MODULE DESCRIPTION FORM

Signature:
Head of Department Name:
Assi. Prof. Dr. Ahmed Muneer Suhail
Date: 4/5/2025

Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Dr. Muthaffar Siddeeq Abdulkareem
Date: 4/5/2025
Signature:

Module Information

Module Title	Environmental Pollution		**Module Delivery**	
Module Type	**Core**		☒**Theory** **Lecture**☒ **Lab**☐ **Tutorial**☐V **Practical**☐ **Seminar**☒	
Module Code	NRE11004			
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	UGI	**Semester of Delivery**	1	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader	Hamid Abdulla Saleh	**e-mail**	hamid.abdulla@uomosul.edu.iq	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.	
Module Tutor	None	**e-mail**	E-mail	
Peer Reviewer Name	None	**e-mail**	E-mail	
Scientific Committee Approval Date	2024-2025	**Version Number**	1.0	

Relation with other Modules

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Here are some basic objectives for a calculus course: 1. Develop an understanding of the causes, effects, and prevention of environmental pollution. 2. Explore the different types of environmental pollution, including air pollution, water pollution, soil pollution, and noise pollution. 3. Understand the impact of pollution on human health, ecosystems, and the environment as a whole. 4. Learn about the laws and regulations related to environmental pollution and their implementation. 5. Understand the role of technology and innovation in preventing and mitigating environmental pollution. 6. Develop critical thinking skills to evaluate and analyze environmental pollution problems and propose solutions. 7. Foster a sense of responsibility and commitment to environmental sustainability and protection. 8. Develop communication and collaboration skills to work effectively with others to address environmental pollution issues.
Module Learning Outcomes	1. Identify the different types of environmental pollution, their sources, and their effects on human health and the environment. 2. Understand the scientific concepts, principles, and theories related to environmental pollution. 3. Analyze and evaluate environmental pollution problems using critical thinking skills and scientific methods. 4. Develop strategies and solutions to prevent and mitigate environmental pollution. 5. Evaluate the effectiveness of current environmental policies and regulations related to pollution control and propose improvements. 6. Understand the role of technology and innovation in preventing and mitigating environmental pollution. 7. Develop communication and collaboration skills to work effectively with others to address environmental pollution issues. 8. Understand the ethical and social implications of environmental pollution and the importance of environmental sustainability. 9. Apply knowledge and skills gained in the course to real-world environmental pollution problems. 10. Foster a sense of responsibility and commitment to environmental protection and sustainability.
Indicative Contents	Indicative content includes the following. Principal layers of atmosphere, Earth atmosphere layers specification ,Pollution definition, Pollutants, Point and nonpoint source pollution, Balance of nature, Pollution sources effects, Air pollution, Principal stationary pollution sources, world's population, Aerosol Atmospheric particulate matter. Subtypes of atmospheric particle matter include, Black carbon, Effects of particle

	matter on health, Size, shape and solubility matter, Health problems, Smog What Is Smog, Summer smog, Winter smog, How Can I Protect Myself from Smog. Ozone, What is a temperature inversion, Global warming, Non-greenhouse gases, Two theory about Global Warming, -Is Global Warming Real, Global Warming isn't Real, Important consideration for dealing with air pollution, Pollutant dilution by chimney, Construction of chimneys, Chimney draught or draft, contamination of the soil(soil pollution). Water pollution, Classification of water pollution, Groundwater pollution, Common sources of water pollution, Organic, inorganic and macroscopic water contaminants, Thermal pollution of water, Measurement of water pollutants, Pollution control devices(strategies), Pollution with Oil spill, Sources and rate of oil spill occurrence, Effects of oil spill on the environmental, United Nations Climate Change conference، The Kyoto Protocol، Doha Amendment، The Paris Agreement، How are countries supporting one another?

Learning and Teaching Strategies

Strategies	1. **Lectures:** used to introduce and explain key concepts related to nuclear energy and electricity generation from reactors. 2. **Interactive discussions:** used to engage students in critical thinking and problem-solving related to nuclear energy through group discussions, debates, case studies, and simulations. 3. **Multimedia resources:** used to enhance student engagement and understanding of complex concepts related to nuclear energy through videos, animations, and simulations. 4. **Assessment and feedback:** used to measure student learning and provide feedback on their progress through quizzes, exams, and projects.

Student Workload (SWL)

Structured SWL (h/sem)	78	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)		**Unstructured SWL (h/w)**	6
Total SWL (h/sem)	**150**		

Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning

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

)Delivery Plan (Weekly Syllabus	
	Material Covered
Week 1	Principal layers of atmosphere, Earth atmosphere layers specification ,Pollution definition, Pollutants.
Week2	Point and nonpoint source pollution, Balance of nature, Pollution sources effects, Air pollution, Principal stationary pollution sources.
Week 3	world's population, Aerosol Atmospheric particulate matter, Tutorial.
Week 4	Subtypes of atmospheric particle matter include, Black carbon, Effects of particle matter on health, Size, shape and solubility matter.
Week 5	Health problems, Smog What Is Smog, Summer smog, Winter smog, How Can I Protect Myself from Smog.
Week 6	Ozone, What is a temperature inversion, Tutorial
Week 7	Mid Exam ,Global warming, greenhouse gases Non-greenhouse gases
Week 8	Two theory about Global Warming, -Is Global Warming Real, Global Warming isn't Real,
Week 9	Important consideration for dealing with air pollution, Pollutant dilution by chimney, Construction of chimneys,
Week 10	Chimney draught or draft, contamination of the soil(soil pollution), Tutorial
Week 11	Water pollution, Classification of water pollution, Groundwater pollution, Common sources of water pollution, Organic, inorganic and macroscopic water contaminants.
Week 12	Thermal pollution of water, , Pollution control devices(strategies), Pollution with Oil spill, Sources and rate of oil spill occurrence, Effects of oil spill on the environmental.
Week 13	United Nations Climate Change conference, The Kyoto Protocol, Doha Amendment, The Paris Agreement, How are countries supporting one another? , Tutorial .
Week 14	Presentation of scientific videos of the material with collective participation.

Week 15	**Presentation of scientific videos of the material with collective participation.**
Week 16	**Final Exam**

Learning and Teaching Resources

Text	Available in the Library	
Required Texts	1. "Pollution – Definition from the Merriam-Webster Online Dictionary". Merriam-webster.com. 2010-08-13. Retrieved 2010-08-26. 2. Carrington, Damian (October 20, 2017). "Global pollution kills 9m a year and threatens 'survival of human societies'". The Guardian. Retrieved October 20, 2017	No
Recommended Texts	1. Patrick Allitt, A Climate of Crisis: America in the Age of Environmentalism (2014) p 206. 2. Gabbatiss, Josh (July 18, 2018). "Meat and dairy companies to surpass oil industry as world's biggest polluters, report finds". The Independent. Retrieved June 29, 2019.	No
Websites	None	

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

Module Information					
Module Title	**General Chemistry I**			**Module Delivery**	
Module Type	**Core**			☒**Theory** **Lecture**☒ **Lab**☒ **Tutorial**☒ **Practical**☐ **Seminar**☐	
Module Code	**NRE1103**				
ECTS Credits	**7**				
SWL (hr/sem)	**150**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Lamya Adnan Sarsam		**e-mail**	lamyasarsam@uomosul.edu.iq	
Module Leader's Acad. Title		Assistant Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	None		**e-mail**	lamyasarsam@uomosul.edu.iq	
Peer Reviewer Name		None	**e-mail**	E-mail	
Scientific Committee Approval Date		2024-2025	**Version Number**		1.0

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	The main objectives of a General Chemistry I module that covers the basics of general Chemistry and how to solve their parameters include: 1. Understanding the basic principles of types of chemistry (Analytical chemistry, organic chemistry, Physical Chemistry, and Inorganic chemistry), This objective would cover the fundamental principles of these types of chemistry, including the Classification of Analytical Chemistry, Qualitative Analysis, and Quantitative Analysis. Properties of Gas, Kinetic Molecular theory of gas, Types of carbon and hydrogen atoms, and electronic structure of the atom. 2. Understanding Properties of Gas, Kinetic Molecular Theory of gas, Pressure and its measurement, Relationship between pressure and volume, Boyle's Law., Relationship between Temperature and volume, Charles's Law., Relationship between Temperature and pressure, Gay- Lussac's law, Vapor pressure & Boiling point, and the principle of the first law of thermodynamics 3. Understanding Alkanes and the structure of alkanes, also types of carbon atoms and hydrogen atoms, in addition to their physical properties, and study how to name the alkanes. Also Understanding Alkenes and their structure (Cis& Trans), and their physical properties. and study how to name the alkenes, their structure, and their physical properties. Finally, study the third type of Alkynes and how to name them. 4. This objective would cover the electronic structure of the atom, and their theories which are Classical theory, Bohr Theory, and Quantum theory, and also broach to a practical example using quantum numbers. In addition to study the Periodic Table of the Elements, Hybridization, Types of Hybridization, and Applications of Hybridization.
Module Learning Outcomes	The students will be able to know: 1. How can they identify the qualitative of the material? 2. How can they identify the quantitative of the material?

	3. Calculate the concentration in different types of Physical and chemical Expression 4. Calculate the equivalent weight. 5. Solve the pH exercise. 6. How can they name the alkane 7. How can they name the alkene 8. How can name the alkyne 9. Physical properties of alkane 10. Physical properties of alkene 11. Physical properties of alkyne 12. How to prepare the alkane. 13. Explain the Electronic structure of the atom. , Classical theory. Bohr Theory. Quantum theory. Practical examples using quantum numbers. 14. Periodic Table of the Elements. Hybridization Types of Hybridization 1- sp Hybridization, 2- sp2 Hybridization, 3- sp3 Hybridization 15. Applications of hybridization include: 1. Linear molecule 2. Trigonal planar molecules 3-.Tetrahedral molecules. 16. Understanding Properties of Gas, Kinetic Molecular Theory of gas, Pressure and its measurement, Relationship between pressure and volume, Boyle's Law., Relationship between Temperature and volume, Charles's Law., Relationship between Temperature and pressure, Gay- Lussac's law, Vapor pressure & Boiling point. 17. Statement of the first law of thermodynamics - Conservation of energy. - Energy can neither be created nor destroyed but it can change forms. -Total amount of energy in a closed system remains constant
Indicative Contents	Indicative content includes the following. **Theory:** -Define Analytical Chemistry, Steps of Analysis, Solutions., Standard Solutions, Methods of Expressing Constant, Physical and Chemical Methods. [3hrs.] - Aqueous Solution and chemical Equilibria, Equilibrium constant expression, Chemical equilibrium. [3hrs.] - Equilibrium constant expression, Solubility product constant, Dissociation constant.

	, Buffer solutions, calculate buffer solution. [3hrs.] - The common ion effect. [3hrs.] Physical chemistry - Properties of Gas, Kinetic Molecular Theory of gas. [3hrs.] - Pressure and its measurement, Relationship between pressure and volume, Boyle's Law. [3hrs.] - Relationship between Temperature and volume. Charles's Law. , Relationship between Temperature and pressure. Gay- Lussac's law. [3hrs.] - Vapor pressure and boiling point. [3hrs.] - The first law of thermodynamics Organic Chemistry - Alkane, Structure of alkane, Types of carbon atoms and hydrogen atoms, Physical properties, Name of alkane. [6hrs.] - Alkene, Structure of alkene (Cis& Trans), Structure of alkene, Physical properties Name of alkene. [3hrs.] -Alkynes, Structure of alkynes, Physical properties, Name of alkynes. [3hrs.] Inorganic chemistry Introduction , Electronic structure of the atom. , Classical theory . -Bohr Theory . Quantum theory . Practical examples using quantum numbers . [3hrs.] -Periodic Table of the Elements . Hybridization Types of Hybridization [6hrs.] 1- sp Hybridization ,2- sp2 Hybridization ,3- sp3 Hybridization - Applications of hybridization 1. Linear molecule 2- Trigonal planar molecules 3- Tetrahedral molecules

Learning and Teaching Strategies	
Strategies	**5. Lectures: used to introduce and explain key concepts related to Analytical chemistry, Physical chemistry, Organic chemistry, and inorganic chemistry.** **6. Interactive discussions: used to engage students in critical thinking and problem-solving questions related to calculating the molecular weight, types of concentration, pH, and common ion through group discussions, debates, case studies, and simulations.**

	7. **Multimedia resources: used to enhance student engagement and understanding of complex concepts related to the types of chemistry through videos, and animations.** 8. **Assessment and feedback: used to measure student learning and provide feedback on their progress through quizzes, exams, and projects.**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

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

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Define Analytical Chemistry, Steps of Analysis, Solutions., Standard Solutions ., Methods of Expressing Constant, Physical and Chemical Methods
Week 2	Aqueous Solution and chemical Equilibria, Equilibrium constant expression, Chemical equilibrium, Equilibrium constant expression.
Week 3	Solubility product constant, Dissociation constant., Buffer solutions, calculate buffer solution
Week 4	The common ion effect.
Week 5	Alkane, Structure of alkane, Types of carbon atoms and hydrogen atoms, Physical properties, Name of alkane.
Week 6	Alkene , Structure of alkene (Cis& Trans) Structure of alkene , Physical properties Name of alkene .
Week 7	Alkynes, Structure of alkynes Physical properties, Name of alkynes.
Week 8	Properties of Gas. , Kinetic Molecular Theory of gas.
Week 9	Pressure and its measurement. , Relationship between pressure and volume, Boyle's Law.
Week 10	Relationship between Temperature and volume. Charles's Law. Relationship between Temperature and pressure.
Week 11	Gay- Lussac's law. , Vapor pressure and the first law of thermodynamics.
Week 12	Introduction, Electronic structure of the atom. , Classical theory.
Week 13	Bohr Theory. , Quantum theory. , Practical examples using quantum numbers.
Week 14	Periodic Table of the Elements. ,Hybridization,Types of Hybridization 1- sp Hybridization, 2- sp2 Hybridization 3- sp3 Hybridization
Week 15	Applications of hybridization 1. Linear molecule

	2- Trigonal planar molecules 3- Tetrahedral molecules
Week 16	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1." Fundamental of Analytical Chemistry. by: Skoog & West. 9th -Ed 2013 2. Organic Chemistry, by: Morison & Boyd. 3. A presentation of the First Law of Thermodynamics. by: Md. Shimul Bhuia 4. Advanced Inorganic Chemistry. by: Cotton, F.A. and Wilkinson, D. 5th ed. 2000	No
Recommended Texts	1. Analytical Chemistry. by Christian. 2004 2. Fundamental Chemistry for Medical Science By Dr. Jameel M. Dhabab 2020 3. Coordination Chemistry. by: Martel, A. E. 2009	No
Websites	https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url= https://www.slideshare.net/shimulbhuia/first-law-of-thermodynamics-143165111&ved=2ahUKEwiHp_mx1cGCAxVOhf0HHXn1BPgQFnoECAsQAQ&usg=AOvVaw2V8kuglg33zEsP01ek2UoX.	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group	**A -** Excellent	امتياز	90 - 100	Outstanding Performance

(50 - 100)	**B -** Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
(0 – 49)	**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	**General Physics I**	**Module Delivery**	
Module Type	**Core**		☒**Theory**
Module Code	NRE1101		☒**Lecture**
ECTS Credits	7		☒ **Lab**
SWL (hr/sem)	175		☒ **Tutorial**
			☐**Practical**
			☐ **Seminar**

Module Level	UGI	**Semester of Delivery**	1
Administering Department	BSc-NRE	**College**	Type College Code
Module Leader	Hazim Saleh Ahmed	**e-mail**	hazimsaleh@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Prof.	**Module Leader's Qualification**	Ph.D.

Module Tutor		**e-mail**	
Peer Reviewer Name	Ibtisam Yahya Abdullah	**e-mail**	ibtisamyahya@uomosul.edu.iq
Scientific Committee Approval Date	2024-2025	**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 Objectives أهداف المادة الدراسية	1. Understanding the basic concepts and principles of physics, such as motion, energy, and forces. 2. Understanding the laws of physics that govern the behavior of matter and energy. 3. Developing the ability to apply physics principles to solve problems in a variety of contexts. 4. Developing critical thinking skills through the analysis and interpretation of experimental data. 5. Understanding the role of physics in the natural world and its applications in technology and engineering. 6. Developing an appreciation for the beauty and elegance of physics theories and their explanatory power. 7. Understanding the concept of energy, potential and kinetic, and its various forms. 8. Understanding the relationship between force, mass, and acceleration. 9. Understanding the role of forces in the motion of objects and the transfer of energy.

	10. Understanding the principles of conservation of energy and momentum.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Explain and apply the fundamental concepts and principles of physics, including mechanics, electromagnetism, thermodynamics, and optics. 2. Solve problems and conduct experiments using mathematical and scientific reasoning, including the use of algebra, calculus, and laboratory equipment. 3. Apply physics principles to real-world problems in areas such as energy, technology, and the environment. 4. Explain and apply Newton's three laws of motion to various physical systems and phenomena. 5. Analyze and solve problems involving the motion of objects, using concepts such as force, mass, acceleration, and energy. 6. Understand and apply the principles of work, energy, and power to various physical systems and phenomena. 7. Understand and apply the principles of conservation of energy and momentum. 8. Understand and apply the concepts of potential and kinetic energy, and the relationship between them. 9. Understand and apply the principles of simple harmonic motion.10. Understand and apply the principles of gravitation and orbital motion.
Indicative Contents المحتويات الإرشادية	Introduction and Scalars and Vectors Motion in one and two dimensions Newton laws of motion Energy, energy transfer and Potential energy Conservation of Linear momentum Rotation motion Static equilibrium Properties of matter Simple harmonic motion Universal gravitation

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	9. **Lectures:** used to introduce and explain key concepts related to principles of physics, such as motion, energy, and forces and energy transfer and Potential energy. 10. **Interactive discussions:** used to engage students in critical thinking and

	problem-solving related to Newton's three laws of motion to various physical systems and phenomena. 11. **Multimedia resources:** used to enhance student engagement and understanding of complex concepts related to general physics through videos, animations, and simulations. 12. **Assessment and feedback:** used to measure student learning and provide feedback on their progress through quizzes, exams, and projects.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction
Week 2	Scalars and Vectors
Week 3	Motion in one and two dimensions
Week 4	Motion in one and two dimensions
Week 5	Newton laws of motion
Week 6	Energy and energy transfer
Week 7	Energy and energy transfer
Week 8	Potential energy
Week 9	Conservation of Linear momentum
Week 10	Rotation motion
Week 11	Static equilibrium
Week 12	Properties of matter
Week 13	Simple harmonic motion
Week 14	Universal gravitation
Week 15	Universal gravitation
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	

Week 1	
Week 2	
Week 3	
Week 4	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	3. Physic for Scientists and Engineers.	No
Recommended Texts	3. Serway and Jewett " 8th " edition 2008	No
Websites	None	

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	حقوق الانسان والديمقراطية Human Rights and Democracy			**Module Delivery**	
Module Type	**B**			☒**Theory** ☐ **Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UOM104**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	**Salah avdo ali**		**e-mail**	Salahavdo2@uomosul.edu.iq	
Module Leader's Acad. Title	Assistant Teacher		**Module Leader's Qualification**	M.A.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	2024-2025		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى

Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

يتم كتابة اهم الأهداف التي تغطيها هذه المادة الدراسية بشكل جمل او فقرات توضح المواضيع التي سيتم التطرق اليها و دراستها و معالجتها)

أ -المعرفة والفهم) الاهداف المعرفية(

أ -1ان يكون الطالب ملماً بمفاهيم حقوق الانسان والديمقراطية ويكتسب الوعي والثقافة السياسية.

أ -2يستطيع ان يميز بين المصطلحات والمفاهيم المختلفة مثل (حقوق الانسان، الدمقرطة، الديمقراطية، الانتقال الديمقراطي، العدالة الانتقالية.)

أ -3القدرة على تحليل تطورات حقوق الانسان والمراحل التي مرت بها.

أ -4ان يكون قادرا على ادراك واستيعاب الاعلانات والمواثيق الدولية لحقوق الانسان مثل الاعلان العالمي لحقوق الانسان.

أ -5ان يكون قادرا على التعبير عن راية بخصوص واحترام اراء الاخرين .

أ -6ان تكون لدية القدرة على تحليل اي مشكلة ووصفها والتنبأ بمستقبل الظاهرة السياسية .

أ7- ان يتعرف على انواع الديمقراطية والتمييز فيما بينها داخل النظم السياسية المعاصرة.

ب - المهارات الخاصة بالموضوع) الاهداف المهاراتية الخاصة بالمقرر(

ب –- 1اكتساب الطالب لمهارات التفاوض والتواصل وتبادل الاراء مع الاخرين.

ب – 2 اكتساب الطالب مهارات الحوار البناء الهادف .

ب – 3 اكتساب الطالب مهارات مواجهة اي موقف والتعبير عن الراي بكل شجاعة وثقة بالنفس.

ج- مهارات التفكير

ج1- مهارات التحليل.

ج2- مهارات التوظيف للمفردات التي تعلمها في الواقع العملي من خلال دراسة مشكلات محددة من الواقع.

ج3- مهارات التنبؤ والدراسات المستقبلية للنظم الديمقراطية.

د - المهارات العامة والمنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).

د1- القدرة على العمل كفريق.

د2- التفاعل مع فريق العمل لتحقيق المهارات المطلوبة.

د3- القدرة على القيام بعرض نظري لبعض الموضوعات ذات العلاقة بمفردات المادة.

