating gradients, Practice Question and examples). [3 hrs.]

Managing drawing with layers: (Creating and assigning layers, using layer properties manager, working with layer states and Layer walk, working with layer filters, Quick access layer tools, Hiding and isolating objects, Practice Question and examples). [3 hrs.]

Dimensioning and annotations: (Creating basic dimensions, DIM command, modifying dimensions, creating dimension style, creating dimension style override, Continue, Baseline and ordinate dimensions, adding tolerances and dual dimensioning, adding feature control frame, creating multileader, modifying multileader, Creating Multileader style, Practice Question and examples). [3 hrs.]

Isometric drawing and projections: (Making Isometric drawing, create dimensions for Isometric drawing, Making projections drawing, Practice Question and examples). [6 hrs.]

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 Lab, while at the same time refining and expanding their critical thinking and imagination skills. This will be achieved through practicing, interactive examples and by considering type of simple experiments involving some sampling activities that are interesting to the students.
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.8
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	4	40% (40)	3-7, 9-15	All
	Assignments	-	-	-	-
	Projects / Lab.	-	-	-	-
	Report	-	-	-	-
Summative assessment	Midterm Exam	1 hr	10% (10)	8	LO # 1-4
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction & user interface
Week 2	Lab 2: Creating Drawings #1
Week 3	Lab 3: Creating Drawings #2
Week 4	Lab 4: Modifying Drawing #1
Week 5	Lab 5: Modifying Drawing #2
Week 6	Lab 6: Status bar toggles
Week 7	Lab 7: Drawing Tools #1
Week 8	Mid-term Exam
Week 9	Lab 8: Drawing Tools #2
Week 10	Lab 9: Drawing properties
Week 11	Lab 10: Hatch and gradient
Week 12	Lab 11: Managing drawing with layers
Week 13	Lab 12: Dimensioning and annotations
Week 14	Lab 13: Isometric drawing
Week 15	Lab 14: Projections
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Tutorial guide to AutoCAD 2013, Shawna Lockhart	online
Recommended Texts	AutoCAD 2021 Beginning and Intermediate, M. HAMAD	online
Websites	https://www.dijlabookshop.com	

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 PROGRAMMING		Module Delivery
Module Type	S		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOBE102		
ECTS Credits	2		
SWL (hr/sem)	125		
Module Level	1 1	Semester of Delivery	1
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
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

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. Introduce C++ Programming: Familiarize students with the fundamentals of C++ programming language, including syntax, data types, variables, operators, and control structures.2. Develop Problem-Solving Skills: Cultivate students' problem-solving abilities by providing them with opportunities to analyze problems, design algorithms, and implement solutions using C++.3. Build a Strong Foundation: Establish a solid foundation in C++ programming concepts, such as functions, arrays, loops, conditionals, and file handling, to enable students to write efficient and reliable code.4. Encourage Object-Oriented Programming (OOP) Concepts: Introduce students to the principles of object-oriented programming, including classes, objects, inheritance, polymorphism, and encapsulation. Enable them to design and implement object-oriented solutions using C++.5. Foster Software Development Practices: Promote good software development practices, such as code modularity, reusability, readability, and documentation. Emphasize the importance of writing clean and well-structured code.6. Enhance Debugging and Troubleshooting Skills: Develop students' ability to identify and debug programming errors, utilize debugging tools, and apply effective troubleshooting strategies in C++ programs.7. Foster Algorithmic Thinking: Nurture students' algorithmic thinking skills by exposing them to different algorithms and data structures commonly used in C++ programming. Enable them to choose appropriate algorithms for specific tasks.8. Promote Collaboration and Teamwork: Encourage students to collaborate with their peers, engage in group projects, and participate in coding discussions. Enhance their ability to work effectively in a team environment.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1. Demonstrate a solid understanding of the fundamental concepts of C++ programming, including variables, data types, operators, control structures, and functions.2. Design and implement C++ programs that solve a variety of problems, applying appropriate algorithms and data structures.3. Utilize object-oriented programming principles to design and develop C++ programs, including class hierarchies, inheritance, polymorphism, and encapsulation.4. Apply debugging techniques and troubleshoot errors in C++ programs, effectively using debugging tools and strategies.5. Write clean, well-structured, and readable code following established coding standards and best practices.6. Utilize file handling mechanisms to read from and write to files in C++ programs, ensuring proper data input/output operations.

	<ol style="list-style-type: none"> 7. Analyze and evaluate the efficiency and complexity of algorithms used in C++ programs, making informed choices based on performance considerations. 8. Collaborate effectively in a team setting, participating in group projects and actively contributing to coding discussions and problem-solving activities. 9.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> 1. Introduction to C++ Programming: <ul style="list-style-type: none"> • History and features of C++ • Setting up a C++ development environment • Basic syntax, variables, and data types in C++ 2. Control Structures and Functions: <ul style="list-style-type: none"> • Decision-making structures (if, else, switch) • Looping structures (for, while, do-while) • Functions: declaration, definition, parameters, and return values • Example function: Calculate the factorial of a number. 3. Arrays, matrices, and Pointers: <ul style="list-style-type: none"> • Arrays and matrices: declaration, initialization, and manipulation • Pointers: memory concepts, pointer arithmetic, and dynamic memory allocation • Example: Find the sum of elements in an array using pointers 4. Object-Oriented Programming (OOP) Basics: <ul style="list-style-type: none"> • Introduction to OOP concepts • Classes and objects: member variables, member functions, and constructors • Inheritance: derived classes, base classes, and polymorphism • Encapsulation and data hiding • Example: Create a class representing a student with relevant attributes and behaviors 5. Advanced C++ Concepts: <ul style="list-style-type: none"> • Templates and generic programming • Exception handling and error management • Standard Template Library (STL) containers and algorithms • Example: Use templates to create a generic sorting function 6. Debugging and Troubleshooting: <ul style="list-style-type: none"> • Debugging techniques and tools • Common errors and their resolution in C++ programs • Effective troubleshooting strategies • Example: Debug and fix a program that crashes due to a null pointer exception 7. Algorithm Analysis and Data Structures: <ul style="list-style-type: none"> • Time and space complexity analysis • Basic data structures: arrays, linked lists, stacks, queues

- Searching and sorting algorithms
- Example: Implement a binary search algorithm on a sorted array

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

Learning and teaching strategies for learning C++ in the first year of college can vary depending on the institution's specific curriculum and teaching approach. However, here are some effective strategies that can be applied:

