Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Course Description Guide

2025−2024

اصافة مقررات الاول

Course Description Form

Course Title:	
Basics of Electrical Engineering I	
Course Code:	
EE101	
Semester/Year:	
First Semester / 2024	
Description setting date:	
01/06/2023	
5. Available attendance forms:	
Theory, Tutorial, Lab	
6. Number of credit hours (total) / number of units (total)	
Number of Credit Hours (Total) / Number of Units (Total): 200 Credit Hours / 8 Credits	
7. Course administrator name (mention all, if more than one)	
Name: Dr. Omar Mowaffaq Mahmoud **Email :** omer_alyousif@uomosul.edu.iq	
8.Course Objectives	
Course Objectives	1. Develop problem-solving skills and understand DC circuit theory through the application of techniques. 2. Understand voltage, current, and power in DC circuits. 3. Introduce the basic concepts of electrical and electronic circuits. 4. Application of Kirchhoff's laws (current and voltage). 5. Conducting network and nodal analysis. 6. Using Thevenin and superposition theorems in circuit analysis.
9.Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering simple experiments involving sampling activities that are interesting to the students

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject Name**	**Learning Method**	**Evaluation Method**
1	**3**	**Understand atomic structure, current, current density, and voltage**	**Basic concepts of electricity**	**Lecture**	**None**
2	**3**	**Identify SI units and the relationship between energy and heat**	**International units, power, and capacity**	**Lecture**	**None**
3	**3**	**Understand the relationship between voltage, current, and resistance**	**Ohm's Law and Resistance**	**Lecture**	**Assignment**
4	**3**	**Analyze internal resistance and heat effects**	**Effect of temperature and internal resistance**	**Lecture**	**Assignment**
5	**3**	**Analyze series and parallel conductivity and delta-star transformation**	**Equivalent resistance and source aggregation**	**Lecture**	**Assignment**
6	**3**	**Apply laws to calculate power and energy in DC circuits**	**Power calculation in DC circuits**	**Lecture**	**Assignment**
7	**3**	**Apply Kirchhoff's laws in circuit analysis**	**Kirchhoff's Laws**	**Lecture**	**Quiz**
8	**3**	**Comprehensive assessment of covered topics**	**Midterm assessment**	**Lecture**	**Midterm Exam**
9	**3**	**Distinguish and convert source types**	**Introduction to network theories**	**Lecture**	**None**
10	**3**	**Apply Maxwell's law for circuit analysis**	**Maxwell current analysis**	**Lecture**	**Assignment**
11	**3**	**Perform circuit analysis using nodal analysis**	**Nodal analysis**	**Lecture**	**Assignment**
12	**3**	**Apply the principle of superposition in circuit analysis**	**Superposition theory**	**Lecture**	**Quiz**
13	**3**	**Perform circuit analysis using Thevenin and Norton theorems**	**Thevenin and Norton theorems**	**Lecture**	**Assignment**
14	**3**	**Achieve the condition of maximum power transfer**	**Maximum power transfer theorem**	**Lecture**	**Assignment**
15	**3**	**Apply Millman's and substitution theorems**	**Millman and substitution theorems**	**Lecture**	**Assignment**
16	**3**	**Final exam preparation and comprehensive review**	**Final exam preparation**	**Lecture**	**Final**

11. Course Evaluation	
Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Analysis of Engineering Circles, Seventh Edition Written by: William Hight, Jack Kemerly, Stephen
Main references (sources)	Schaum's Outline of Basic Circuit Analysis, Second Edition (Schaum's Outlines) 2nd Edition, by John O'Malley
Recommended books and references (scientific journals, reports...)	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2017.