د4- اكتساب مهارات التحليل العلمي لاي ظاهرة سياسية تتعلق بحقوق الانسان.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية يتم كتابة اهم المُخرجات او الناتج و الكَم العلمي الذي يتم استخدامه للتدريس في هذه المادة على شكل أسئلة أساسية تخص منهاج المادة بأكمله و يجب ان لا تقل هذه المُخرجات من ناحية العدد عن 6 مُخرجات و يفضل ان تكون بعدد أسابيع الدراسة.	1.عرف المفاهيم الاتية: حقوق الانسان، الشرعة الدولية، الديمقراطية، الدمقرطة، التحول الديمقراطي. 2. وضح اهمية الحقوق السياسية والمدنية. 3. اذكر اهم ما جاء في المواثيق الدولية لحقوق الانسان فيما يخص حق الحياة. 4. تكلم باختصار عن انواع الحقوق الاقتصادية والاجتماعية والثقافية. 5.ناقش ما جاء في الدستور العراقي لعام 2005 النافذ من ضمانات فيما يخص حقوق الانسان. 6.حدد اهم خصائص النظام الديمقراطي 8.اشرح انواع الديمقراطية ثم بين اهم الانواع القابلة للتطبيق العملي. 9.عدد مع الشرح انواع النظم الانتخابية. 10.ناقش الاطار الوظيفي للسلطة التشريعية ضمن مؤسسات النظام السياسي العراقي وفق ما جاء في دستور عام 2005. 11.حدد الاطار البنيوي للمؤسسة التنفيذية في النظام السياسي العراقي وفق دستور 2005. 12.تكلم عن اختصاصات مجلس النواب في اطار المؤسسة التشريعية. 13. ناقش شروط انتخاب رئيس الجمهورية وفق الدستور العراقي لعام 2005.
Indicative Contents المحتويات الإرشادية يتم كتابة اهم العناوين الرئيسية للمواضيع بشكل متسلسل و التي تشمل كافة الفقرات التي تحتويها مع إدراج عدد الساعات المطلوبة لتنفيذ كل فقرة.	يتضمن المحتوى الإرشادي ما يلي. مفهوم حقوق الانسان وتطور الحقوق تاريخياً يتناول تعريف الحق وتعريف الانسان، تعريفاً لغوياً واصطلاحياً واجرائياً، خصائص حقوق الانسان، ثم التطور التاريخي لحقوق الانسان، من العصور القديمة مروراً بالعصور الوسطى والحديثة، ومن ثم حقوق الانسان المعاصرة، وما انبثق منها من اشكال واجيال لحقوق الانسان، وانواع ومصادر حقوق الانسان ومن ضمنها الحقوق المدنية والسياسية والحقوق الاقتصادية والاجتماعية والثقافية، وحقوق الانسان في المواثيق الدولية والتشريعات الوطنية، والتحديات العالمية لحقوق الانسان ومن ضمنها التحديات الثقافية مثل العولمة والتطور التكنولوجي، والتحديات السياسية مثل الارهاب والحروب اللامتماثلة والحروب بين الدول. (5 ساعات) حقوق الانسان والحريات العامة في الدستور العراقي يتناول ما تضمنه الدستور العراقي من ضمانات قانونية لحماية حقوق الانسان وحرياته العامة، وانواع تلك الضمانات. (ساعتان). الحريات العامة والديمقراطية يتناول التطور التاريخي للديمقراطية، في الحضارات القديمة لاسيما في دول المدن اليونانية، مروراً بالديمقراطية عند المفكرين الغربيين امثال توماس هوبز ومونتسكيو وجان جاك روسو، ثم النماذج التقليدية للديمقراطية (انواع الديمقراطية)، المباشرة وغير المباشرة وشبه المباشرة، وخصائص وشروط النظام الديمقراطي، وانواع النظم الانتخابية في الانظمة الديمقراطية. (3 ساعات). الديمقراطية في نظام الحكم العراقي وفق دستور 2005 يتناول الاطار البنيوي لمؤسسات النظام السياسي العراقي، بنية المؤسسة التشريعية المكونة من مجلس النواب ومجلس الاتحاد، وبنية المؤسسة التنفيذية المكونة من رئيس الجمهورية ومجلس الوزراء، وبنية المؤسسة القضائية المكونة من مجلس القضاء الاعلى والمحكمة الاتحادية العليا، محكمة التمييز الاتحادية، وجهاز الادعاء العام، وهيئة الاشراف القضائي، والمحاكم الاتحادية الاخرى، ثم الاطار الوظيفي واختصاصات مؤسسات النظام السياسي العراقي (التشريعية، التنفيذية، القضائية)،

واخيراً العلاقة بين السلطات (التوازن والتعاون، والفصل بين السلطات). (4 ساعات).	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	
يتم كتابة ملخص الاستراتيجية الرئيسية التي سيتم تبنيها في تقديم هذه المادة	1. المحاضرة المصحوبة بالشرح والتحليل. 2. الحلقة النقاشية. 3. التقارير والبحوث. 4. عرض المادة عبر شرائح (بوربوينت) . 5. الاسئلة والاجوبة. 6. المشاركة الصفية .

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
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	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	مفهوم حقوق الانسان
Week 2	التطور التاريخي لحقوق الانسان
Week 3	اشكال واجيال حقوق الانسان
Week 4	حقوق الانسان في المواثيق الدولية
Week 5	التحديات العالمية لحقوق الانسان
Week 6	الحقوق المدنية والسياسية والاقتصادية
Week 7	حقوق الانسان والحريات العامة في الدستور العراقي
Week 8	الحريات العامة والديمقراطية
Week 9	التطور التاريخي للديمقراطية
Week 10	النماذج التقليدية للديمقراطية (انواع الديمقراطية)
Week 11	خصائص وشروط النظام الديمقراطي
Week 12	الديمقراطية في نظام الحكم العراقي وفق دستور 2005
Week 13	الاطار البنيوي لمؤسسات النظام السياسي العراقي (التشريعية، التنفيذية، القضائية)
Week 14	الاطار الوظيفي واختصاصات مؤسسات النظام السياسي العراقي (التشريعية، التنفيذية، القضائية)

Week 15	الاطار الوظيفي واختصاصات مؤسسات النظام السياسي العراقي (التشريعية، التنفيذية، القضائية)

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered يوجد	لا
Week 1	Lab 1:	
Week 2	Lab 2:	
Week 3	Lab 3:	
Week 4	Lab 4:	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	1. حافظ علوان حمادي الدليمي، حقوق الانسان، وزارة التعليم العالي والبحث العلمي، جامعة بغداد، 2013. 2. محمد سليم محمد، نظرات حول الديمقراطية، دار وائل للطباعة، عمان، 2000.	Yes Yes
Recommended Texts	1. بهاء الدين ابراهيم واخرون، حقوق الانسان بين التشريع والتطبيق، دار الجامعة الجديدة، الاسكندرية، 2008. 2. الدستور العراقي الدائم لعام 2005، الامانة العامة لمجلس الوزراء، بغداد، 2006.	Yes Yes
Websites	https://www.coe.int/en/web/compass/democracy.	

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	**Principle of Energy and Sources**			**Module Delivery**	
Module Type	**Core**			☒**Theory**	
Module Code	NRE1102			☒**Lecture**	
ECTS Credits	**6**			☐**Lab**	
SWL (hr/sem)	**150**			☐**Tutorial** ☐**Practical** ☐ **Seminar**	
Module Level		UGx11 UGI	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**		Type College Code
Module Leader	Lubna Abdulaziz Salih		**e-mail**		lubnaabdulaziz@uomosul.edu.iq

Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	E-mail
Peer Reviewer Name	None	**e-mail**	E-mail
Scientific Committee Approval Date	2024-2025	**Version Number**	4.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The main objectives of an Principle of energy sources that covers the all types of energy 1. The main objective of the course is the importance of all sources of energy and its applications. the future Introducing the student to the basic energy sources on the surface of the earth. 2. This course deals with the basic concept about conventional and non conventional energy sources 3. Learn about the new energy sources 4. Learn about renewable energy sources Studying the types of renewable energy and their principles and applications, and explaining the importance of using such energies from an environmental and economic point of view.. 5. Learn about Primary and secondary sources of energy, Energy and measurement units.
Module Learning	1. Study all types of Energy(conventional, new and Renewable) on the surface

Outcomes مخرجات التعلم للمادة الدراسية	of the earth 2. Understand the meaning of energy and Define the various terms associated with energy sources. 3. Combinations of different energy sources 4. Learn the advantages and disadvantages of each source 5. learn about Photosynthesis; Plantation (energy crops) 6. . learn about production of oil and natural gas by unconventional means: energy alternatives 7 . learn about Energy and measurement units
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **<u>Theory:</u>** <u>Part A – Theoretical lectures</u> Hydrocarbon resources-Fossil sources-(FES)(conventional sources): 1. Natural gas (NG) Types of N.G: Associated gas: Non Associated gas:. [*3*hrs] ,. 2. Crude oil and reserves 3. Coal Ranks of coal: Coal formation Wood: FUELS FROM WOOD Tar sands and oil shales: The reality of the change in global energy consumption and the change in the type of sources supplied to it: Challenges facing the future of oil: Non-conventional energy sources [*6* hrs] . New and renewable types: New sources:

	1: production of oil and natural gas by unconventional means: energy alternatives. Tar sands. Oil shales. Heavy crude oil. Liquid gas. Coal bed methane CBM. Shale gas. Gas hydrate. Gasification and liquefaction of coal. New methods to stimulate the extraction of oil and gas from the fields. Nuclear energy. Hydrogen: [*10* hrs] Renewable energy sources: Hydro – power energy Wind energy Tidal energy Thermal energy of oceans and seas water Geothermal energy Waves energy Solar energy Direct heating Solar furnaces Solar cell Photosynthesis: Plantation (energy crops) Biomass (3h) Biomass as a fuel: Organic waste as an energy source: Primary and secondary sources of energy:

	Secondary energy sources: Hydrogen: Energy and measurement units [9 h]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	13. Lectures: used to introduce and explain key concepts related to all Energy Sources hn the surface of the earth 14. Interactive discussions: used to engage students in critical thinking and problem-solving related to nuclear energy through group discussions, debates, case studies, and simulations. 15. Multimedia resources: used to enhance student engagement and understanding of complex concepts related to nuclear energy through videos, animations, and simulations. 16. Assessment and feedback: used to measure student learning and provide feedback on their progress through quizzes, exams, and projects. 17. Expanding students' perceptions about this science and its contents it includes that help in stratigraphic Show related video. White board,& Data show

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

Module Evaluation تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Overview of energy sources and its history What is Energy, Work Energy Principles, Principle of conservation of energy, Define of energy, Energy sources on the surface of the earth
Week 2	Fossil energy sources, Natural gas and reserves, Associated gas, Non Associated gas.
Week 3	Crude oil and reserves, Coal, Ranks of coal, Coal formation
Week 4	Wood: FUELS FROM WOOD, Tar sands and oil shales
Week 5	The reality of the change in global energy consumption and the change in the type of sources supplied to it, Challenges facing the future of oil
Week 6	New Energy sources: Coal as a fuel
Week 7	New methods to promote oil extraction from the depleted fields,
Week 8	Coal Bed Methane, Shale Gas,
Week 9	Nuclear fuel,

Week 10	Gas Hydrate
Week 11	Renewable energy sources, Solar energy, Hydro – power energy: Wind energy Tidal energy Ocean Thermal Energy Conversion (OTEC): Geo-thermal energy Solar energy
Week 12	Photosynthesis, Plantation (energy crops). Biomass .
Week 13	Organic waste as an energy source
Week 14	Hydrogen fuel
Week 15	**Primary and secondary sources of energy, Energy and measurement units**
Week 16	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- Synthetic Fuel 2- Types of Renewable Energy	No
Recommended Texts	1. Renewable Energy Sources for Sustainable Development By Narendra Singh Rathore, N. L. Panwar · 2007Justin 2. Fossil Fuel Healey • 2013	No
Websites	None	

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	اللغة العربية Arabic Languge	**Module Delivery**	
Module Type	**B**	☒**Theory** ☐ **Lecture** ☐**Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UOM101**		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	**Semester of Delivery**	1
Administering Department	Medical physics	**College**	Science

Module Leader	د. عبير طارق الحاصود	**e-mail**	
Module Leader's Acad. Title	lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	Enassatwam@uomosul.edu.iq
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	2024-2025	**Version Number**	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	تعريف الطلاب بأساسيات اللغة العربية. كذلك كسر حاجز الخجل وزيادة ثقتهم داخل وخارج الفصل. هناك فرصة كبيرة لإشراكهم في مناقشات قصيرة حيث يمكنهم الكتابة أو التعبير عن أنفسهم شفهيًا. بالإضافة إلى ما سبق ، ستعمل الدورة على تحسين مهارات القراءة والكتابة والاستماع والتحدث كطلاب ، وتقوية ملكة الطلاب الأدبية لتذوق أساليب اللغة وإدراك مواطن الجمال فيها
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- خلق وعي كامل بالاستخدام الصحيح لقواعد اللغة العربية في الكتابة والمحادثة. 2- إدراك أهمية اللغة العربية داخل وخارج الحياة الجامعية. 3- سيحسن الطلاب قدرتهم على التحدث باللغة العربية من حيث الطلاقة والاستيعاب. 4- سيقوم الطلاب بمراجعة الأشكال النحوية للغة العربية واستخدام هذه الأشكال في سياقات تواصلية محددة ، والتي تشمل: الأنشطة الصفية ، والواجبات المنزلية ، وقراءة النصوص ، والكتابة. 5- سيعزز الطلاب قدرتهم على كتابة فقرات قصيرة وملخصات باستخدام نهج العملية.
Indicative Contents	مقدمة عن الاتصال بشكل عام واللغة العربية بشكل خاص ، مع مقدمة عن فئات الكلمات (أجزاء الكلام) في اللغة العربية [4 ساعات]. شرح كل جزء من الكلام في اللغة العربية مثل الأسماء والضمائر

المحتويات الإرشادية	والأفعال والصفات والظروف وحروف الجر وحروف العطف والاقتران [16 ساعة]. المهارات الأساسية في تعلم اللغة الإنجليزية: القراءة والكتابة يتم تقديمها بشكل تدريجي خلال الأسابيع الماضية [6 ساعات]. الجزء الأخير مخصص لبعض جلسات تصحيح الأخطاء وردود الفعل [2 ساعة]. -جعل الطلبة على دراية بالعلاقة بين أساليب التعلم وأساليب التدريس. -تشجيع الطلبة على "توسيع" أساليبهم.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. المحاضرة المصحوبة بالشرح والتحليل. 2. الحلقة النقاشية. 3. التقارير والبحوث. 4. عرض المادة عبر شرائح (بوربوينت) . 5. الاسئلة والاجوبة. 6. المشاركة الصفية.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
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% (5)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	**الكلام وأقسامه**
Week 2	**علامات الاسم**
Week 3	**علامات الفعل**
Week 4	**قواعد كتابة العدد**
Week 5	**قواعد كتابة العدد**
Week 6	**أنوع المفاعيل**
Week 7	**المبتدأ والخبر**
Week 8	**همزة القطع وهمزة الوصل**
Week 9	**الهمزة المتوسطة وهمزة السطر**
Week 10	**الفرق بين الضاد والضاء**
Week 11	**الفرق بين التاء المربوطة والتاء المفتوحة**
Week 12	**زيادة الحرف وحذفه**
Week 13	**زيادة الحرف وحذفه**
Week 14	**الأفعال الناقصة ، الحروف المشبه بالفعل**

Week 15	**اختبار**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	لا يوجد
Week 1	
Week 2	
Week 3	
Week 4	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	شرح ابن عقيل على الفية ابن مالك ، المرشد في الاملاء ، محمد شاكر سعيد	Yes Yes
Recommended Texts	الاسلوب ، احمد الشايب ، طرق تعليم التعبير ، محمد عبد القادر أحمد	Yes Yes
Websites		

Grading Scheme مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Analytical Chemistry**			**Module Delivery**	
Module Type	**Basic**			☒**Theory** ☒**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☒**Seminar**	
Module Code	**NRE12009**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		1	**Semester of Delivery**		2
Administering Department		Type Dept. Code	**College**	Type College Code	

Module Leader	Lamya Adnan Sarsam	**e-mail**	lamyasarsam@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D
Module Tutor	None	**e-mail**	E-mail
Peer Reviewer Name	None	**e-mail**	E-mail
Scientific Committee Approval Date	2024-2025	**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 Objectives أهداف المادة الدراسية	The main objectives of a General Chemistry I module that covers the basics of general Chemistry and how to solve their parameters, include: 1. Understanding the Buffer solutions, Volumetric Analysis. ,Types of Titration. , Gravimetric Analysis. , Analytical Statistics. ,Analytical Separation Methods. And Green Chemistry . 2. Understanding about Buffer solution Understanding about Buffer solutions and the Buffer capacity , how can solve the problems of Buffer calculate when used strong acid and strong base or weak acid and base. 3. Understanding volumetric analysis , This objective would cover the types of classical methods with the titration steps and explain them details and solve their different question. 4. Understanding the second type of classical method it's gravimetric analysis and define the types of it , also explain the different between organic an in organic reagents , and the steps of gravimetric analysis in details. and examining the advantage and disadvantages between the types of gravimetric analysis. 5. Study the analytical Statistics ,this objective would cover statistical laws with

	learning how to used them to solve the practical data. 7. Explain another type of analytical chemistry is Analytical Separation Methods, and types of column which used to separate the different positive and negative ion . explain also how can separated the analyte from the interferences in the same sample , and which masking agent should used to avoid the interferences. 8. Green Chemistry, this objective would cover after all the subjects which the student studied them. how can chose the green material and used it instead of chemistry materials, or at least the students will Know how to choose the material which is safety for health and the environment From that this section would also cover the role that green chemistry may play in meeting future energy needs and reducing greenhouse gas emissions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The students will be able to: 15. Solve the solubility constant 16. Calculate the molar solubility 17. How can identify the primary standard materials and solutions . 18. How can identify the secondary standard materials and solutions . 19. Calculate the pH function for strong and weak acid and base , and how to distinguish between them. 20. Calculate the concentration of the liquid example and the percentage of example. 21. How to derive the calibration curve. 22. How to determine of Calcium or Magnesium ions which cause hardness in water at PH 10. 23. How to determination of halids in presence of the other without problem or side reaction. 24. How to calculate the mean, Recovery , Relative standard division and relative error. 25. How to separated the different ions from the other 26. How can avoid the interferences. 27. What is green chemistry .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Theory:** - Buffer solutions and their calculations. [3 hrs]. - Volumetric Analysis. ,Types of Titrations., Acid- base titrations [12hrs] - Gravimetric Analysis. [9hrs] - Analytical Statistics. [3hrs] - Analytical Separation Methods. [18hrs] - Green Chemistry [3hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	**1. Lectures:** used to introduce and explain key concepts related to Buffer solutions. Volumetric Analysis. Types of Titration, Gravimetric Analysis, Analytical Statistics, Analytical Separation Methods, Green Chemistry**.** **2.Interactive discussions:** used to engage students in critical thinking and problem-solving questions related to calculate the pH ,the percentage , the concentration of metal ion , separation the ion through group discussions, debates, case studies, and simulations. **3.Multimedia resources:** used to enhance student engagement and understanding of complex concepts related to the types of chemistry through videos, and animations**.** **4.Assessment and feedback:** used to measure student learning and provide feedback on their progress through quizzes, exams, and projects.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #3, #6
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #5, #7
	Projects / Lab.	1	10% (10)	Continuous	All

	Report	1	10% (10)	13	LO #2, #3 and #5
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Volumetric Analysis methods , Titrations
Week 2	Neutralization titrations (Acid -base titrations),and solve the problems.
Week 3	Precipitation titrations
Week 4	Solve the problems of Precipitation titrations.
Week 5	Complex-Formation titrations
Week 6	Solve the problems of Complex-Formation titrations.
Week 7	Oxidation -Reduction titrations.
Week 8	Solve the problems of Oxidation -Reduction titrations.
Week 9	Gravimetric analysis methods
Week 10	Steps of Gravimetric analysis.
Week 11	Calculations.
Week 12	Analytical Statistics.
Week 13	Analytical Separation Methods
Week 14	Types of Analytical Separation Methods.
Week 15	Green Chemistry
Week 16	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Fundamental of Analytical Chemistry. by Skoog & West, Holler , Crouch. 10th-Ed 2022 2. Handbook of Green Analytical Chemistry MIGUEL DE LA GUARDIA SALVADOR GARRIGUES 1st Ed. 2012 3. Principle of Instrumental Analysis 7Th Edition By Douglas A. Skoog, F.Games Holler, Stanley R. Crouch 2016.	No
Recommended Texts	1. Analytical Chemistry. by Christian. 2004 2. Fundamental Chemistry for Medical Science By Dr. Jameel M. Dhabab 2020	No
Websites	None	

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	**Calculas**	**Module Delivery**	
Module Type	B	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	SCi-101		
ECTS Credits	**2**		
SWL (hr/sem)	**50**		
Module Level	1	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	**Zinah Falih Salih**	**e-mail**	Zn_f2020@uomosul.edu.iq
Module Leader's Acad. Title	LECTURER	**Module Leader's Qualification**	M.Sc.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	2024-2025	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	N/A	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- Giving an introduction to different types of functions and their basic concepts so that the student can develop the basic concepts in calculus, such as limits, continuity, derivatives, and integrals. 2- The student learns how to solve mathematical problems by applying the laws given to him 3- Practical examples and several problems are taken that the student stopped solving during the middle school stage. 4- Developing the concept of differentiation, new methods of derivation, and studying many types of functions and their behavior. 5- The student learns about other types of functions that he did not discuss in the preparatory stage, such as hyperbolic trigonometric functions and methods of deriving them. 6- Developing the student's concept of integration. 7- The student learns how to solve mathematical problems by applying the laws given to him 8- Practical examples and several problems were taken, which the student had stopped solving in the middle school stage. 9-Developing the concept of integration and finding different ways to integrate complex functions that are difficult to integrate using the usual methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. study the functions and the domain . 2. evaluation the range of functions and their drawing. 3. A study of the limits. 4. A continuity study. 5. Derivability. 6. A study of the derivation of the transcendental exponential ,trigonometric and natural logarithm functions. 7. By studying integrations, student can enhance your knowledge of functions, limits, derivatives, and the relationship between them. 8. Mastery of Integration Techniques: Integration involves various methods and techniques such as integration by parts and partial fractions, Studying

	integrations allows you to become proficient in these techniques, enabling the student to handle different types of integrals effectively. 9. Mastery of Integration Techniques: Integration involves various methods and techniques such as substitution, integration by parts, partial fractions, and trigonometric substitutions. Studying integrations allows you to become proficient in these techniques, enabling the student to handle different types of integrals effectively.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in the exercises, while improving and expanding their critical thinking skills at the same time. This will be achieved through classes and interactive tutorials and by looking at the types of simple experiments that include some sampling activities that are of interest to the students. Mathematics, including calculus, requires practice to reinforce understanding and develop problem-solving skills. Work through a variety of problems, both from your textbook and supplementary resources. Start with simple problems and gradually increase the difficulty level.