1. **Structured Curriculum:** Start with a well-structured curriculum that introduces C++ concepts gradually, starting from the basics and progressing to more advanced topics. The curriculum should include a balance of theory and hands-on practice.
2. **Active Learning:** Encourage active learning by providing opportunities for students to actively engage with the material. This can include hands-on coding exercises, problem-solving tasks, and projects that require the application of C++ concepts.
3. **Practical Examples:** Use practical examples and real-world scenarios to illustrate the application of C++ concepts. That helps students understand the relevance and importance of the language in real-life situations.
4. **Collaborative Learning:** Encourage collaborative learning by incorporating group projects and activities. That allows students to work together, share knowledge, and learn from each other's experiences.
5. **Code Review and Feedback:** Regularly review students' code and provide constructive feedback. That helps students identify and correct mistakes, improving their understanding and coding skills.
6. **Coding Challenges:** Introduce coding challenges or competitions to motivate students and provide them with opportunities to apply their knowledge and problem-solving skills. That can help foster a sense of achievement and encourage further learning.
7. **Resources and References:** Provide a list of recommended resources and references such as textbooks, online tutorials, coding platforms, and documentation. These resources can serve as additional references for students to explore topics in-depth and reinforce their understanding.
8. **Practical Projects:** Assign practical projects that require students to apply C++ concepts to solve real-world problems. These projects can help students develop their problem-solving skills and gain hands-on experience with C++ development.
9. **Regular Assessments:** Conduct regular assessments to evaluate students' understanding of C++ concepts and their ability to apply them. That can include quizzes, exams, and coding assignments.
10. **Support and Guidance:** Offer support and guidance through office

	hours, online forums, or tutoring sessions. That helps students clarify doubts, seek assistance, and overcome challenges they may face during learning.
--	---

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered

Week 1	Introduction to programming language
Week 2	Data types and expression, string, Control Flow
Week 3	<p>Introduction to Switch Statements:</p> <ul style="list-style-type: none"> • Exploring the purpose and syntax of the switch statement. • Understanding the concept of a switch expression and case labels. • Discussing the execution flow and the use of the break statement within a switch statement.
Week 4	<p>Introduction to if Statements:</p> <ul style="list-style-type: none"> • Understanding the purpose and syntax of the if statement. • Exploring the conditional execution of code based on a specified condition. • Discuss the use of comparison operators and logical operators in if statements. <p>if-else Statements:</p> <ul style="list-style-type: none"> • Introducing the if-else statement as an extension of the if statement. • Understanding the execution flow when the condition in the if statement is true or false. • Discuss nested if-else statements and multiple if-else if-else constructs.
Week 5	<p>Introduction to While Loop:</p> <ul style="list-style-type: none"> • Understanding the purpose and syntax of the while loop. • Exploring the condition-based repetition of code in a while loop. • Discussing the order of execution and flow of control within a while loop. <p>Loop Variables and Sentinel-Controlled Loops:</p> <ul style="list-style-type: none"> • Introducing loop variables and their role in controlling the execution of the while loop. • Discuss sentinel-controlled loops, where the loop continues until a specific value is encountered. • Demonstrating how to use a loop variable and the sentinel value to control the repetition process. <p>Introduction to Do/While Loop:</p> <ul style="list-style-type: none"> • Exploring the purpose and syntax of the do/while loop. • Understanding the difference between a do/while loop and a regular while loop. • Discussing the execution flow and the use of the do/while loop in situations where the code must be executed at least once. <p>Loop Control Statements:</p> <ul style="list-style-type: none"> • Introducing loop control statements that allow for more control over the flow of execution within a loop. • Discuss the break statement to terminate the loop prematurely. • Exploring the continue statement to skip the rest of the current iteration and proceed to the next iteration. <p>Practical Applications:</p> <ul style="list-style-type: none"> • Applying the while loop and the do/while loop to solve practical programming problems. • Using a while loop for indefinite repetition and handling user input validation. • Utilizing a do/while loop for menu-driven programs and repetitive calculations.

<p>Week 6</p>	<p>Introduction to For Loop:</p> <ul style="list-style-type: none"> • Understanding the purpose and syntax of the for loop. • Exploring the three components of a for loop: initialization, condition, and iteration. • Discussing the order of execution and flow of control within a for loop. <p>Loop Variables and Counter-Controlled Loops:</p> <ul style="list-style-type: none"> • Introducing loop variables and their role in controlling the execution of the for loop. • Discussing the concept of counter-controlled loops, where the number of iterations is known in advance. • Demonstrating how to use a loop variable to control the iteration process.
<p>Week 7</p>	<p>Mid-term Exam</p>
<p>Week 8</p>	<p>Introduction to Arrays:</p> <ul style="list-style-type: none"> • Understanding the purpose and concept of arrays in programming. • Exploring the syntax for array declaration, initialization, and accessing array elements. • Discussing the properties of arrays, such as size, index, and element storage. <p>One-Dimensional Arrays:</p> <ul style="list-style-type: none"> • Introducing one-dimensional arrays and their use in storing and accessing a collection of elements. • Understanding how to declare and initialize one-dimensional arrays. • Exploring various operations on one-dimensional arrays, such as reading and modifying array elements, traversing the array, and performing calculations.
<p>Week 9</p>	<p>Introduction to Matrices:</p> <ul style="list-style-type: none"> • Understanding the concept and properties of matrices. • Exploring the syntax for declaring and initializing matrices. • Discussing the indexing and accessing of elements in a matrix. <p>Matrix Operations:</p> <ul style="list-style-type: none"> • Performing arithmetic operations on matrices, such as addition, subtraction, and multiplication. • Discussing the rules and requirements for matrix operations. • Exploring element-wise operations versus matrix-level operations. <p>Matrix Manipulation:</p> <ul style="list-style-type: none"> • Transposing a matrix by interchanging rows and columns. • Understanding the concept of matrix inversion. • Exploring techniques for matrix manipulation, such as finding the determinant and solving systems of linear equations.
<p>Week 10</p>	<p>Matrix Algorithms and Applications:</p> <ul style="list-style-type: none"> • Implementing matrix algorithms, including matrix multiplication and matrix exponentiation. • Applying matrices in various applications, such as image processing, computer graphics, and data analysis.