Course Description Form

Course Title:	
Mathematics I	
Course Code:	
EE102	
Semester/Year:	
First Semester / 2024	
Description setting date:	
01/06/2023	
5. Available attendance forms:	
Theory, Tutorial	
6. Number of credit hours (total) / number of units (total)	
Number of Credit Hours (Total) / Number of Units (Total): 150 Credit Hours / 6 Credits	
7. Course administrator name (mention all, if more than one)	
Name: Dr. Saad Enad Mohammed **Email :** saadmohamed@uomosul.edu.iq	
8.Course Objectives	
Course Objectives	1. Ability to solve simultaneous linear equations and inequalities involving square roots and modulus functions. 2. Understand and apply addition and double-angle formulas in trigonometric expressions. 3. Recognize function types: odd/even, periodic, increasing/decreasing. 4. Understand function composition and inverse functions. 5. Recognize and sketch graphs of linear, polynomial, rational, exponential, trigonometric, logarithmic, and hyperbolic functions. 6. Calculate limits by substitution and simplification, including limits at infinity. 7. Know differentiation rules and apply them to various function types. 8. Apply the chain rule and implicit differentiation.
9.Teaching and Learning Strategies	
Strategy	Encouraging student participation in exercises, enhancing critical thinking through class activities, tutorials, and interactive examples. Practical mathematical exploration will be included to maintain interest and develop analytical skills.

	10. Course Structure			
Hours	**Required Learning Outcomes**	**Unit or Subject Name**	**Learning Method**	**Evaluation Method**
6	Matrix operations and solving systems	Matrices: Definitions and operations	Lecture + Tutorial	Quizzes, Assignments
6	Solving equations using Gaussian elimination	Gaussian elimination and inverse matrix method	Lecture + Tutorial	Quizzes, Assignments
6	Graphing in the coordinate plane	Coordinates, distances, graphing equations	Lecture + Tutorial	Quizzes, Assignments
6	Understanding slope and line equations	Slope, parallel and perpendicular lines	Lecture + Tutorial	Quizzes, Assignments
6	Functions: types, domains, graphs	Function characteristics and graphs	Lecture + Tutorial	Quizzes, Assignments
6	Graph shifts, circles, parabolas	Shifting graphs, circles, parabolas	Lecture + Tutorial	Quizzes, Assignments
6	Trigonometric functions and graphs	Review of trigonometric functions	Lecture + Tutorial	Quizzes, Assignments
6	Limits and continuity	Limits and continuity concepts	Lecture + Tutorial	Quizzes, Assignments
6	Derivatives and slopes	Introduction to derivatives	Lecture + Tutorial	Quizzes, Assignments
6	Differentiation rules	Rules of differentiation	Lecture + Tutorial	Quizzes, Assignments
6	Rates of change: velocity, acceleration	Motion and rate of change	Lecture + Tutorial	Quizzes, Assignments
6	Trigonometric derivatives	Trigonometric function derivatives	Lecture + Tutorial	Quizzes, Assignments
6	The Chain Rule	Applying the Chain Rule	Lecture + Tutorial	Quizzes, Assignments
6	Implicit differentiation	Higher order and implicit differentiation	Lecture + Tutorial	Quizzes, Assignments
6	Fractional powers and approximations	Differentials and linear approximation	Lecture + Tutorial	Quizzes, Assignments
6	Final exam preparation	Review before final exam	Lecture + Tutorial	Quizzes, Assignments

11. Course Evaluation	
Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5

Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources

Required textbooks (curricular books, if any)	*Calculus*, 13th Edition – George B. Thomas
Main references (sources)	*Calculus, Mathematics for Engineers and Technologists – Huw Fox and Bill Bolton*
Recommended books and references (scientific journals, reports...)	https://www.khanacademy.org/

Course Description Form

Course Title:
Engineering Drawing
Course Code:
EE103
Semester/Year:
First Semester / 2024
Description setting date:
01/06/2023
5. Available attendance forms:
Theory, Lab
6. Number of credit hours (total) / number of units (total)
Number of Credit Hours (Total) / Number of Units (Total): 100 Credit Hours / 4 Credits
7. Course administrator name (mention all, if more than one)
Name: Sura Mohammad Adil Alhayali Email : sura_alhayali@uomosul.edu.iq
8.Course Objectives

