

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Mathematics		Module Delivery
Module Type	S		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	2101CET		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	3
Administering Department	CET	College	ETC
Module Leader	Jafar Saleh	e-mail	Jafar.Saleh@alayen.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Jafar Saleh	e-mail	Jafar.Saleh@alayen.edu.iq
Peer Reviewer Name	Asst. Prof. Ghadir Ibrahim Madi	e-mail	Ghadir.Ibrahim@alayen.edu.iq
Scientific Committee Approval Date	18/01/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CET1204	Semester	Two
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات البرنامجية	
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of probability theory. 2. To distinguish aspects of probability terminology. 3. This course deals with the basic concept of Statistics. 4. To understand graphical representation of data measures. 5. To perform Simple Linear Regression.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Basic terminology. 2. Describe Axioms for probability. 3. Discuss Conditional probabilities and independent events. 4. Explain random variable, Expectation and variance. 5. understand Bayes Theorem, PDF and CDF. 6. Define Expectation and variance of continuous random variables. 7. Identify Binomial, Poisson and Normal Distribution. 8. Discuss Joint and Marginal distributions aspects. 9. Discuss the Distributions of sums of independent random variables. 10. Explain Expectation and variance of sums of random variables, in addition to Covariance and correlation. 11. Describe Conditional expectation and Prediction. 12. Discuss Graphical Representation of frequency tables and charts, Measures of Central Tendency, and Dispersion. 13. Get acquainted with Relationship Modelling, Pearson's Correlation Coefficient. 14. Explain Significance of the correlation co-efficient and Simple Linear Regression. 15. Describe Chi Square test for association, Chi Square test of goodness of fit.
Indicative Contents المحتويات البرنامجية	<u>Part A - Probability</u> This part includes Sample spaces and events. Axioms for probability and their consequences. Conditional probabilities. Bayes' formula. Independent events. Definition of random variable. Discrete random variables. Expectation and variance. Bayes Theorem, Discrete Probability Distributions, The cumulative distribution function. Probability density function. Expectation and variance of continuous random variables. Binomial Distribution, Poisson Distribution, The Normal Distribution, Joint distribution functions. Marginal distributions. Independent random variables. Distributions of sums of independent random variables. Expectation and variance of sums of random variables. Covariance and correlation. Conditional expectation. Prediction. [33 hrs] + Revision problem classes in weekly tutorials [11 hrs] <u>Part B - Statistics</u> This part will take in details Graphical Representation - frequency tables and charts, Measures of Central Tendency, and Dispersion. Relationship Modelling, Pearson's Correlation Coefficient Significance of the correlation co-efficient, Simple Linear Regression Chi Square test for association, Chi Square test of goodness of fit [12 hrs] + Revision problem classes in weekly tutorials [4 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This module will primarily focus on encouraging students to participate in the activities, as well as refining and developing their critical thinking skills. This will be achieved through lectures, tutorials, discussions, and grading activities.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.13
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 #1-4 , LO #5-9
	Assignments	2	20% (10)	4, 11	LO # 1-3 , LO # 4- 10
	Projects / Lab.	N/A			
	Report	1	10% (10)	15	LO # 1-14
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

البرنامج الاسبوعي النظري

	Material Covered
Week 1	Basic terminology, Populations and Samples.
Week 2	Sample spaces and events. Axioms for probability and their consequences.
Week 3	Conditional probabilities. Bayes' formula. Independent events.
Week 4	Definition of random variable. Discrete random variables. Expectation and variance.
Week 5	Bayes Theorem, Discrete Probability Distributions, The cumulative distribution function.
Week 6	Probability density function. Expectation and variance of continuous random variables.
Week 7	Binomial Distribution, Poisson Distribution, The Normal Distribution
Week 8	Midterm Exam
Week 9	Joint distribution functions. Marginal distributions. Independent random variables. Distributions of sums of independent random variables.
Week 10	Expectation and variance of sums of random variables. Covariance and correlation.
Week 11	Conditional expectation. Prediction.
Week 12	Graphical Representation - frequency tables and charts, Measures of Central Tendency, and Dispersion.
Week 13	Relationship Modelling, Pearson's Correlation Co-efficient
Week 14	Significance of the correlation co-efficient, Simple Linear Regression
Week 15	Chi Square test for association, Chi Square test of goodness of fit
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Tutorial)

البرنامج الاسبوعي الاضافي

	Material Covered
Each week, a question sheet related to the material presented in the theoretical lecture will be solved and debated.	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Probability & Statistics for Engineers & Scientists", Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying E. Ye, Pearson Education, 9th edition, (August 19, 2016), ISBN-13:978-1292161365.	Yes
Recommended Texts	"Essential Mathematics and Statistics for Science", Graham Currell, Antony Dowman, Wiley, 2nd edition (June 22, 2009), ISBN-13:978-0470694480.	No

Websites

<https://users.cs.utah.edu/~jeffp/teaching/cs3130.html>

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 الرجعة)	(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	Object Oriented Programming		Module Delivery	
Module Type	S		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	2102CET			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	2	Semester of Delivery		3
Administering Department	CET	College	ETC	
Module Leader	maher ali ibrahim		e-mail	maher.ali.ibrahim@alayer.edu.iq
Module Leader's Acad. Title	Ass. professor		Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Mazen mohammad yousef		e-mail	Mazen.mohammad@alayer.edu.iq
Peer Reviewer Name	Dr. Bashar Hindawi Hewaidi		e-mail	bashar.hindawi@alayer.edu.iq
Scientific Committee Approval Date	18/01/2025	Version Number	1.0	

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	Programming Essentials / CET1203		Semester	2
Co-requisites module	None		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المهادة الدراسية ونتائج التعلم والمحتويات البرنامجية

Module Aims أهداف المهادة الدراسية	1. Understand and apply object-oriented programming principles. 2. Design and implement object-oriented solutions to programming problems. 3. Utilize C++ libraries and frameworks for application development. 4. Implement data abstraction and encapsulation for secure and efficient code. 5. Plan and execute testing strategies for reliable programs. 6. Debug and optimize program performance for efficient execution.
Module Learning Outcomes مخرجات التعلم للمهاده الدراسية	1. Demonstrate a clear understanding of object-oriented programming principles, including inheritance, polymorphism, and encapsulation. 2. Design and implement classes and objects to represent real-world entities, applying appropriate inheritance and encapsulation. 3. Utilize C++ libraries and frameworks effectively to develop robust and scalable applications. 4. Implement data abstraction and encapsulation techniques to ensure secure and efficient code. 5. Plan and execute comprehensive testing strategies to validate the functionality and reliability of object-oriented programs. 6. Identify and debug program errors using appropriate tools and techniques, enhancing program robustness. 7. Evaluate and optimize program performance through code analysis and profiling, improving execution efficiency. 8. Collaborate effectively with peers to develop object-oriented solutions to complex programming challenges. 9. Apply exception handling techniques to handle errors and ensure program stability. 10. Demonstrate proficiency in utilizing debugging tools to identify and fix program errors. 11. Apply object-oriented design patterns and principles to analyze and solve programming problems. 12. Evaluate the efficiency and effectiveness of object-oriented solutions through critical analysis and optimization techniques.
Indicative Contents المحتويات البرنامجية	Indicative content includes the following. <u>Part A: Introduction to Object-Oriented Programming (8 hours)</u> - Overview of object-oriented programming principles and concepts - Classes, objects, and their relationships - Inheritance and polymorphism - Encapsulation and data abstraction

Part B: Designing Object-Oriented Solutions (12 hours)

- Problem analysis and requirements gathering
- Identifying classes and objects
- Object-oriented design principles and patterns
- Designing class hierarchies and relationships
- UML diagrams for visualizing designs

Part C: Implementing Object-Oriented Solutions in C++ (20 hours)

- C++ language essentials for object-oriented programming
- Implementing classes and objects in C++
- Inheritance and polymorphism in C++
- Handling exceptions in C++
- Utilizing C++ libraries and frameworks

Part D: Testing and Debugging Object-Oriented Programs (12 hours)

- Testing methodologies and strategies
- Unit testing and test-driven development
- Integration testing and system testing
- Debugging techniques and tools
- Error handling and exception management

Part E: Optimization and Performance Analysis (8 hours)

- Profiling and performance analysis tools
- Identifying performance bottlenecks
- Optimization techniques for object-oriented programs
- Memory management and resource optimization

Part F: Collaborative Object-Oriented Programming (8 hours)

- Collaborative development environments and version control systems
- Code reviews and best practices
- Pair programming and team collaboration
- Communication and coordination in object-oriented projects

Part G: Project Work and Application Development (20 hours)

- Applying object-oriented principles and techniques in a practical project
- Developing a complete application using C++ and object-oriented design
- Project planning, implementation, and documentation
- Integration of various modules and testing the application

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The learning and teaching strategies for the Object-Oriented Programming Course include lectures to introduce concepts, practical exercises for hands-on programming, group discussions for collaboration, case studies for real-world application, code reviews for feedback, practical projects to apply knowledge, guest lectures for industry insights, online resources for self-study, assessments to evaluate understanding, and presentations to enhance communication skills. These strategies aim to actively engage students, develop their programming abilities, and foster a deep understanding of object-oriented programming principles.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.73
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5)	5,10	LO #1 - 4, LO #1 - 9
	Assignments	2	10% (10)	4,11	LO #1 - 3, LO #4 - 10
	Projects / Lab.	1	10% (10)	Continuous	LO #1 - 12
	Report	1	10% (10)	11	LO # 1- 10
Summative assessment	Midterm Exam	2 hrs.	10% (10)	7	LO # 1-6
	Final Exam	4hrs.	50% (50)	16	All

Total assessment	100% (100 Marks)		
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Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Object-Oriented Programming
Week 2	Classes, Objects, and Relationships
Week 3	Inheritance and Polymorphism principles
Week 4	Encapsulation and Data Abstraction
Week 5	Problem Analysis and Requirements Gathering
Week 6	Object-Oriented Design Principles and Patterns
Week 7	Mid-term Exam
Week 8	C++ Language Essentials and Advanced Topics
Week 9	Implementing Classes and Objects in C++
Week 10	Implementing Inheritance and Polymorphism in C++
Week 11	Handling Exceptions in C++
Week 12	Utilizing C++ Libraries and Frameworks
Week 13	Testing Methodologies and Strategies in C++
Week 14	Debugging Techniques and Tools in C++
Week 15	Optimization and Performance Analysis in C++
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الأسبوعي للمختبر

	Material Covered
Week 1	Introduction to C++ programming environment and basic syntax.
Week 2	Implementing simple classes and objects.
Week 3	Experimenting with inheritance and polymorphism in C++.
Week 4	Implementing data abstraction and encapsulation.
Week 5	Problem-solving exercise using object-oriented design principles and patterns.
Week 6	Utilizing C++ libraries and frameworks for application development.
Week 7	Midterm Exam (No lab session).
Week 8	Implementing exception handling techniques in C++.
Week 9	Testing and debugging strategies for object-oriented programs.
Week 10	Profiling and performance analysis of C++ programs.
Week 11	Code optimization techniques for object-oriented programming.
Week 12	Collaborative programming exercise utilizing version control systems.
Week 13	Implementing advanced data structures using object-oriented techniques.
Week 14	Project work and application development using object-oriented concepts.
Week 15	review and practice exercises, Preparatory for Final Exam.
Week 16	Final Exam (No lab session).