	<ul style="list-style-type: none"> • Discussing the importance of matrices in solving real-world problems. <p>Practical Examples:</p> <ul style="list-style-type: none"> • Applying matrix operations and manipulations to solve practical programming problems. • Performing matrix calculations for tasks such as data transformation, linear transformations, or solving systems of equations. • Utilizing matrices for tasks such as image filtering, rotation, or transformation.
Week 11	<p>Function Declaration and Definition:</p> <ul style="list-style-type: none"> • Reviewing the concept of functions and their purpose in programming. • Understanding the syntax for a function declaration, including the return type, function name, and parameter list. • Exploring different ways to define functions and their respective scopes.
Week 12	<p>Introduction to Flowcharts:</p> <ul style="list-style-type: none"> • Understanding the purpose and benefits of using flowcharts in program design. • Exploring the basic symbols and conventions used in flowchart construction. • Discussing the importance of clarity, simplicity, and readability in creating flowcharts. <p>Flowchart Symbols and Constructs:</p> <ul style="list-style-type: none"> • Introducing the various symbols and constructs used in flowcharts, such as start/end symbols, process symbols, decision symbols, and connector symbols. • Understanding the meaning and usage of each symbol in representing program logic. • Discussing the rules and guidelines for connecting symbols and creating the flow of control. •
Week 13	<p>Control Structures in Flowcharts:</p> <ul style="list-style-type: none"> • Representing control structures, such as sequence, selection, and iteration, in flowcharts. • Demonstrating the use of conditional statements (if, switch) and loops (while, for) in flowchart representation. • Discuss the different ways to illustrate branching and looping constructs in flowcharts. <p>Flowchart Design Techniques:</p> <ul style="list-style-type: none"> • Exploring techniques for breaking down complex problems into manageable steps in a flowchart. • Discussing the importance of modular design and subroutines in creating structured and modular flowcharts. • Demonstrating the use of hierarchy and nesting in flowcharts to represent complex program logic.
Week 14	<p>Introduction to Object-Oriented Programming:</p> <ul style="list-style-type: none"> • Understanding the basic principles and concepts of object-oriented programming.

	<ul style="list-style-type: none"> • Exploring the advantages and benefits of using OOP in software development. • Discussing the differences between procedural programming and object-oriented programming. <p>Classes and Objects:</p> <ul style="list-style-type: none"> • Introducing classes as blueprints for creating objects. • Understanding the structure of a class, including data members and member functions. • Discussing the concept of objects as instances of a class and the process of object creation.
Week 15	<p>Encapsulation and Data Hiding:</p> <ul style="list-style-type: none"> • Exploring the concept of encapsulation and its role in OOP. • Understanding the access modifiers (public, private, protected) and their impact on class members. • Discussing the importance of data hiding and information hiding for achieving encapsulation. <p>Inheritance:</p> <ul style="list-style-type: none"> • Introducing inheritance as a mechanism for creating new classes based on existing ones. • Understanding the concepts of base class, derived class, and inheritance hierarchy. • Exploring different types of inheritance, such as single inheritance and multiple inheritance.
Week 16	The preparatory week before the Final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Recommended Texts	<ul style="list-style-type: none"> • "C++ Primer" by Stanley B. Lippman, Josée Lajoie, and Barbara E. Moo. • "Programming: Principles and Practice Using C++" by Bjarne Stroustrup. • "Effective Modern C++" by Scott Meyers. • "C++ How to Program" by Paul Deitel and Harvey Deitel. 	No
Online Tutorials and Courses:	<p>Codecademy: Offers interactive C++ courses for beginners.</p> <p>Udemy: Provides a wide range of C++ courses for different levels of expertise.</p> <p>Coursera: Offers online courses on C++ programming from renowned universities.</p>	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	DIGITAL TECHNIQUES		Module Delivery
Module Type	CORE		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	EE406		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGI	Semester of Delivery	2
Administering Department	EE	College	COE
Module Leader	Nadia Qassim Mohammed		e-mail Nadia.qasim@coeng.uobaghdad.edu.i q
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	N.A.		e-mail N.A.
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	6-2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. Develop understanding and application of digital techniques in various fields.2. Foster problem-solving skills and logical reasoning in digital circuit design and analysis.3. Enhance practical skills in implementing and troubleshooting digital circuits.4. Promote the application of sequential logic circuits in building sequential systems.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1. understanding of number systems, arithmetic operations, Boolean algebra, and logic gates.2. Ability to design and analyze digital circuits using Karnaugh maps, Quine McClusky method, and flip-flops.3. Practical skills in implementing circuits such as adders, encoders, multiplexers, counters, and shift registers.4. Problem-solving and logical reasoning in complex digital circuit problems and optimization.5. Application of sequential logic circuits in counters, shift registers, and practical systems.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>The indicative contents of the Power Electronics and Special Machines module may include the following topics:</p> <ol style="list-style-type: none">1. Number systems, binary representation, and arithmetic operations.2. Logic gates, Boolean algebra, and simplification techniques.3. Design and analysis of arithmetic circuits.4. Implementation of encoders, decoders, multiplexers, and demultiplexers.5. Digital comparators and common logic circuits.6. Sequential logic circuits, including flip-flops and counters.7. Shift registers and their applications.8. Analysis and design of synchronous and asynchronous counters.9. Up/down counters and decade counters.10. Introduction to specialized counters (ring counters, Johnson counters, etc.).11. Application of sequential logic circuits in practical systems.

--	--

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Digital techniques module can be taught using various effective teaching strategies. These strategies include traditional lectures to convey theoretical concepts, , case studies to illustrate real-world applications, group discussions to foster collaboration, computer simulations to simulate and analyze systems, and online resources for additional learning materials. By incorporating these strategies, educators can create an engaging learning environment that promotes understanding, application, and critical thinking skills in Digital techniques.
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.13
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	8	20% (20)	2, 3, 4, 5, 8, 11, 14, 15	LO #1,2,3,4,5,6
	Assignments	15	10% (10)	Each week	LO # 1-8
	Projects / Lab.	0	0% (0)	N.A.	N.A.

	Report	0	10% (10)	N.A.	N.A.
Summative assessment	Midterm Exam	3 hrs	10% (10)	7	LO # 1-2
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Common number systems (Binary, Octal, Decimal, Hexadecimal, Numbers base conversion) Sign magnitude binary representation & complements of numbers.
Week 2	Arithmetic operations in(Binary, BCD, Octal, Hexadecimal systems) Binary codes (BCD, Excess-3, Gray, etc.), Error Detecting & Correcting codes.
Week 3	Logic gates & universal building blocks. Fundamentals of Boolean algebra
Week 4	Minterms & Maxterms in Boolean S.O.P. AND P.O.S. Expressions. Karnaugh maps (2, 3, 4 & 5 variables) & Don't care conditions.
Week 5	Quine McClusky method. Design of Parity Generators / Checkers.
Week 6	Design & Applications of Encoders and Decoders. Design & Applications of Multiplexers & De-multiplexers.
Week 7	Design of Digital Comparators. Design of some common logic circuits.
Week 8	Introduction to Sequential Logic Circuits.