Course Objectives	1. Develop the engineer's spatial visualization and projection skills. 2. Practice hand-drawing through engineering sketch exercises. 3. Understand orthographic projection theory. 4. Build foundational skills for isometric drawing. 5. Learn engineering drawing with AutoCAD, both theoretical and practical. 6. Efficiently use AutoCAD tools in design and project documentation.
9.Teaching and Learning Strategies	
Strategy	The course promotes student participation in practical tasks, enhancing analytical and critical thinking through both hand drawing and CAD exercises. Emphasis is placed on

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	6	Introduction and understanding drawing tools	Introduction, tools and layout	Lecture + Lab	None
2	6	Learn line types and drawing scales	Line types and drawing scale	Lecture + Lab	None
3	6	Apply tools through classwork 1	Classwork 1	Lecture + Lab	Assignment

4	6	Apply and draw engineering processes	Engineering processes (part 1)	Lecture + Lab	Assignment
5	6	Classwork 2 practice	Classwork 2	Lecture + Lab	Assignment
6	6	Draw tangents and engineering shapes	Engineering processes (part 2)	Lecture + Lab	Assignment
7	6	Classwork 3 practice	Classwork 3	Lecture + Lab	Assignment
8	6	Midterm Exam	Midterm	Lecture + Lab	Midterm Exam
9	6	Understand Orthographic Projection (part 1)	Orthographic Projection theory	Lecture + Lab	Lecture
10	6	Classwork 4 practice	Classwork 4	Lecture + Lab	Assignment
11	6	Orthographic views arrangement	Orthographic arrangement	Lecture + Lab	Assignment
12	6	Classwork 5 practice	Classwork 5	Lecture + Lab	Assignment
13	6	Understand isometric drawing (part 1)	Isometric Drawing I	Lecture + Lab	Assignment
14	6	Classwork 6 practice	Classwork 6	Lecture + Lab	Assignment
15	6	Isometric drawing (part 2): circles	Isometric Drawing II	Lecture + Lab	Assignment
16	6	Review and prepare for final exam	Final exam preparation	Lecture + Lab	Final

11. Course Evaluation

Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources

Required textbooks (curricular books, if any)	*Engineering Drawing and Graphic Technology, 12th Edition – French & Vierk*
Main references (sources)	*by Abdul Rasool Al-Khuffaf (1986)*

Recommended books and references (scientific journals, reports...)	https://www.dailymotion.com/video/x31bg6x

Course Description Form

Course Title:	
Physics	
Course Code:	
EE104	
Semester/Year:	
First Semester / 2024	
Description setting date:	
01/06/2023	
5. Available attendance forms:	
Theory, Tutorial	
6. Number of credit hours (total) / number of units (total)	
Number of Credit Hours (Total) / Number of Units (Total): 100 Credit Hours / 4 Credits	
7. Course administrator name (mention all, if more than one)	
Name: Mr. Shamil Hamzah Hussein **Email :** Shamil_alnajjar84@uomosul.edu.iq	
8.Course Objectives	
Course Objectives	1. Understand SI units, vectors/scalars, and the difference between kinematic and kinetic energy. 2. Apply Hooke's law and solve problems in work and friction. 3. Define displacement, velocity, acceleration, and apply Newton's laws. 4. Use the work–energy theorem and conservation of energy principles. 5. Solve problems involving gravity and fluids using universal gravitation and continuity equations. 6. Analyze heat transfer through materials using conduction theory. 7. Understand energy levels, atomic structure, conduction in different materials. 8. Perform diode and transistor circuit analysis, including I-V characteristics and biasing. 9. Apply small and large signal modeling of electronic devices.

9.Teaching and Learning Strategies	
Strategy	Encouraging active participation and critical thinking through classwork and tutorials. Simple experimental scenarios and exercises help reinforce physical concept