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Object-Oriented Programming in C++" by Robert Lafore	
Recommended Texts	"Design Patterns: Elements of Reusable Object-Oriented Software" by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides	
Websites	https://www.w3schools.com/cpp/cpp_oop.asp	

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 البعالة)	(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 Organization and Applications		Module Delivery	
Module Type	core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	2103CET			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		3
Administering Department	CET	College	ETC	
Module Leader	Bashar Hindawi Hewaidi		e-mail	bashar.hindawi@alayen.edu.iq
Module Leader's Acad. Title	Lecture	Module Leader's Qualification	Ph.D.	
Module Tutor	Dr. maher ali ibrahim		e-mail	maher.ali.ibrahim@alayen.edu.iq
Peer Reviewer Name	Dr. Magdy Adel Abdelhay		e-mail	Magdy.Adel@alayen.edu.iq
Scientific Committee Approval Date	18/01/2025	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 البرنامجية

Module Aims أهداف المادة الدراسية	1. Understand the basic components and organization of a computer system. 2. Explain the function and operation of the CPU, memory, and I/O devices. 3. Analyze and evaluate different computer architectures and their trade-offs. 4. Design and implement basic computer systems using appropriate hardware and software components. 5. Demonstrate an understanding of the relationship between computer organization and computer performance. 6. Apply knowledge of computer organization principles to solve real-world computing problems. 7. To develop essential skills in creating, saving, and opening documents in Microsoft Word, including formatting text and paragraphs and working with styles and themes. 8. To explore advanced features in Microsoft Word, such as page layout options, working with headers, footers, and page numbers, and incorporating tables, images, and objects. 9. To introduce spreadsheets and worksheets in Microsoft Excel, and develop students' skills in data entry, manipulation, and basic formulas and functions. 10. To delve into advanced Microsoft Excel features, including working with ranges and cells, sorting and filtering data, and creating charts and graphs. 11. To guide students in creating and editing slides in Microsoft PowerPoint, applying themes and templates, and adding text, images, and multimedia elements. 12. To explore advanced PowerPoint features, such as slide transitions, animations, using SmartArt and shapes, and utilizing presenter tools and slide show options.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the basic components and organization of a computer system. 2. Explain the function and operation of the CPU, memory, and I/O devices. 3. Analyze and evaluate different computer architectures and their trade-offs. 4. Design and implement basic computer systems using appropriate hardware and software components. 5. Demonstrate an understanding of the relationship between computer

	organization and computer performance. 6. Apply knowledge of computer organization principles to solve real-world computing problems. 7. demonstrate the ability to evaluate and compare different computer organization techniques, such as memory management strategies and caching optimizations, to improve system performance. 8. Understand computer architectures, including their performance characteristics, and understand the impact of design choices on computer performance 9. Develop practical skills in using simulation tools, emulators, and programming languages to design, implement, and test computer organization concepts. 10. Analyze and identify performance bottlenecks in computer systems and propose appropriate optimizations to improve system efficiency. 11. Understand the principles and challenges of memory management, including memory allocation, deallocation, and garbage collection. 12. Apply knowledge of cache memory organization and mapping techniques to analyze cache behavior and optimize cache utilization. 13. Demonstrate a solid understanding of Microsoft Word, Excel, and PowerPoint, including their key features, user interfaces, and common functions. 14. Create, format, and manage documents effectively in Microsoft Word, utilizing styles, themes, page layout options, headers, footers, tables, images, and objects. 15. Utilize Microsoft Excel for data entry, manipulation, basic calculations using formulas and functions, sorting and filtering data, and creating charts and graphs. 16. Develop proficiency in creating and editing slides, applying themes, templates, and multimedia elements, and utilizing advanced features in Microsoft PowerPoint.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to Computer Organization Basic computer architecture and components Von Neumann architecture Instruction execution cycle Memory Organization Memory hierarchy and cache memory Virtual memory and paging techniques Memory management and allocation strategies PU Organization and Instruction Set Architecture (ISA)

	CPU components: ALU, registers, control unit Instruction formats and addressing modes Input/Output (I/O) Organization I/O devices and interfaces Polling, interrupts, and DMA I/O communication and bus architectures
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
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 #1-4 , LO #4-9
	Assignments	2	10% (10)	4, 12	LO # 1-3, LO #4-11
	Projects / Lab.	1	10% (10)	Continuous	ALL
	Report	1	10% (10)	13	LO # 1-11
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO # 1-8
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Computer system organization and architecture.
Week 2	Von Neumann architecture and its components
Week 3	Interfacing devices and system buses • Tristate buffer • Decoder • Multiplexer • Address bus, data bus and control bus (specifications, function and interfacing)
Week 4	Memory hierarchy

	• Review of memory classification • Cache memory levels, Replacement Techniques, effective access time, read and write protocol
Week 5-6	Memory organization • Memory requirements and memory expansion • Memory addresses and memory map
Week 7	Midterm Exam
Week 8	Basic computer microoperations • Registers types, registers interconnection and data transfer • Arithmetic microoperation • Logical microoperation
Week 9	Computer instructions • instruction type and format • instruction addressing mode
Week 10	Control and timing unit • decoding and executing instruction • instruction cycle
Week 11-12	Instruction Set • register reference instruction • memory reference instruction • I/O reference instruction
Week 13	Stack memory
Week 14	Input/output (I/O) Organization
Week 15	Interrupt and subroutines

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Computer Organization ,Familiarization with the lab environment and tools
Week 2	hardware components: CPU, memory, and I/O devices
Week 3	Introduction to Assembly Language Programming, microprocessor instruction set
Week 4	register and memory transfer instructions
Week 5	Arithmetic instructions
Week 6	Logical Instructions
Week 7	Stack instructions
Week 8	Loop and Subroutine programs
Week 9	Writing and executing simple assembly language programs
Week 10	Introduction to Lab Environment and Office Suite: Microsoft Word Lab - Creating, editing, and formatting documents. Inserting and formatting images and tables.
Week 11	Microsoft Excel Lab - Creating spreadsheets and entering data. Formulas and functions for calculations.
Week 12	Data Analysis Lab with Excel - Advanced formula and function exercises. Sorting, filtering, and analyzing data.
Week 13	Microsoft PowerPoint Lab - Creating, editing, and designing slides. Adding multimedia elements and animations.
Week 14	Dealing with google form, customized the design, control the access, presents answers.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Computer Architecture and Organization " by Moris Mano	no
Recommended Texts	"8085 Microprocessor and Programming "by Ramesh S. Gaonkar	yes
Websites	https://www.tutorialspoint.com/computer_organization/index.asp	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Electronic Fundamentals		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	2104CET			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		3
Administering Department	CET	College	ETC	
Module Leader	Noor Alhuda salam khleel		e-mail	Noor.Alhuda.salam@alayen.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	MSc.	
Module Tutor	Narges Adel Yasser		e-mail	Narges.Adel@alayen.edu.iq
Peer Reviewer Name	Dr. Mazen mohammad yousef		e-mail	Mazen.mohammad@alayen.edu.iq
Scientific Committee Approval Date	18/01/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CET1202	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات البرنامجية

Module Aims أهداف المادة الدراسية	1. To understand materials conductivity, semiconductor materials, and types 2. This is the basic subject for all electronic circuits and devices. 3. This course deals with first and the simplest semiconductor device, diode, diode physical construction, biasing, characteristics, application circuits and Zener 4. Mathematical derivation and implementation of the load line analysis, and Q point with in diode characteristics curve to develop problem solving skills and understanding of diode circuits 5. This course deals with second semiconductor device, BJT This course deals with BJT physical construction, biasing, configuration methods, input and output characteristics 6. To understand the D.C biasing of BJT and circuit types , analysis and calculations of BJT parameters 7. To understand and construct re model for BJT circuits 8. To deal with small signal analysis of BJT
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize classifications of materials according to its conductivity. 2. Identify the semiconductor material characteristics and classifications 3. Recognize the physical structure and properties of P and N layers 4. Identify diode as a first example of semiconductor devices. 5. Discuss diode physical construction, biasing, and characteristics 6. Identify the variable parameters of diodes, and V threshold 7. Summarize what is meant by Load line analysis , and Q point 8. Identify the applications of diodes in electrical circuits using AC. And DC. Power supplies 9. To understand the concept of Zener region and the differences between zener and original diodes 10. To solve zener circuits and calculate its voltage current with different cases 11. To understand and discuss the second semiconductor device which is Transistor (Bipolar Junction Transistor)(BJT) 12. To discuss BJT physical construction, Operation, and configuration methods 13. To understand and implement input and output Characteristics of each configuration method and load line and Q point implementations 14. To implement and solve BJT biasing circuit types and calculations of important parameters of BJT in DC. Biasing state 15. Design BJT circuit types by using Quesent point parameters 16. Understand and construct re model for BJT circuits 17. Derive and calculate Z_i, Z_o A_v and A_i from re model of BJT circuits 18. Understand and calculate small signal analysis of BJT