	SR Flip Flops.
Week 9	D, JK, and T Flip Flops. Flip Flop Triggering, Edge – Triggered Flip Flops.
Week 10	Master / Slave Flip Flops. Conversion from One Type of Flip Flop to Another.
Week 11	Analysis of Asynchronous Counters. Design of Asynchronous Counters.
Week 12	Analysis of Synchronous Counters. Design of Synchronous Counters.
Week 13	Up / Down Counters. Decade counter, Shift Registers.
Week 14	Common Types of Counters (Ring Counters, Johnson Counters, etc.).
Week 15	Some Applications of Sequential Logic Circuits.
Week	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Logic Gates
Week 2	Combinational logic circuits
Week 3	Parity Generation / checkers
Week 4	Magnitude comparator
Week 5	Arithmetic operations
Week 6	Code conversion
Week 7	Decoder and encoder
Week 8	Multiplexer and DE multiplexer
Week 9	Sequential logic circuits
Week 10	Counters
Week 11	Shift registers

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<input type="checkbox"/> digital-design-4th-ed-m-morris-mano	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 is required but credit awarded
	F - Fail	راسب	(0-44)	A 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	ELECTRICAL ENGINEERING LAB. I		Module Delivery
Module Type	CORE		<input type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	EE106		
ECTS Credits	11		
SWL (hr/sem)	275		
Module Level	1 1	Semester of Delivery	2
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
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	UOBE102	Semester	1
Co-requisites module	EE107	Semester	2

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. Develop a strong foundation in electrical circuit concepts and principles, enabling students to understand and analyze various electrical circuits.2. Enhance practical skills through hands-on experience, allowing students to apply theoretical knowledge in experimental setups and accurately measure circuit parameters.3. Foster critical thinking and problem-solving abilities by interpreting experimental results, comparing them with theoretical predictions, and analyzing circuit behavior.4. Promote a safety-conscious mindset and adherence to laboratory protocols, ensuring a secure and responsible environment for electrical circuit experimentation.5. Develop a solid understanding of C++ programming fundamentals and object-oriented principles:<ol style="list-style-type: none">a. Gain proficiency in core concepts such as variables, data types, control structures, functions, classes, and objects.b. Apply object-oriented programming principles including inheritance, polymorphism, and encapsulation.6. Enhance problem-solving and algorithmic thinking skills in the context of C++ programming:<ol style="list-style-type: none">a. Learn to solve a variety of problems using appropriate algorithms and data structures.b. Analyze and evaluate the efficiency and complexity of algorithms in C++ programs.7. Cultivate effective coding practices and debugging techniques:<ol style="list-style-type: none">a. Emphasize writing clean, well-structured code following coding standards and best practices.b. Develop skills in debugging and troubleshooting to identify and fix errors in C++ programs.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">10. Electrical Circuit Analysis:<ol style="list-style-type: none">a. Apply laws and theorems to analyze and solve electrical circuits.b. Calculate and interpret circuit parameters accurately.c. Understand circuit behavior in resonance and AC circuits.

	<p>11. Measurement and Experimental Skills:</p> <ol style="list-style-type: none"> Use measurement instruments effectively. Perform accurate measurements and interpret results. Develop practical skills in experimental setup and troubleshooting. <p>12. Diode Characteristics and PN Junctions:</p> <ol style="list-style-type: none"> Understand diode behavior and characteristics. Measure and analyze diode properties. Gain knowledge of diode applications in circuits. <p>13. Data Analysis and Interpretation:</p> <ol style="list-style-type: none"> Analyze experimental data and draw conclusions. Evaluate data accuracy and reliability. Enhance skills in data-driven decision-making. <p>14. Solid Understanding of C++ Fundamentals:</p> <ol style="list-style-type: none"> Demonstrate comprehension of variables, data types, control structures, and functions in C++ programming. <p>15. Application of Object-Oriented Programming Principles:</p> <ol style="list-style-type: none"> Utilize inheritance, polymorphism, and encapsulation to design and implement C++ programs with class hierarchies. <p>16. Effective Troubleshooting and Debugging Skills:</p> <ol style="list-style-type: none"> Apply debugging techniques and strategies to identify and fix errors in C++ programs, ensuring program stability and correctness. <p>17. Proficient Coding Practices and Algorithm Analysis:</p> <ol style="list-style-type: none"> Write clean and well-structured code following coding standards and best practices. Analyze and evaluate the efficiency and complexity of algorithms used in C++ programs, making informed choices for optimal performance. <p>18.</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A</u></p> <ol style="list-style-type: none"> Experimental Concepts and Techniques: <ul style="list-style-type: none"> Introduction to fundamental electrical circuit concepts such as Ohm's law, Kirchhoff's laws, superposition, Thevenin's theorem, Norton's theorem, and PN diode characteristics. Hands-on experience with measurement instruments, including ammeters, voltmeters, and oscilloscopes, to perform accurate

	<p>measurements and validate theoretical concepts.</p> <p>2. Practical Circuit Analysis and Application:</p> <ul style="list-style-type: none"> • Application of theoretical knowledge in experimental setups to verify and analyze electrical circuits. • Interpretation of experimental results, comparison with theoretical predictions, and understanding the practical implications of circuit behavior. <p>In summary, the indicative contents encompass understanding and applying fundamental circuit concepts, hands-on experience with measurement instruments, practical circuit analysis, and relating experimental results to theoretical concepts.</p> <p>Part B</p> <p>1. Core C++ Programming Concepts:</p> <ul style="list-style-type: none"> • Introduction to C++ programming: history, features, and basic syntax. • Variables, data types, control structures, functions, arrays, matrices, and pointers. • Object-oriented programming (OOP) basics: classes, objects, inheritance, polymorphism, encapsulation. • Advanced C++ concepts: templates, exception handling, and the Standard Template Library (STL). <p>2. Problem-Solving and Debugging Skills:</p> <ul style="list-style-type: none"> • Developing algorithmic thinking and problem-solving skills in the context of C++ programming. • Analyzing and evaluating algorithm efficiency and complexity. • Debugging techniques, common error resolution, and effective troubleshooting strategies.
--	--