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject Name**	**Learning Method**	**Evaluation Method**
1	6	Understand basic physics quantities and Newton's laws	Introduction to physics and motion	Lecture + Tutorial	Quiz
2	6	Apply Hooke's law, work, energy, and power	Forces, energy, and power	Lecture + Tutorial	Quiz
3	6	Momentum, impulse, and SHM	Momentum and SHM	Lecture + Tutorial	Quiz
4	6	Understand and apply universal gravitation	Universal gravitation	Lecture + Tutorial	Quiz
5	6	Analyze fluid mechanics and Bernoulli's equation	Fluids and Bernoulli	Lecture + Tutorial	Quiz
6	6	Understand architectural physics and solar radiation (Part 1)	Architectural physics and solar (1)	Lecture + Tutorial	Assignment
7	6	Understand architectural physics and solar radiation (Part 2)	Architectural physics and solar (2)	Lecture + Tutorial	Assignment
8	6	Sound and noise principles	Sound and intensity	Lecture + Tutorial	Assignment
9	6	Thermal behavior and sound insulation	Thermal insulation and materials	Lecture + Tutorial	Assignment
10	6	Understand atomic structure and energy levels	Atomic structure and electronics materials	Lecture + Tutorial	Assignment
11	6	Understand current, voltage, and Ohm's Law	Basics of electrical circuits and Ohm's Law	Lecture + Tutorial	Assignment
12	6	Diode characteristics and temperature effects	Introduction to diodes	Lecture + Tutorial	Assignment
13	6	Applications of diode circuits	Diode circuit applications	Lecture + Tutorial	Assignment
14	6	Zener, LED, and special purpose diodes	Special purpose diodes	Lecture + Tutorial	Assignment
15	6	Transistor operation, Q-point, and biasing	Transistors and biasing	Lecture + Tutorial	Assignment
16	6	Final exam preparation	Final exam review	Lecture + Tutorial	Final

11. Course Evaluation	
Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12

Reports: 1	8
In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources

Required textbooks (curricular books, if any)	*Electronics Fundamentals: Circuits, Devices and Applications, Thomas L. Floyd (2006)*
Recommended books and references (scientific journals, reports...)	*Semiconductor Physics and Devices*, Donald A. Neamen (2003)

Course Description Form

Course Title:	
Mechanics Engineering	
Course Code:	
EE105	
Semester/Year:	
First Semester / 2024	
Description setting date:	
01/06/2023	
5. Available attendance forms:	
Theory	
6. Number of credit hours (total) / number of units (total)	
Number of Credit Hours (Total) / Number of Units (Total): 75 Credit Hours / 3 Credits	
7. Course administrator name (mention all, if more than one)	
Name: Dr. Ammar Younis Ibrahim **Email :** drammar2020@uomosul.edu.iq	
8.Course Objectives	
Course Objectives	1. Understand fundamental principles of mechanics and thermodynamics. 2. Develop analytical and problem-solving skills in mechanical and thermal systems. 3. Analyze thermodynamic properties, energy conversion, and fluid behavior. 4. Learn modes of heat transfer and applications in engineering contexts. 5. Study dynamics of mechanical systems, including motion, forces, and components.
9.Teaching and Learning Strategies	
Strategy	The course encourages interactive learning through problem-solving activities, discussions, and tutorials. Students will engage in analytical exercises and scenario-based learning to enhance their grasp of mechanical and thermal principles.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Understand static force systems	Statics: Force systems	Lecture	Quiz
2	5	Apply unit systems and resolve forces	Units, Forces, and Components	Lecture	Assignment
3	5	Determine resultants, moments, and couples	Resultant, Moment and Couples	Lecture	Assignment
4	5	Analyze equilibrium and centroid	Equilibrium and Centroid	Lecture	Assignment
5	5	Analyze moment of inertia and friction	Moment of Inertia and Friction	Lecture	Quiz
6	5	Understand rectilinear motion	Dynamics: Rectilinear motion	Lecture	Assignment
7	5	Analyze curvilinear, projectile, and circular motion	Curvilinear, Projectile and Circular motion	Lecture	Assignment
8	5	Midterm Exam	Midterm Exam	Lecture	Midterm Exam
9	5	Analyze acceleration components	Acceleration components	Lecture	Assignment
10	5	Apply Newton's second law (kinetics)	Kinetics and Newton's 2nd Law	Lecture	Quiz
11	5	Understand thermodynamic properties and pressure	Thermodynamics: Properties, Pressure, Temp.	Lecture	Assignment
12	5	Analyze work, energy, and ideal gases	Work, Energy, Ideal Gas	Lecture	Assignment
13	5	Apply the first law of thermodynamics	First Law of Thermodynamics	Lecture	Assignment
14	5	Apply the second law of thermodynamics	Second Law of Thermodynamics	Lecture	Assignment
15	5	Apply Hook's law	Hook's Law	Lecture	Assignment
16	5	Final exam preparation	Final exam review	Lecture	Final