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

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1		Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO #1 - #7
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	definition of the function and Finding Domain and Range of the functions with different techniques.
Week 2	Limit+ Limits Involving Infinity+ Continuity.
Week 3	Derived using definition and laws of derivation with examples.
Week 4	Trigonometric functions and their Derivatives.
Week 5	Graphing trigonometric functions.
Week 6	Exponential functions and their Derivatives.
Week 7	Logarithmic functions and their Derivatives.
Week 8	Inverse trigonometric functions and their Derivatives.
Week 9	Hyperbolic functions.
Week 10	Integration of trigonometric functions.
Week 11	Integration of exponential functions of base e and base a.
Week 12	Integration of natural logarithm functions.
Week 13	Integration methods+ Integration by part.
Week 14	Integration of the functions $sin^n(x) and\ cos^n(x)$.

Week 15	Integration of the functions $tan^n(x) and\ cot^n(x)$ and Integration of the functions $sec^n(x) and\ csc^n(x)$.

Delivery Plan (Weekly Lab. Syllabus) N/A المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- أي. برسل /الجزء الاول /1982 حسبان التفاضل والتكامل مع الهندسة التحليلية./ **2- George B. Thomas, Jr. Massachusetts** **" INSTRUCTOR'S SOLUTIONS MANUAL SINGLE VARIABLE "** **3- Calculus 11th Thomas**	**Yes** **yes** **Yes**
Recommended Texts	1- د. رمضان محمد جهينة و د.احمد عبد العالي هب الريح التفاضل والتكامل /الجزء الاول /دار الكتاب الجديد المتحدة. **2- ROBERT T. SMITH, ROLAND B. MINTON, " Calculus Fourth Edition" 2012**	**Yes** **No**
Websites	**https:// www.wolframalpha.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
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria

Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Fundamental of computer science**		**Module Delivery**		
Module Type	**Core**		**Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**		
Module Code	UOM103				
ECTS Credits					
SWL (hr/sem)	3				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Zakaria Abdul Wahid Hameed and Dr. nagham salim al_lella		**e-mail**	Nagham.salim@uomosul.edu.iq zakriahamoalnaish@uomosul.edu.iq	
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	2024-2025		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Mathematic ,material energy science, electromagnetic	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Teaching students fundamental computer. 2. Teaching student Using the Microsoft office word. 3. Learn about the basics of Windows 7 and how to use it. 4. Understanding the world wide web
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 2. Learn the basics of computer® through this introductory tutorial on commonly used features and workflows. 2. help student use internet in various field, benefit of using search engines for finding information over the internet. 3. create and save, edit, modify, rename, delete and move content in Microsoft word . 4. To encourage students, develop their own skills in using the computer. 5. Introducing the student to computer basics and the purpose of the operating system. As for the goals of the practical side It provides the student with skills in using the Word printing program And also use the Windows operating system.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Basic window, objective, how use widow, operate on window, background and control panel, computer type, desktop, laptop, personal computer, server, memory type, size, important, internet, word wide web, type of internet browser, use internet, Microsoft word, how use it, open new file, save, adding text, close file, save it, editing, adding table, editing on table, insert text and picture, algin it, etc Matlab, command window, inept, output, workspaces, command history, File, edit, debug, desktop, window, help. Course Outcomes: Teaching the student to be familiar with the basic rules for dealing with and managing a computer to help him complete projects Printing matters, preparing statistics and graphs, creating presentations and designing engineering plans And others, and the emergence of the Internet as a means of communication available to everyone, it has become very necessary for students to learn to use Computer due to the role of the Internet in many fields, including education, scientific research, trade and marketing Through electronic correspondence, web pages, and electronic communication.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The theoretical method and explanation is by presenting the material on the Point Power program in the form of diagrams and pictures This is to attract the student's attention and help him not feel bored. The practical method is to apply what has been presented On the calculator and conduct daily and monthly exams

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	40	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	60	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	3	10% (10)	3 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	5% (5)	Continuous	All
	Report	1	5% (5)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Learn about the basics of Windows
Week 2	Lab 2: using windows on computer .
Week 3	Lab 3: computer types
Week 4	Lab 4: computer memory types
Week 5	Lab 5: basic internet
Week 6	Lab 6: world wide web
Week 7	Lab 7: fundamental of Microsoft word file
Week 8	Lab 8: add table in Microsoft file
Week 9	Lab9: adding picture in Microsoft word file
Week10	Lab 10: add, deleting, editing, Microsoft word file content
Week 11	Lab 11: Change the text in the file, line, style text, ect
Week 12	Lab 12: Desktop and control panel wallpapers

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	.Computer literacy BASICS 2012, LeBlanc, Brandon."A closer look at the, windows 7. 2009	yes
Recommended Texts	Computing Fundamentals, Innovative training works USA, Inc, 2006	Yes
Websites	Classroom Digital 2010 Word. https://www.agitraining.com/books/microsoft-officebooks/word-2010-digital-classroom-book	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings

	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	***English***			***Module Delivery***	
Module Type	***Basic***			☒ ***Theory***	
Module Code	***UOM102***			☐ ***Lecture***	
ECTS Credits	***2***			☐ ***Lab***	
SWL (hr/sem)	***50***			☐ ***Tutorial***	
				☐ ***Practical***	
				☐ ***Seminar***	
Module Level	*UGI*		***Semester of Delivery***	*2*	
Administering Department	*New and Renewable Energies*		***College***	*College of sciences*	
Module Leader	*Dr. Saad Fadhil Mahmood*		***e-mail***	*Saadfadhil32@uomousl.edu.iq*	
Module Leader's Acad. Title	*Lecture*		***Module Leader's Qualification***	*P.hD.*	
Module Tutor			***e-mail***	*E-mail*	
Peer Reviewer Name	*None*		***e-mail***	*E-mail*	
Scientific CommitteeApproval Date	2024-2025		***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 Objectives أهداف المادة الدراسية	*1- Develop an understanding of the English language and its importance inthe field of renewable energy.* *2- Gain knowledge of the overview of the English language, including itshistory, grammar, vocabulary, and pronunciation.* *3- Acquire the necessary English language skills to effectively communicateand discuss renewable energy topics.* *4- Explore the specific vocabulary, terminology, and expressions related to renewable energy sources.* *5- Enhance English language proficiency through the study and discussion ofvarious renewable energy sources, such as solar energy, wind energy, tidal energy, wave energy, geothermal energy, and biofuels.* *6- Develop the ability to comprehend and interpret written and spokenEnglish texts related to renewable energy.* *7- Practice and improve English language skills, including reading, writing, listening, and speaking, within the context of renewable energy discussions.* *8- Participate in quizzes to assess understanding and knowledge of bothEnglish language concepts and renewable energy topics.*
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	*1- Develop a comprehensive understanding of the English language, including its grammar, vocabulary, pronunciation, and overall structure.* *2- Acquire specialized knowledge and vocabulary related to renewable energy sources, such as solar energy, wind energy, tidal energy, wave energy, geothermal energy, and biofuels.* *3- Enhance English language proficiency in all four language skills - reading, writing, listening, and speaking - within the context of renewable energy discussions.* *4- Demonstrate the ability to comprehend and interpret written and spoken*

	English texts related to renewable energy sources and effectivelycommunicate ideas and opinions on these topics. 5- *Apply English language skills to effectively discuss, analyze, and present information about renewable energy sources in English.*
Indicative Contents المحتويات الإرشادية	*Indicative content includes the following.* • *Introduction to the English language and its importance in the field of renewable energy* • *Overview of English grammar, including tenses, sentence structure, andparts of speech* • *Vocabulary building exercises related to renewable energy* • *Pronunciation practice and drills* • *Introduction to common idioms and expressions in English* • *Introduction to renewable energy sources and their significance* • *Vocabulary and terminology related to renewable energy* • *Reading and discussing articles and texts on renewable energy topics* • *Writing exercises on renewable energy sources and their benefits* • *Listening to and practicing spoken English related to renewable energy*

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	*Integrated Language and Scientific Content: Integrate the teaching of English language skills with scientific content related to Renewable Energy. Incorporate reading scientific articles, analyzing data, and discussing researchfindings in English to enhance students' scientific literacy and language skills simultaneously.*

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ٥١ اسبوعا			
Structured SWL (h/sem)	*31*	***Structured SWL (h/w)***	*2*

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	*44*	***Unstructured SWL (h/w)*** الحمل الدراسي غير المنتظم للطالب أسبوعيا	*3.1*
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	***75***		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	*English language overview*

Week 2	*English language overview continue*
Week 3	*Renewable Energy in English book*
Week 4	*Renewable Energy continue*
Week 5	*Solar Energy in English book*
Week 6	*Solar Energy continue*
Week 7	*Wind Energy in English book*
Week 8	*Wind Energy continue*
Week 9	*Tidal Energy in English book*
Week 10	*Tidal Energy continue*
Week 11	*Wave Energy in English book*
Week 12	*Wave Energy continue*
Week 13	*Geothermal Energy in English book*
Week 14	*Geothermal Energy continue*
Week 15	*Biofuels in English book*
Week 16	***Final Exam***

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	***Available in the Library?***
Required Texts	*1-* *2-*	*No*
Recommended Texts	*1.*	*No*
Websites	*None*	

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 theoriginal marker(s) will be the automatic rounding outlined above.*

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	**Fundamental of Electricity**	**Module Delivery**
Module Type	**Core**	☒ **Theory**

Module Code	**NRE1205**			☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**
ECTS Credits	**8**			
SWL (hr/sem)	**200**			
Module Level	UGx11 1	**Semester of Delivery**	2	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader	Ibtisam Yahya Abdullah	**e-mail**	ibtisamyahya@uomosul.edu.iq	
Module Leader's Acad. Title	Lecture	**Module Leader's Qualification**	P hD.	
Module Tutor	Rana Hesham Mahmood Zahraa Badie Ibraheem	**e-mail**	ranahesham@uomosul.edu.iq zahraabadie@uomosul.edu.iq	
Peer Reviewer Name	Ibtisam Yahya Abdullah	**e-mail**	ibtisamyahya@uomosul.edu.iq	
Scientific Committee Approval Date	2024-2025	**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 Objectives أهداف المادة الدراسية	1- Identify Electrical Quantities 2- Understand the structure of matter. 3- Explain the concept of electricity and what's meant by the free electron. 4- Distinguish between static and moving current.

	5- Expresses current, voltage, work, and power concepts. 6- Defines direct current and alternating current. 7- Describe the Electromotive Force & Potential Difference. 8- Describes the relationship between resistance, current and voltage. 9- Calculate the electric power. 10- Describe the Electromagnetic Induction 11- Distinguish the D.C Machine (Motor & Generator) and A.C Machine (Motor & Generator) 12- Explain the Eddy currents 13- Distinguish between DC & AC Current. 14- Distinguish the Time & Frequency 15- Calculate the Root mean square value. 16- Find current, voltage, and resistance in simple circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this module, a student should be able to: 1. Understand the physical meaning of variables used to describe electricity. 2. Understand the major parts of an atom. 3. Discuss the differences between conductors, semiconductors, and insulators. 4. Understand the basic quantities in electric circuits such as voltage and current. 5. Understand the basic quantities in electric circuits such as voltage and current. 6. Relate the three main parameters of an electric circuit: the voltage, the electric current, and the electrical resistance through Ohms law. 7. Realize how the above three parameters are used to compute circuit characteristics and conditions. 8. Realize how the above parameters are used to compute electrical power. 9. Demonstrate an understanding of the basic knowledge of Electromagnetic Induction, Transformers and generator. 10. State the Faraday's &Lenz's laws of Electromagnetic Induction 11. Understand the Eddy currents 12. Identify the A.C. Fundamental 13. Solve the circuit connected of Capacitance & Inductance.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **<u>Theory:</u>** 1. Atoms, Electrons, Charge 2. Conductors and Insulators 3. Current 4. Voltage 5. Power

	6. Resistance 7. Magnetism and Electromagnetism 8. Circuit Components and Resistance 9. Magnetism and Electromagnetism 10. Electromagnetic Induction 11. Faraday's law of Electromagnetic Induction 12. Lenz's law of Electromagnetic Induction 13. Eddy currents 14. Transformer 15. Generator 16. Alternating Current 17. Type of Waveforms 18. Time & Frequency of the Waveform: 19. RMS Value of a Sine Wave 20. Phase

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	18. Lectures: used to introduce and explain key fundamentals of electricity. 19. Interactive discussions: used to engage students in critical thinking and problem-solving related to electricity through group discussions, debates, case studies, and simulations. 20. Multimedia resources: used to enhance student engagement and understanding of concepts related to electricity through videos, animations, and simulations. 21. Assessment and feedback: used to measure student learning and provide feedback on their progress through quizzes, exams, and projects.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Electrical unit system, Basic principles & Atomic theory Atoms
Week 2	Types of Materials , Types of Electricity , Current
Week 3	Voltage, Electromotive Force and Potential Difference, Sources of electrical force
Week 4	Electric Power
Week 5	Resistance and resistivity (Ohm's Law), Resistance & Conductance,
Week 6	Magnetism and Electromagnetism, Electromagnetic Induction

Week 7	Faraday's law of Electromagnetic Induction
Week 8	Lenz's law of Electromagnetic Induction, Eddy currents
Week 9	Eddy currents
Week 10	Transformer
Week 11	Transformer
Week 12	Generators
Week 13	Alternating Current , Type of Waveforms, Time & Frequency of the Waveform
Week 14	RMS Value of a Sine Wave , Phase
Week 15	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week 1	Lab 1: Electromotive force and internal resistance
Week 2	Lab 2: Weston Bridge
Week 3	Lab 3: Electrical Transformer
Week 4	Lab 4: Efficiency of the electrical transformer
Week 5	Lab 5: Faraday's Law of Electromagnetic Induction
Week 6	Lab 6: Eddy Currents Experiment

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	3- Fundamentals of Electric Circuits , Charles K. Alexander | Matthew n. o. Sadiku. FiFth Edition 4- Fundamental Electrical and Electronic Principles , Christopher R Robertson, Third Edition	No

Recommended Texts	3. ELECTRICAL FUNDAMENTALS COMPETENCY, Industry Training Authority of BC. LibreTexts ™ 4. Basic Principles of Electricity, by Prof. Dr. Osman SEVAİOĞLU Electrical and Electronics Engineering Department.	No
Websites	None	

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
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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	**Fundamental of computer science**			**Module Delivery**	
Module Type	**Core**			**Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOM103				
ECTS Credits					
SWL (hr/sem)	3				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Zakaria Abdul Wahid Hameed and Dr. nagham salim al_lella		**e-mail**	Nagham.salim@uomosul.edu.iq zakriahamoalnaish@uomosul.edu.iq	
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	2024-2025		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mathematic ,material energy science, electromagnetic	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	5. Teaching students fundamental computer. 6. Teaching student Using the Microsoft office word. 7. Learn about the basics of Windows 7 and how to use it. 8. Understanding the world wide web

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 2. Learn the basics of computer® through this introductory tutorial on commonly used features and workflows. 2. help student use internet in various field, benefit of using search engines for finding information over the internet. 3. create and save, edit, modify, rename, delete and move content in Microsoft word . 4. To encourage students, develop their own skills in using the computer. 5. Introducing the student to computer basics and the purpose of the operating system. As for the goals of the practical side It provides the student with skills in using the Word printing program And also use the Windows operating system.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Basic window, objective, how use widow, operate on window, background and control panel, computer type, desktop, laptop, personal computer, server, memory type, size, important, internet, word wide web, type of internet browser, use internet, Microsoft word, how use it, open new file, save, adding text, close file, save it, editing, adding table, editing on table, insert text and picture, algin it, etc Matlab, command window, inept, output, workspaces, command history, File, edit, debug, desktop, window, help. Course Outcomes: Teaching the student to be familiar with the basic rules for dealing with and managing a computer to help him complete projects Printing matters, preparing statistics and graphs, creating presentations and designing engineering plans And others, and the emergence of the Internet as a means of communication available to everyone, it has become very necessary for students to learn to use Computer due to the role of the Internet in many fields, including education, scientific research, trade and marketing Through electronic correspondence, web pages, and electronic communication.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The theoretical method and explanation is by presenting the material on the Point Power program in the form of diagrams and pictures This is to attract the student's attention and help him not feel bored. The practical method is to apply what has been presented On the calculator and conduct daily and monthly exams

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

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	40	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	60	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	3	10% (10)	3 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	5% (5)	Continuous	All
	Report	1	5% (5)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Learn about the basics of Windows
Week 2	Lab 2: using windows on computer .
Week 3	Lab 3: computer types
Week 4	Lab 4: computer memory types
Week 5	Lab 5: basic internet
Week 6	Lab 6: world wide web
Week 7	Lab 7: fundamental of Microsoft word file

Week 8	Lab 8: add table in Microsoft file
Week 9	Lab9: adding picture in Microsoft word file
Week10	Lab 10: add, deleting, editing, Microsoft word file content
Week 11	Lab 11: Change the text in the file, line, style text, ect
Week 12	Lab 12: Desktop and control panel wallpapers

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	.Computer literacy BASICS 2012, LeBlanc, Brandon."A closer look at the, windows 7. 2009	yes
Recommended Texts	Computing Fundamentals, Innovative training works USA, Inc, 2006	Yes
Websites	Classroom Digital 2010 Word. https://www.agitraining.com/books/microsoft-officebooks/word-2010-digital-classroom-book	

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	**Circuit Analysis**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☒ **Lab** ☒**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NRE2309**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		UGII	**Semester of Delivery**		3
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Ibtisam Yahya Abdullah		**e-mail**	ibtisamyahya@uomosul.edu.iq	
Module Leader's Acad. Title		Lecture	**Module Leader's Qualification**		P hD.
Module Tutor	Rana Hesham Mahmood Zahraa Badie Ibraheem		**e-mail**	ranahesham@uomosul.edu.iq zahraabadie@uomosul.edu.iq	
Peer Reviewer Name		Ibtisam Yahya Abdullah	**e-mail**	ibtisamyahya@uomosul.edu.iq	
Scientific Committee Approval Date		2024-2025	**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 Objectives أهداف المادة الدراسية	1- Introducing the student to the theoretical foundations and basic principles of analyzing constant-current and alternating-current electrical circuits. 2- Introducing the student to the components of electrical circuits such as

	resistors, capacitors, inductors, load, etc. 3- Enable the student to analyze electrical circuits and use different theories to solve them and calculate currents, voltages, and power in direct current and alternating current circuits. 4- Analysis of the Series and Parallel Circuit. 5- Solve the Kirchhoff's voltage and current Laws. 6- Analysis of circuits using Thevenin's Theorem, Norton's, and Superposition Theorem. 7- Distinguish and solve the voltage and current divider rules. 8- Analysis of the Branch-Current, Mesh, and Nodal Analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this module, a student should be able to: 1. Identify the fundamentals of DC electrical circuits and their components 2. Apply the electrical circuit methods in the lab. 3. Determine the suitable analysis method to solve the problems & analyze the electrical circuits by multiple methods 4. Utilize Kirchhoff's voltage law, the voltage divider rule, and Ohm's law to find nodes and components. 5. Utilize Kirchhoff's current law, current divider rule, and Ohm's law to find branch currents in parallel networks that utilize current sources or a single voltage source. 6. Find the Voltages in series networks that utilize voltage sources or a single current source. 7. Utilize nodal analysis techniques to solve for voltages in multi-source series-parallel networks. 8. Utilize mesh analysis techniques to solve for currents in multi-source series-parallel networks. 9. Analyze networks that use dependent voltage and/or current sources. 10. Utilize Thevenin's, Norton's, and Superposition Theorems for circuit analysis.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **<u>Theory:</u>** 1- Simple Electrical Circuit 2- Basic Terminologies 3- Circuit Analysis 4- Series Circuits 5- Voltage Sources in Series 6- Kirchhoff's Voltage Law 7- Interchanging Series Elements 8- Voltage Divider Rule 9- Parallel Elements 10- Total Conductance and Resistance 11- Parallel Circuits 12- Kirchhoff's Current Law 13- Current Divider Rule 14- Problems

	15- Branch-Current Analysis 16- Mesh Analysis 17- Nodal Analysis 18- Superposition Theorem 19- Thevenin's Theorem

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures: used to introduce and explain the Concepts of Electric Circuits and what are the components and Types, 2. Interactive discussions: used to engage students in critical thinking and problem-solving related to electric circuits through group discussions. 3. Multimedia resources: used to enhance student engagement and understanding of concepts related to electric circuits through videos, and animations. 4. Assessment and feedback: used to measure student learning and provide feedback on their progress through quizzes, exams, and projects.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	88	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

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

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction
Week 2	Electric Circuits: Components, Types, and Related Concepts.
Week 3	Circuit Analysis, Series Circuits, Voltage Sources in Series
Week 4	Kirchhoff's Voltage Law
Week 5	Interchanging Series Elements
Week 6	Voltage Divider Rule
Week 7	Solve problems
Week 8	Parallel Elements, Total Conductance and Resistance
Week 9	Parallel Circuits, Kirchhoff's Current Law
Week 10	Current Divider Rule
Week 11	Solve problems
Week 12	Branch-Current Analysis
Week 13	Mesh Analysis
Week 14	Nodal Analysis
Week 15	Superposition Theorem
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week 1, 2	Experiment No.1: Ohm's Law
Week 3,4	Experiment NO.2 Series and parallel connection
Week 5,6	Experiment No.3 Kirchhoff's Laws
Week 7,8	Experiment NO.4 Divider Rules
Week 9,10	Experiment No.5 Mesh Method
Week 11,12	Experiment No.6 Thevenin's Theorem
Week 13,14	Experiment No.6 Superposition Theorem

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- Introduction circuit analysis, Tenth edition 2- Electronic Circuits: Fundamentals and Application. 2nd edition. Michael Tootey, BA 3- Fundamentals of Electric Circuits: Firth Edition. Charles K. Alexander & Matthew N. O. Sadiku	No
Recommended Texts	1. A Textbook of Electrical Technology, Theraja. Vol. 2 2. ELECTRICAL CIRCUIT ANALYSIS. 2nd edition, MAHADEVAN, K. ،CHITRA, C.	No
Websites	None	