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Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Semiconductor Materials Energy Levels , n- and p-Type, Semiconductor Diode Construction ,biasing, Characteristics and Zener Diodes, Load-Line Analysis [8 hrs] . Series Diode Configurations with DC Inputs, Parallel and Series-Parallel Configurations Sinusoidal Inputs Half-Wave Rectification, Full-Wave Rectification Clippers ,Clampers , Zener Diodes Voltage-Multiplier Circuit [10hrs] Transistor Construction , Transistor Operation ,Common-Base Configuration Transistor Amplifying Action ,Common-Emitter Configuration ,Common-Collector Configuration ,Limits of Operation [8hrs] Operating Point, Fixed-Bias Circuit , Emitter-Stabilized Bias Circuit , Voltage-Divider Bias , DC Bias with Voltage Feedback , Miscellaneous Bias Configurations, Design Operations Transistor Switching Networks, [[15 hrs] Revision problem classes [12 hrs] BJT Transistor Modeling The Important Parameters: Z_i, Z_o, A_v, A_i The r e Transistor Model The Hybrid Equivalent , small signal analysis Common-Emitter Fixed-Bias Configuration , Voltage-Divider Bias CE Emitter-Bias Configuration Emitter-Follower Configuration Common-Base Configuration[11 hr]

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

Student Workload (SWL)

الحمل الدراسي للطالب موزع على 15 اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
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, 12	LO #1- 4, LO #5-12
	Assignments	2	10% (5)	4, 11	LO # 1-3, LO #4-10
	Projects / Lab.	1	10% (10)	Continuous	ALL
	Report	1	10% (10)	13	LO # 1-12
Summative assessment	Midterm Exam	2 hr	10% (10)	6	LO #1-8
	Final Exam	4 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction, Semiconductor Materials, Energy Levels , Extrinsic Materials—n- and p-Type
Week 2	Semiconductor Diode construction, biasing, characteristics, Zener region
Week 3	Load-Line Analysis, RESISTANCE LEVELS, DIODE EQUIVALENT CIRCUITS
Week 4	Series Diode Configurations with DC Inputs , Parallel and Series- Parallel Configurations
Week 5	Sinusoidal Inputs; Half-Wave Rectification, Full-Wave Rectification
Week 6	Midterm Exam
Week 7	Clipper's series and parallel ,Clampers , Zener Diodes, Introduction , Transistor Construction
Week 8	Transistor Operation, Common-Base Configuration Transistor, Amplifying Action , Common-Emitter Configuration , Limits of Operation
Week 9	Operating Point, Fixed-Bias Circuit ,Emitter-Stabilized Bias Circuit ,
Week 10	Voltage-Divider Bias , DC Bias with Voltage Feedback , Miscellaneous Bias Configurations
Week 11	Design Operations , Transistor Switching Networks
Week 12	Amplification in the AC Domain, BJT Transistor Modeling ,The Important Parameters: Z_i , Z_o , A_v , A_{re} Transistor Model
Week 13	Small signal analysis
Week 14	Common-Emitter Fixed-Bias Configuration Voltage-Divider Bias
Week 15	CE Emitter-Bias Configuration Emitter-Follower Configuration Common-Base Configuration

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction
Week 2	Lab 2: Diode characteristics
Week 3	Lab 3 Zener diode characteristics
Week 4	Lab 4 Half wave rectifier
Week 5	Lab 5: full wave rectifier
Week 6	Half and full wave rectifier with filter

Week 7	Lab 7: clippers
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Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Electronic devices and circuit theory Poylested	Yes
Recommended Texts	.	No
Websites		

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX - Fail	راسب (قيد الرجعة)	(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	Communication Fundamentals		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET2105		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	CET	College	ETC
Module Leader	Mazen mohammad youssef	e-mail	Mazen.mohammad@alayer.edu.iq
Module Leader's Acad. Title	Lecture	Module Leader's Qualification	Ph.D.
Module Tutor	Baneen shuaibth bzaiea	e-mail	Baneen.shuaibth@alayer.edu.iq
Peer Reviewer Name	Ass. Prof. Ghadir Ibrahim Madi	e-mail	Ghadir.Ibrahim@alayer.edu.iq
Scientific Committee Approval Date	18/01/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Understanding the communication systems and signals. 2. Viewing and knowledge block diagram communication system 3. Analyzing the advantage and disadvantage of each type of signals and systems. 4. Analyzing signals in Fourier series and Fourier transform. 5. To develop problem solving skills and understanding of filters types and design
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Basic Principles of Communication. 2. Explain the Block Diagram of a Communication System. 3 Identify essential parts that must be present in communication systems. 4. List the different types of media used in a communication system. 5. Describe the measured effect of noise on a communication system. 6. Define modulation over some carriers to make it suitable for transmission over a long distance. 7. Discuss Principles of Signals in Communication and shows examples of signals of various types. 8. Identify the difference between Analog and Digital Signals. 9. List the various types of continuous-time signals 10. Discuss the classification of signals based on their characteristics and nature of availability. 11. Define the advantages and disadvantages of each type of signal in communications. 12. Explain the two the Fourier Series in the Continuous Domain is associated with the important classes of Fourier series methods and Trigonometric Fourier series. 13. Summarize by various magnitudes or coefficients of Exponential Fourier Series on Determination for different harmonic signals. 14. Definition A major disadvantage of the Fourier series is on account of its periodicity, by means of the limitation of the Fourier series 15. Identify Fourier transform representation for the non-periodic signals 16. Describe the Inverse Fourier transform as a mathematical transformation technique that transforms signals from the continuous-frequency domain to the corresponding time domain and vice-versa 17. Definition Filters, four basic types of filters: Passive or Active depending on the Construction of filters. 18. Describe the filter depending on the design of filters: Low Pass Filter

	(LPF), High Pass Filter (HPF), Band Pass Filter (BPF) and Band Stop Filter (BSF). 19. Summarize the design formula for a passive filter LPF and HPF consisting of coils, capacitors, and resistors. 20. Identify the design formula for a passive filter Constant-K: LPF, HPF, and BPF consisting of coils, capacitors, and resistors. 21. Definition active filters, listing the advantage of active filter over disadvantage of passive filter. 22. Identify the design formula for active filter first order LPF, HPF and BPF used op-Amp as main component.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A -Communication System : Basic Principles of Communication System, types of media used in a communication system, effect of noise on a communication system and modulation in analogue communication (10 hr) Part B Signals in Communication: Principles of Signals, examples of signals of various types, difference between Analog and Digital Signals, various types of continuous-time signals, classification of signals based on their characteristics and nature of availability and the advantages and disadvantages of each type of signal in communications.(15 hr) Part C- I Fourier Series in the Continuous Domain: the important classes of Fourier series methods and Trigonometric Fourier series, Exponential Fourier (5 hr) Part C- II: Fourier transform representation: disadvantage of the Fourier series, Fourier transform for non-periodic signals, Inverse Fourier transform as a mathematical transformation technique.(10 hr) Part D- Filters: basic types of filters: Passive and Active, design of filters: Low Pass Filter (LPF), High Pass Filter (HPF), Band Pass Filter (BPF) and Band Stop Filter (BSF), design formula for each type of filters for passive and active.(34 hr)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)			
الحمل الدراسي للطالب موزع على 15 اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
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- 4, LO #5- 15
	Assignments	2	10% (10)	2, 12	LO # 1-7, , LO #8- 18
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1-17
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-16
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Basic Principles of Communication: Introduction to Communication, The Block Diagram of a Communication System
Week 2	Signals: Principles of Signals & Definition, Difference between Analog and Digital Signals
Week 3	Types of continuous-time signals: (Unit–Step Function, Unit –Ramp Function, Impulse Function, Unit –Parabola Function, Signum Function, Rectangular Function, Triangular Function, Real Exponential Signal, Sinusoidal Function & Sampling Function)
Week 4	Classification of Signals , Continuous –Time Signal, Discrete- Time Signals ,Even Signals, Odd Signals , Deterministic Signals, Random Signals, Sinusoidal Signals, Complex Exponential Signals
Week 5	Solved Problems: Periodic Signals, Aperiodic Signals ,Solved Problems: Energy Signals ,Power Signals
Week 6	Fourier series: The Fourier Series in Continuous Domain, Trigonometric Fourier series and Solved Examples , Exponential Fourier series and Solved Examples . Fourier Transform : Fourier Transform Examples
Week 7	Midterm Exam
Week 8	The Inverse Fourier Transform :Example Inverse Fourier Transform
Week 9	Filters : Types of filters : Classification Based on Construction and Design RC-LPF, RC-HPF)2 BPF (Low Pass Filter Stage and High Pass Filter Stage) (Type 1& Type Band Stop Filter
Week 10	Passive Filters : Formula and Procedure of Design RL-LPF, RL-HPF
Week 11	) &LC- LPF, Constant-K-(T) &LC- HPF, Constant-K-(T) &LC- BPF, Constant-K-(T
Week 12	Band Pass Filter Stage) (Type 1& Type 2)
Week 13	Active Filters Comparison Between Passive & Active Filters
Week 14	First- Order LPF First- Order HPF
Week 15	BPF Active Filter & Band reject or Notch Filter
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Lab Instruments
Week 2	Lab 2: Function Generator and Oscilloscope.
Week 3	Lab 3: Introduction to filters types construction
Week 4	Lab 4: Fourier series and Fourier Transform examples using the Math Function
Week 5	Lab 5: Introduction to filters types design
Week 6	Lab 6: Introduction to Passive filters
Week 7	Lab 7: Introduction to active filters
Week 8	Lab 8: Constant-K-(T& π Section) construction
Week 9	Lab 9: Constant-K-(T& π Section) design
Week 10	Lab 10: Constant-K-(T& π Section) LC- LPF
Week 11	Lab 11: Constant-K-(T& π Section) LC-HPF
Week 12	Lab 12: Constant-K-(T& π Section)- BPF
Week 13	Lab 13: Constant-K-(T& π Section)- BPF – Type-1
Week 14	Lab 14: Constant-K-(T& π Section)-BPF –Type-2