11. Course Evaluation

Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5

Midterm exam: 1	10
Final exam	50
Total	100

Course Description Form

Course Title:	
Computer 1	
Course Code:	
UOM1031	
Semester/Year:	
First Semester / 2024	
Description setting date:	
26/11/2023	
5. Available attendance forms:	
Theory, seminar	
6. Number of credit hours (total) / number of units (total)	
Number of Credit Hours (Total) / Number of Units (Total): 75 Credit Hours / 3 Credits	
7. Course administrator name (mention all, if more than one)	
Name: Dr. Talal Ahmed Bashir Email: t.basheer@uomosul.edu.iq Name: Dr. Omar Kanaan Taha Email: omar.alsultan@uomosul.edu.iq	
8.Course Objectives	
Course Objectives	The module aims to prepare the student to deal with computers. In addition to teaching the student the basics of computers and their components. Additionally, learn how to use two Microsoft Office applications (Word and Excel).
9.Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classrooms, lab and consideration of the type of external research that incorporates some computer technology of interest to students.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject Name**	**Learning Method**	**Evaluation Method**
1	5	Understand Computers and Operating System basics	Computers and Operating System	Lecture + Lab	Quiz
2	5	Continue exploring Operating System concepts	Computers and Operating System (Cont.)	Lecture + Lab	Quiz
3	5	Understand Software and Hardware interaction	Software and Hardware Interaction	Lecture + Lab	Assignment
4	5	Continue Software and Hardware interaction	Software and Hardware Interaction (Cont.)	Lecture + Lab	Assignment
5	5	Learn Windows File Management	Windows File Management	Lecture + Lab	Assignment
6	5	Understand OS customization techniques	Operating System Customization	Lecture + Lab	Assignment
7	5	Explore components of Computer Hardware	Computer Hardware	Lecture + Lab	Assignment
8	5	Continue Computer Hardware study	Computer Hardware (Cont.)	Lecture + Lab	Assignment
9	5	Monthly Exam	Monthly Exam	Lecture + Lab	Exam
10	5	Explore MS Office 2013	Exploring Microsoft Office 2013	Lecture + Lab	Assignment
11	5	Learn Word Essentials	Getting Started with Word Essentials	Lecture + Lab	Assignment
12	5	Edit and format Word documents	Editing and Formatting Documents	Lecture + Lab	Assignment
13	5	Learn Excel Essentials	Getting Started with Excel Essentials	Lecture + Lab	Assignment
14	5	Organize and enhance Excel worksheets	Organizing and Enhancing Worksheets	Lecture + Lab	Assignment
15	5	Create formulas and charts in Excel	Creating Formulas and Charting Data	Lecture + Lab	Assignment
16	5	Final exam preparation	Final Exam Preparation	Lecture + Lab	Final

11. Course Evaluation	
Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8

In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources

Required textbooks (curricular books, if any)	Computer Literacy Basics 2015: A Comprehensive Guide to IC3 Connie Morrison, Dolores Wells, Lisa Rufolo Cengage learning. ISBN: 128576658X

Course Description Form

Course Title:
Arabic Language
Course Code:
UOM101
Semester/Year:
First Semester / 2024
Description setting date:
01/06/2023
5. Available attendance forms:
Theory, seminar
6. Number of credit hours (total) / number of units (total)
Number of Credit Hours (Total) / Number of Units (Total): 50 Credit Hours / 2 Credits
7. Course administrator name (mention all, if more than one)
Name: **Email :**
8.Course Objectives

Course Objectives	1. Introduce students to the main topics of the Arabic language 2. Coverage of the basic requirements of grammar, and their applications 3. Development of grammatical, spelling and rhetorical abilities 4. Enable the student to write reports and presentations in proper Arabic