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
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
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	F – Fail	راسب	(0-44)	Considerable amount of work required

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Geology	**Module Delivery**	
Module Type	**Core**		☒**Theory** ☒**Lecture** ☒ **Lab** ☒**Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	**NRE23011**		
ECTS Credits	**6**		
SWL (hr/sem)	**150**		

Module Level	UGII	**Semester of Delivery**	3
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Radhwan Khaleel Hayder	**e-mail**	dr.radhwanatroshe@uomosul.edu.iq
Module Leader's Acad. Title	Lecture	**Module Leader's Qualification**	Ph. D.
Module Tutor	Radhwan Khaleel Hayder	**e-mail**	dr.radhwanatroshe@uomosul.edu.iq
Peer Reviewer Name	Radhwan Khaleel Hayder	**e-mail**	dr.radhwanatroshe@uomosul.edu.iq
Scientific Committee Approval Date	2024-2025	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Geothermal	**Semester**	
Co-requisites module	Hydrogeology	**Semester**	

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

Module Objectives أهداف المادة الدراسية	1. Introducing the student to the theoretical foundations and basic principles of geology 2. Identify the basic concepts and perceptions of the branches of earth science and their connection to other branches of science

	3. Gaining the ability to link the theoretical aspect of the branches of earth science with their various applications to contribute to the process of scientific progress, raise the level of education, and provide the labor market with graduates to work in all fields of investing in the country's mineral and oil wealth and other geological applications
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this module, a student should be able to: 1. Identify the earth, the universe's creation, and the divisions of the Earth and its parts. 2. Determine the crystal's properties, crystal symmetry, elements of symmetry, crystallographic axes, and crystal systems. 3. Identifying the main elements of the earth's crust, studying minerals and their types, and methods of diagnosing them. 4. Identify igneous rocks and the method of their origin and divisions. 5.Identify sedimentary rocks, their types, characteristics, methods of formation, and areas of formation (depositional environments). 6. Identify metamorphic rocks, methods of transformation, conditions of transformation, and their divisions. 7. Identify the factors affecting the weathering of rocks and methods of transporting sediments, their aggregation, and cohesion.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Theory:** 1. Introduction to geology, what is geology? What do geologists do? Solar system. 2. Structure of the earth. Crust, Mantle, Core, The rock cycle, and Group of rocks. 3. Mineral, Crystal structure, Chemical composition of minerals, Physical properties of minerals. Minerals groups, Silicate minerals t, Clay minerals, and Nonsilicate minerals. Minerals identification, Color, Luster…etc. 4. How minerals form, Cooling magma, Chemical 5. weathering processes, Metamorphism, The rock-forming minerals. 6. Igneous rocks, magma, and lava, Composition of magma, How magma originates, and characteristics of igneous rocks. 7. Bowen's reaction series. 8. Classification of igneous rocks, Volcanism, Sills and dikes, Batholiths, and stocks. 9. Sedimentary rocks, Introduction, Formation of sedimentary rocks, Occurrence of sedimentary rocks, Sedimentary depositional environments. 10. Sediments and sedimentary rocks, Types of sedimentary rocks, Detrital sedimentary

	11. rocks, Chemical and biochemical sedimentary rocks Fossils, Formation, Petroleum and natural gas. 12. Metamorphic rocks, Introduction, the agents of metamorphism, Types of metamorphism, the classification of metamorphic rocks, Foliated & Nonfoliate metamorphic rocks. 13. Weathering, erosion and soil formation, Introduction, Types of weathering, Mechanical weathering, Chemical weathering.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	5. Lectures: used to introduce and explain the Concepts of geology. 6. Interactive discussions: used to engage students in critical thinking and problem-solving related to geology through group discussions. 7. Multimedia resources: used to enhance student engagement and understanding of concepts related to geology through videos, and animations. 8. Assessment and feedback: used to measure student learning and provide feedback on their progress through quizzes, exams, and projects.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

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

Formative assessment	**Quizzes**	2	10% (5)	5 and 11	LO #1, #2, #3, #4 and #5
	Assignments	2	10% (5)	4 & 12	LO #1 - #10
	Projects	1	10% (2)	Continuous	All
	Report/ Lab.	9	10% (2)	Continuous	All
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction
Week 2	The importance of geology • Branches of the geology • Relationship between geology and other science
Week 3	Earth site in the universe •Planets of the solar • How the solar system formed
Week 4	Crystals: (Introduction, Crystals properties, Crystal symmetry, Elements of symmetry, Crystallographic axes, Crystal systems)
Week 5	Structure of the earth. Crust, Mantle, Core, The rock cycle, and Group of rocks.
Week 6	Theoretical and practical exam
Week 7	Minerals: (Introduction, Minerals groups, Physical properties of minerals, Economic use)
Week 8	Minerals groups, Silicate minerals, Nonsilicate minerals, Minerals identification, Color, Luster…etc,

Week 9	Igneous rocks (Introduction to igneous rocks, Texture of igneous rocks, Compositions of igneous rocks, Naming igneous rocks)
Week 10	characteristics of igneous rocks, Classification of igneous rocks, Volcanism, Sills and dikes, Batholiths and stocks.
Week 11	Theoretical and practical exam
Week 12	Sedimentary rocks (Introduction to sedimentary rocks, Types of sedimentary rocks, Sedimentary environments)
Week 13	Fossils, Petroleum and natural gas.
Week 14	Metamorphic rocks (Introduction to metamorphic rocks, Agents of metamorphism, Textural and mineralogical changes)
Week 15	weathering, erosion and soil formation, Types of weathering, Mechanical weathering, Chemical weathering,
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week 1	Lab 1: How to identify minerals
Week 2	Lab 2: Physical properties of minerals.
Week 3	Lab 3: Physical properties of minerals.
Week 4	Lab 4: Chemical properties of minerals.
Week 5	Lab 5: Types of rocks in nature.
Week 6	Lab 6: Properties of Igneous rocks.
Week 7	Lab 7: classification of Igneous rocks.
Week 8	Lab 8 Properties of Metamorphic rocks.
Week 9	Lab9: classification of Metamorphic rocks.
Week 10	Lab 10: Properties of Sedimentary rocks.
Week 11	Lab 11: classification of Sedimentary rocks.
Week 12	Lab 12: summary

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	AL-Dabbagh. T.H. (2017) The Eart. An Introduction to Physical geology First edition. 366 P.	Yes
Recommended Texts	Thompson Graham R, Turk Jonathen, 2011. Earth, what inside, Student Edition, Brookes/ Cole, Cengage leering.	Yes
Websites	Web Geology	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**جرائم حزب البعث المنحل** **Crimes of the defunct Baath Party**			**Module Delivery**	
Module Type	**B**			☒**Theory** ☒**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UOM201**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		UGII	**Semester of Delivery**		3
Administering Department		BSC-NRE	**College**	Type College Code	
Module Leader	**Salah avdo ali**		**e-mail**	Salahavdo2@uomosul.edu.iq	
Module Leader's Acad. Title		Assistant Teacher	**Module Leader's Qualification**		M.Sc
Module Tutor			**e-mail**		
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		2024-2025	**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 Objectives أهداف المادة الدراسية	أ -المعرفة والفهم) الاهداف المعرفية(1- معرفة تاريخ تأسيس دولة العراق والتطورات السياسية المعاصرة. 2- فهم طبيعة النظام السياسي في عهدي الملكي والجمهوري في العراق. 3- إدراك طبيعة الجرائم السياسية والاقتصادية الاجتماعية والثقافية التي ارتكبها نظام حزب البعث البائد ضد أبناء الشعب بمختلف مكوناته خلال حقبة حكمه. 4- دعم مهارات فهم قضايا السياسية، وتعزيز سبل التعليم التفاعلي لتعزيز سبل المشاركة في الشأن العام – المواطنة-. ب - المهارات الخاصة بالموضوع) الاهداف المهاراتية الخاصة بالمقرر(ب -- 1اكتساب الطالب لمهارات التفاوض والتواصل وتبادل الاراء مع الاخرين. ب – 2 اكتساب الطالب مهارات الحوار البناء الهادف . ب – 3 اكتساب الطالب مهارات مواجهة اي موقف والتعبير عن الراي بكل شجاعة وثقة بالنفس. ج- مهارات التفكير ج1- مهارات التحليل. ج2- مهارات التوظيف للمفردات التي تعلمها في الواقع العملي من خلال دراسة مشكلات محددة من الواقع. ج3- مهارات التنبؤ والدراسات المستقبلية للنظم الديمقراطية. د - المهارات العامة والمنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي). د1- القدرة على العمل كفريق. د2- التفاعل مع فريق العمل لتحقيق المهارات المطلوبة. د3- القدرة على القيام بعرض نظري لبعض الموضوعات ذات العلاقة بمفردات المادة. د4- اكتساب مهارات التحليل العلمي لاي ظاهرة سياسية تتعلق بانتهاكات النظام الحاكم.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1.عرف المفاهيم الاتية: حقوق الانسان، الشرعة الدولية، الديمقراطية، الدمقرطة، التحول الديمقراطي. 2. وضح اهمية الحقوق السياسية والمدنية. 3. اذكر اهم ما جاء في المواثيق الدولية لحقوق الانسان فيما يخص حق الحياة. 4. تكلم باختصار عن انواع الحقوق الاقتصادية والاجتماعية والثقافية. 5.ناقش ما جاء في الدستور العراقي لعام 2005 النافذ من ضمانات فيما يخص حقوق الانسان. 6.حدد اهم خصائص النظام الديمقراطي 8.اشرح انواع الديمقراطية ثم بين اهم الانواع القابلة للتطبيق العملي. 9.عدد مع الشرح انواع النظم الانتخابية. 10.ناقش الاطار الوظيفي للسلطة التشريعية ضمن مؤسسات النظام السياسي العراقي وفق ما جاء في دستور عام 2005.

	11.حدد الاطار البنيوي للمؤسسة التنفيذية في النظام السياسي العراقي وفق دستور 2005. 12.تكلم عن اختصاصات مجلس النواب في اطار المؤسسة التشريعية. 13. ناقش شروط انتخاب رئيس الجمهورية وفق الدستور العراقي لعام 2005.
Indicative Contents المحتويات الإرشادية	يتضمن المحتوى الإرشادي ما يلي. مفهوم النظام الملكي والجمهوري والتطور السياسي للعراق تاريخياً يتناول تعريف نظام الحكم وتعريف النظام الملكي ونظام الجهوري، تعريفاً لغوياً واصطلاحياً واجرائياً، تأسيس دولة العراق، ثم التطور التاريخي للعراق، من بعد الحرب العالمية الأولى مروراً بالأحداث والثورات والانقلابات العسكرية، ومن ثم وصول حزب البعث البائد إلى الحكم، وما انبثق عن تمركز وتمسط بالسلطة وممارسة الاستبداد والدكتاتورية. (5 ساعات) تأسيس حزب البحث العربي الاشتراكي يتناول تاريخ تأسيسي حزب البعث في سوريا سنة 1946 ومن ثم تأسيس فرع للحزب في العراق سنة 1952. (ساعتان). الانتهاكات والجرائم يتناول اشكال وصور من انتهاكات نظام حزب البعث البائد على المستوى الداخلي من ارتكابه لجريمة الدجيل والانفال والقصف الكيمياوي ومنع الاحزاب السياسية من ممارسة نشاطاتها واعدام الكثير من المعارضين. (3 ساعات). جرائم على مستوى الخارجي يتناول الجرائم والانتهاكات التي مارسها نظام حزب البعث البائد في علاقاته مع الدول الجوار والاقليمية والعالمية مثل الحرب العراقية الايرانية لثماني سنوات 1980-1988 وغزو واحتلال دولة الكويت سنة 1990 فضلا عن سجن واغتيال السياسيين الاجانب . (4 ساعات).

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. المحاضرة المصحوبة بالشرح والتحليل. 2. الحلقة النقاشية. 3. التقارير والبحوث. 4. عرض المادة عبر شرائح (بوربوينت) . 5. الاسئلة والاجوبة. 6. المشاركة الصفية .

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
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% (5)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (5)	6 and 12	LO #3, #4 and #6, #7
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	نبذة مختصر عن تأسيس واهداف حزب البعث البائد
Week 2	العهد الملكي والعهد الجمهوري في العراق
Week 3	انتهاكات نظام حزب البعث للحقوق والحريات العامة في العراق
Week 4	اثر سلوكيات النظام البعثي في المجتمع العراقي
Week 5	اثر المرحلة الانتقالية في العراق في محاربة السياسة الاستبدادية

Week 6	الآليات النفسية والاجتماعية التي استعملها النظام البعثي في العراق ضد أبناء الشعب
Week 7	الدين والدولة في عهد نظام حزب البعث في العراق
Week 8	الثقافة والاعلام وعسكرة المجتمع في عهد نظام حزب البعث في العراق
Week 9	اثر القمع والحروب على البيئة والسكان في عهد نظام حزب البعث في العراق
Week 10	تجفيف الاهوار والهجرة القسرية في عهد نظام حزب البعث في العراق
Week 11	تدمير البيئة الزراعية والحيوانية في عهد نظام حزب البعث في العراق
Week 12	جريمة المقابر الجماعية في عهد نظام حزب البعث في العراق
Week 13	جريمة الانفال في عهد نظام حزب البعث في العراق
Week 14	جريمة قصف مدينة حلبجة في عهد نظام حزب البعث في العراق
Week 15	التميز العنصري والطائفي بين أبناء الشعب في عهد نظام حزب البعث البائد في العراق

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered لا يوجد
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	1 منهاج جرائم حزب البعث البائد في العراق / جمهورية العراق/ وزارة التعليم العالي والبحث العلمي، دائرة الدراسات والتخطيط والمتابعة، بغداد،2023. 2- قيس ناصر وعبدالهادي معتوق، التأسيس المعرفي لدراسة جرائم حزب البعث في العراق (مقدمة عامة)، مركز العراقي لتوثيق جرائم التطرف،	Yes Yes

	بغداد،2023.	
Recommended Texts	1. الدستور العراقي الدائم لعام 2005، الامانة العامة لمجلس الوزراء، بغداد، 2006.	Yes Yes
Websites	https://www.google.com /url?sa=t&source=web&rct=j&opi=89978449&url=https://www.youtube.	

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	**Thermodynamic**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐ **Seminar**	
Module Code	**NRE23012**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	UGII		**Semester of Delivery**	3	
Administering Department	BSC-NRE		**College**		
Module Leader	Dr. Saad Fadhil Mahmood		**e-mail**	Saadfadhil32@uomousl.edu.iq	
Module Leader's Acad. Title	Lecture		**Module Leader's Qualification**	P.hD.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Saad Fadhil Mahmood		**e-mail**	Saadfadhil32@uomousl.edu.iq	
Scientific Committee Approval Date	2024-2025		**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 Objectives	These objectives provide a general overview of the knowledge and skills you can expect to acquire during the Thermodynamics module.

أهداف المادة الدراسية	1- Understand the behavior of gases and the concept of an ideal gas. 2- Study the properties of gases, including pressure, temperature, volume, and their interrelationships. 3- Apply the combined gas law to analyze the changes in pressure, temperature, and volume of a gas. 4- Comprehend the principles of the kinetic molecular theory and its application to gases. 5- Calculate and analyze heat capacity, including specific heat capacity and molar heat capacity. 6- Gain knowledge of the First Law of Thermodynamics and its applications in energy conservation and heat transfer. 7- Familiarize oneself with the Second Law of Thermodynamics and its implications for energy conversion and entropy. 8- Understand the concept of the Third Law of Thermodynamics and its relationship to absolute zero and entropy. 9- Participate in quizzes to assess understanding and knowledge of the topics covered in each respective period.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the behavior of gases and apply the concept of an ideal gas to solve problems related to pressure, volume, and temperature. 2- Describe and analyze the properties of gases, including pressure, temperature, and volume, and apply the appropriate gas laws to solve related problems. 3- Explain the principles of the kinetic molecular theory and its application to gases, including the relationship between molecular motion and gas properties. 4- Apply the combined gas law to analyze changes in pressure, volume, and temperature of gases, and solve problems involving the interrelation of these variables. 5- Calculate and analyze heat capacity, including specific heat capacity and molar heat capacity, and understand their significance in energy transfer and temperature changes.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Week 1, 2: Gases and Ideal Gas • Introduction to the behavior of gases • Gas laws: Boyle's law, Charles's law, and Avogadro's law • Ideal gas equation and its applications • Calculation of gas properties using the ideal gas equation • Gas stoichiometry and molar volume Week 3, 4: Properties of Gases • Pressure and its measurement • Temperature scales and thermometers

	• Gas mixtures and partial pressures • Dalton's law of partial pressures • Real gases and their deviations from ideal behavior • Van der Waals equation and its significance First Quiz: Assessment of understanding and knowledge of gases and ideal gas behavior. Week 5, 6: Kinetic Molecular Theory • Introduction to the kinetic molecular theory • Molecular motion and the relationship with temperature • Distribution of molecular speeds and kinetic energy • Effusion and diffusion of gases • Graham's law of effusion • Mean free path and collision theory Week 7, 8: Combined Gas Law • Combined gas law and its derivation • Applications of the combined gas law • Gas density and molar mass determination • Gas laws and changes in state (Boyle's law, Charles's law, Avogadro's law) Second Quiz: Assessment of understanding and application of the kinetic molecular theory and the combined gas law. Week 9, 10: Heat Capacity • Introduction to heat and thermal energy • Specific heat capacity and its measurement • Calculation of heat transfer and temperature changes • Calorimetry and heat exchange • Molar heat capacity and its relationship with specific heat capacity Week 11, 12: The First Law • Introduction to the First Law of Thermodynamics • Internal energy and its relationship with heat and work • Heat transfer processes: conduction, convection, and radiation • Enthalpy and enthalpy change Application of the First Law to various thermodynamic systems Third Quiz: Assessment of understanding and application of heat capacity and the First Law of Thermodynamics. Week 12, 13: The Second Law • Introduction to the Second Law of Thermodynamics • Heat engines and their efficiency • Carnot cycle and Carnot efficiency • Entropy and its relationship with heat transfer

	• Entropy change in reversible and irreversible processes Week 14, 15: The Third Law • Introduction to the Third Law of Thermodynamics • Absolute zero and its significance • Entropy at absolute zero • Calculation of entropy changes • Applications of the Third Law to thermodynamic systems

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	9. **Lectures:** used to introduce and explain key concepts related to Thermodynamic. 10. **Interactive discussions:** used to engage students Thermodynamic 11. **Multimedia resources:** used to enhance student engagement and understanding of Thermodynamic concepts related to nuclear energy through videos, animations, and simulations. 12. **Assessment and feedback:** used to measure student learning and provide feedback on their progress through quizzes, exams, and projects.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.9
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% (5)	5 and 10	LO #1, #2 and #3, #5
	Assignments	2	10% (5)	2 and 12	LO #3, #4 and #5
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #2, #3 and #5
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Gases and Ideal gas
Week 2	Gases and Ideal gas continue
Week 3	Properties of gases
Week 4	Properties of gases continue
Week 5	Kinetic molecular theory
Week 6	Kinetic molecular theory continue
Week 7	Combined gas Law
Week 8	Combined gas Law continue
Week 9	Heat Capacity
Week 10	Heat Capacity continue
Week 11	The First Law
Week 12	The First Law Applications
Week 13	The Second Law
Week 14	The Second Law Applications

Week 15	The Third Law
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. /Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1,2,3,4	Determination of the Absolute Density of Liquids
Week 5,6,7,8	Determination of the Absolute Density of Solids
Week 9,10,11,12	Determination of the Surface Tension of Liquids
Week 13,14,15	Determination of the Relative Viscosity of Liquids using Viscometer
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1-Physical chemistry by ATKINS 2-	No
Recommended Texts	3.	No
Websites	None	

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	**Theory inorganic chemistry / 2 nd semester**	**Module Delivery**	
Module Type	**Core**		☒**Theory** ☒**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐ **Seminar**
Module Code	**NRE23010**		
ECTS Credits	**3**		
SWL (hr/sem)	**75**		
Module Level	UGII	**Semester of Delivery**	3
Administering Department	BSC-NRE	**College**	Type College Code
Module Leader	Thana Yaqup Yousif Al-Obedy	**e-mail**	Thana.y.yousif@uomosul.edu.iq

Module Leader's Acad. Title	Assistance Professor	**Module Leader's Qualification**	M.Sc.
Module Tutor	Thana Yaqup Yousif Al-Obedy	**e-mail**	Thana.y.yousif@uomosul.edu.iq
Peer Reviewer Name	Thana Yaqup Yousif Al-Obedy	**e-mail**	Thana.y.yousif@uomosul.edu.iq
Scientific Committee Approval Date	2024-2025	**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 Objectives أهداف المادة الدراسية	1. Acquisition of skills in General Chemistry and Inorganic Chemistry. 2. To develop the ability to correlate the chemical and physical properties of elements and their compounds with their positions in the periodic table. 3. To establish the link between theory and laboratory practice by conducting laboratory experiments. 4. To acquire expertise in chemistry laboratory in handling of reagents and solvents as well as in analytical techniques.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introduction, Matter, Atom, Electronic structure of the atom 2. Classical theory, Bohr Theory, Quantum theory: Examples 3. Practical examples using quantum numbers 4. Periodic Table of the Elements: s-block, p-block, d-block, f-block 5. Important Notes, 6. Some periodic properties of atoms, Shielding constant 7. To calculate the shielding constant of the electron in orbital s, p: 8. Periodic Properties: Atom radius , Ionization Energy, Electron Affinity, Electronegativity 9. The basic conditions for the composition of ionic compound.[15 hr] 10. Group I (1A): Introduction, The Alkali Metals, General properties