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Principles of Communication Systems By J.S.Chitode, First Edition-2007 Modern Digital and Analog Communication Systems ,By B.P.Lathi OXFORD	Yes
Recommended Texts	Analog and Digital Communications, By Schaum Second Edition Data Communications and Networking, By Behrouz A. Forouzan, Fifth Edition	No
Websites		

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتنياز	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 Language II		Module Delivery	
Module Type	B		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MTU1003			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	1	Semester of Delivery		1
Administering Department	CET	College	ETC	
Module Leader	Magdy Adel Abdelhay		e-mail	Magdy.Adel@alayen.edu.iq
Module Leader's Acad. Title	Asst. Professor		Module Leader's Qualification	PhD
Module Tutor	Dr. Magdy Adel Abdelhay		e-mail	Magdy.Adel@alayen.edu.iq
Peer Reviewer Name	Ass. Prof. Ghadir Ibrahim Madi		e-mail	Ghadir.Ibrahim@alayen.edu.iq
Scientific Committee Approval Date	18/01/2025	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 البرنامجية

Module Objectives أهداف المادة الدراسية	1. Provide students with essential information in the English language in association with reading, writing and speaking skills, and knowing more English vocabulary. 2. To understand sentences, tenses, and practicing writing. 3. This module works towards enhancing students' English language competencies along with their technical or professional knowledge. 4. Enhancing students' communication skills in English can result in better job opportunities in the future
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student will have the ability to: 1. Know the English skills of reading, and writing. 2. Recognize other English language skills such as: grammar, vocabulary. 3. Understand and appreciate the importance of grammar aspects and vocabulary to increase the ability of communicating ideas about the English language. 4. Understand sentences with multiple clauses, and comparative and superlative. 5. Understand time expression in tenses, and active and passive voice. 6. Discuss distinguish words such as do and make, like and alike, and other and another. 7. Discuss the various skills of writing such as writing essays, developing supporting ideas, and writing a paragraph. 8. Enhance students' communication skills in English.
Indicative Contents المحتويات البرنامجية	Indicative content includes the following. <u>Part A: Sentences and Tenses.</u> an overview of verb tenses, comparatives and superlatives, time expression in tenses, active and passive voice, distinguish words, Verb Patterns, Quantity, Time and Conditional Clauses, and articles. [15 hrs] <u>Part B: Reading and Writing Skills</u> Writing essays, expressing yourself, common expressions, developing supporting ideas, types of writing, and how to write a paragraph. [15 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategies that will be adopted in delivering this module are:
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	- Allow students to actively participate in the learning process with class discussions and exercises that support the initiative. - Use didactic questioning through questions to determine student understanding of the material. - Writing an assignment and report that encourages students to clarify and organize their thinking and independently research and present on a topic.
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Student Workload (SWL) الحمل الدراسي للطالب بحسب ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) 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	2	10% (10)	3 , 10	LO# 1-2, LO# 3-9
	Assignments	2	20% (10)	4, 12	LO# 1-3, LO# 3-11
	Projects / Lab.	NA			
	Report	1	10% (10)	Continuous	
Summative assessment	Midterm Exam	2hr	10% (10)	5	LO# 1-4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) النهج الأسبوعي النظري	
	Material Covered

Week 1	Unit 1: Grammar: Tenses (Present, Past, and Future), Questions, Questions word Vocabulary: Parts of speech, adjective, preposition, word with more than one meaning Reading and writing Skill, Everyday English (Social Expression)
Week 2	Unit 2: Grammar: Present Tenses (Present Simple, Present Continuous) Tens, have/have got Vocabulary: Description countries, Collection Reading and writing Skill, make conversation, Asking question
Week 3	Unit 3: Grammar: Past Tenses (Past Simple, Past Continuous) Vocabulary: Irregular verbs, making connections, nouns, verbs, and adjectives, Making negatives Reading and writing Skill, Everyday English (Time Expression)
Week 4	Unit 4: Grammar: Quantity, Articles, and some and Any Vocabulary: Buying Things Reading and writing Skill, Everyday English (Prices and shopping)
Week 5	Midterm Exam
Week 6	Unit 5: Grammar: Verb Patterns 1, Future intentions Vocabulary: Hot verbs Reading and writing skills, Everyday English (How do you feel?) Unit 6: Grammar: What's it like?, Comparative and superlative adjectives. Vocabulary: Talking about towns, Money, Synonyms and antonyms Reading and writing Skill, Everyday English (Directions)
Week 7	Unit 7: Grammar: Present Perfect and Past Simple, for and since, Tense revision Vocabulary: Past participles, Adverbs, Word pairs. Reading and writing Skill, Everyday English (short answers)
Week 8	Unit 8: Grammar: Have (got) to, Should, Must Vocabulary: Jobs, Traveling abroad, Words that go together, Compound nouns Reading and writing Skill, Everyday English (At the doctor's)
Week 9	Unit 9: Grammar: Time and Conditional Clauses, What if? Vocabulary: Hot verbs, Hotels Reading and writing Skill, Everyday English (In a hotel)
Week 10	Unit 10: Grammar: Verb Patterns 2, Infinitives, Purpose, (What, etc.+ infinitive), (something, etc.+ infinitive) Vocabulary: Shops, describe feelings and situations. Reading and writing Skill, Everyday English (Exclamations)
Week 11	Unit 11: Grammar: Active and Passive Voice Vocabulary: Verbs and past participles, verbs and nouns that go together Reading and writing Skill, Everyday English (Notices)
Week 12	Unit 12: Grammar: Second conditional, might Vocabulary: Phrasal verbs Reading and writing Skill, Everyday English (Social expression 2)
Week 13	Unit 13: Grammar: Present Perfect Continuous, Present Perfect Simple versus Continuous Vocabulary: Job and the alphabet game, Word formation, Adverb Reading and writing Skill, Everyday English (Telephoning)
Week 14	Unit 14: Grammar: Past Perfect, Reported statements Vocabulary: Word in context Reading and writing Skill, Everyday English (Saying goodbye)

Week 15	Grammar: Distinguish make and do, will and would, like, alike, unlike, and dislike, and other, another, and others Vocabulary Reading and writing Skill
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Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	New Headway Plus/ Pre-Intermediate, John and Liz Soars, Oxford University Press	NO
Recommended Texts	Understanding and Using English Grammar, 5 th Edition, Betty S. Azar Stacy A. Hagen.	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 البرعالية)	(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	Advanced Engineering Mathematics		Module Delivery
Module Type	S		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	2201CET		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	Four
Administering Department	CET	College	ECT
Module Leader	Jaafar Saleh Anaid	e-mail	Jaafar.Saleh@alayen.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Magdy Adel Abdelhay	e-mail	Magdy.Adel@alayen.edu.iq
Peer Reviewer Name	Dr. Mazen mohammad youssef	e-mail	Mazen.mohammad@alayen.edu.iq
Scientific Committee Approval Date	18/01/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CET2101	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المهادة الدراسية ونتائج التعلم والمحتويات البرنامجية	
Module Aims أهداف المهادة الدراسية	1. To develop problem solving skills complex analysis. 2. To understand power series. 3. To the way around Fourier series. 4. To get the grip on using Laplace transform. 5. To develop a good understanding of ODEs. 6. This course deals with Advanced Engineering Mathematics.
Module Learning Outcomes مخرجات التعلم للمهاده الدراسية	1. Describe Complex environment. 2. Discuss derivative of Analytic Function. 3. Describe Exponential, Trigonometric and Hyperbolic Functions. 4. Explain Line Integral in the Complex Plane and Cauchy's Integral Formula. 5. Using power Series and how to expand a function 6. Identify elements of Fourier Series. 7. Identify elements of Laplace Transform. 8. Discuss different aspects of First-Order ODEs. 9. Identify Bernoulli Equation and Population Dynamics. 10. Discuss different aspects of Second-Order Linear ODEs. 11. Using Variation of Parameters. 12. Discuss different aspects of Higher Order Linear ODEs. 13. Using Power Series to solve ODE. 14. Explain Fourier Series solution of ODE. 15. Discuss Laplace Transform solution of ODE.
Indicative Contents المحتويات البرنامجية	<u>Part A – Complex Analysis.</u> This part includes Complex Numbers. Polar Form of Complex Numbers. Powers and Roots. Complex variables. Complex Function. Derivative. Analytic Function. Cauchy–Riemann and Laplace's Equation. Exponential, Trigonometric and Hyperbolic Functions. Euler's Formula. Logarithm. Line Integral in the Complex Plane. Cauchy's Integral Formula. Derivatives of Analytic Functions. [12 hrs] + Revision problem classes in weekly tutorials [4 hrs]

	<u>Part B – Preliminaries to Methods of solving ODE.</u> This part includes Power Series. Functions Given by Power Series. Fourier Series. Arbitrary Period. Even and Odd Functions. Fourier Analysis for Periodic Functions. Fourier series Formula of a function. Differentiation and Integration of Fourier Series Laplace Transform. Transforms of Derivatives and Integrals. Table of Laplace Transforms. inverse Laplace transform [9 hrs] + Revision problem classes in weekly tutorials [3 hrs] <u>Part C – ODE.</u> This part includes First-Order ODEs. Separable ODEs. Exact ODEs. Integrating Factors. Linear ODEs. Bernoulli Equation. Population Dynamics. Second-Order Linear ODEs. Homogeneous. Homogeneous with Constant Coefficients. Nonhomogeneous ODEs. Solution by Variation of Parameters. Higher Order Linear ODEs. Homogeneous Linear ODEs. Homogeneous Linear ODEs with Constant Coefficients. Nonhomogeneous Linear ODEs. Power Series solution of ODE. Fourier Series solution of ODE. Laplace Transform solution of ODE. [24 hrs] + Revision problem classes in weekly tutorials [8 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module will primarily focus on encouraging students to participate in the activities, as well as refining and developing their critical thinking skills. This will be achieved through lectures, tutorials, discussions, and grading activities.