9.Teaching and Learning Strategies	
Strategy	**Expanding students' understanding of the Arabic language, familiarity with the basic concepts of Arabic language and rhetoric, and the ability to distinguish between tenses. This class has many components that include lecture study, tutorials, discussion, homework, and e-learning platforms. The course will be taught in Arabic, and all mandatory assignments must be submitted within the exam admission deadlines.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Introduction to Arabic language and its characteristics	Introduction to Arabic	Theory + Seminar	Lecture
2	3	Understand past tense grammar	Grammar: Past Tense	Theory + Seminar	Quiz

3	3	Understand present tense grammar	Grammar: Present Tense	Theory + Seminar	Quiz
4	3	Understand the five verbs in Arabic	Grammar: Five Verbs	Theory + Seminar	Assignment
5	3	Develop grammar rules: dual and plural forms	Grammar: Dual and Plural	Theory + Seminar	Assignment
6	3	Learn expressions of exclamation, diptote, and verb forms	Grammar: Exclamation, Diptote, and Verb Forms	Theory + Seminar	Assignment
7	3	Midterm exam	Midterm Exam	Theory + Seminar	Exam
8	3	Understand metaphor (بلاغة)	Rhetoric: Metaphor	Theory + Seminar	Lecture
9	3	Understand paronomasia (جناس)	Rhetoric: Paronomasia	Theory + Seminar	Lecture
10	3	Understand antithesis (طباق)	Rhetoric: Antithesis	Theory + Seminar	Lecture
11	3	Understand simile (تشبيه)	Rhetoric: Simile	Theory + Seminar	Lecture
12	3	Learn common spelling mistakes	Spelling Mistakes	Theory + Seminar	Assignment
13	3	Practice official correspondences	Administrative Writing	Theory + Seminar	Assignment
14	3	Rules of counting in Arabic grammar	Rules of Counting (Part 1)	Theory + Seminar	Assignment
15	3	Continued practice on number rules	Rules of Counting (Part 2)	Theory + Seminar	Assignment
16	3	Final exam preparation	Final Exam Preparation	Theory + Seminar	Final

11. Course Evaluation

Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources

Required textbooks (curricular books, if any)	The collector of Arabic lessons / Mustafa Ghalayini Adequate grammar / Abbas Hassan

Course Description Form

Course Title:	
Basic of Electrical Engineering II	
Course Code:	
EE108	
Semester/Year:	
Second Semester 2024-	
Description setting date:	
01/06/2023	
5. Available attendance forms:	
Theory, seminar	
6. Number of credit hours (total) / number of units (total)	
Number of Credit Hours (Total) / Number of Units (Total): 200 Credit Hours / 8 Credits	
7. Course administrator name (mention all, if more than one)	
Name: Dr. Omar Mowaffaq Mahmoud Email: omer_alyousif@uomosul.edu.iq	
8.Course Objectives	
Course Objectives	1. Develop problem-solving skills and understand AC circuit theory through the application of techniques. 2. Understand the voltage, current and power of a given AC circuit. 3. This course covers the basic concept of AC circuits. 4. This is the basic subject of all electrical and electronic AC circuits. 5. To understand the problems of Kirchhoff's laws of current and voltage. 6. To conduct a network and nodal analysis. 7. To conduct thevinin theorem and superposition theory. To understand resonant circuits.
9.Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this course is to encourage students to participate in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classrooms, interactive lessons and consideration of the kind of simple experiments that include some sampling activities of interest to students.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	6	Understand AC circuit basics and waveform types	AC concepts and waveforms	Lecture + Lab + Tutorial	Quiz
2	6	Calculate average/RMS values, form and crest factors	Average/RMS values and factors	Lecture + Lab + Tutorial	Assignment
3	6	Apply Ohm’s law in AC circuits, impedance and admittance	Impedance and admittance in AC	Lecture + Lab + Tutorial	Assignment
4	6	Calculate equivalent impedance using series/parallel, delta/star	Impedance equivalence (series, parallel, delta-star)	Lecture + Lab + Tutorial	Assignment
5	6	Perform power calculations and understand power factor	AC power and power factor	Lecture + Lab + Tutorial	Assignment
6	6	Apply Kirchhoff's laws (KVL & KCL)	Kirchhoff's voltage and current laws	Lecture + Lab + Tutorial	Assignment
7	6	Draw and interpret phasor diagrams	Phasor diagrams	Lecture + Lab + Tutorial	Assignment
8	6	Midterm Exam	Midterm assessment	Lecture + Lab + Tutorial	Midterm Exam
9	6	Understand network theorems and source transformations	Network theorems and source types	Lecture + Lab + Tutorial	Assignment
10	6	Apply mesh analysis (Maxwell’s currents)	Mesh analysis using Maxwell’s currents	Lecture + Lab + Tutorial	Assignment
11	6	Apply nodal analysis	Nodal analysis	Lecture + Lab + Tutorial	Assignment
12	6	Apply superposition theorem	Superposition theorem	Lecture + Lab + Tutorial	Assignment
13	6	Apply Thevenin’s and Norton’s theorems	Thevenin’s and Norton’s theorems	Lecture + Lab + Tutorial	Assignment
14	6	Apply maximum power transfer theorem	Maximum power transfer	Lecture + Lab + Tutorial	Assignment
15	6	Understand and analyze resonant circuits	Resonant circuits	Lecture + Lab + Tutorial	Assignment
16	6	Final exam preparation	Final exam review	Lecture + Lab + Tutorial	Final
11. Course Evaluation					

Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Engineering Circuit Analysis Version 7 by William Hight, Jack Kemerly, Stephen

Course Description Form

Course Title:
Mathematics II
Course Code:
EE109
Semester/Year:
Second Semester 2024-
Description setting date:
01/06/2023
5. Available attendance forms:
Theory, seminar
6. Number of credit hours (total) / number of units (total)
Number of Credit Hours (Total) / Number of Units (Total): 150 Credit Hours / 6 Credits
7. Course administrator name (mention all, if more than one)
Name: Dr. Saad Enad Mohamed Email: saadmohamed@uomosul.edu.iq

8.Course Objectives	
Course Objectives	1. Provide students with strong support for the basic concepts of calculus for learning: boundaries, derivatives, and integrals. 2. Help students communicate mathematical ideas by practicing appropriate mathematical symbols. 3. Help students verify mathematical ideas through mathematical proof techniques. 4. Develop students' mathematical thinking instead of memorizing rules. Enhance students' awareness of alternative learning methods such as group study
9.Teaching and Learning Strategies	
Strategy	Encourage students' participation in exercises and expand critical thinking skills through interactive classes and some simple experiments

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject Name**	**Learning Method**	**Evaluation Method**
1	6	Understand area under curves and definite integrals	Area under curve and Riemann sums	Lecture + Tutorial	Quiz
2	6	Apply definite integrals to constant functions	Definite integrals	Lecture + Tutorial	Assignment
3	6	Understand indefinite integrals and solve initial value problems	Indefinite integrals and algebraic rules	Lecture + Tutorial	Assignment
4	6	Apply integration by substitution	Integration by substitution	Lecture + Tutorial	Assignment
5	6	Calculate areas between curves using integration	Areas between curves using integration	Lecture + Tutorial	Assignment
6	6	Understand volume of solids of revolution (disc, washer, shell methods)	Volumes of revolution: Disc/Washer/Shell methods	Lecture + Tutorial	Assignment
7	6	Apply curve length formulas and differentials	Curve length formulas and discontinuities	Lecture + Tutorial	Midterm Exam
8	6	Apply surface area of revolution formulas	Surface area of revolution	Lecture + Tutorial	Assignment
9	6	Use basic integration formulas and trig identities	Basic integration identities	Lecture + Tutorial	Assignment
10	6	Apply integration by parts and tabular methods	Integration by parts techniques	Lecture + Tutorial	Assignment
11	6	Solve trigonometric integrals (sine, cosine, sec, tan)	Trigonometric integrals and powers	Lecture + Tutorial	Assignment
12	6	Apply trigonometric substitution techniques	Trig substitution for quadratic forms	Lecture + Tutorial	Assignment
13	6	Apply partial fractions for rational integrals	Partial fractions and substitution	Lecture + Tutorial	Assignment
14	6	Understand polar coordinates and Cartesian transformation	Polar coordinates and definitions	Lecture + Tutorial	Assignment
15	6	Graph polar functions and interpret intersections	Graphing polar curves and intersections	Lecture + Tutorial	Assignment
16	6	Review and prepare for final exam	Final exam preparation	Lecture + Tutorial	Final