	11. The diagonal relation ships: 12. Sodium (Na): Chemical properties, Sodium: reactions of elements 13. Alkaline Earth Metals Group II (IIA): Calcium, Chemical properties, Calcium: reactions of elements 14. Elements of Group IIIA, Boron: reactions of element, Aluminum, Aluminum: reactions of elements 15. Fourth group IVA: Carbon: reactions of elements, Silicon: reactions of elements. 16. Ionic Compound Polarization 17. Factors affecting the increase or decrease of polarization 18. Hydrogen: Preparation Methods of Hydrogen, Reactions of Hydrogen 19. Hydrogen Compounds: Nitrogen Hydrogen Compounds, Phosphorus Hydrogen Compounds, Sulfur Hydrogen Compounds, Halogen Hydrogen Compounds 20. Hydrogen isotopes [15 hr] 21. Hybridization: Types of Hybridization: sp Hybridization, sp2 Hybridization, sp3 Hybridization 22. Applications of hybridization: Linear molecule: Trigonal planar molecules, Tetrahedral molecules, Tetrahedral molecule (Pyramidal), Tetrahedral molecule (V-Shape), Trigonal bipyramid molecule, Octahedral molecule, Conclusion. 23. Valence bond theory: Examples
Indicative Contents المحتويات الإرشادية	1. Matter, Atom, Electronic structure of the atom 2. Classical theory, Bohr Theory, Quantum theory: Examples 3. Periodic Table of the Elements: s-block, p-block, d-block, f-block 4. Important Notes, 5. Group I (1A) 6. Group II (IIA) 7. Group IIIA 8. group IVA 9. Hydrogen isotopes 10. Hybridization: 11. Applications of hybridization 12. Valence bond theory

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Expanding students' perceptions about this science and its contents it includes that help in acquisition of skills in General Chemistry and Inorganic Chemistry. To develop the ability to correlate the chemical and physical properties of elements and their compounds with their positions in the periodic table and involving some examples activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**75**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered

Week 1	Introduction, Matter, Atom, Electronic structure of the atom
Week 2	Classical theory, Bohr Theory, Quantum theory: Examples
Week 3	Practical examples using quantum numbers
Week 4	Periodic Table of the Elements: s-block, p-block, d-block, f-block
Week 5	Periodic Properties: Atom radius , Ionization Energy, Electron Affinity, Electronegativity
Week 6	The basic conditions for the composition of ionic compound.[15 hr]
Week 7	Group I (1A): Introduction, The Alkali Metals, General properties
Week 8	Alkaline Earth Metals Group II (IIA): Calcium, Chemical properties, Calcium: reactions of elements
Week 9	Elements of Group IIIA, Boron: reactions of element, Aluminum, Aluminum: reactions of elements
Week 10	Factors affecting the increase or decrease of polarization
Week 11	Hybridization
Week 12	Hydrogen isotopes
Week 13	Valence bond theory: Examples
Week 14	Hydrogen Compounds: Nitrogen Hydrogen Compounds, Phosphorus
Week 15	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Cotton, F.A. and Wilkinsan, D. 2000 . Advanced Inorganic Chemistry. 5th ed. Wiley-Interscience, New York,.	No
Recommended Texts	Martel,A. E. ,2009. Coordination Chemistry. Van Nostrans Reinhold, NewYork.	No
Websites	https://classroom.google.com/u/2/c/NjUxMzQ1MTIwMTEz	

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		
Module Title	**English Language**	**Module Delivery**
Module Type	**B**	☒**Theory** ☒**Lecture** ☐**Lab**
Module Code	**UOM2022**	

ECTS Credits	2	☐Tutorial ☐Practical ☐Seminar	
SWL (hr/sem)	**125**		
Module Level	**2**	**Semester of Delivery**	**3**
Administering Department	New and Renewable Energies	**College**	**Science**
Module Leader	Dr. Saad Fadhil Mahmood	**e-mail**	Saadfadhil32@uomousl.edu.iq
Module Leader's Acad. Title	**Lecturer**	**Module Leader's Qualification**	**MA**
Module Tutor	Dr. Saad Fadhil Mahmood	**e-mail**	Saadfadhil32@uomousl.edu.iq
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	2024-2025	**Version Number**	**2.0**

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	**UOM-12011**	**Semester**	**1**
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	**This course is aimed to increase students' knowledge in terms of different vocabulary, phrases, clauses and medical physics-related terminology. It enables the learners to express what they would like to communicate while they are still studying at college or even when they get their potential jobs. Also, this course encourages the learners to read books, articles and browse department-related websites to search for information needed.**
Module Learning Outcomes	**- Differentiating between general English communications and academic English communication.** **- Learning commonly-used terminology in the field of Medical Physics.** **- Understanding specific phrases & expressions written or spoken.** **- Increasing learners' confidence in reading books and research conducted**

	by scholars around the world. **- Motivating learning strategies for learners and improving their autonomous skills.** **- Evaluating their language skills and benefitting from feedback given throughout the course.**
Indicative Contents	**Introduction about communication in English language, followed by general English information. Also, explaining some strategies useful for learners to progress in the subject [8hrs]. Clarifying the English language skills in general and moving to vocabulary and its importance in English language [6]. Differentiating between parts of speech and showing the difference between general English and academic English [3]. Detailing the main skills; writing, listensing, reading and speaking and doing some practice sessions with feedback sessions where needed [9]. Feedback and error corrections practices with some review over the whole course [4hrs].**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Engaging learners in the learning process is essential . Modern teaching and learning methods depend hugely on collaborative work by students. Also, focusing on some quick quizzes is seen as successful strategies though. Also, it is known that homework plays important roles in improving learners' academic records. Paying attention to the point that every classes have mostly mixed-ability learners.**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**33**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**17**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**4**
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% (5)	5 and 6	LO #1, #2 and #5 and #6
	Assignments	2	10% (5)	4 and 8	LO #2, #3, #5and #6
	Projects / Lab.	1	10% (10)	13	All
	Report	1	10% (10)	3,4,6 and 8	LO #3, #4, #5 and #6
Summative assessment	Midterm Exam	2hr	10% (10)		
	Final Exam	3hr	50% (50)		
Total assessment					100% (100 Marks)

ملاحظة: في حالة كون المادة لا تحتوي على جانب عملي تضاف الدرجة الخاصة بها الى أي محور اخر يختاره استاذ المادة من تفصيلات الدرجة اعلاه

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري

	Material Covered
Week 1	An introduction on linguistic communication
Week 2	An introduction on English language around the world
Week 3	Delivering Advanced study strategies for learners throughout their academic life.
Week 4	Modern methods of improving the four skills of English language
Week 5	An introduction about vocabulary in English language in general
Week 6	Teaching some skills required to increase and improve learners' vocabulary in the course.
Week 7	Teaching learners different phrases, clauses and expressions commonly-used in the field.
Week 8	Doing useful class activity in order to encourage collaborative work between students.
Week 9	Teaching writing skills and focusing on writing short paragraphs correctly.
Week 10	Doing feedback sessions and focusing on error corrections
Week 11	Teaching listening skills and assigning homework individually and collaboratively.
Week 12	Teaching reading skills in general and focusing on necessary strategies required.
Week 13	Doing some reading practice inside classroom and giving some feedback and error correction.
Week 14	Teaching speaking skills and encouraging group sessions and course-related discussions
Week 15	Reviewing some main topics from the past weeks and doing quick re-capping for the course.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week10	
Week 11	
Week 12	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Murphy, R. (2019). English Grammar in Use. Cambridge University Press**	**YES**
Recommended Texts	**Edward, S. (2011). English Grammar for ESL Learners. Mc.Graw.Hill**	**NO**
Websites	English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Learners of English by Raymond Murphy - PDF Drive English Grammar for ESL Learners (PDFDrive).pdf	

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	**Analog Electronics**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☒**Lab** ☒**Tutorial** ☐**Practical** ☐ **Seminar**	
Module Code	**NRE2308**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		UGII	**Semester of Delivery**		3
Administering Department		BSC-NRE	**College**		
Module Leader	Dr. Assim Ahmed Issa		**e-mail**	Assim.ahmed@uomosul.edu.iq	
Module Leader's Acad. Title		Lecture	**Module Leader's Qualification**		PhD.

Module Tutor	Assim Ahmed Issa	**e-mail**	Assim.ahmed@uomosul.edu.iq
Peer Reviewer Name	Assim Ahmed Issa	**e-mail**	Assim.ahmed@uomosul.edu.iq
Scientific Committee Approval Date	2024-2025	**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 Objectives أهداف المادة الدراسية	These objectives provide a general overview of the knowledge and skills you can expect to acquire during the Analog Electronics. 10- Understand the behavior of - Conduction Electrons and Holes, Electron and Hole Current, P-Type and N-Type Semiconductor. 11- p-n junction ,Diode Operationand Voltage-Current (*V-I*) Characteristics of a Diode .. 12- Diode Models, Half-Wave Rectifiers,Full-Wave RectifiersComplements of Binary Numbers and Signed Numbers Comprehend the principles of the kinetic molecular theory and its application to gases. 13- The Zener Diode and Zener Diode Applications. 14- Bipolar Junction Transistor (BJT) Structure BJT Characteristics and Parameters. 15- Amplifier Operation , Transistor AC Models , The Common-Emitter Amplifier. Participate in quizzes to assess understanding and knowledge of the topics covered in each respective period
Module Learning Outcomes	6- Understand the behavior of the Analog Electronics and apply the concept of P-Type and N-Type Semiconductor to solve problems

مخرجات التعلم للمادة الدراسية	related to Semiconductor . 7- Describe and analyze the properties of Transistor (BJT) Structure BJT Characteristics and Parameters. 8- Explain the principles of The Zener Diode and Zener Diode Applications.the Common-Emitter Amplifier.
Indicative Contents المحتويات الإرشادية	Students do study the following fields: 1- Conduction Electrons and Holes, Electron and Hole Current, P-Type and N-Type Semiconductor. 2- p-n junction ,Diode Operationand Voltage-Current (V-I) Characteristics of a Diode . 3- Diode Models, Half-Wave Rectifiers,Full-Wave RectifiersComplements of Binary Numbers and Signed Numbers. 4- The Zener Diode and Zener Diode Applications . 5- Bipolar Junction Transistor (BJT) Structure BJT Characteristics and Parameters. 6- Amplifier Operation , Transistor AC Models , The Common-Emitter Amplifier 7- Common-Collector Amplifier, The Common-Base Amplifier . 8- solved problems . Course Outcomes: the student will be able to: 1. know the type of electronics elements . 2-solve problem . 3- Connecting electrical circuits. 4. Explanation of the Amplifier Operation .

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures: used to introduce and explain key concepts related to P-Type and N-Type Semiconductor 2. Multimedia resources: used to enhance student engagement and understanding of Analog Electronics concepts 3. Assessment and feedback: used to measure student learning and provide feedback on their progress through quizzes, exams, and projects.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Conduction Electrons .
Week 2	Holes, Electron and Hole Current, P-Type and N-Type semiconductor.
Week 3	Diode Operation and Voltage-Current (V-I) Characteristics of a Diode.
Week 4	Characteristics of a Diode.
Week 5	First Quiz, and Diode Models.
Week 6	Half-Wave Rectifiers Full-Wave Rectifiers.
Week 7	Diode Limiters.
Week 8	Diode Clampers.
Week 9	Second Quiz, and The Zener Diode
Week 10	Zener Diode Applications.
Week 11	Bipolar Junction Transistor (BJT) Structure.
Week 12	Third Quiz , BJT Characteristics and Parameters, Amplifier Operation, Transistor AC Models
Week 13	The Common-Emitter Amplifier.
Week 14	Common-Collector Amplifier.
Week 15	The Common-Base Amplifier .
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. /Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1,2	1.توليد ورسم الاشارات
Week 3,4	2. خصائص الدايود
Week 5,5	3. دوائر التوحيد

Week 7,8	4. خصائص دايود زنر
Week 9,10	5. دوائر المحددات
Week 11,12	6. مضاعفة الجهد
Week 13, 14	7. خواص الترانزستور

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- ANALOG ELECTRONICS (CIRCUITS AND DEVICES) Dr. D.K.Kaushik Head Department of Electronics andComputer Science, Dayanand Post Graduate College,Hisar (Haryana) 2- ANALOG ELECTRONICSII B.TECH I SEMESTER FOR EEE	No
Recommended Texts	4. Lecture Notes for Analog Electronics	No
Websites	https://adevelops.nl/en/technology/analog-electronics/	

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
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Material Science and fluids**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☐**Lecture** ☐ **Lab** ☐**Tutorial** ☐**Practical** ☐ **Seminar**	
Module Code	**NRE24014**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	New and Renewable Energies		**College**	College of sciences	
Module Leader	Dr. Saad Fadhil Mahmood		**e-mail**	Saadfadhil32@uomousl.edu.iq	
Module Leader's Acad. Title	Lecture		**Module Leader's Qualification**	P.hD.	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name	None		**e-mail**	E-mail	
Scientific Committee Approval Date	2024-2025		**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 Objectives أهداف المادة الدراسية	9- Understand the principles and methods used to classify materials based on their properties, structures, and applications. 10- Study the properties, characteristics, and behavior of metals and ceramics. 11- Understand the applications and engineering considerations related to metals and ceramics. 12- Gain knowledge of polymers, including their structures, properties, and synthesis methods. 13- Examine the mechanical, thermal, and electrical properties of polymers. 14- Study advanced materials that possess unique properties or exhibit exceptional performance. 15- Gain an understanding of semiconductor materials and their properties. 16- Study the properties, design considerations, and biocompatibility of biomaterials. 17- Examine emerging materials and their potential impact on future technologies. 18- Explore the properties, synthesis methods, and applications of nano-engineered materials.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Able to classify materials based on their properties, structures, and applications, and differentiate between different categories such as metals, ceramics, polymers, composites, advanced materials, semiconductors, biomaterials, and nano-engineered materials. 2- Gain knowledge of the properties, behavior, and characteristics of metals and ceramics, including their mechanical, thermal, and electrical properties, and understand their engineering applications and considerations. 3- Evaluate the properties and behavior of polymers and composites, including their structure, synthesis methods, mechanical, thermal, and electrical properties, and 4- Understanding of advanced materials that possess unique properties or exhibit exceptional performance, and analyze their synthesis techniques, properties, and applications in cutting-edge technologies and industries. 5- Study the principles of semiconductors, including band theory and doping, and analyze their behavior in electronic devices. They will also explore the applications of semiconductors in integrated circuits, optoelectronics, and

	renewable energy technologies.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Classification of Materials: • Introduction to material science and its importance • Overview of material classification based on properties, structures, and applications • Study of different material categories: metals, ceramics, polymers, composites, etc. Metals and Ceramic: • Properties, characteristics, and behavior of metals and their alloys • Structure and properties of ceramics and their applications • Engineering considerations and practical applications of metals and ceramics Polymers and Composites: • Introduction to polymers and their classifications • Study of polymer properties, behavior, and processing techniques • Composites: types, composition, reinforcement, and applications Advanced Materials: • Introduction to advanced materials and their significance • Study of nanomaterials, smart materials, shape memory alloys, etc. • Synthesis methods, properties, and applications of advanced materials Semiconductors: • Overview of semiconductors and their role in electronic devices • Band theory, doping, and semiconductor behavior • Applications of semiconductors in integrated circuits, optoelectronics, and renewable energy technologies Biomaterials: • Introduction to biomaterials and their importance in medical applications • Study of biocompatibility, properties, and behavior of biomaterials • Applications of biomaterials in tissue engineering, implants, and medical devices Materials of the Future: • Emerging materials and their potential impact on future technologies • Study of graphene, carbon nanotubes, nanocomposites, etc. • Exploration of the challenges and opportunities in developing future materials

	Nano-engineered Materials: • Introduction to nanotechnology and its applications in material science • Synthesis techniques and properties of nano-engineered materials • Study of nanoscale phenomena and their influence on material behavior

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Lectures: Engage students through interactive lectures where the instructor introduces and explains key concepts related to each topic. Use visual aids, demonstrations, and real-life examples to enhance understanding and capture students' interest. 2- Laboratory Work: Provide hands-on laboratory experiments and practical sessions to allow students to observe and analyze the properties and behavior of different materials. This enables them to apply theoretical knowledge and develop practical skills in material characterization and testing. 3- Group Discussions: Encourage students to participate in group discussions and problem-solving activities. This promotes critical thinking and collaborative learning, allowing students to share their insights, exchange ideas, and develop a deeper understanding of the subject matter.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Material Science
Week 2	Structure of Materials
Week 3	Mechanical Properties of Materials
Week 4	Thermal Properties of Materials
Week 5	Electrical Properties of Materials
Week 6	Materials for Photovoltaics
Week 7	Materials for Energy Storage
Week 8	Corrosion and Material Degradation
Week 9	Advanced Materials and Nanotechnology
Week 10	Sustainability and Material Lifecycle
Week 11	Introduction to Fluid Mechanics
Week 12	Fluid Dynamics Fundamentals
Week 13	Flow in Pipes and Channels
Week 14	Fluid Machinery

Week 15	Computational Fluid Dynamics (CFD) and Renewable Energy Applications
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. /Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1,2,3,4	• Introduction to Material Science • Structure of Materials Topics: Atomic structure and bonding Crystalline vs. amorphous materials Phase diagrams and phase transformations • Mechanical Properties of Materials Topics: Stress-strain relationships Hardness, toughness, and ductility Impact of mechanical properties on renewable energy systems • Thermal Properties of Materials Topics: Thermal conductivity and thermal expansion Phase change materials for energy storage Applications in solar thermal systems
Week 5,6,7,8	• Electrical Properties of Materials Topics: Conductors, semiconductors, and insulators Materials for photovoltaic cells Superconductors and their potential in renewable energy • Materials for Photovoltaics Topics: Silicon and thin-film solar cells Emerging materials: perovskites and organic photovoltaics Efficiency and degradation of solar materials • Materials for Energy Storage Topics: Batteries: Lithium-ion and beyond Supercapacitors and their materials Materials for hydrogen storage • Corrosion and Material Degradation
Week 9,10,11,12	• Advanced Materials and Nanotechnology Topics: Nanomaterials: properties and applications Role of nanotechnology in enhancing material performance Smart materials for renewable energy applications • Sustainability and Material Lifecycle Topics: Life cycle assessment of materials Recycling and sustainable practices in material science Future trends in materials for renewable energy • Introduction to Fluid Mechanics Topics: Overview of fluid mechanics and its importance in renewable energy Properties of fluids: density, viscosity, and surface tension Fluid statics: pressure and buoyancy • Fluid Dynamics Fundamentals Topics: Continuity equation and conservation of mass Bernoulli's equation and its applications Introduction to flow types: laminar vs. turbulent flow
Week 13,14,15	• Flow in Pipes and Channels Topics: Darcy-Weisbach equation and head loss in pipes Flow in open channels and hydraulic design Applications in hydropower systems and irrigation

	• Fluid Machinery Topics: Pumps and fans: types and operation Turbines: principles of wind and hydro turbines Performance characteristics and efficiency analysis • Computational Fluid Dynamics (CFD) and Renewable Energy Applications Topics: Introduction to CFD and its importance in fluid analysis Case studies: wind turbine performance analysis and solar thermal systems Future trends in fluid mechanics for renewable energy
Week 16	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	•	No
Recommended Texts	• "Materials Science and Engineering: An Introduction" by William D. Callister • "Materials for Renewable Energy Applications" (specific articles and resources • "Fluid Mechanics" by Frank M. White • "Fundamentals of Fluid Mechanics" by Bruce R. Munson et al.	No
Websites	None	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings

	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
(0 – 49)	**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	اللغة العربية Arabic Languge 2			**Module Delivery**	
Module Type	**B**			☒**Theory** ☐ **Lecture** ☐**Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UOM2012**				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	2		**Semester of Delivery**	2	
Administering Department	New and Renewable Energies		**College**	Science	
Module Leader	د. عبير طارق الحاصود		**e-mail**	Abeer.t.d@uomosul.edu.iq	
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	2024-2025		**Version Number**		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	تعريف الطلاب بأساسيات اللغة العربية. كذلك كسر حاجز الخجل وزيادة ثقتهم داخل وخارج الفصل. هناك فرصة كبيرة لإشراكهم في مناقشات قصيرة حيث يمكنهم الكتابة أو التعبير عن أنفسهم شفهيًا. بالإضافة إلى ما سبق ، ستعمل الدورة على تحسين مهارات القراءة والكتابة والاستماع والتحدث كطلاب ، وتقوية ملكة الطلاب الأدبية لتذوق أساليب اللغة وإدراك مواطن الجمال فيها
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- خلق وعي كامل بالاستخدام الصحيح لقواعد اللغة العربية في الكتابة والمحادثة. 2- إدراك أهمية اللغة العربية داخل وخارج الحياة الجامعية. 3- سيحسن الطلاب قدرتهم على التحدث باللغة العربية من حيث الطلاقة والاستيعاب. 4- سيقوم الطلاب بمراجعة الأشكال النحوية للغة العربية واستخدام هذه الأشكال في سياقات تواصلية محددة ، والتي تشمل: الأنشطة الصفية ، والواجبات المنزلية ، وقراءة النصوص ، والكتابة. 5- سيعزز الطلاب قدرتهم على كتابة فقرات قصيرة وملخصات باستخدام نهج العملية.
Indicative Contents المحتويات الإرشادية	مقدمة عن الاتصال بشكل عام واللغة العربية بشكل خاص ، مع مقدمة عن فئات الكلمات (أجزاء الكلام) في اللغة العربية [4 ساعات]. شرح كل جزء من الكلام في اللغة العربية مثل الأسماء والضمائر والأفعال والصفات والظروف وحروف الجر وحروف العطف والاقتران [16 ساعة]. المهارات الأساسية في تعلم اللغة الإنجليزية: القراءة والكتابة يتم تقديمها بشكل تدريجي خلال الأسابيع الماضية [6 ساعات]. الجزء الأخير مخصص لبعض جلسات تصحيح الأخطاء وردود الفعل [2 ساعة]. -جعل الطلبة على دراية بالعلاقة بين أساليب التعلم وأساليب التدريس. -تشجيع الطلبة على "توسيع" أساليبهم.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. المحاضرة المصحوبة بالشرح والتحليل. 2. الحلقة النقاشية. 3. التقارير والبحوث. 4. عرض المادة عبر شرائح (بوربوينت) . 5. الاسئلة والاجوبة. 6. المشاركة الصفية .