Student Workload (SWL) الحمل الدراسي للطالب موزع على 15 اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال	125		

الفصل	
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Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1-4, LO #5-9
	Assignments	2	20% (10)	3, 11	LO # 1,2 , LO# 3-10
	Projects / Lab.	N/A			
	Report	1	10% (10)	Continuous	LO#1-14
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
البرنامج الأسبوعي النظري	
	Material Covered
Week 1	Complex Numbers. Polar Form of Complex Numbers. Powers and Roots. Complex variables.
Week 2	Complex Function. Derivative. Analytic Function. Cauchy–Riemann and Laplace’s Equation.
Week 3	Exponential, Trigonometric and Hyperbolic Functions. Euler’s Formula. Logarithm.
Week 4	Line Integral in the Complex Plane. Cauchy’s Integral Formula. Derivatives of Analytic Functions
Week 5	Power Series. Functions Given by Power Series.
Week 6	Fourier Series. Arbitrary Period. Even and Odd Functions. Fourier Analysis for Periodic Functions. Fourier series Formula of a function. Differentiation and Integration of Fourier Series
Week 7	Laplace Transform. Transforms of Derivatives and Integrals. Table of Laplace Transforms. inverse Laplace transform
Week 8	Midterm Exam
Week 9	First-Order ODEs. Separable ODEs. Exact ODEs. Integrating Factors. Linear ODEs. Bernoulli Equation. Population Dynamics.
Week 10	Second-Order Linear ODEs. Homogeneous. Homogeneous with Constant Coefficients.
Week 11	Nonhomogeneous ODEs. Solution by Variation of Parameters.
Week 12	Higher Order Linear ODEs. Homogeneous Linear ODEs. Homogeneous Linear ODEs with Constant Coefficients. Nonhomogeneous Linear ODEs.
Week 13	Power Series solution of ODE.
Week 14	Fourier Series solution of ODE.

Week 15	Laplace Transform solution of ODE.
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Delivery Plan (Weekly Tutorial)

المنهاج الاسبوعي الاضافي

Material Covered
Each week, a question sheet related to the material presented in the theoretical lecture will be solved and debated.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Advanced Engineering Mathematics ", Erwin Kreyszig, Wiley, 10th edition (August 16, 2011), ISBN-13: 978-0470458365.	Yes
Recommended Texts	"Differential Equations for Engineers and Scientists", Yunus Cengel, William Palm, McGraw Hill, 1st edition (January 31, 2012), ISBN-13: 978-0073385907.	No
Websites	https://www.coursera.org/learn/differential-equations-engineers	

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 المرحلة)	(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	Python Programming		Module Delivery	
Module Type	S		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	2202CET			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	2	Semester of Delivery		4
Administering Department	CET	College	ETC	
Module Leader	maher ali ibrahim		e-mail	maher.ali.ibrahim@alayen.edu.iq
Module Leader's Acad. Title	Ass. Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Zahraa Rasim Nada		e-mail	Zahraa.Rasim@alayen.edu.iq
Peer Reviewer Name	Dr. Mohammad Ali Anbar		e-mail	Mohammad.Ali.Anbar@alayen.edu.iq
Scientific Committee Approval Date	18/01/2025	Version Number	1.0	

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	Programming Essentials / CET1203		Semester	2
Co-requisites module	None		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات البرنامجية

Module Aims أهداف المادة الدراسية	1. Introduce students to the fundamental concepts and principles of Python programming language. 2. Develop students' proficiency in writing Python code and solving programming problems. 3. Familiarize students with essential programming constructs, such as variables, data types, control flow structures, and functions. 4. Provide students with a solid foundation in object-oriented programming (OOP) and its application in Python. 5. Enable students to work with various data structures and perform operations on them. 6. Prepare students for practical application of Python in real-world scenarios, such as data manipulation, web scraping, and GUI development.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamentals of Python programming language, including variables, data types, and basic operators. 2. Demonstrate proficiency in control flow structures, such as conditional statements and loops, to control program execution. 3. Develop functions and utilize function arguments to enhance code modularity and reusability. 4. Utilize exception handling techniques to effectively manage errors and ensure program robustness. 5. Gain familiarity with modules and packages to leverage existing code and extend Python's functionality. 6. Understand object-oriented programming (OOP) concepts and apply them to create classes, objects, and inheritance hierarchies. 7. Manipulate strings, lists, dictionaries, and sets to efficiently store and retrieve data. 8. Perform file handling operations, including reading from and writing to files. 9. Apply Python to practical tasks, such as web scraping, data manipulation, and analysis. 10. Demonstrate proficiency in working with files and directories, including navigating file systems and managing file permissions. 11. Develop graphical user interfaces (GUIs) using Python libraries to create interactive applications. 12. Prepare for exams by reviewing course materials, practicing exercises, and answering sample questions.
Indicative Contents المحتويات البرنامجية	Indicative content includes the following. <u>Part A: Introduction to Python and Basic Concepts (Estimated time: 10 hours)</u> Overview of Python programming language Installation and setup Variables and data types Basic operators Input and output operations

	<u>Part B: Control Flow and Functions (Estimated time: 16 hours)</u> Conditional statements (if, else, elif) Loops and iterations (for loop, while loop) Functions and function arguments Recursion
	<u>Part C: Data Structures and File Handling (Estimated time: 16 hours)</u> Strings and string manipulation Lists and list manipulation Dictionaries and sets File handling and input/output operations
	<u>Part D: Advanced Topics (Estimated time: 16 hours)</u> Exception handling and error management Modules and packages Object-oriented programming (OOP) concepts Classes, objects, inheritance, and polymorphism
	<u>Part E: Applications and Practical Projects (Estimated time: 16 hours)</u> Working with files and directories GUI programming Web scraping Data manipulation and analysis

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	
	Effective learning and teaching strategies involve creating an engaging and interactive learning environment. This can be achieved through a combination of various approaches, such as incorporating active learning techniques like group discussions, problem-solving activities, and hands-on experiments. Additionally, employing visual aids, multimedia resources, and real-world examples can enhance comprehension and retention. Encouraging student participation and providing timely feedback also play vital roles in fostering student engagement and understanding. It is important to promote a growth mindset, encourage critical thinking, and create opportunities for collaboration and peer learning. By employing these strategies, educators can facilitate meaningful learning experiences and empower students to become active participants in their own learning journey.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1-5, LO #5-8
	Assignments	1	10% (10)	9	LO# 1-8
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1-12
Summative assessment	Midterm Exam	2 hrs.	10% (10)	7	LO # 1-7
	Final Exam	4hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Python, Variables, Data Types, and Basic Operators
Week 2	Control Flow and Conditional Statements
Week 3	Loops and Iterations
Week 4	Strings and String Manipulation
Week 5	Lists and List Manipulation
Week 6	Dictionaries and Sets
Week 7	Midterm Exam
Week 8	Functions and Function Arguments
Week 9	File Handling and Input/Output Operations
Week 10	Exception Handling and Error Management
Week 11	Modules and Packages
Week 12	Object-Oriented Programming (OOP) Concepts
Week 13	Classes and Objects
Week 14	Inheritance and Polymorphism
Week 15	Working with Files and Directories

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Python, Variables, and Basic Operators
Week 2	Control Flow and Conditional Statements
Week 3	Loops and Iterations
Week 4	Strings and String Manipulation
Week 5	Lists and List Manipulation
Week 6	Dictionaries and Sets
Week 7	Midterm Exam (No lab session).
Week 8	Functions and Function Arguments
Week 9	File Handling and Input/Output Operations
Week 10	Exception Handling and Error Management
Week 11	Modules and Packages
Week 12	Object-Oriented Programming (OOP) Concepts
Week 13	Classes and Objects
Week 14	Inheritance and Polymorphism
Week 15	Working with Files and Directories
Week 16	Final Exam (No lab session).

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Title: "Python Crash Course: A Hands-On, Project-Based Introduction to Programming" Author: Eric Matthes	
Recommended Texts	Title: "Learning Python" Author: Mark Lutz	No
Websites	URL: https://realpython.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 العالجة)	(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	Microprocessors		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	2203CET			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		4
Administering Department	CET	College	ETC	
Module Leader	Bashar Hindawi Hewaidi		e-mail	bashar.hindawi@alayen.edu.iq
Module Leader's Acad. Title	Lecture	Module Leader's Qualification	Ph.D.	
Module Tutor	Dr. Mazen mohammad yousef		e-mail	Mazen.mohammad@alayen.edu.iq
Peer Reviewer Name	Ass. Prf. Ghadir Ibrahim Madi		e-mail	Ghadir.Ibrahim@alayen.edu.iq
Scientific Committee Approval Date	18/01/20234	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Computer Organization & Architecture) CET2103(	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات البرنامجية

Module Aims أهداف المادة الدراسية	1. To understand the basic operating concept of specific microprocessor. 2. To study the hardware architecture of specific microprocessor. 3. To encode programs based on the specific processor language. 4. To solve problems encountered in the architecture of a specific microprocessor
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify the basic characteristic of specific processor 2. Define the processor signals and their functions 3. Explain the architecture from the hardware point of view 4. Identify various machine cycle. 5. Explain the memory different interfacing techniques with the microprocessor. 6. Explain the input output different interfacing techniques with the microprocessor. 7. Explain the concept of Stack memory. 8. List the addressing mode of the processor instruction. 9. Encode different program based on assembly. 10. Perform different arithmetic and logical operations using the processor instruction set. 11. Encode different problems associative with branching instructions. 12. Solve problem encountered with delay and counter. 13. Identify different interrupt procedures. 14. Design different interfacing systems due to the problem requirements.
Indicative Contents المحتويات البرنامجية	Indicative content includes the following. <u>Part A – Microprocessor H/W architecture</u> --MP signals, MP operations, Machine cycle, memory interfacing, input-output devices interfaces [30hrs] <u>Part b – Microprocessor S/W architecture</u> --Instruction set, data transfer, arithmetic, logical. [25 hrs]