<p>Learning and Teaching Strategies استراتيجيات التعلم والتعليم</p>	
<p>Strategies</p>	<p>The main strategy that will be adopted in delivering this module is to encourage the student</p> <ul style="list-style-type: none"> • To read the theoretical background of the experiments

	<ul style="list-style-type: none"> • Implementing the experiments in the Lab • Doing a report about the implemented experiment.
--	---

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	156	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	10
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	119	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	7.93
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	275		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	15% (15)	2, 4, 6, 8, 10, 12, 14	LO #1, 2, 10 and 11
	Assignments	0	0% (0)		LO # 3, 4, 6 and 7
	Projects / Lab.	1	0% (0)		
	Report	15	25% (25)	Every week	LO # 5, 8 and 10
Summative assessment	Midterm Exam	6 hr	10% (10)	8	LO # 1-7
	Final Exam	6hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered

Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
	Ohm's Law Verification
Week 1	Week 1: Introduction to C++ Programming Lab Experiment 1: Setting up a C++ Development Environment
	Kirchhoff's laws
Week 2	Week 2: Control Structures and Functions Lab Experiment 2: Decision-Making Structures (if, else, switch)

	Lab Experiment 3: Looping Structures (for, while, do-while)
Week 3	Measurement Instruments
	Week 3: Arrays and Pointers Lab Experiment 4: Array Manipulation Lab Experiment 5: Introduction to Pointers
Week 4	Superposition Theorem
	Week 4: Functions and Parameters Lab Experiment 6: Function Declaration and Definition Lab Experiment 7: Function Parameters and Return Values
Week 5	Thevenin's Theorem.
	Week 5: Object-Oriented Programming (OOP) Basics Lab Experiment 8: Class and Object Creation Lab Experiment 9: Inheritance and Polymorphism
Week 6	Norton's Theorem.
	Week 6: Encapsulation and Data Hiding Lab Experiment 10: Encapsulation in Classes Lab Experiment 11: Data Hiding Techniques
Week 7	Finding internal resistance for voltage source
	Week 7: Dynamic Memory Allocation and Pointers Lab Experiment 12: Dynamic Memory Allocation Lab Experiment 13: Pointer Arithmetic and Array Access
Week 8	Mid-term Exam
Week 9	Measurement of Coil Inductance

	<p>Week 8: Exception Handling and Error Management</p> <p>Lab Experiment 14: Exception Handling in C++</p>
Week 10	<p>Operation of an oscilloscope and how to be use</p>
	<p>Week 9: File Handling and Data Input/Output</p> <p>Lab Experiment 15: File Input and Output Operations</p>
Week 11	<p>Phase Relations of the Alternating Current</p>
	<p>Week 10: Templates and Generic Programming</p> <p>Lab Experiment 16: Templates in C++</p>
Week 12	<p>Phasor Diagram for RLC Series Circuit and Power Factor Calculation</p>
	<p>Week 11: Standard Template Library (STL)</p> <p>Lab Experiment 17: STL Containers</p> <p>Lab Experiment 18: STL Algorithms</p>
Week 13	<p>Series and Parallel Resonance</p>
	<p>Week 12: Debugging and Troubleshooting</p> <p>Lab Experiment 19: Debugging Techniques and Tools</p>
Week 14	<p>Series and Parallel Resonance</p>
	<p>Week 13: Algorithm Analysis and Data Structures</p> <p>Lab Experiment 20: Time and Space Complexity Analysis</p>
Week 15	<p>PN diode characteristics</p>

	<p>Week 14: Recap and Review</p> <p>Lab Experiment 21: Comprehensive Programming Project</p> <p>Lab Experiment 22: Recap and Review Session</p>
Week 16	Review the module experiments

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education "C++ Primer" by Stanley B. Lippman, Josée Lajoie, and Barbara E. Moo. "Programming: Principles and Practice Using C++" by Bjarne Stroustrup. 	No
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	ENGLISH I	Module Delivery	
Module Type	BASIC	<input checked="" type="checkbox"/> Theory Lecture Lab <input type="checkbox"/> Tutorial Practical <input type="checkbox"/> Seminar	
Module Code	UOBE103		
ECTS Credits	2		
SWL (h/sem)	50		
Module Level	1	Semester of Delivery	1
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr. Rabab Hameed Shghedl	e-mail	dr.rababaldarraj@coeng.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	PhD
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date		Version Number	

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

<p>Module Aims أهداف المادة الدراسية</p>	<p>The aim of this course is to empower students with the language and life skills they need to carry out their goals. To this end it provides ample opportunities for students to build awareness and practice language in real-life scenarios. The integrated skills approach of the course develops the student's self-confidence to survive and succeed in professional and social encounters within an English-speaking global community.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>BY THE END OF THIS COURSE, THE STUDENTS WILL:</p> <p>(1) FIND AND UNDERSTAND INFORMATION ABOUT VOCABULARY, PRONUNCIATION, USAGE, AND GRAMMAR IN REFERENCE TEXTS, ONLINE RESOURCES, AND ENGLISH LANGUAGE DICTIONARIES,</p> <p>(2) DEVELOP CONVERSATIONAL ENGLISH SKILLS NECESSARY FOR BECOMING A CONTRIBUTING PARTICIPANT IN SMALL GROUP ACTIVITIES, LARGE GROUP DISCUSSIONS, AND ORAL PRESENTATIONS,</p> <p>(3) UNDERSTAND TEXTS USING EFFECTIVE LEARNING STRATEGIES FOR READING AND VOCABULARY BUILDING,</p> <p>(4) DEMONSTRATE AN APPROPRIATE LEVEL OF CONTROL OF GRAMMATICAL ACCURACY AND LEXICAL APPROPRIACY IN WRITTEN AND ORAL COMMUNICATION</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Listening , Speaking, Reading and Writing</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p>Strategies</p>	<p>Lectures and classroom discussions</p>
--------------------------	---

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem): الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w):75 الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem); الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w);14 الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem): الحمل الدراسي الكلي للطالب خلال الفصل	50		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered

Week 1	Units 1 and 2
Week 2	Units 3 and 4
Week 3	Unit 5
Week 4	Unit 6
Week 5	English for Specific Purposes
Week 6	Units 7
Week 7	Mid Term Exam
Week 8	Unit 8
Week 9	Unit 9
Week 10	Unit 10
Week 11	Unit 11
Week 12	English for Specific Purposes
Week 13	Unit 12
Week 14	Unit 13
Week 15	Unit 14
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	(1) <u>New Headway Plus</u> [Beginner] by John and Liz Soars, Oxford: Oxford University Press (2006) (2) Modern scientific articles from the news related to the students' specialty	No
Recommended Texts	None	No
Websites	Internet links and videos related to the topics discussed in General English and English for Specific Purposes lectures will be shared with students.	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	FUNDAMENTALS OF ELECTRICAL ENGINEERING		Module Delivery
Module Type	CORE	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	EE107		
ECTS Credits	9		
SWL (hr/sem)	225		
Module Level	1	Semester of Delivery	2
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Salam J. Mohammed	e-mail	s.jassim@coeng.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
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