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
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% (5)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	١.بناء الأفعال وأقسامها وجزم مضارعها ونصبه.
Week 2	٢.بناء الفعل للمعلوم والمجهول.
Week 3	٣.أقسام الأفعال في العربية.
Week 4	٤.جزم الفعل المضارع.
Week 5	٥. نصب الفعل المضارع.
Week 6	٦.الاعداد في العربية.
Week 7	٧.قواعد كتابة العدد.
Week 8	٨.الفرق بين الضاد والظاء.
Week 9	٩.علامات الترقيم.
Week 10	١٠.أخطاء شائعة.
Week 11	١١.المبتدأ والخبر(الجملة الاسمية)
Week 12	١٢. نواسخ المبتدأ والخبر.
Week 13	١٣.المفعول به والمفعول المطلق.
Week 14	١٤.المفعول فيه والمفعول لأجله.
Week 15	١٥.تطبيقات نحوية.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	لا يوجد
Week 1	
Week 2	

Week 3	
Week 4	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	شرح ابن عقيل على الفية ابن مالك ، المرشد في الاملاء ، محمد شاكر سعيد	Yes Yes
Recommended Texts	الاسلوب ، احمد الشايب ، طرق تعليم التعبير ، محمد عبد القادر أحمد	Yes Yes
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Digital Electronics**	**Module Delivery**	
Module Type	**Core**	☒**Theory** ☒**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☒**Seminar**	
Module Code	**NRE24013**		
ECTS Credits	**7**		
SWL (hr/sem)	**175**		

Module Level	2	**Semester of Delivery**	4
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Assim Ahmed Issa	**e-mail**	assim.ahmed@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Lecture	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	E-mail
Peer Reviewer Name	None	**e-mail**	E-mail
Scientific Committee Approval Date	2024-2025	**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 Objectives أهداف المادة الدراسية	The main objectives of a nuclear energy module that covers the basics of nuclear energy and how reactors generate electricity could include: 1. Understanding the basic principles of electric energy: This objective would cover the fundamental principles of electric energy, including the structure of the electric circuits. 2. Understanding the components of an electric circuit: This objective would cover the major components of an electric circuit. 3. Understanding Digital Electronics, The Underpinnings of Digital Electronics and how it generates electricity: This objective would cover the process of Digital Electronics 4. Analyzing the Boolean Arithmetic, Truth Tables and Gates and the Six Elementary Logic Operations 5. Examining the benefits and drawbacks of Digital Electronics: This objective would cover the advantages and disadvantages of Digital Electronics as a source of electricity, including its reliability, safety, cost-effectiveness, and environmental impact. 6. Evaluating the future of Digital Electronics: This objective would cover the potential for new and emerging Digital Electronics technologies, including advanced Digital Electronic Circuits, Capacitors, and Semiconductor Operations. It would also cover Digital Electronics' role in meeting future energy needs and reducing greenhouse gas emissions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the structure of Digital Electronics, the basic principles of Digital Electronics and Simple Digital Logic Circuit Development. 2. Identify a Digital Logic Circuit's major components and functions. 3. Describe the process of the Digital Logic Circuit and how it generates electricity. 4. Explain the safety measures and regulations in place to ensure the safe

	operation of Digital Logic Circuit. 5. Evaluate the advantages and disadvantages of Digital Logic Circuit as a source of electricity. 6. Understand the role that Digital Logic Circuit may play in meeting future energy needs and reducing greenhouse gas emissions. 7. Apply critical thinking and problem-solving skills to evaluate complex issues related to Digital Logic Circuits. 8. Communicate effectively about Digital Logic Circuit concepts and issues with others.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Theory:** Digital Electronics - Introduction to Digital Electronics - The Underpinnings of Digital Electronics [6 hrs] Introduction to Boolean Arithmetic - Boolean Arithmetic - Truth Tables and Gates - The Six Elementary Logic Operations [6 hrs] Waveform Diagrams - Combinatorial Logic Circuits: Combining Logic Gates - Sum of Products and Product of Sums - Waveform Diagrams [6 hrs] Effectively Optimizing Combinatorial Circuits - Truth Table Function Reduction - Karnaugh Maps - Boolean Arithmetic Laws - Optimizing for Technology [6 hrs] Digital Electronic Circuits - Creating Digital Electronic Circuits - Basic Electronic Laws - Capacitors [6 hrs] Semiconductor

	- Semiconductor Operation - Logic Gate Input and Output - Simple Digital Logic Circuit Development - Testing a Simple TTL Inverter [9 hrs] Number Systems - Base 16 or Hexadecimal Numbers - Binary Coded Decimal [9 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. **Lectures:** used to introduce and explain key concepts related to digital electronics and electricity generation. 2. **Interactive discussions:** used to engage students in critical thinking and problem-solving related to digital electronics through group discussions, debates, case studies, and simulations. 3. **Multimedia resources:** used to enhance student engagement and understanding of complex concepts related to digital electronics through videos, animations, and simulations. 4. **Assessment and feedback:** used to measure student learning and provide feedback on their progress through quizzes, exams, and projects.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Digital Electronics
Week 2	The Underpinnings of Digital Electronics
Week 3	Overview of Boolean Arithmetic, Basic Principles of Truth Tables and Gates. The Six Elementary Logic Operations
Week 4	Combinatorial Logic Circuits: Combining Logic Gates, Sum of Products and Product of Sums Waveform Diagrams
Week 5	Effectively Optimizing Combinatorial Circuits
Week 6	Truth Table Function Reduction, Karnaugh Maps
Week 7	Boolean Arithmetic Laws, Optimizing for Technology
Week 8	Creating Digital Electronic Circuits

Week 9	Basic Electronic Laws
Week 10	Capacitors
Week 11	Semiconductor Operation
Week 12	Logic Gate Input and Output
Week 13	Simple Digital Logic Circuit Development testing a Simple TTL Inverter
Week 14	Number Systems Base 16 or Hexadecimal Numbers
Week 15	Binary Coded Decimal
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week 1, 2	**Implementing a AND gate using diodes ,** **Implementing a OR gate using diodes**
Week 3,4	**Implementing a NOT gate using diodes, Implementing a NOT gate using IC**
Week 5,6	**Implementing a AND gate using IC, Implementing a OR gate using IC**
Week 7,8	**Implementing a NOR gate using IC, Implementing a NAND gate using IC**
Week 9,10	**Counting with JK flip-flop**
Week 11,12	**Boolean Algebra and De Morgan Theorem**
Week 13,14	**Exclusive OR gate and Exclusive NOR gate**
Week 15	**Final Exam**

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

Required Texts	**Digital Fundamentals,Thomas L. Floyd**	No
Recommended Texts	Digital Electronics Lab , B.Tech. IV Semester EE	No
Websites	1- https://electronicsclub.info/ 2- https://electronicsclub.info/	

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	**Organic Chemistry**	**Module Delivery**

Module Type	**Core**			☒**Theory** ☒**Lecture** ☒**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	NRE24016				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		UGII	**Semester of Delivery**		4
Administering Department		BSC-NRE	**College**	Type College Code	
Module Leader	Ala Ismael Ayoob		**e-mail**	ala i ayoob@uomosul.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	None		**e-mail**	E-mail	
Peer Reviewer Name		None	**e-mail**	E-mail	
Scientific Committee Approval Date		2024-2025	**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 Objectives أهداف المادة الدراسية	The main objective of an organic chemistry that covers the all type of organic 1. The main object of organic chemistry is the importance of organic compounds and its applications. 2. The course deals with the preporation and reaction of organic compound. 3. Learn about the physical and chemical properties. 4. Learn about the sterochemistry of some organic compound.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Study of some organic compound. 2. Understand the meaning of organic compounds that study. 3. Combinations between different kind of organic compounds . 4. learn about conformation , configuration . 5. learn about the uses of organic compound .

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Theory:** Theoretical lectures Hydrocarbon compounds ,type of hydrocarbon : 1. Alkanes Structureof alkanes (isomers) Physical properties of alkanes Conformation of alkanes Name of alkanes Preporation of alkanes Reaction of alkanes 2.Alkenes Structureof alkanes (cis - trans) Physical properties of alkenes Name of alkenes Preporation of alkenes Reaction of alkenes 3.Alkynes Structureof alkynes Physical properties of alkynes Name of alkynes Preporation of alkynes Reaction of alkynes Uses of alkynes 4.Benzene Structure of benzene Resonance of benzene Reaction of benzene 5.Alkyl benzene Structure of alkyl benzene Orientation in disubstuted benzene (O, P ,M) Name of alkyl benzene Reaction of alkyle benzene Preporation of alkyl benzene

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	13. Lectures: used to introduce and explain allorganic compound . 14. Interactive discussions: used to engage students in critical thinking and problem-solving to organic compound .

	15. Multimedia resources: used to enhance student engagement and understanding of complex concepts related to sterochemistry, conformation.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Hydrocarbon (alkane) structure of hydrocarbon name of hydrocarbon
Week 2	Conformation of alkane Preporation of alkane
Week 3	Reaction of alkane

	Physical properties
Week 4	Alkene structure of alkene name of alkene cis –trans configuration
Week 5	Preporation of alkene Physical properties
Week 6	Reaction of alkene
Week 7	Alkyne Structure of alkyne Physical properties
Week 8	Prreporation of alkynes Acidity of hydrogene atom
Week 9	Reaction of alkynes
Week 10	Benzene Structure of benzene Name of benzene and related compound
Week 11	Orientionin disubstituted benzene (O ,N ,M)
Week 12	Reaction of benzene Physical properties
Week 13	Alkyl benzene Structure of alkyl benzene Physical properties Orientation in disubstied alkyl benzene
Week 14	Preporation of alkyl benzene Reaction of alkyl benzene Mechanism of some kind of reaction
Week 15	finaly.

Delivery Plan (Weekly Lab. /Syllabus) المنهاج الاسبوعي النظري	
	Material Covered

Week 1	Boiling point
Week 2	Simple Distillation
Week 3	Quiz 1+ Fractional Distillation
Week 4	Sublimation
Week 5	Methane preparation
Week 6	Quiz 2
Week 7	Acetylene preparation
Week 8	Cyclohexene preparation
Week 9	Quiz 3
Week 10	Propanal preparation
Week 11	Benzoic acid preparation
Week 12	Meta-nitro Methyl bezoate preparation
Week 13	**finaly**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Organic chemistry by morrison and boyed	No
Recommended Texts	Organic chemistry by finar	No
Learning resources of lab.	- Practical organic chemistry fourth edition 1974 by F.G.Menn - experimental organic chemistry 2009 by Hannan A. and Mohammed.A.A	
Websites	None	

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	**Statistics**			**Module Delivery**	
Module Type	**Core**			☐**Theory** ☒**Lecture** ☐**Lab** ☐ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**NRE24018**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Waheed Abdi SHEEKHOO		**e-mail**	waheed.abdi@uomosul.edu.iq	
Module Leader's Acad. Title	Assistant Lecture		**Module Leader's Qualification**	M.Sc.	
Module Tutor	None		**e-mail**	E-mail	
Peer Reviewer Name	None		**e-mail**	E-mail	
Scientific Committee Approval Date	2024-2025		**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 Objectives أهداف المادة الدراسية	The main objectives of statistics could include: 5. Equip students with the necessary skills to effectively handle and organize data into statistical tables. 6. Enable students to accurately calculate and interpret key statistical measures, including mean, variance, geometric mean, harmonic mean, and quadratic mean for both grouped and ungrouped datasets. 7. students' ability to determine and analyze the median and mode, enhancing their understanding of data distribution. 8. Teach students to represent data visually using various graphical forms, such as histograms, frequency polygons, and pie charts, to facilitate data interpretation. 9. Encourage students to interpret statistical results and draw meaningful conclusions from calculations, including the arithmetic mean and variance. 10. Provide students with a comprehensive understanding of variance and standard deviation, emphasizing their importance in analyzing the spread of data. 11. Familiarize students with the concepts of permutations and combinations, highlighting their relevance in statistical analysis and problem-solving. 12. Help students articulate and explore the relationships among various statistical measures and concepts, promoting a cohesive understanding of statistical analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	11. Students will be able to effectively manage and organize data into well-structured statistical tables. 12. Students will demonstrate the ability to calculate key statistical measures, including the mean, variance, geometric mean, harmonic mean, and quadratic mean for both grouped and ungrouped data. 13. Students will be proficient in determining the median and mode of a given dataset.

	14. Students will be capable of visually representing data using various graphical forms, such as histograms, frequency polygons, and pie charts. 15. Students will be able to interpret statistical results derived from calculations, including the arithmetic mean and variance. 16. Students will comprehend the concepts of variance and standard deviation and their significance in data analysis. 17. Students will gain an understanding of permutations and combinations, including their definitions and applications in statistical contexts. 18. Students will be able to articulate the relationships between various statistical measures and concepts, enhancing their overall analytical skills.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **<u>Theory:</u>** The emergence and development of statistics Definition of statistics and its fields of application The statistical method in scientific research and research design techniques **Duration: 4 hours** Methods of data collection (complete registration, sampling) Data collection techniques (direct collection, surveys) **Duration: 6 hours** Data classification and tabulation Sampling selection **Duration: 4 hours** Random variables (discrete and continuous; qualitative and quantitative) Tabular data presentation (frequency distribution / relative frequency distribution) **Duration: 6 hours** Double frequency distribution / cumulative frequency distributions Graphical presentation (bar charts, histograms, pie charts, line graphs; frequency polygons; cumulative frequency curves) **Duration: 6 hours** Symbols for addition and multiplication Concept of averages and the purpose of calculating them Arithmetic mean, geometric mean, harmonic mean, quadratic mean, and their relationships

	Median and mode (advantages and disadvantages of means, median, and mode) Selecting the appropriate measure of central tendency **Duration: 4 hours**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	16. **Lectures** 17. **Interactive discussions** 18. **Multimedia resources** 19. **Assessment and feedback**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

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

assessment	**Final Exam**	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Statistics
Week 2	Definition of statistics, importance, and applications.
Week 3	Types of data (qualitative vs. quantitative, discrete vs. continuous).
Week 4	Measures of central tendency (mean, median, mode).
Week 5	Range, variance, standard deviation.
Week 6	Introduction to graphical representation of data (bar charts).
Week 7	Introduction to graphical representation of data (histograms).
Week 8	Introduction to graphical representation of data (pie charts).
Week 9	Create various graphs using sample data.
Week 10	Introduction to probability, basic concepts, and rules.
Week 11	Discrete Probability Distributions
Week 12	Continuous Probability Distributions
Week 13	Types of sampling methods and the concept of the sampling distribution.
Week 14	Constructing and interpreting confidence intervals.
Week 15	Create various graphs using sample data.
Week 16	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	4- "Statistics: A Very Short Introduction" by David Freedman, Robert Pisani, and Roger Purves. 5- "Introduction to the Practice of Statistics" by David S. Moore, George P. McCabe, and Bruce A. Craig.	No
Recommended Texts	5. "The Elements of Statistical Learning" by Trevor Hastie, Robert Tibshirani, and Jerome Friedman.	No
Websites	1. Khan Academy 2. coursera.org/browse/data-science/statistics	

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	السلامة المهنية Vocational safety	**Module Delivery**	
Module Type	**Core**	☒**Theory** ☒**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**NRE24017**		
ECTS Credits	**2**		
SWL (hr/sem)	50		

Module Level	**UGII**	**Semester of Delivery**	4
Administering Department	**BSC- NRE**	**College**	Type College Code
Module Leader	**Ala Ismael Ayoob**	**e-mail**	ala i ayoob@uomosul.edu.iq
Module Leader's Acad. Title	**Professor**	**Module Leader's Qualification**	Ph.D
Module Tutor	None	**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	2024-2025	**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 Objectives	يجب ان يعرف الطالب:

أهداف المادة الدراسية	مفهوم السلامة . والاهداف التي تسعى لتحقيقها . والمخاطر الناتجة من الاستخدام السيء للمواد.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	تعريف السلامة والاهداف والمخاطر الكيميائية والعوامل المؤثرة على مدى الاستجابة لتأثيرات المواد الكيميائية وكيفية تصنيف المواد الكيميائية وقواعد ومواصفات السلامة في المختبرات وشروط تخزين المواد بصورة عامة.
Indicative Contents المحتويات الإرشادية	يتضمن المحتوى الإرشادي على :- البطاقات التعريفية والملصقات

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	7. المحاضرة المصحوبة بالشرح والتحليل. 8. الحلقات النقاشية. 9. الاسئلة والاجوبة. 10. المشاركة الصيفية .

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem)	**50**		

الحمل الدراسي الكلي للطالب خلال الفصل	

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	مفهوم السلامة والاهداف التي نسعى الى تحقيقها
Week 2	المخاطر الكيميائية وكيفية دخول المواد الى جسم الانسان
Week 3	العوامل المؤثرة على مدى الاستجابة لتأثيرات المواد الكيميائية
Week 4	تصنيف المواد الكيمياوية والبطاقات التعريفية
Week 5	قواعد ومواصفات السلامة في المختبرات
Week 6	الشروط الواجب اتباعها من قبل العاملين في المختبرات (طلبة وباحثين)

Week 7	شروط تخزين المواد الكيمياوية والبايولوجية الخطرة والسامة
Week 8	فئات الخطورة وشروط تخزينها
Week 9	المذيبات والمواد القابلة للاشتعال
Week 10	المواد المؤكسدة والبير وكسيدات العضوية
Week 11	المواد المشعة والمواد الاكلة
Week 12	الاحماض غير العضوية القوية
Week 13	الاحماض العضوية القوية
Week 14	التوعية بدلالة العلامات التحذيرية
Week 15	اختبار

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered لا يوجد
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	السلامة في المختبرات الكيميائية .المملكة العربية السعودية .٢-سبتمبر ٢٠٠٩ السلامى والامن الكيميائي ١٩٢٠ المخاطر والسلامة المختبرية للمتعاملين بالمواد الكيميائية .عماد تميم،٣يناير ٢٠١٩	
Recommended	. ادارة المخاطر الكيميائية والبايلوجية . شيراز محمد خضر ٢٠٢٢	

Texts		
Websites		

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

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.

Course Description Form

1. Course Name:

Energy Sources

2. Course Code: SCNRE21S3031

3. Semester 5 / Year: 2024-2025

4. Description Preparation Date:7-6-2024

5. Available Attendance Forms:

lecture hall

6. Number of Credit Hours (125) / Number of Units (3)

7. Course administrator's name (mention all, if more than one name)

Name: Assist. Prof. Dr. Lubna Abdulaziz Salih
Email: lubnaabdulaziz@uomosul.edu.iq

8. Course Objectives

Course Objectives	• Introducing the student to the basic energy source • This course deals with the basic concept about con • Learn about the new energy sources • Learn about renewable energy sources. • Learn about Primary and secondary sources of ene

9. Teaching and Learning Strategies

Strategy	1. **Lectures:** used to introduce and explain key concepts related to all Energ 2. **Interactive discussions:** used to 3. . **Assessment and feedback:** used to measure student learning and prov projects. Expanding students' perceptions about this science and its contents it in board,& Data show

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
15	125	Study all types of Energy(conventional new and Renewable) on the surface of the earth.		1- Theoretic lectures 2- Group discussio	Quizzes Assignments Projects / Lab. Report Midterm Exam Final Exam

11. Course Evaluation

Quizzes	2	10% (10)
Assignments	2	10% (10)
Projects / Lab.	1	10% (10)
Report	1	10% (10)
Midterm Exam	2hr	10% (10)
Final Exam	3hr	50% (50)

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12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**1.**Synthetic Fuel 2.Types of Renewable Energy
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:

Energy Storage

2. Course Code:

SCNRE21S3091

3. Semester / Year:

2024-2025

4. Description Preparation Date:

2024

5. Available Attendance Forms:

Classroom, google classroom and online meeting

6. Number of Credit Hours (Total) / Number of Units (Total)

3hr. *15 weeks

7. Course administrator's name (mention all, if more than one name)

Name: Dr. Meaad Salim Younes Al-hadidi
Email: meaadsalim@uomosul.edu.iq

8. Course Objectives

Course Objectives	1. Understand the structure of batteries. 2. Distinguish between batteries' types. 3. Use Peukert's law and other laws to solve problems. 4. Units of Measurement Common in electrical circuits (elements) 5. Understanding the components of batteries and comprehendin 6. Solve mathematical problems. 7. The structure and operational principles of a flywheel.

9. Teaching and Learning Strategies

Strategy	**Lectures – PowerPoint - Interactive discussions - Multimedia resources - Assessment and feedback - g**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method
1,2	3+3		Introduction - Types of batteries	

			Lead acid, Nickel-metal hydride	
3,4	3+3		Lithium-ion, Lithium-polymer, Zinc-air Battery Performance (Battery Ratings, Energy efficiency, Internal resistance)	
5,6	3+3		Battery Performance (Charge efficiency, self-discharge and trickle charge, memory effect, effect of temperature Internal loss and temperature rise, random failure, wear out failure	
7,8	3+3		Various batteries compared, Battery design Battery charging , Charge regulators, Multiple charge rates	
9,10	3+3		Solve Mathematical problems Unregulated charging, Battery management	
11,12	3+3		Monitoring and controls, Safety Flywheel, Energy relating, Flywheel benefits over battery	
13	3		Solve Mathematical problems	
14,15	3+3		Compressed air. Super conducting coil.	

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily prepar exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	Power System Energy Storage Technologies By Paul Breeze
Main references (sources)	Energy Storage Technologies & Their Role in Renewable Integration

	By Andreas Oberhofer
Recommended books and references (scientific journals, reports…)	Energy Storage Technologies & Their Role in Renewable Integration By Andreas Oberhofer
Electronic References, Websites	Energy saving https://en.wikipedia.org/wiki/Electric_batteryhttps://www.b -electronics

Course Description Form

1. Course Name:
Measurements and Control
2. Course Code:
SCNRE21S3021
3. Semester / Year:
2024-2025
4. Description Preparation Date:
1/8/2024
5. Available Attendance Forms:
Classroom, google classroom and online meeting
6. Number of Credit Hours (Total) / Number of Units (Total)
3hr. *15 weeks
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Meaad Salim Younes Al-hadidi Email: meaadsalim@uomosul.edu.iq

8. Course Objectives

Course Objectives	1. Understand the structure of electronic components of devices. 2. Distinguish between computer ports. 3. Units of Measurement Common in electrical circuits (elements). 4. knowledge of parts of electrical circuits

9. Teaching and Learning Strategies

Strategy	**Lectures – PowerPoint - Interactive discussions - Multimedia resources - Assessment a feedback - google classroom and online meeting.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	3+3		Introduction Quantities, units and standards Basic Units and Derived		

			Units - Standards – Prefixes Identification of basic electronic components		
3,4	3+3		Transducers - Passive and active transducers - Principle of operation Classification of transducers		
5,6	3+3		Examples of the transducers (Temperature transducer) Examples of the transducers (pressure transducers)		
7,8	3+3		Examples of the transducers (strain gags transducers) Electrical measurements		
9,10	3+3		Solve Mathematical problems Definition of instruments (Absolute Instrument- Secondary Instrument)		
11,12	3+3		Voltage measurements-current measurements Errors in Measurement-Types of Errors		
13	3		Solve Mathematical problems the oscilloscope - signal analysis- spectrum.		
14,15	3+3		Computer data acquisition Analog and Digital		

			signals, Analog to Digital Converter (ADC), Pulse Code Modulation (PCM), computers Ports. Super capacitors.		