	--Stack register and stack area [15hrs] --Branching instructions and applications [20hrs] --Revision problem classes [10 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
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)	7, 10	LO #1- 6, LO #8-11
	Assignments	4	10% (10)	Continuous	
	Projects / Lab.	5	10% (10)	Continuous	
	Report	2	10% (10)	7,10	LO #1- 6, LO # 8-11
Summative	Midterm Exam	2 hr	10% (10)	6	LO # 1-6

assessment	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - microprocessor evolution
Week 2	Basics specific microprocessor architecture and its specifications
Week 3	Microprocessor signals and machine cycle
Week 4	Memory organization, interfacing and memory map
Week 5	Input devices interfacing, Output devices interfacing
Week 6	Midterm Exam
Week 7	Introduction to microprocessor assembly language and addressing mode
Week 8	Data transfer instruction
Week 9	Arithmetic instructions
Week 10	logical instruction
Week 11	Stack register , stack area and related instructions
Week 12	Branching instruction
Week 13	Delay and counters
Week 14	Interrupt concept and types
Week 15	Subroutine

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to microprocessor kit
Week 2	Lab 2: key function definition, read/write memory location, read/write registers

Week 3	Lab 3: Data transfer instructions
Week 4	Lab 4: Arithmetic instructions
Week 5	Lab 5: logical instruction
Week 6	Lab 6: Stack instructions
Week 7	Lab 7: Branching instruction

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	8085 μ p architecture and programming_Gonkar	Yes
Recommended Texts	UNDERSTANDING 8085/8086 MICROPROCESSORS and PERIPHERAL ICs	no
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX - Fail	رأسب (قيد) الرجعة	(45-49)	More work required but credit awarded
	F - Fail	رأسب	(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	Analog Communications		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET2204		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	CET	College	ETC
Module Leader	Mazen mohammad youssef	e-mail	Mazen.mohammad@alayan.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Magdy Adel Abdelhay	e-mail	Magdy.Adel@alayan.edu.iq
Peer Reviewer Name	Ass. Prof. Ghadir Ibrahim Madi	e-mail	Ghadir.Ibrahim@alayan.edu.iq
Scientific Committee Approval Date	18/01/2025	Version Number	1.0
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CET2105	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Understanding the modulation and de-modulation 2. Viewing and knowledge Amplitude modulation and Frequency modulation. 3. Analyzing the advantage and disadvantage of AM over FM. 4. Analyzing the generation and detection each of AM and FM. 5. To develop problem solving skills and understanding of PM equations
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Basic Principles of modulation and de-modulation 2. Explain the Need for Modulation. 3. Define a Carrier Wave, Radio Frequency Spectrum, Sound and Radio Broadcasting 4. Identify Amplitude Modulation, Percent Modulation, Upper and Lower Sidebands 5. Explain Methods of Modulation. 6. Mathematical Analysis of a Modulated Carrier Wave 7. Discuss forms of Amplitude Modulation and Methods of Amplitude Modulation. 8. Describe the Power Relation in an AM Wave. 9. Identify modulating Amplifier Circuit: AM- Transmitter & Radio Receiver Essential Parameter 10. Explain the AM generation of SSB, DSB-SC balanced modulators (Cowan & Ring). 11. Summarize various demodulation type of AM Signal: AM-Detector (Envelope & Synchronous) 12. Identify the Frequency Modulation Process: Modulation Index, Deviation Ratio, Percent Modulation and FM Sidebands. 13. Discuss the relationship between the modulation index and number of sidebands. 14. List the various types of generation of FM (the direct method and indirect method) & demodulation or detection. 15. Identify the comparison between AM and FM. 16. Discuss Principles of FM Receiver: FM Discriminator (Foster –Seeley & Ratio Detector). 17. Explain the Phase modulation (PM) Definition. 18. Discuss the PM equation and PM wave forms
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A –MODULATION AND DEMODULATION: Need for Modulation,. Define a Carrier Wave, Radio Frequency Spectrum, Sound and Radio

	Broadcasting. (20 hr) Part B- Amplitude Modulation: Percent Modulation, Upper and Lower Sidebands, Methods of Modulation, Mathematical Analysis of a Modulated Carrier Wave, forms of Amplitude Modulation and Methods of Amplitude Modulation, Power Relation in an AM Wave,. Identify modulating Amplifier Circuit: AM- Transmitter & Radio Receiver Essential Parameter, The AM generation of SSB, DSB-SC balanced modulators (Cowan & Ring), demodulation type of AM Signal: AM-Detector (Envelope & Synchronous) (30hr) Part C Frequency Modulation Process: Modulation Index, Deviation Ratio, Percent Modulation and FM Sidebands, the relationship between the modulation index and number of sidebands, generation of FM (the direct method and indirect method) & demodulation or detection, the comparison between AM and FM, FM Receiver :FM Discriminator (Foster –Seeley & Ratio Detector), the Phase modulation (PM) Definition and the PM equation and PM wave forms.(24 hr)
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب موزع على 15 اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
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 #1-6 , LO #6-11
	Assignments	2	10% (10)	2, 12	LO # 1,2 , LO #3-11
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1-14
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-8
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	MODULATION AND DEMODULATION: Forms of Amplitude Modulation , Methods of Amplitude Modulation
Week 2	Carrier Wave, Radio Frequency Spectrum, Sound, Radio Broadcasting
Week 3	Need for Modulation,
Week 4	Methods of Modulation:
Week 5	Amplitude Modulation Percent Modulation, Upper and Lower Sidebands,
Week 6	Mathematical Analysis of a Modulated Carrier Wave. Power Relation in an AM Wave,
Week 7	Midterm Exam
Week 8	Modulating Amplifier Circuit: AM- Transmitter
Week 9	Radio Receiver Essential Parameter
Week 10	Generation of SSB, DSB-SC Balanced Modulators :(Cowan & Ring) Demodulation of AM Signal: AM-Detector (Envelope & Synchronous
Week 11	Frequency Modulation: Modulation Index, Deviation Ratio , Percent Modulation, FM Side bands FM Receiver :FM Discriminator (Foster –Seeley & Ratio Detector),
Week 12	Modulation Index and Number of Side bands, Demodulation or Detection, Comparison between AM and FM, The Four Fields of FM
Week 13	FM Generation (Direct & Indirect Method)
Week 14	Phase modulation (PM) Definition
Week 15	PM equation and PM wave forms

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Methods of Modulation Process and why modulation
Week 2	Lab2: Demodulation methods Process and detection.
Week 3	Lab 3:Methods of Amplitude Modulation
Week 4	Lab4: Calculating the time and a frequency of carrier wave
Week 5	Lab 5: Calculating of Index Modulation AM and Percent Modulation.
Week 6	Lab 6:Calculating of Upper and Lower Side bands frequencies of AM
Week 7	Lab 7: Modulation AM wave.
Week 8	Lab 8:Calculating power content of AM
Week 9	Lab 9: DE-modulation wave of AM
Week 10	Lab 10:Frequency modulation Process
Week 11	Lab 11:Calculating the maximum and minimum frequency
Week 12	Lab 12: Calculating carrier frequency of FM
Week 13	Lab 13: Index Modulation and Percent Modulation of FM
Week 14	Lab 14: Modulation wave of FM
Week 15	Lab 15: De-Modulation wave of FM

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Principles of Communication Systems By J.S.Chitode, First Edition-2007 Modern Digital and Analog Communication Systems ,By B.P.Lathi OXFORD	Yes
Recommended Texts	Analog and Digital Communications, By Schaum Second Edition Data Communications and Networking, By Behrouz A. Forouzan, Fifth Edition	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	Electronic Circuits		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	2205CET		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	CET	College	ETC
Module Leader	Noor Alhuda salam khleel	e-mail	Noor.Alhuda.salam@alayen.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	MSc.
Module Tutor	Magdy Adel Abdelhay	e-mail	Magdy.Adel@alayen.edu.iq
Peer Reviewer Name	Dr. Mazen mohammad youssef	e-mail	Mazen.mohammad@alayen.edu.iq
Scientific Committee Approval Date	18/01/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CET2104	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف الهادة الدراسية ونتائج التعلم والمحتويات البرنامجية

Module Aims أهداف الهادة الدراسية	1. This course deals with Third semiconductor or device, FET physical construction, biasing, configuration s , output and transfer characteristics 2. To understand the D.C biasing of BJT and circuit types , analysis and calculations of FET parameters 3. To understand and construct re FET modeling, and circuits analysis 4. To deal with small signal analysis of FET 5. Deals with Depletion-Type MOSFET , and Enhancement-Type MOSFETs and Combination ,and Design 6. Deals with Operational amplifiers (OP_AMP) their advantages, classifications and types and application circuits
Module Learning Outcomes مخرجات التعلم للهادة الدراسية	1. To understand and discuss the third semiconductor device which is Transistor (Field Effect Transistor)(FET), Construction and Characteristics of JFETs 2. To Identify and Calculate And implement Transfer Characteristics of FET 3. To Identify and discuss Important Relationships 227 5.7 Depletion-Type MOSFET 228 5.8 Enhancement-Type MOSFET , MOSFET Handling , VMOS CMOS 4. To implement and solve FET DC biasing and circuits analysis Fixed-Bias Configuration Self-Bias Configuration Voltage-Divider Biasing, implementations 5. To understand Depletion-Type MOSFETs Enhancement-Type MOSFETs 6. To identify and implement Combination Networks , Design P-Channel FETs Universal JFET Bias Curve . 7. To understand FET small signal Model, 8. To Identify, Calculate and analyses JFET Fixed-Bias Configuration , JFET Self-Bias Configuration , JFET Voltage-Divider Configuration , 9. To understand JFET Source-Follower (Common-Drain) Configuration , JFET Common-Gate Configuration , 10. To identify Depletion-Type MOSFETs, Enhancement-Type MOSFETs E-MOSFET Drain-Feedback Configuration, 11. To Understand and implement E-MOSFET Voltage-Divider Configuration, Designing FET Amplifier Networks. 12. To understand and identify Operational amplifiers (Introduction) , Differential and Common-Mode Operation 13. To understand Op-Amp, Practical Op-Amp Circuits , and Op-Amp Specifications 14. To identify DC Offset Parameters, Op-Amp Specifications and Frequency