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. Understanding the fundamental concepts of electric circuits, including voltage, current, resistance, power, energy, and magnetic fields. 2. Analyzing and solving both DC and AC circuits, considering the behavior of circuit elements and their interactions. 3. Developing circuit analysis techniques and problem-solving skills, utilizing principles such as Ohm's law, Kirchhoff's laws, and circuit theorems. 4. Introducing magnetic circuits and their components, including magnetic materials, magnetic cores, coils, and magnetic circuit elements. 5. Analyzing and designing magnetic circuits, considering magnetic flux, reluctance, inductance, and their integration with electric circuits. 6. Exploring practical applications of electric and magnetic circuits in various systems.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. Knowledge: Understand the concepts and principles of electric circuits, including magnetic fields and circuit elements. 2. Analysis: Apply circuit analysis techniques to solve DC and AC circuits, as well as magnetic circuit analysis. 3. Design: Design and evaluate basic electric and magnetic circuits for specific applications. 4. Practical Skills: Perform laboratory experiments and utilize circuit simulation software to verify and analyze circuit behavior. 5. Application: Apply circuit theory to practical scenarios, recognizing the relevance of electric and magnetic circuits in real-world systems. 6. Communication: Effectively communicate circuit analysis results and collaborate with peers in project work. 7. Lifelong Learning: Embrace continuous learning, staying updated with advancements in electric and magnetic circuit technologies.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Part A – DC circuits</p> <p>DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [75 hrs]</p> <p>Part B-AC circuits</p> <ol style="list-style-type: none"> 1. Time dependent signals, average and RMS values. Capacitance and

inductance, energy storage elements, simple AC steady-state sinusoidal analysis.

2. AC Circuits - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers.

3. RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [75 hrs]

Part C- Magnetic circuits

1. Introduction to Magnetic Circuits:

2. Magnetic Materials:

Classification of magnetic materials (ferromagnetic, paramagnetic, diamagnetic), Magnetic properties of materials (magnetization curves, hysteresis loops), Magnetic permeability and its variations with different materials,

3. Magnetic Field Analysis:

Ampere's law and its application to magnetic circuits, Calculation of magnetic field intensity and flux density, Magnetic circuits with air gaps and their impact on magnetic field distribution

4. Magnetic Circuit Elements:

Magnetic cores and their types (e.g., laminated, solid, powdered), Magnetic coils (solenoids) and their role in magnetic circuits, Magnetic circuit components (e.g., yokes, poles, armatures)

5. Magnetic Circuit Analysis:

Calculation of magnetic flux and reluctance, Series and parallel magnetic circuits, Magnetic equivalent circuits and their use in analysis and design

6. Inductance and Magnetic Energy:

Inductance and mutual inductance in magnetic circuits, Calculation of inductance values, Energy storage in magnetic fields and its applications [75 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The Fundamentals of Electric Engineering module can be taught using various effective teaching strategies. These strategies include traditional lectures to convey theoretical concepts, , case studies to illustrate real-world applications, group discussions to foster collaboration, computer simulations to simulate and analyze systems, and online resources for additional learning materials. By incorporating these strategies, educators can create an engaging learning environment that promotes understanding, application, and critical thinking skills in power electronics and special machines. Top of Form</p>
-------------------	---

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	123	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	8
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	102	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	225		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	8	30% (30)	2, 3, 4, 5, 8, 11, 14, 15	LO #1,2,3,4,5,6
	Assignments	15	10% (10)	Each week	LO # 1-8

	Projects / Lab.	0	0% (0)	N.A.	N.A.
	Report	0	0% (0)	N.A.	N.A.
Summative assessment	Midterm Exam	3 hrs	10% (10)	7	LO # 1-2
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		100% (100 Marks)

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introducing the SI units, resistance resistivity and temperature coefficients of resistance.
Week 2	Series and parallel connections of resistances and Star/delta & delta/star transformation.
Week 3	Ohm's and Kirchhoff's law.
Week 4	D.C. networks theorems for dependent & independent source Substitution & reciprocity theorems.
Week 5	Circuit Analysis - Nodal and Mesh.
Week 6	Thevenin and Norton theorem.
Week 7	Superposition theorem and Maximum power transfer.
Week 8	Alternating voltage and current for Single phase circuits + Complex notations & phasor diagram.
Week 9	Network theorems for dependent & independent Source for A.C circuit.
Week 10	Thevenin and Norton theorem for A.C circuit.
Week 11	Superposition theorem and Power calculations.
Week 12	Power factor corrections.
Week 13	Resonance circuits.
Week 14	Magnetic circuits
Week 15	Hysteresis & eddy current losses + Basic electromagnetic self - inductance.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
Recommended Texts	Electric Circuits (James W. Nilsson, Susan A. Riedel)	Yes
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	FUNDAMENTALS OF MECHANICAL ENGINEERING	Module Delivery	
Module Type	BASIC	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	GE104		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1 1	Semester of Delivery	1
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
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

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. Introduce core principles and concepts of mechanical engineering in statics, dynamics, and thermodynamics.2. Develop analytical and problem-solving skills for engineering applications in mechanical systems.3. Foster design and evaluation capabilities for efficient and functional mechanical systems.4. Cultivate practical skills through hands-on experiments and data analysis.5. Highlight the relevance and societal impact of mechanical engineering.6. Enhance communication skills for effective presentation of engineering concepts and solutions.7. Promote lifelong learning and professional development in the field of mechanical engineering.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>Module Learning Outcomes for the fundamentals of Mechanical Engineering (Statics, Dynamics, and Thermodynamics):</p> <ol style="list-style-type: none">1. Knowledge: Understand fundamental concepts and principles of mechanical engineering, including statics, dynamics, and thermodynamics.2. Analysis and Problem-Solving: Apply statics, dynamics, and thermodynamics principles to analyze and solve engineering problems.3. Design and Evaluation: Design and evaluate mechanical systems considering equilibrium, motion, energy, and thermodynamic efficiency.4. Practical Skills: Apply mathematical and computational methods, conduct experiments, and analyze data in the context of mechanical engineering.5. Application and Relevance: Apply engineering principles to real-world problems, recognizing the importance and implications of mechanical engineering.6. Communication: Communicate effectively, presenting engineering concepts, analysis results, and design solutions.7. Lifelong Learning: Embrace continuous learning, staying updated with advancements in mechanical engineering and seeking further professional development.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p>