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular boc if any)	**Electrical and Electronics Measurements and Instrumentation** *By* Prithwiraj Purkait, Budhaditya Biswas, Santanu Das and Chiranjibm Koley
Main references (sources)	**Modern electronic instnmentation technique** By Abent D.Hdfrick
Recommended books and references (scientific journals, reports…)	**Electrical Measurement and Control** By S.K. Bhattacharya & S. Bhattacharya
Electronic References, Websites	**https://www.vikaspublishing.com/books/engineering/electrical-engineering/electrical-measurement-control- for-wbscte/9789325984592/**

Course Description Form

1. Course Name:
Mathematical modeling /practical
2. Course Code:
3. Semester / Year:
2024-2025
4. Description Preparation Date: 31/8/2023
31/8/2024
5. Available Attendance Forms:
practical/ class room
6. Number of Credit Hours (Total) / Number of Units (Total):
2 H/ 1U
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Nagham salim & Zakaria Abdul Wahid Hameed email: nagham.salim@uomosul.edu.iq zakriahamoalnaish@uomosul.edu.iq
8. Course Objectives

Course Objectives	1. Teaching students . Identify the Simulink in matlb 2. Use matlab simulation to build model for solve problem. 3. understanding of the fundamental matlab simulation, build model, use simulation library, working with model, difference between mux and demux. 4. Discussing scientific reports on new and renewable simulation model . Weekly Teaching Plan

9. Teaching and Learning Strategies	
Strategy	The theoretical method and explanation is by presenting the material on the Point Power program in the form of diagrams and pictures This is to attract the

	student's attention and help him not feel bored. The practical method is to apply what has been presented On the calculator and conduct daily and monthly exams

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introducing the student to Simulink basics and the purpose of the using. As for the goals of the practical side It provides the student with skills in using the MATLAB Simulink program	What is Simulink, The Simulink Toolbar, Adding Blocks to Model	Computer, smart screen, Power point, Electronic class	Examination , reports , execute example on computer and question and answer between teacher and student
2	3	Libraries Simulink content	Overview of Libraries	Computer, smart screen, Power point, Electronic class	Examination , reports , execute example on computer and question and answer between teacher and student
3	3	Type of block and for each block for what use	Block Parameters	Computer, smart screen, Power point, Electronic class	Examination , reports , execut example on computer and question and answer betwee teacher and student

4	3	How can student treatment with Simulink model for debugging errors	Simulink Models & MATLAB Variables, Text and Image Annotation, Display Menu – Useful for Debugging Errors	Computer, smart screen, Power point, Electronic class	Examination , reports , execut example on computer and question and answer betweer teacher and student
5	3	How can add annotation to model, apply format menu type .	Format Menu – Block Annotation, The Solver, Sources Library, Data Logging without Scope: To Workspace Block, quiz	Computer, smart screen, Power point, Electronic class	Examination , reports , execute example on computer and question and answer between teacher and student
6	3	Content of sinks library how can add and subtract operation using block in simulink	Other Blocks in the Sinks Library, Add, Subtract and Sum Blocks, Product and Divide Blocks, Mathematical Functions	Computer, smart screen, Power point, Electronic class	quize
7	3	How can creat subsystem and run it, define type of subsystem	Ports & Subsystems, Creating a Subsystem, Trigger, Reset and Enable Inputs to Subsystems	Computer, smart screen, Power point, Electronic class	question and answer between teacher and student
8	3	Difference between mux and demux	Mux & Demux, Buses, Compare To…	Computer, smart screen, Power point, Electronic class	question and answer between teacher and student

9	3	Type of other block	Selectors : Accessing specific signals, Goto / From Blocks : Move signals without connecting wires, Logic Operator quiz	Computer, smart screen, Power point, Electronic class	question and answer between teacher and student
10	3	Create model from different libraries	Build Simulink model	Computer, smart screen, Power point, Electronic class	question and answer between teacher and student
11	3	Define type of logic gate, build different logic gate model, write truth table for each gate	Build logic gate model	Computer, smart screen, Power point, Electronic class	question and answer between teacher and student
12	3	Build sine wave model with different parameter and scope the result	Build sine wave model	Computer, smart screen, Power point, Electronic class	question and answer between teacher and student
13	3	How can create subsystem for solving numerical equation and then mask that system	Create sub system and mask system	Computer, smart screen, Power point, Electronic class	question and answer between teacher and student
14	3	Build system for solving equation	Solving mathematical equation	Computer, smart screen, Power point, Electronic class	question and answer between teacher and student
15	3		Repeat all above Experiences	Computer, smart screen, Power point, Electronic class	question and answer between teacher and student
Course Evaluation					

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	MATLAB and Simulink for Engineers, Agam Kumar Tyagi,2012
Main references (sources)	Basic MATLAB, Simulink, and Stateflow, James B. Dabney, Thomas L. Harman,2004
Recommended books and references (scientific journals, reports…)	non
Electronic References, Websites	Matlab Simulink tutorial point, YouTube

Course Description Form

1. Course Name: Wind Energy

2. Course Code: SCNRE21S3111

3. Semester / Year: second/ 2024-2025

4. Description Preparation Date: 30/8/2024

5. Available Attendance Forms: Attendance

6. Number of Credit Hours (Total) / Number of Units (Total): 150 h/ 4 units

7. Course administrator's name (mention all, if more than one name)

Name: Ghada Ghanim Younis
Email: ghadaghanim@uomosul.edu.iq

8. Course Objectives

Course Objectives	• Understanding the basic principles of wind energy. • Understanding the generation and movement of wind. • Understanding the components of a wind turbine. • Examining the benefits and drawbacks of wind energy • Evaluating the future of wind energy.

9. Teaching and Learning Strategies

Strategy	1. **Lectures:** used to introduce and explain key concepts related to wind energy and electricity generation from turbines. 2. **Interactive discussions:** used to engage students in critical thinking and problem-solving related to wind energy through group discussions, debates, case studies, and simulations. 3. **Multimedia resources:** used to enhance student engagement and understanding of complex concepts related to wind energy through videos, animations, and simulations. 4. **Assessment and feedback:** used to measure student learning and provide feedback on their progress through quizzes, exams, and projects.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	3 theory 3 lab.	Define Energy and Power	Definition of Energy and Power , Energy conservation and efficiency principles	Lecture	Short test
Week 2	3 theory 3 lab.	Summarize the overview of wind energy and its History, Basic principles of wind energy physics	Overview of wind energy and its History, Basic principles of wind energy physics	Lecture	Short test
Week 3	3 theory 3 lab.	Explain Power Extracted from The Wind	Power Extracted from The Wind , wind power potential or wind power density	Lecture	Short test
Week 4	3 theory 3 lab.	Define wind velocity, swept area, air density	wind velocity, swept area, air density	Lecture	Short test
Week 5	3 theory 3 lab.	Explain Wind Speed Histograms, Duration Curve, turbulence	Wind Speed Histograms, Duration Curve, turbulence	Lecture	Short test
Week 6	3 theory 3 lab.	Study Wind Speed Distributions, Rayleigh distribution, Weibull distribution	Wind Speed Distributions, Rayleigh distribution, Weibull distribution	Lecture	Short test
Week 7	3 theory 3 lab.	Compare MODE wind speed, MEAN wind speed, RMC wind speed	MODE wind speed, MEAN wind speed, RMC wind speed	Lecture	Short test
Week 8	3 theory	Summarize Wind turbine Design, Components of a	Wind turbine Design, Components of a	Lecture	Short test

	3 lab.	Wind turbine	Wind turbine		
Week 9	3 theory 3 lab.	Compare Wind turbine types and applications	Wind turbine types and applications	Lecture	Short test
Week 10	3 theory 3 lab.	Define Maximum efficiency and Betz's law	Maximum efficiency and Betz's law	Lecture	Short test
Week 11	3 theory 3 lab.	Discuses Power Curve of the Wind Turbine	Power Curve of the Wind Turbine, Power generation and control	Lecture	Short test
Week 12	3 theory 3 lab.	Conclude Challenges in wind power generation, Environmental impacts	Challenges in wind power generation, Environmental impacts	Lecture	Short test
Week 13	3 theory 3 lab.	Define Wind turbine noise, Integration of wind power into the grid	Wind turbine noise, Integration of wind power into the grid	Lecture	Short test
Week 14	3 theory 3 lab.	Define Thermal management of wind turbines	Thermal management of wind turbines	Lecture	Short test
Week 15	3 theory 3 lab.	Define Wind energy storage, Wind turbine lifetime	Wind energy storage, Wind turbine lifetime	Lecture	Short test

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	"Wind Energy Fundamentals, Resource Analysis and Economics". By: Sathyajith Mathew
Main references (sources)	1. "CLEAN ENERGY PROJECT ANALYSIS: RETSCREEN ENGINEERING & CASES"
Recommended books and references (scientific journals, reports…)	"Fundamentals of wind energy". By: Wei Tong
Electronic References, Websites	https://energypedia.info/wiki/Estimation_of_Wind_Energy_Production#toc

Course Description Form

1. Course Name:

Energy Storage

2. Course Code:

SCNRE21S3091

3. Semester / Year:

2024-2025

4. Description Preparation Date:

2024

5. Available Attendance Forms:

Classroom, google classroom and online meeting

6. Number of Credit Hours (Total) / Number of Units (Total)

3hr. *15 weeks

7. Course administrator's name (mention all, if more than one name)

Name: Dr. Meaad Salim Younes Al-hadidi
Email: meaadsalim@uomosul.edu.iq

8. Course Objectives

Course Objectives	1. Understand the structure of batteries. 2. Distinguish between batteries' types. 3. Use Peukert's law and other laws to solve problems. 4. Units of Measurement Common in electrical circuits (elements) 5. Understanding the components of batteries and comprehendin 6. Solve mathematical problems. 7. The structure and operational principles of a flywheel.

9. Teaching and Learning Strategies

Strategy	**Lectures – PowerPoint - Interactive discussions - Multimedia resources - Assessment and feedback - g**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method
1,2	3+3		Introduction - Types of batteries	

			Lead acid, Nickel-metal hydride	
3,4	3+3		Lithium-ion, Lithium-polymer, Zinc-air Battery Performance (Battery Ratings, Energy efficiency, Internal resistance)	
5,6	3+3		Battery Performance (Charge efficiency, self-discharge and trickle charge, memory effect, effect of temperature Internal loss and temperature rise, random failure, wear out failure	
7,8	3+3		Various batteries compared, Battery design Battery charging , Charge regulators, Multiple charge rates	
9,10	3+3		Solve Mathematical problems Unregulated charging, Battery management	
11,12	3+3		Monitoring and controls, Safety Flywheel, Energy relating, Flywheel benefits over battery	
13	3		Solve Mathematical problems	
14,15	3+3		Compressed air. Super conducting coil.	

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily prepar exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	Power System Energy Storage Technologies By Paul Breeze
Main references (sources)	Energy Storage Technologies & Their Role in Renewable Integration

	By Andreas Oberhofer
Recommended books and references (scientific journals, reports…)	Energy Storage Technologies & Their Role in Renewable Integration By Andreas Oberhofer
Electronic References, Websites	Energy saving https://en.wikipedia.org/wiki/Electric_batteryhttps://www.b -electronics

Course Description Form

1. Course Name: **Petroleum Chemistry**

2. Course Code:

SCNRE21S3101

3. Semester / Year:2/2024-2025

4. Description Preparation Date: 10/09/2024

5. Available Attendance Forms: Attendance

6. Number of Credit Hours (125) / Number of Units (4)

7. Course administrator's name (mention all, if more than one name)

Lubna Abdulaziz Salih lubnaabdulaziz@uomosul.edu.iq

8. Course Objectives

Course Objectives	1. Learn about oil and its derivatives as the basis of energy sources 2. This course deals with the basic concept of the most important Physical and technical specifications and methods for evaluating oil and petroleum products 3. Specifications and quality measurement. 4. The possibility of merging with renewable energy sources 5. . Study the specifications of derivatives and their uses

9. Teaching and Learning Strategies

Strategy	Expanding students'The ability to determine the quality of the derivative, Simulation of refining processes in refineri Identifying the quality of the derivative through physi measurements, that are interesting to the students

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introducti	Introduction	Lecture	Short test

		Origin Petroleum Methods productior	Origin of Petroleum		
2	3	Classificati of petroleu	Classification of petroleum	Lecture	Short test
3	3	Evaluation petroleum and distillates	Evaluation of petroleum and its distillates	Lecture	Short test
4	3	Chemical compositic of petroleu	composition of petroleum	Lecture	Short test
5	3	Chemical composition petroleum	Chemical composition of petroleum	Lecture	Short test
6	3	Introduction refining proce	refining process	Lecture	Short test
7	3	Refining chemistry	**refining process**	Lecture	Short test
8	3	Distillation Thermal cracking	Thermal cracking	Lecture	Short test
9	3	Distillation Thermal cracking	Thermal cracking	Lecture	Short test
10	3	Catalytic crak	Catalytic craking	Lecture	Short test
11	3	. Chemistry basic refin process	refining process	Lecture	Short test
12	3	Petroleum products	Petroleum products	Lecture	Short test
13	3	Octane num of Gasoline Cetane num of diesel fuel	Octane number Cetane number	Lecture	Short test
14	3	Tutorial scientific vi show	Tutorial and scientific video show	Lecture	Short test
15		**Final-term exam**			

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any	1- The Chemistry and Technology of Petroleum James G. Speight 2- Practical Petroleum Geochemistry for Exploration and Production By Harry Dembicki
Main references (sources)	•An Introduction to Petroleum Technology, Economics, and Politics •By James G. Speight
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	**Fundamentals of Petroleum Refining** **By Mohamed A. Fahim,**

Course Description Form

1. Course Name:
Biomass
2. Course Code:
SCNRE21S4011
3. Semester / Year:
2--2024-2025
4. Description Preparation Date:
2024
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
15 weeks / three units
7. Course administrator's name (mention all, if more than one name)
Name: Hamid Abdulla Salih Email: hamid.abdulla@uomosul.edu.iq
8. Course Objectives

Course Objectives	1- Definition of green energy and renewable energies. 2- Definition of biomass and identification of its different types and methods of obtaining it. 3- Identify the different ways to obtain clean energy from biomass. 4- Identify the types of biofuels, their characteristics and their positive effects to reduce global warming.

9. Teaching and Learning Strategies

Strategy	Using blended learning with the help of the smart board and vario means of illustration, with the involvement of students throu electronic duties and the use of the smart board.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Weeks 1,2 and 3		Green energy, What is green energy, Renewable Energy, ma renewable energy sources, Biomass, Main biomass resourc Common sources of biomass, Types of biomass, Distin sources of biomass energy , Primary, secondary, sourc tertiary and tertialy types of biomass, Components of bioma feedstock , Bioenergy crops .			

First quiz		
Weeks 4,5, 6 a 7		Specification of feedstock, The chemistry of biomass, Bioma conversion processes, Process Types, mechanism of t pyrolysis of biomass, The most important properties relati to gasification process.
second quiz		
Weeks 8,9 a 10		Densification, Fischer-Tropsch process, Combustion, Fu from biomass, Gaseous fuels, Liquid fuels.
Third quiz		
Weeks 11 12, and 13		Biodiesel, properties of biodiesel, Produce of biodiese Application of glycerol , Bio-Oil, Solid fuels, Biofuels fro Synthesis Gas, Uses of biomass , Applying of biofuel, Ener efficiency of biofuel production, Bio refinery, Greenhouse G Production, Other Aspects, The future uses of biofuel,
		Mid-term exam
Week 14,15		Tutorial and scientific video show
		Final- term exam

11. Course Evaluation

Distribution of score out of 100 : quiz(5), homework (5), daily participation and attendance (5), midterm exam (25), final exam (60).

12. Learning and Teaching Resources

Required textbooks (curricular books any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	1. 1- "Types of renewable energy". Renewable Energy World. Retrieved 27 October 2019. 2. 2- Ellabban, Omar; Abu-Rub, Haitham; Blaabjerg, Frede (2014). "Renewable energy resources: Current status, future prospects and

	their enabling technology". Renewable and Sustainable Energy Reviews. 39: 748–764 [749]. doi:10.1016/j.rser.2014.07.113. 3- "Biomass - Energy Explained, Your Guide To Understanding Energy". U.S. Energy Information Administration. June 21, 2018. 4- Akhtar, A., Krepl, V., & Ivanova, T. (2018). A Combined Overview of Combustion, Pyrolysis, and Gasification of Biomass. Energy & Fuels, 32(7), 7294–7318
Electronic References, Websites	
Curriculum update rate	**15%**

Name and signature of the course holder

Dr. Hamid Abdulla Salih

Name and signature of the head of the department

Dr. Ahmed Muneer Suhal

Course Description Form

1. Course Name: Small Solar Energy Systems

2. Course Code: SCNRE21S4061

3. Semester / Year: First/ 2024-2025

4. Description Preparation Date: 2024

5. Available Attendance Forms: Attendance

6. Number of Credit Hours (Total) / Number of Units (Total): 150 h/ 4 units

7. Course administrator's name (mention all, if more than one name)

Name: Ghada Ghanim Younis
Email: ghadaghanim@uomosul.edu.iq

8. Course Objectives

Course Objectives	• Understanding the basic principles of heat transfer. • Understanding the modes and movement of heat transfer. • Understanding the components of a Small Solar Energy Systems. • Examining the benefits and drawbacks of a Small Solar Energy Systems. • Evaluating the future of a Small Solar Energy Systems.

9. Teaching and Learning Strategies

Strategy	1. **Lectures:** used to introduce and explain key concepts related to a Small Solar Energy Systems. 2. **Interactive discussions:** used to engage students in critical thinking and problem-solving related to a Small Solar Energy Systems through group discussions, debates, case studies, and simulations. 3. **Multimedia resources:** used to enhance student engagement and understanding of complex concepts related to Small Solar Energy Systems through videos, animations, and simulations. 4. **Assessment and feedback:** used to measure student learning and provide

	feedback on their progress through quizzes, exams, and projects.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	3 theory 3 lab.	Define Heat Transfer	Heat Transfer, conduction, Free and forced convection, Nusselt number	Lecture	Short test
Week 2	3 theory 3 lab.	Summarize the Free convection between parallel plates	- Free convection between parallel plates	Lecture	Short test
Week 3	3 theory 3 lab.	Calculation of convective heat transfer	Calculation of convective heat transfer, Convective cooling of a cooking pot, Forced plus free convection	Lecture	Short test
Week 4	3 theory 3 lab.	Define Thermal Radiation, Surface Property	Radiation, Thermal Radiation, Surface Property	Lecture	Short test
Week 5	3 theory 3 lab.	Explain Blackbody Radiation	Blackbody Radiation, Real body Radiation	Lecture	Short test
Week 6	3 theory 3 lab.	Study Thermal Resistance	Thermal Resistance, Thermal Resistance Network, resistors in parallel, resistors in series	Lecture	Short test
Week 7	3 theory 3 lab.	Compare Heat transfer by single phase, Heat transfer by phase change	Heat transfer by mass transport, Heat transfer by single phase, Heat transfer by phase change	Lecture	Short test
Week 8	3 theory 3 lab.	Summarize Solar water heaters Design	Solar water heaters Design, Components of a Solar water heater	Lecture	Short test

Week 9	3 theory 3 lab.	Compare Solar water heater types	Solar water heater types and applications, Safety systems and mechanisms	Lecture	Short test
Week 10	3 theory 3 lab.	Define Solar collector	Solar collector, Flat-Plate Collector, Evacuated-Tube Solar Collectors	Lecture	Short test
Week 11	3 theory 3 lab.	Discuses Heat Pipe Evacuated Tube Collectors	Heat Pipe Evacuated Tube Collectors, Direct Flow Evacuated Tube Collector, Integral Collectors	Lecture	Short test
Week 12	3 theory 3 lab.	Conclude Solar Water Heating Application	Solar Water Heating Application	Lecture	Short test
Week 13	3 theory 3 lab.	Calculate of heat balance: general remarks	Calculation of heat balance: general remarks	Lecture	Short test
Week 14	3 theory 3 lab.	Define heat balance of an unsheltered black bag	The heat balance of an unsheltered black bag, Heat balance of a sheltered collector	Lecture	Short test
Week 15	3 theory 3 lab.	Define Efficiency of a flat plate collector	Efficiency of a flat plate collector, Metal–semiconductor stack	Lecture	Short test

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- "Solar Engineering of Thermal Processes". By: John A. Duffie and William A. Beckman
Main references (sources)	1. "CLEAN ENERGY PROJECT ANALYSIS: RETSCREEN ENGINEERING & CASES"
Recommended books and references (scientific journals, reports…)	"Renewable Energy Resources". By: John Twidell and Tony Weir
Electronic References, Websites	

Course Description Form

1. Course Name:
Grid connected system
2. Course Code:
SCNRE21S4071
3. Semester / Year:
2nd /2024-2025
4. Description Preparation Date:
8\2\2024
5. Available Attendance Forms:
On class
6. Number of Credit Hours (Total) / Number of Units (Total)
150\3
7. Course administrator's name (mention all, if more than one name)
Name: Mustafa Hussein Email: MutafaHussein@uomosul.edu.iq

8. Course Objectives	
Course Objectives	These objectives highlight the goals of the course in grid connecting system , and illustrate the knowledge and skills that students will develop throughout their studies in this department 1. Understand the functioning mechanism of each component in standalone and grid-tied solar energy systems, and how to provide optimal conditions for their operation. 2. Perform all calculations related to the design of photovoltaic solar energy systems. This includes calculating the required size and capacity of solar modules, batteries, inverters, and other system components. 3. Comprehend the methods for connecting renewable energy systems to the local grid. This includes understanding how to integrate solar energy systems with the existing infrastructure and connect them to the local distribution network. 4. Familiarize with the methods for recording and accounting renewable energy in accordance with global standards. This includes understanding how to measure and record the generated renewable energy, calculate system performance, and monitor energy consumption.