	Parameters 15. To understand and identify OP AMP applications circuits. 16. To Analyze, calculate and implement Constant-Gain Multiplier, Voltage Summing , Voltage Buffer, Controller Sources Instrumentation Circuits ,and Active Filters
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. FET (Field Effect Transistor) (FET), Construction and Characteristics of JFETs, Transfer Characteristics of FET , Important Relationships Depletion-Type MOSFET Enhancement-Type MOSFET , MOSFET Handling , VMOS CMOS [8hrs]. FET D.C. biasing and circuits analysis Fixed-Bias Configuration, Self-Bias Configuration , and Voltage-Divider Biasing, implementations [8 hrs] Depletion-Type MOSFETs Enhancement-Type MOSFETs, Combination Networks , Design, and P-Channel FETs Universal JFET Bias Curve [10hrs]. FET small signal Model, JFET Fixed-Bias Configuration , JFET Self-Bias Configuration , JFET Voltage-Divider Configuration [8hrs]. JFET Source-Follower (Common-Drain) Configuration , JFET Common-Gate Configuration , Depletion-Type MOSFETs , Enhancement-Type MOSFETs E-MOSFET Drain-Feedback Configuration, Voltage-Divider Configuration ,and Designing FET Amplifier Networks . [12hrs] 2. Operational amplifiers (OP_AMPS) Operational amplifiers (Introduction) , Differential and Common-Mode Operation Op-Amp introduction , Practical Op-Amp Circuits , and Op-Amp Specifications DC Offset Parameters , Op-Amp Specifications and Frequency Parameters [8 hrs] OP AMP applications circuits Constant-Gain Multiplier , Voltage Summing , Voltage Buffer, Controller Sources Instrumentation Circuits ,and Active Filters[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 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.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على 15 اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
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 # 1-6 , LO # 6-11
	Assignments	2	10% (10)	5, 10	LO # 1-4, LO # 5-9
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1-12
Summative assessment	Midterm Exam	2 hr	10% (10)	9	LO #1-10
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction ,Field effect transistor FET, Introduction , CONSTRUCTION AND CHARACTERISTICS
Week 2	TRANSFER CHARACTERISTICS, Applying Shockley's Equation, and short hand method
Week 3	DEPLETION-TYPE MOSFET, Basic Construction, c Operation and Characteristics
Week 4	p-Channel Depletion-Type MOSFET, ENHANCEMENT-TYPE MOSFET, Basic construction
Week 5	Enhancement MOSEFET Basic Operation and Characteristics, MOSFET HANDLING
Week 6	FET DC. Biasing , FIXED-BIAS CONFIGURATION,
Week 7	FET SELF-BIAS CONFIGURATION, VOLTAGE-DIVIDER BIASING
Week 8	DEPLETION-TYPE MOSFETs, ENHANCEMENT-TYPE MOSFETs. DESIGN
Week 9	Midterm Exam
Week 10	FET SMALL-SIGNAL MODEL, Graphical Determination of gm, Mathematical Definition of gm
Week 11	FET AC Equivalent Circuit, JFET VOLTAGE-DIVIDER CONFIGURATION, JFET SOURCE-FOLLOWER (COMMON-DRAIN) CONFIGURATION,
Week 12	JFET COMMON-GATE CONFIGURATION, DEPLETION-TYPE MOSFETs, ENHANCEMENT-TYPE MOSFETs
Week 13	Operational amplifier, DIFFERENTIAL AND COMMONMODE OPERATIO, OP-AMP BASICS
Week 14	Operational amplifier applications
Week 15	Operational amplifier applications
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction
Week 2	Lab 2: Clampers
Week 3	Lab 3 Input characteristic of CBC BJT
Week 4	Lab 4 output characteristic of CBC BJT
Week 5	Lab 5: Input characteristic of CEC BJT

Week 6	Lab 6: output characteristic of CEC BJT
Week 7	Lab 7:review

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electronic devices and circuit theory Poylested	Yes
Recommended Texts		No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX - Fail	راسب (قيد العالجة)	(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	Instrumentation and Measurement		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	2206CET			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	2	Semester of Delivery		4
Administering Department	CET	College	ETC	
Module Leader	Bassem Sabah		e-mail	Bassem.Sabah@alayen.edu.iq
Module Leader's Acad. Title	Assoc. Professor.		Module Leader's Qualification	M.Sc.
Module Tutor	Ghadir Ibrahim Madi		e-mail	Ghadir.Ibrahim@alayen.edu.iq
Peer Reviewer Name	Dr. Mustafa Mohsen Ghaithan Al-Badir		e-mail	mostafa.albdair@alayen.edu.iq
Scientific Committee Approval Date	29/10/2023	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 المهادة الدراسية ونتائج التعلم والمحتويات البرنامجية	
Module Aims أهداف المهادة الدراسية	1. Identify and analyze factors affecting the performance of measuring systems and errors types and cause 2. Understand voltage and current measurements from a given circuit. 3. Choose appropriate instruments for the measurement of voltage, and current in ac and dc measurements 4. Describe the operating principle of DC and AC bridges 5. Identify Oscilloscopes, signal generators, and transducers
Module Learning Outcomes مخرجات التعلم للمهادة الدراسية	1. Explain the static characteristics of measuring systems. 2. Discuss problems related to measurement errors. 3. Explain the construction and working indicating Instruments. 4. Explain the principle of operation of the galvanometer. 5. Discuss the DC bridges- Wheatstone Bridge, Kelvin Bridge 6. Discuss the AC bridges, Capacitance Comparison Bridges, Maxwell's Bridge, Wein's bridge 7. Explain the Design of DC voltmeter and ammeter. 8. Describe Cathode Ray Tube Oscilloscope. 9. Identify High Bandwidth Digital Storage Oscilloscope. 10. Identify Spectrum Analyzer and BER Tester 11. Discuss Signal Generator. 12. Identify Arbitrary Waveform Generator 13. Explain Transducers.
Indicative Contents المحتويات البرنامجية	Indicative content includes the following. <u>Part A – Measurement and Error Analysis</u> Basics of Measurements, Accuracy, Precision, Resolution, Gross errors and systematic errors, Absolute and relative errors, Accuracy, Precision, Resolution, and significant figures, standard of measurements [24 hrs.] <u>Part B – Measuring Instruments</u> Measurement of resistance, inductance, and capacitance Whetstone's Bridge, Kelvin Bridge; AC bridges, Capacitance Comparison Bridge, Maxwell's Bridge, Wein's Bridge, [9 hrs]. Voltmeters and Ammeters Introduction, voltmeter, Multirange

	voltmeter, ammeter, Multirange ammeter Extending voltmeter and ammeter ranges [11hrs] Introduction Oscilloscopes, Basic principles, CRT features, Block diagram and working of each block High Bandwidth Digital Storage Oscilloscope- Spectrum Analyzer -BER Tester [8 hrs] Introduction Signal Generators, Fixed and variable AF oscillator, Standard signal generator Arbitrary Waveform Generator. [4 hrs] Introduction Transducers, Electrical transducers, Selecting a transducer, Resistive transducer [2 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	lecture and seminars will be used to explain the theory and principles of the module. Also, laboratory reports and mini-projects will be used. Quantitative instruments such as pre-test and post-test will be used to check students' conceptual knowledge of electrical measurement after the theory lecture or laboratories work. Video will be used to explain the electrical measurement instruments. Observation form and laboratory rubric will be used to analyze the skills of the students. The observer comments from the laboratory staff on student skills will be classified according to thematic analysis to evaluate students learned skills.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على 15 (اسبوع)

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.4
Total SWL (h/sem)	100		

الحيل الدراسي الكلي للطلاب خلال الفصل	
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Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - System of Units- Basics of Measurements
Week 2	Accuracy, Precision, Resolution
Week 3	Reliability, Repeatability, Validity
Week 4	Types of Errors
Week 5	Errors analysis
Week 6	Standard of Measurements
Week 7	Bridge Measurement .DC bridges- Wheatstone Bridge, Kelvin Bridge
Week 8	AC bridges, Capacitance Comparison Bridges, Maxwell's Bridge, Wein's bridge
Week 9	Midterm Exam
Week 10	Measuring of Basic Electrical Parameters- DC Voltmeter
Week 11	DC Ammeter- Extension of DC Voltmeter and Ammeter Range
Week 12	Cathode Ray Tube Oscilloscope
Week 13	High Bandwidth Digital Storage Oscilloscope- Spectrum Analyzer -BER Tester
Week 14	Signal Generator - Arbitrary Waveform Generator
Week 15	Transducers

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Galvanometer – sensitivity of Galvanometer
Week 2	Lab 2: measurement of DC current
Week 3	Lab 3: measurement of DC voltage
Week 4	Lab 4: measurement of AC current
Week 5	Lab 5: measurement of AC Voltage
Week 6	Lab 6: loading effect on the voltmeter
Week 7	Lab 7: Wheatstone Bridge
Week 8	Lab 8: Maxwell's Bridge
Week 9	Lab 9: Mid-term Exam
Week 10	Lab 10: DC Voltmeter Design
Week 11	Lab 11: DC Ammeter Design
Week 12	Lab 12: Oscilloscope and frequency measurement
Week 13	Lab 13: Project Discussion
Week 14	Lab 14: A preparatory week before the Final Exam
Week 15	Lab 15: Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electronic Instrumentation and Measurements , David A Bell, PHI / Pearson Education.	Yes
Recommended Texts	"Principles of measurement systems" , John P. Beately, Pearson Education. Modern electronic instrumentation and measuring techniques" , Cooper D & A D Helfrick, PHI	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	رأسب (قيد العالجة)	(45-49)	More work required but credit awarded
	F - Fail	رأسب	(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.				