	<p>Part 1: Statics (Weeks 1-5)</p> <ul style="list-style-type: none"> • Introduction to Mechanical Engineering • Equilibrium of particles and rigid bodies • Truss and frame analysis • Friction and moments <p>Part 2: Dynamics (Weeks 6-10)</p> <ul style="list-style-type: none"> • Kinematics and dynamics of motion • Newton's laws and applications • Work, energy, and power • Impulse, momentum, and angular motion <p>Part 3: Thermodynamics (Weeks 11-15)</p> <ul style="list-style-type: none"> • Introduction to thermodynamics • Properties of substances • First and second laws of thermodynamics • Ideal gas laws and processes • Thermal cycles and heat transfer
--	---

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>Fundamentals of mechanical engineering module can be taught using various effective teaching strategies. These strategies include traditional lectures to convey theoretical concepts, , case studies to illustrate real-world applications, group discussions to foster collaboration, computer simulations to simulate and analyze systems, and online resources for additional learning materials. By incorporating these strategies, educators can create an engaging learning environment that promotes understanding, application, and critical thinking skills in mechanical engineering</p>

Student Workload (SWL) الحمل الدراسي للطالب	
---	--

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.47
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	9	30% (30)	2, 3, 4, 5, 7, 8, 11, 14, 15	LO #1, 2, 6 and 7
	Assignments	15	10% (10)	Each week	LO # 3, 4, 6 and 7
	Projects / Lab.	0	0% (0)	N.A.	
	Report	0	0% (0)	N.A.	LO # 5, 6 and 7
Summative assessment	Midterm Exam	3 hrs	10% (10)	7	LO # 1-7
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		100% (100 Marks)

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Part 1: Statics (Weeks 1-5) <ul style="list-style-type: none"> Introduction to Mechanical Engineering
Week 2	<ul style="list-style-type: none"> Concept of force and its representation
Week 3	<ul style="list-style-type: none"> Equilibrium of particles and rigid bodies
Week 4	<ul style="list-style-type: none"> Free-body diagrams and analysis of trusses and frames
Week 5	<ul style="list-style-type: none"> Moments and couples Friction and its effects

Week 6	Part 2: Dynamics (Weeks 6-10) <ul style="list-style-type: none"> • Kinematics: Rectilinear and curvilinear motion
Week 7	<ul style="list-style-type: none"> • Kinetics: Newton's laws of motion
Week 8	<ul style="list-style-type: none"> • Work, energy, and power
Week 9	<ul style="list-style-type: none"> • Impulse and momentum
Week 10	<ul style="list-style-type: none"> • Application of dynamics principles to mechanical systems • Application of dynamics principles to mechanical systems
Week 11	Part 3: Thermodynamics (Weeks 11-15) <ul style="list-style-type: none"> • Basic concepts and definitions of thermodynamics
Week 12	<ul style="list-style-type: none"> • Properties of pure substances
Week 13	<ul style="list-style-type: none"> • First law of thermodynamics: energy conservation and heat transfer • Ideal gas laws and processes
Week 14	<ul style="list-style-type: none"> • Second law of thermodynamics: entropy and heat transfer direction • Introduction to thermal cycles and heat engines
Week 15	<ul style="list-style-type: none"> • Refrigeration and heat pump cycles • Psychrometrics: properties of moist air and air conditioning systems
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Engineering Mechanics: Statics, Dynamics, and Thermodynamics" by R.C. Hibbeler	No
Recommended Texts	1. "Fundamentals of Engineering Thermodynamics" by Michael J. Moran, Howard N. Shapiro, Daisie D. Boettner, and Margaret B. Bailey 2. "Engineering Mechanics: Dynamics" by J.L. Meriam and L.G. Kraige 3. "Mechanical Engineering Design" by Joseph E. Shigley, Charles R. Mischke, and Richard G. Budynas	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	MATHEMATICS I		Module Delivery
Module Type	SUPPORT		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	GE101		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	1 1	Semester of Delivery	1
Administering Department	Type Dept. Code	College	Type College Code
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

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">8. Develop problem-solving skills by enabling students to identify and solve complex engineering problems using engineering, science, and mathematics principles.9. Foster engineering design abilities by providing opportunities for students to apply engineering principles and create solutions that meet specified needs, considering factors such as public health, safety, welfare, and global impacts.10. Enhance communication skills to effectively convey engineering concepts to diverse audiences and promote awareness of ethical and professional responsibilities in engineering, encouraging informed judgments with consideration of broader impacts.11. Promote teamwork and continuous learning by cultivating students' abilities to work collaboratively in teams, exhibit leadership, establish goals, and foster an inclusive environment. Additionally, it aims to instill a lifelong learning mindset, enabling students to acquire and apply new knowledge and skills using effective learning strategies.12. Develop a Strong Foundation in Integration: The course aims to establish a solid understanding of the fundamental concepts of integration, including the interpretation of integrals, the fundamental theorems of integral calculus, and the rules and techniques of integration.13. Foster Proficiency in Integration Techniques and Application: The course aims to develop students' proficiency in various integration techniques and enable them to apply them to solve real-world problems in mathematics, physics, engineering, and other scientific disciplines.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">19. Problem-Solving: The ability to identify and solve complex engineering problems by applying engineering, science, and mathematics principles.20. Engineering Design and Impact: The ability to design solutions that meet specific needs while considering public health, safety, welfare, and the broader global, cultural, social, environmental, and economic factors.21. Communication and Ethics: The ability to effectively communicate with diverse audiences and recognize ethical and professional