9. Teaching and Learning Strategies	
Strategy	1. Lectures: Traditional lectures can be used to present foundational concepts,

theories, and principles to students. This allows for the dissemination of information and provides a framework for understanding the subject matter.

2. Discussions and Debates: Encouraging students to engage in discussions and debates promotes critical thinking and analysis of different perspectives. It allows them to delve deeper into the subject matter, challenge assumptions, and develop their communication and argumentation skills.
3. Case Studies: Presenting real-world case studies relevant to the course material can help students apply theoretical concepts to practical situations. This enables them to develop problem-solving skills and understand the real-life implications of the theories they are learning.
4. Group Projects: Assigning group projects or presentations that require students to work collaboratively can enhance their understanding of the material. It promotes teamwork, research skills, and the application of theoretical concepts in a practical context.
5. Multimedia and Visual Aids: Incorporating multimedia resources such as videos, interactive simulations, and visual aids (e.g., diagrams, charts, infographics) can enhance student engagement and understanding. Visual representations can often simplify complex concepts and make them more accessible.
6. Self-directed Learning: Encouraging students to take ownership of their learning through self-directed activities, such as independent research, literature reviews, or project-based assignments, fosters critical thinking, independent thought, and a deeper understanding of the subject matter.
7. Assessments: Utilizing a variety of assessment methods, such as quizzes, tests, essays, or reflective journals, allows students to demonstrate their understanding of the material and provides feedback for their learning progress. Assessments should be aligned with the learning outcomes and encourage critical thinking and analysis.
8. Guest Speakers or Experts: Inviting guest speakers or subject matter experts to share their knowledge and experiences can provide additional insights and practical examples. It also exposes students to different perspectives and real-world applications of the theoretical concepts being taught.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	3	Understanding Stand Alone PV System	Stand Alone PV System	Lectures and Discussions	Assignments
Week 2	3	Solar (PV) Array structure	Solar (PV) Array	Lectures and Discussions	Assignments
Week 3	3	Calculating Solar Cell Efficiency:	Solar Cell Efficiency:	Lectures and Discussions	Quizzes
Week 4	3	The external factors that affecting upon the modules Efficiency.	The external factors tha affecting upon the mod Efficiency.	Lectures and Discussions	oral
Week 5	3	Explain Charge Controller	Charge Controller	Lectures and Discussions	Assignments
Week 6	3	Specification of Batteries	Batteries	Case Studies and Multimedia and Vis Aids	Assignments
Week 7	3	Depth Of Discharge.	Depth Of Discharge.	Case Studies	Assignments
Week 8	3	Inverter.	Inverter.	Case Studies	Quizzes
Week 9	3	Grid Connected PV System.	Grid Connected PV Syst	Lectures and Discussions	Report
Week 10	3	grid tie inverter.	grid tie inverter.	Lectures and Discussions	Assignments

Week 11	3	synchronization process.	synchronization process	Lectures and Discussions	Assignments
Week 12	3	Electricity Meter.	Electricity Meter.	Lectures and Discussions	Report
Week 13	3	metering system (Gross metering & Bi Directional metering)	metering system (Gross metering & Bi Direction metering)	Lectures and Discussions	Quizzes
Week 14	3	Hybrid Solar Wind System	Hybrid Solar Wind Syste	Lectures and Discussions	Assignments
Week 15	3	understanding Solar Houses and Pv system sizing	Solar Houses and Pv system sizing	Lectures and Discussions	Projects
Week 16	3		Final Exam		

11. Course Evaluation

	Time/Number	Weight (Marks)
Quizzes	2	10% (10)
Assignments	2	10% (10)
Projects	1	10% (10)
Report	1	10% (10)
Midterm Exam	2hr	10% (10)
Final Exam	3hr	50% (50)
Total assessment		100% (100 Marks)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Grid-connected Solar Electric Systems: The Earthscan Expert Handbook for Planning, Design Installation 1st Edition by Geoff Stapleton
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Hydropower
2. Course Code:
SCNRE21S3051
3. Semester / Year:
2024-2025
4. Description Preparation Date:
1/8/2024
5. Available Attendance Forms:
Classroom, google classroom and online meeting
6. Number of Credit Hours (Total) / Number of Units (Total)
3hr. *15 weeks
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Meaad Salim Younes Al-hadidi Email: meaadsalim@uomosul.edu.iq

8. Course Objectives	
Course Objectives	1. Understand the structure of hydropower system. 2. Distinguish between hydropower system and other renewable systems. 3. knowledge of hydroelectric power stations in the world. 4. knowledge of hydroelectric power stations in Iraq. 5. Solve mathematical problems.

9. Teaching and Learning Strategies	
Strategy	**Lectures – PowerPoint - Interactive discussions - Multimedia resources - Assessment a feedback - google classroom and online meeting.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1,2	3+3		Introduction Water resource distribution of water resource, cycle of water resource, and condition of water resource in the world. Introduction of hydroelectr power production.		
3,4	3+3		Components of hydropower station (Dam or a weir, Water Reservoir (artificial lake), Intake or Control Gates, The Penstock (Pressure pipe)) Components of hydropower station (Turbines, Power generations, Powerhouse, Grid connection and Tail race).		
5,6	3+3		Classification of hydropower plants. Impact of climate change on resource potential		
7,8	3+3		Types of Hydroelectric power stations ● Low pressure power stations ● Pumping power stations Hydraulic Turbines		
9,10	3+3		Solve Mathematical problems Pelton turbine (Design and applications)		

			Kaplan and Frances turbines (Design and applications)		
11,12	3+3		Hydroelectric power stations in the world (Guri hydroelectric power plants) Hydroelectric power stations in the world (Venezuela, Grand Coulee)		
13	3		hydroelectric power plant (three gorges hydroelectric power plant)		
14,15	3+3		Hydroelectric power stations in Iraq (Mosul, Sammara, Kuut, Hindia) Environment impacts (Advantages and disadvantages)		

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	Introduction to Hydro Energy Systems Basics, Technology and Operation By Hermann-Josef Wagner, Jyotirmay Mathur
Main references (sources)	Hydropower By Paul Breeze · 2018
Recommended books and references (scientific journals, reports…)	Renewable Hydropower Technologies By Basel I. Ismail · 2017
Electronic References, Websites	https://www.energy.gov/eere/water/types-hydropower-plants

Course Description Form

1. Course Name:
Nano materials(lab)/SCNRE21S4031
2. Semester / Year:
first semester/4th/2024-2025
3. Description Preparation Date:
2024
4. Available Attendance Forms:
In the class and online
5. Number of Credit Hours (Total) / Number of Units (Total)
3*8=24h Number of Units= (1units)
6. Course administrator's name (mention all, if more than one name)
Name: zahraa badie Email: zahraabadie@uomosul.edu.iq Name: Ahmed Muneer, Maimoonah Khalid Qasim Email: ahmed.198381@uomosul.edu.iq , maimoonah.qasim@uomosul.edu.iq
7. Course Objectives

Course Objectives	1. Clarification of nano scales that can make significant and contribute to a wide range of technical applications. 2. Identify the basics of nanotechnology. 3. This course deals with the basic concept of the most important elements in nano such approaches, the structure of nanomaterials, examples of nanomaterials, tools used to investigate materials, experiments and techniques used for preparing and applications of nano technology. 4. Learn about the most important scientific terms (Terminology) and their definitions related to this topic. 5. To understand and comprehend the impact of these elements from Physics point of view.

8. Teaching and Learning Strategies

Strategy	Expanding students' perceptions about this science and its contents. In addition, assisting students in knowledge gathering of basic sound and wave motion principles and concepts through understanding behaviors of certain wave components. Practical work should enhance perceptions of students about particular design and analysis of wave motion.

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	nanotechnology	Introduction	simple explanation explanation	Discussion
2	3	Structures of nanomaterials	Nanomaterials	datashow+expl.	A report
3	3	Devices	Screening nanomaterials	datashow+expl	A report
4	3	SEM	to examine		
5	3	TEM		datashow+expl.	A report
6	3	Application	In The		
7	3	Application	chemistr y	In the class	exam degree
8	3	Student testing and evaluation	quiz		

10.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

11.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Poole, Charles P., and Frank J. Owens. "Introduction to nanotechnology." (2003): 145-150.
Recommended books and references (scientific journals, reports...)	Satyanarayana, T. S. V., & Rai, R. (2011). Nanotechnology: the future. Journal of interdisciplinary dentistry, 1(2), 93.
Electronic References, Websites	Any website includes above materials

Course Description Form

1. Course Name:
Nano energy (practical)
2. Course Code:
SCNRE21S4091
3. Semester / Year:
2nd semester / 2024-2025
4. Description Preparation Date:
28/1/2024
5. Available Attendance Forms:
Attendance inside the laboratory and electronically on the classroom platform
6. Number of Credit Hours (Total) / Number of Units (Total)
Number of hours (3 hours per week) / number of units = 1 3*10=30
7. Course administrator's name (mention all, if more than one name)
Name: Ahmed Muneer, Maimoonah Khalid Qasim Email: ahmed.198381@uomosul.edu.iq , maimoonah.qasim@uomosul.edu.iq Zainab Walid Majed zaunabwaleed@uomosul.edu.iq
8. Course Objectives

Course Objectives	1. Clarification lab of nanoscales that can make significant and contribute to a wide range of technical applications Identify the basics of nonenergy labs. 2. This Lab deals with the basic concept of the most important elements in nano such approaches, the structure of nanomaterials, examples of nanomaterials, tools used to

	investigate materials, experiments and techniques used for preparing and applications of nano –. 3. Learn about the most important scientific terms (Terminology) and their definitions related to this topic. 4. To understand and comprehend the impact of these elements from Physics point of view.

9. Teaching and Learning Strategies

Strategy	Expanding students' perceptions about this science and its contents. In addition, assisting students in knowledge gathering of basic sound and wave motion principles and concepts through understanding behaviours of certain wave components. Practical work should enhance perceptions of students about particular design and analysis of wave motion.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	**3**		Introduction		
Week 2	**3**		Approaches		
Week 3	**3**		Tools		
Week 4	**3**		Experiments		
Week 5	**3**		Experiments		
Week 6	**3**		Techniques		
Week 7	**3**		Preparing materials		

Week 8	**3**		Preparing materials		
Week 9	**3**		Application		
Week 10	**3**		Revision		

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports …. etc.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Poole, Charles P., and Frank J. Owens. "Introduction to nano-." (2003): 145-150.
Recommended books and references (scientific journals, reports…)	Satyanarayana, T. S. V., & Rai, R. (2011). Nano-: the future. Journal of interdisciplinary dentistry, 1(2), 93.
Electronic References, Websites	Any website includes above materials.

Course Description Form

1. Course Name:
Photochemistry (theoretical)
2. Course Code:
UMSCRE24S4101
3. Semester / Year:
Second semester /2024-2025
4. Description Preparation Date:
2024
5. Available Attendance Forms:
In attendance and electronically on the classroom platform
6. Number of Credit Hours (Total) / Number of Units (Total)
Number of hours (3 hours per week) / number of units = 3 3*15=45
7. Course administrator's name (mention all, if more than one name)
Name: Maimoonah Khalid Qasim Duaa Hassan Yahya **Email:** maimoonah.qasim@uomosul.edu.iq Duaaaaltamer@uomosul.edu.iq
8. Course Objectives

Course Objectives	Introducing the student to photochemistry and its laws and its applications in various fields.

9. Teaching and Learning Strategies	
Strategy	Students will be able to 1. Identify the science that is concerned with studying the chemical changes or physical processes that occur in molecules as a result of their absorption of radiation in the range between 200−800 nanometers (ultraviolet−visible rays). 2. Identify the properties of light and what happens when light interacts with matter. 3. Identify the photochemistry of the atmosphere. 4.Learn about solar cells, their history, and generations.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	**3**		Explanation An introduction to photochemistry and theories of light interpretation	Theoretical lectures on a data show	• Daily Preparation • Daily Exams • Monthly Exams Final Exams
Week 2	**3**		Explain the properties of light. Reflection and its laws Refraction and its laws		
Week 3	**3**		Quiz examination		

Week 4	**3**		Explain the properties of light. Dispersion and speed of light Learn about the laws of photochemistry.		
Week 5	**3**		Explaining the interaction of radiation with matter, identifying the phenomena of fluorescence and phosphorescence, and clarifying Beer-Lambert's law of absorption.		
Week 6	**3**		Mid examination		
Week 7	**3**		Explain natural photosynthesis and artificial photosynthesis and compare them.		
Week 8	**3**		Explain the photochemistry of the atmosphere.		
Week 9	**3**		Quiz examination		

Week 10	**3**		Explaining the solar cell and its working principle		
Week 11	**3**		Explanation of the generations of the solar cell - the first-generation and its types, the second - generation and its first type only.		
Week 12	**3**		Quiz examination		
Week 13	**3**		Explaining the remaining types of second-generation solar cells		
Week 14	**3**		Explaining the third-generation of solar cells and its types		
Week 15	**3**		Quiz examination		

11.Course Evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	1. **Principles and Applications of Photochemistry**, Brian Wardle Manchester Metropolitan University, Manchester, UK, 2009, A John Wiley & Sons, Ltd., Publication 2. **Solar Cells: In Research and Applications—A Review**, Shruti Sharma, Kamlesh Kumar Jain, Ashutosh Sharma, Materials Sciences and applications, 2015, 6, 1145 – 1155 . http://dx.doi.org/10.4236/msa.2015.612113
Recommended books and references (scientific journals, reports...)	**1. Artificial Photosynthesis,** From Basic Biology to Industrial Application Edited by Anthony F. Collings and Christa Critchley, 2005, Wiley - VCH. 2. **NATURAL AND ARTIFICIAL PHOTOSYNTHESIS**, SOLAR POWER AS AN ENERGY SOURCE, Edited by Reza Razeghifard,2013, John Wiley & Sons, Inc. 3. **Solar Cell Trends and the Future: A Review**, A. Garg1, R. K. Ratnesh, Volume 13, Special Issue 6, 2022, Journal of Pharmaceutical Negative Results. https://doi.org/10.47750/pnr.2022.13.S06.268
Electronic References, Websites	**Photochemistry and Photophysics,** Concepts, Research, Applications, Vincenzo Balzani, Paola Ceroni, and Alberto Juris, 2014, Wiley-VCH.

Course Description Form

1. Course Name:
Professional ethics / 2nd course
2. Course Code:
SCNR…..
3. Semester / Year:
1st semester / 2024-2025
4. Description Preparation Date:
2024
5. Available Attendance Forms:
Attendance in the hall, electronic description
6. Number of Credit Hours (Total) / Number of Units (Total)
2*15=30 hours 2nd semester/2 units
7. Course administrator's name (mention all, if more than one name)
Name: Asist. Lecture: Salah Afdo Ali .. **Email:** Salahavdo2@uomosul.edu.iq Asist.Prof. Thana Yaqup Yousif Al-Obedy **Email:** Thana.y.yousif@uomosul.edu.iq
8. Course Objectives

Course Objectives	- The student should know the ethics of the profession and its status in Islam. - That the student realizes the importance of professional ethics in the success of work and an individual's life. - The student should be familiar with the applications of professional ethics in professional work.

9. Teaching and Learning Strategies

Strategy	1- Theoretical exams. 2- Class participations. 3- Evaluation of reports and research. 4- Questions and answers during the explanation of the material.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Required learning outcomes The student should know the vocabulary of the subject and the objectives of the course	An introductory lecture on vocabulary The material and its	Lectures accompanied by explanation and clarification. - Use the blackboard to mark the main lecture sections and	• Daily Preparation • Daily Exams • Monthly Exams • Final Exams

			objectives	sections and some summaries of the points. - Conducting discussion and participatory sessions. - Using information gathering and brainstorming methods. - Reports, research and information gathering. - Displaying the scientific material on the projector (data show) through the (Power Point) program.	
2	2	The student should know the concept of ethics, profession, and ethics Profession and its status in Islam	Concepts		
3	2	The student should know the sources Professional ethics are like religion Customs, traditions and law.	Ethics, profession, professional ethics		
4	2	That the student knows sincerity In performing his duties and being honest in Work and career.	Sources of professional ethics		
5	2	The student should know the meanings of honesty, humility, good behavior, and integrity in work and career.	General components of professional ethics		
6	2	For the student to understand what it is Self-censorship and what it has to do with it	(Honesty, humility and good behavior,		
7	2	The student knows the standards	Means of		

		Choose a good role model How to hold negligent people accountable As a means of establishing ethics Occupation.	establishing professional ethics		
8	2	That the student knows the challenges Internal such as distractions Behaviorism, bullying and its effects Negativity on the job.	(Being a good example, holding negligent people accountable)		
9	2	That the student knows the challenges External competition such as non The project and its impact on performance Function.	Challenges and their impact on professional ethics		
10	2	That the student knows what it is Administrative and financial corruption	External challenges		
11	2	For the student to know pictures And the types and forms of corruption that faced by state institutions.	Pictures and shapes		
12	2	The student should know the reasons The spread of the phenomenon of administrative corruption And financial in Iraq.	Administrative and financial corruption		
13	2	That the student knows the solutions And proposals for the judiciary On administrative and financial corruption.	Ways to address administrative and financial corruption		
14	2	That the student knows the concept Social Responsibility Its types and elements And its components.	Social Responsibility		

15	2	That the student knows the foundations Basic professional ethics like like commitment direction General public and destination direction Work and career direction.	The basic foundations of ethics Occupation		

11. Course Evaluation
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc. 10 marks for quizzes, reports, and class participation. 30 marks for mid-semester theoretical exam (extended) 60 marks for a theoretical exam at the end of the course.

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	- Management ethics in public employment / Prof. Dr. Fa Al-Othaimeen.
Main references (sources)	- Work ethics/Dr. Bilal is behind the drunkard.
Recommended books and references (scientific journals, reports...)	Summary of practical organic chemistry lectures
Electronic References, Websites	1 https://youtu.be/jcJMfOlU4LI?si=D04RSZnOzt_pczN 2 https://youtu.be/PffMlbwjlPE?si=Wq_xLX_wRWREnrT

نموذج وصف المقرر

الجامعة : الموصل الكلية : العلوم القسم او الفرع: الطاقات المتجددة

1. اسم المقرر والمرحلة الدراسية
اشعاع شمسي
2. رمز المقرر
510SCNRE21S4
3. الفصل / السنة
الفصل الاول/ 2024-2025
4. تاريخ إعداد هذا الوصف
2024/8/10
5. أشكال الحضور المتاحة
في داخل الصف
6. عدد الساعات الدراسية (الكلي) / عدد الوحدات (الكلي)
3/3
7. اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر) واللقب العلمي
الاسم: أ.م. بشير خليل احمد الآيميل: basheerahmed@uomosul.edu.iq
8. اهداف المقرر

اهداف المادة الدراسية	• التعرف على الاشعاع الشمسي ومركباته • تاثير العوامل الجوية على الاشعاع الشمسي • كيفية اجراء الحاسابات المتعلقة بالاشعاع الشمسي
9. استراتيجيات التعليم والتعلم	
الاستراتيجية	**المحاضرات – المناقشة – الامتحانات القصيرة**

10. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
1	3	تعريف الشمس العلمي	تعريف الشمس العلمي	محاضرات	اسئلة شفهية
2	3	الخواص الفيزيائية للاشعاع	الخواص الفيزيائية للاشعاع	محاضرات	اسئلة شفهية

3	3	حسابات المسافة بين الشمس والارض	حسابات المسافة بين الشمس والارض	محاضرات	اسئلة شفهية
4	3	الثابت الشمسي	الثابت الشمسي	محاضرات	اسئلة شفهية
5	3	تحديد مواقع الشمس	تحديد مواقع الشمس	محاضرات	اسئلة شفهية
6	3	الزوايا الشمسية	الزوايا الشمسية	محاضرات	اسئلة شفهية
7	3	الاشعاع الشمسي عند سطح الارض	الاشعاع الشمسي عند سطح الارض	محاضرات	اسئلة شفهية
8	3	الاشعاع خارج الغلاف الجوي	الاشعاع خارج الغلاف الجوي	محاضرات	واجبات
9	3	مركبات الاشعاع الشمسي	مركبات الاشعاع الشمسي	محاضرات	اسئلة شفهية
10	3	امتحان نصف فصلي	امتحان نصف فصلي	امتحان	امتحان
11	3	الطيف الشمسي	الطيف الشمسي	محاضرات	تقرير
12	3	تاثيرات العوامل الجوية على الاشعاع	تاثيرات العوامل الجوية على الاشعاع	محاضرات	سمنار
13	3	حساب مركبات الاشعاع	حساب مركبات الاشعاع	محاضرات	اسئلة شفهية
14	3	مناقشة واسئلة	مناقشة واسئلة	مناقشة وتعليم تعاوني	تطبيقات
15	3	الامتحان النهائي	الامتحان النهائي	امتحان	امتحان

11. تقييم المقرر وتقسيمات الدرجة	
توزيع الدرجة من 100 على وفق المهام المكلف بها الطالب مثل التحضير اليومي والامتحانات اليومية والشفوية والشهرية والتحريرية والتقارير... الخ	
12. مصادر التعلم والتدريس	
الكتب المقررة المطلوبة (المنهجية أن وجدت)	المدخل الى الاشعاع الشمسي لمحمد اقبال
المراجع الرئيسة (المصادر)	
الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية, التقارير...)	

المراجع الإلكترونية, مواقع الانترنيت	
نسبة تحديث المنهاج	%30

اسم وتوقيع صاحب المقرر **اسم وتوقيع رئيس القسم او الفرع**