10/15/2024

Arabic Language (2)

1009MTU

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		معلومات المادة الدراسية	
Module Title	Arabic Language (2)	Module Delivery	
Module Type	Basic	☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	1009MTU		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2		
Administering Department	CET	College	ETC
Module Leader	Azhar Rahim Owaid	e-mail	Azhar.Rahim.Owaid@alayen.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Abbas Kamel Ghadban	e-mail	Abbas.Kamel@alayen.edu.iq
Peer Reviewer Name	Riam Abdel Reda Sharif	e-mail	RIYAM.ABDULRIDHA@alayen.edu.iq
Scientific Committee Approval Date	18/01/2025	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 الهادة الدراسية ونتائج التعلم والمحتويات الدراسية

Module Aims أهداف الهادة الدراسية	أهداف الهادة الدراسية هي اني يكون الطالب قادر على أن 1. يتعرف على ماهية التعبير القرآني. 2. يتعلم القواعد النحوية المستعملة في التعبير القرآني، والاثار البلاغي والفني الذي يترتب على كيفية التعبير القرآني، وأن يفهم الطالب كيفية التحليل للنصوص القرآنية. 3. يتعرف على شخصيات من أهم شخصيات الأدب والنثر العربي والعراقي، بدر تناكر السباب، ومعرفة نثره. 4. يتعرف على علامات الإعراب الأصلية والفرعية، ويتعلم استعمالها في اللغة العربية، ويفهم الفرق بين علامات الإعراب الفرعية والأصلية. 5. يتعلم الفرق بين الجمل الاسمية والفعلية، ويتعرف على أنواع المبتدأ وأنواع الخبر، ويفهم الفرق بينها. 6. يتعرف على إن وأخواتها، ويتعلم القواعد الخاصة بها. 7. يفهم الفرق بين إن و أن، وأنو أن، ويطبق ذلك عند استعمال كل منها في النصوص. 8. يتعرف على كان وأخواتها، ويتعلم عمل كل منها في اللغة، ويتكهن من استعمالها الصحيح في اللغة. 9. يتعرف على عمل الأفعال الخمسة، وعلامات إعرابها، ويستطيع استعمالها بشكل صحيح في الخطاب، أو النص. 10. يتعرف على الأخطاء اللغوية، ويتعلم تجنبها أثناء الكتابة. 11. يدرس معلومات لغوية: الأضداد والمرادفات، والفرق اللغوية، والعلامات النحوية، ويفهم الفرق بينها، ويتكهن من تحليلها. 12. يتعلم إعراب المثنى. 13. يتعرف على أنواع الجموع، ويتعلم التفريق بينها، ويفهم كيفية إعرابها. 14. يتعلم كيفية كتابة قواعد اللغة العربية في لوحة بيانية، ويتكهن من تصويب الأخطاء اللغوية.
Module Learning Outcomes مخرجات التعلم للهادة الدراسية	مخرجات التعلم للهادة الدراسية هي: 1. قدرة الطالب على فهم التعبير القرآني، وتحليل النصوص. 2. القدرة على استعمال القواعد النحوية، وفهم الأساليب البلاغية والقدرة على استعمالها. 3. معرفة الطالب لشخصية النثر والأدب بدر تناكر السباب، وأهم أنثاره وآثاره. 4. القدرة على التمييز بين علامات الإعراب الأصلية والفرعية، والقدرة على استعمالها في الخطاب، أو النص. 5. قدرة الطالب على التمييز بين الجمل الاسمية والفعلية، وقدرته على التمييز بين أنواع المبتدأ والخبر، وكيفية استعمال الجمل وإعرابها. 6. فهم الطالب لعمل إن وأخواتها، وقدرته على استعمالها بشكل صحيح في الجمل. 7. القدرة على التفريق بين أن وإن، وأن وإن، واستعمالها في مواضعها الصحيحة في النصوص. 8. القدرة على فهم عمل كان وأخواتها، واستعمالها بشكل صحيح. 9. التمكن من معرفة و إعراب الأفعال الخمسة، وكيفية استعمالها في الجمل. 10. القدرة على معرفة وتجنب الأخطاء اللغوية عند الكتابة. 11. معرفة إعراب المثنى.

	القدرة على التمييز بين الجموع ، وكيفية إعرابها ، واستعمالها في الجمل . 12. معرفة الطالب لمعلومات لغوية : المرادفات ، والأضداد ، والفروق اللغوية ، 13. والمعادلات النحوية ، والقدرة على استخراجها ، أو استعمالها في الجمل .
Indicative Contents المحتويات الإرشادية	المحتويات الأساسية في مادة اللغة تشمل مجموعة من المفاهيم والمواضيع التي يتم تغطيتها خلال عملية التعلم . ومن بين المحتويات الأساسية الإرشادية : 1. مقدمة عن التعبير القرآني ، وتعريف بالإعجاز اللغوي في آيات القرآن الكريم . وجاهية اللغة العربية وبلاغتها . (4 ساعات) 2. التعرف بننخصية النناحر الكبار بدر نناحر السباب ، وأهمية نناحره في الادب العربي والعراقي . (4 ساعات) 3. دراسة علامات الإعراب ، بنوعها ، وكيفية الإعراب . (4 ساعات) 4. دراسة الجمل الاسمية والفعلية ، وتعلم التفرقة بين الأنواع المبتدأ ، وأنواع الخبر . (4 ساعات) 5. دراسة إن وأخواتها ، وكيفية عملها وأعرابها . (4 ساعات) 6. دراسة الفرق بين إنْ وإنْ وإنْ ، وكيفية عملها وأعرابها . (4 ساعات) 7. دراسة كان وأخواتها ، وكيفية عملها وإعرابها . (4 ساعات) 8. التعرف بالأفعال الخمسة ، وعملها وإعرابها . (4 ساعات) 9. دراسة الأخطاء اللغوية النحوية وتطبيقاتها في النصوص . (4 ساعات) 10. تعلم المعلومات اللغوية : الأضداد والمترادفات ، والفروق اللغوية ، والمعادلات النحوية . (3 ساعات) 11. دراسة المثنى وأعرابه . (٣ ساعات) 12. دراسة الجموع ، وأنواعها وإعرابها . (٢ ساعات) 13. دراسة القواعد النحوية وكتابتها في رسم بياني ، وتصويب الأخطاء اللغوية . (3 ساعات)
استراتيجيات التعلم والتعليم Learning and Teaching Strategies	
Strategies	استراتيجيات التعلم والتعليم المستخدمة في مادة اللغة تشمل مجموعة متنوعة من النهج والتقنيات التي تعزز عملية التعلم للطلاب . من بين هذه الاستراتيجيات : 1. التفاعل النشط : يتم تشجيع الطلاب على المشاركة والمشاركة الفعالة في الدروس من خلال المناقشات الجماعية والأنشطة التفاعلية . 2. التعلم التعاوني : ينتج التعاون والتعاون بين الطلاب من خلال العمل الجماعي والمشاركة الجماعية ، حيث يتعاون الطلاب مع بعضهم البعض لتحقيق أهداف التعلم المحددة . 3. التطبيق العملي : يتم توفير فرص للطلاب لتطبيق المفاهيم والمهارات المكتسبة في سياقات عملية وواقعية . مما يعزز التفاعل الفعال مع المادة . 4. استخدام التقنيات الحديثة : يستخدم الطلاب من استخدام التكنولوجيا في عملية التعلم ، مثل استخدام الحواسيب والإنترنت للبحث والتعلم الذاتي . 5. توفير ردود فعل فورية : يتم توفير ردود فعل فورية وتقييم مستمر للطلاب ، سواء عن طريق التقييمات المنتهية أو الكتابية ، مما يساعدهم على تحسين أدائهم وتطوير مهاراتهم . 6. التنوع في وسائل التواصل : يتم استخدام مجموعة متنوعة من وسائل التواصل والتعليم ، مثل المحاضرات التوضيحية ، والمناقشات الجماعية ، والأنشطة العملية ، والعروض التقديمية ، لتلبية احتياجات وأساليب التعلم المختلفة للطلاب . 7. باستخدام هذه الاستراتيجيات ، يتم تعزيز التفاعل والتعلم الفعال للطلاب ، و تحفيزهم على المشاركة واكتساب المعرفة والمهارات بشكل شامل ومنتج . 8.

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعاً (SWL) Student Workload

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

Module Evaluation تقييم الهادة الدراسية					
		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	3	15% (15)	5, 10, 13	LO # 1, 5, and 11
	Assignments	3	15% (15)	2, 11, 14	LO # 3, 6 and 12
	Projects / Lab.				
	Report	1	10% (10)	14	LO # 1-13
Summative Assessment	Midterm Exam	2 hours	10% (10)	7	LO # 1-7
	Final Exam	3 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

النهج الأسبوعي النظري)Delivery Plan (Weekly Syllabus	
الأسبوع الأول ، والثاني	التعبير القرآني. نحويًا من حيث تركيب الجملة والنص. بلاغيًا من حيث التأثير الفني. والرجوع إلى المصدر (كتاب التعبير القرآني) للدكتور فاضل السامرائي.
الأسبوع الثالث	المناعير بدر تناكر السياب.
الأسبوع الرابع	علامات الإعراب الأصلية: الفتحة والضمة والكسرة ، وعلامات الإعراب الفرعية: الألف ، والواو ، والياء .
الأسبوع الخامس	الجميل الأسمية - المبتدأ والخبر ، وأنواع المبتدأ ، وأنواع الخبر .
الأسبوع السادس	أن وأخواتها
الأسبوع السابع	الفرق بين إنَّ وإنْ ، وأنَّ وإنْ .
الأسبوع الثامن	كان وأخواتها.
الأسبوع التاسع والعاشر	الأفعال الخمسة .
الأسبوع الحادي عشر	الأخطاء اللغوية (الجزء 2)
الأسبوع الثاني عشر	معلومات لغوية : المراتفات والاضداد ، وفروق لغوية. ومعادلات نحوية.
الأسبوع الثالث عشر والرابع	المثنى وإعرابه.

عنتر	
الاسبوع الخامس	أنواع الجموع : جمع المذكر السالم - جمع المؤنث السالم - جمع التكرار .
عنتر	
الاسبوع السادس	هندسة النحو : قواعد اللغة العربية في لوحة تعليمية ، وتصويبات لغوية
عنتر	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library
Required Texts	المرجع اللغة العربية (المصنفة من وزارة التعليم العالي والبحث العلمي)	Yes
Recommended Texts	التعبير القرآني للدكتور فاضل السامرائي .	No
Websites	The Collage E-Library	

Grading Scheme

مخطط الدرجات

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