	<p>responsibilities in engineering, considering the impact of solutions in global, economic, environmental, and societal contexts.</p> <p>22. Teamwork and Learning: The ability to collaborate effectively in teams, provide leadership, and create a collaborative and inclusive environment, as well as the ability to acquire and apply new knowledge using appropriate learning strategies continuously.</p> <p>23. Integration Fundamentals: Gain a strong understanding of the fundamental concepts of integration, including the meaning and interpretation of integrals and their connection to differentiation.</p> <p>24. Integration Techniques: Develop proficiency in various integration methods, such as substitution, integration by parts, trigonometric substitution, and partial fractions.</p> <p>25. Numerical Integration: Acquire knowledge of numerical integration techniques and rules for approximating integrals numerically.</p> <p>26. Applications of Integration: Apply integration techniques to solve problems in real-world contexts, including physics, engineering, and other scientific disciplines.</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Part 1: Functions, Graphs, and Limits</p> <p>Part 2: Logarithms, Trigonometric Functions, and Conic Sections</p> <p>Part 3: Derivatives, Implicit Differentiation, and Curve Sketching</p> <p>Part 3: Integration, Fundamental Theorems, and Indefinite Integrals</p> <p>Part 4: Numerical Integration, Approximation Rules, and Methods of Integration</p> <p>Part 5: Trigonometric Integrals, Matrices, Determinants, and Vectors</p> <p>Part 6: Complex Variables, Applications of Integration</p>

<p>Learning and Teaching Strategies استراتيجيات التعلم والتعليم</p>	
<p>Strategies</p>	<p>The main strategy that will be adopted in delivering this module is to encourage</p>

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

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.13
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	Quizzes	8	30% (30)	2,3, 5,7,9,11,13, 15	LO #1, 2, 4,6 and 8
	Assignments	15	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	0	0% (0)	Continuous	
	Report	0	0% (0)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	3 hrs	10% (10)	7	LO # 1-7
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		100% (100 Marks)

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introductory Concepts to Functions Graphs of Functions
Week 2	Introductory Concepts to Limits Introductory Concepts to Continuity Assignment
Week 3	Introductory Concepts to Logarithms 6 Introductory Concepts to Natural Logarithm
Week 4	Introductory Concepts to Trigonometric Functions Introductory Concepts to Hyperbolic Functions and Conic Sections
Week 5	Introductory Concepts to Circles, Parabolas, Ellipses, Hyperbolas Derivatives of Trigonometric Functions
Week 6	Implicit Differentiation Fractional Powers
Week 7	Introduction to Curve Sketching with Y' And Y'' Introduction to Graphing Rational Functions
Week 8	Application of Differentiations
Week 9	Introductory Concepts to Integration The Fundamental Theorems of Integral Calculus
Week 10	Introductory Concepts to Indefinite Integrals Introductory Concepts to Numerical Integration
Week 11	Rules for Approximating Integrals Methods of Integration Part 1
Week 12	Methods of Integration Part 2 Methods of Integration Part 3
Week 13	Trigonometric Integral's Using Integral Table Mid-Term Exam
Week 14	Introductory Concepts to Matrices Introductory Concepts to Determinants
Week 15	Introduction to Vectors and Complex Variables Applications of Integration
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. "Thomas Calculus" G. Thomas, M. Weir, et al., 11th edition, 2004. 2. "Calculus II"; by Paul Dawkins, 2007. 3. "Engineering Mathematics", by John Bird, 5th edition, Elsevier Ltd., 2007. 4. "Engineering Mathematics", by K.A. Stroud, First edition, MACMILLAN and CO LTD, 1970.	Yes
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	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit

(0 – 49)				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	ELECTRONIC PHYSICS		Module Delivery
Module Type	CORE		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	EE108		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	1 1	Semester of Delivery	1
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	abdullah.zyarah@uob.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
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

<p>Module Aims أهداف المادة الدراسية</p>	<p>14. To learn about materials and electronic device's structure</p> <p>15. To understand the physical operation of electronic devices, particularly silicon-based devices.</p> <p>16. To use electronic devices effectively in the design of electrical circuits.</p> <p>17. To be able to perform the characterization and modeling of electronic devices, such as diodes, BJT transistors, etc.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>27. Understanding the physical properties and working principles of electronic devices.</p> <p>28. Applications of electronic devices across various domains</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Atomic structure and band theory; Electrical conduction in metals. [6 hrs]</p> <p>Semiconductor physics: Intrinsic semiconductor, doped semiconductor, current flow in semiconductor, the PN junction with open-circuit terminals, the PN junction with applied voltage, capacitive effects in the PN junction [54 hrs]</p> <p>Diode and its applications: The diode as a circuit element, the diode as a non-linear device, static and dynamic resistance of the diode , piece-wise linear equivalent circuits, clipping circuits, clamping circuits, rectifier circuits, voltage regulation and ripple factor, the harmonic components in rectifier circuits, inductive filters, capacitive filters, L-section filters, π-section filters, multiple L-section filters, D.C. power supplies, regulator circuits using zener diodes, regulator circuit stability, voltage multipliers. [70 hrs]</p> <p>Other devices: Light emitting diodes, solar cells, photo diodes, pin diodes, semiconductor lasers, thyristor basic C/CS, triggering the SCR, SCR turn-off, other devices structures. [4 hrs]</p> <p>Transistors: Device structure and physical operation of bipolar transistor (BJT), current-voltage characteristics, common base dc C/CS, common base amplifier, common emitter DC</p>

	<p>C/CS, low frequency, small signal model. [30 hrs]</p> <p>CMOS – Device structure and physical operation, CMOS – Current-voltage characteristics, MOS – MOSFET circuit at DC. [30 hrs]</p> <p>Electron Ballistics [6 hrs]</p>
--	---

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>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 type of simple experiments involving some sampling activities that are interesting to the students.</p>
-------------------	---

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.5
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	Quizzes	3	25% (25)	3, 7,10	LO #1, 2, 10 and 11
	Assignments	2	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	5% (5)	Continuous	
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Atomic structure and bonding theory
Week 2	Semiconductor physics – Intrinsic semiconductor, doped semiconductor
Week 3	Semiconductor physics – Current flow in semiconductors (drift and diffusion)
Week 4	Semiconductor physics – PN junction
Week 5	Semiconductor physics – Capacitive effects in PN junction
Week 6	Diodes – The ideal diode
Week 7	Diodes – Terminal characteristics of junction diodes
Week 8	Diodes–Operating in the reverse breakdown region + Zener
Week 9	Diodes – Clamping circuits + Diodes – Clipping circuits
Week 10	Diodes – Rectifier circuits + Diodes – Rectifier circuits + Other devices
Week 11	MOS – Device structure and physical operation
Week 12	MOS – MOSFET circuit at DC
Week 13	BJT – Device structure and physical operation
Week 14	BJT – Circuits at DC
Week 15	Electron Ballistics
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Sedra, Adel S. and Kenneth C. Smith, “ <i>Microelectronic circuits</i> ”, 7 th Edition, New York: Oxford University Press, 2015. ISBN.	Yes
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.