11. Course Evaluation	
Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Calculus**, thirteenth edition, by George B. Thomas
Websites	Khan Academy

Course Description Form

Course Title:
Computer Programming
Course Code:
EE110
Semester/Year:
Second Semester 2024-
Description setting date:
01/06/2023
5. Available attendance forms:
theoretical and laboratory
6. Number of credit hours (total) / number of units (total)
Number of Credit Hours (Total) / Number of Units (Total): 150 Credit Hours / 6 Credits
7. Course administrator name (mention all, if more than one)
Name: Nagham Hikmat Aziz **Email** naghamhikmat@uomosul.edu.iq

8.Course Objectives	
Course Objectives	1. Introduction to MATLAB (.m file). 2. Understand the types of variables, numbers, expressions, and functions. 3. Dissolving electrical circuits using MATLAB. 4. Make symbolic solutions to equations. 5. Perform pulse and slope functions. 6. Implement geometric drawings (2D and 3D) such as vector graphs and bar charts. 7. The use of matrices and their applications.

9.Teaching and Learning Strategies	
Strategy	Encourage students to participate in exercises, and expand their critical thinking skills through interactive classroom lessons and simple experiences related to their interests.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	6	Introduction to MATLAB and variable types	MATLAB introduction and syntax	Lecture + Lab	Quiz

2	6	Work with complex numbers and matrix operations	Complex numbers and arrays	Lecture + Lab	Assignment
3	6	Solve linear equations using matrices	Matrix applications and equation solving	Lecture + Lab	Assignment
4	6	Use control structures in MATLAB	Control structures in programming	Lecture + Lab	Assignment
5	6	Create 2D plots using MATLAB commands	2D plotting and graphics	Lecture + Lab	Assignment
6	6	Analyze polynomials in MATLAB	Polynomial computation	Lecture + Lab	Assignment
7	6	Use function files (pulse and ramp)	Function files and signal applications	Lecture + Lab	Assignment
8	6	Review and practice previous content	Mid-semester review	Lecture + Lab	Midterm Exam
9	6	Solve equations symbolically in MATLAB	Symbolic computation	Lecture + Lab	Assignment
10	6	Apply numerical integration techniques	Numerical integration methods	Lecture + Lab	Assignment
11	6	Perform transient analysis	Transient response analysis	Lecture + Lab	Assignment
12	6	Analyze frequency response using MATLAB	Frequency analysis in circuits	Lecture + Lab	Assignment
13	6	Apply partial fraction expansion	Partial fraction in circuit systems	Lecture + Lab	Assignment
14	6	Simulate battery charging circuit	Simulation of battery circuits	Lecture + Lab	Assignment
15	6	Create 3D engineering graphics in MATLAB	3D graphics and visualization	Lecture + Lab	Assignment
16	6	Final exam preparation	Final exam review	Lecture + Lab	Final

11. Course Evaluation

Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources

Required textbooks (curricular books, if any)	"Numerical Analysis Using MATLAB and Excel", Third Edition, Stephen T. Carris

	ELECTRONICS and CIRCUIT ANALYSIS using MATLAB", John O. Attia, 1999.

Course Description Form

Course Title:
Digital Technologies
Course Code:
EE111
Semester/Year:
Second Semester 2024-
Description setting date:
01/06/2023
5. Available attendance forms:
theoretical, and seminar
6. Number of credit hours (total) / number of units (total)
Number of Credit Hours (Total) / Number of Units (Total): 70 Credit Hours / 3 Credits
7. Course administrator name (mention all, if more than one)
Name: Mohamed Idris Daoud **Email:** Mohammed.idrees@uomosul.edu.iq
8.Course Objectives

Course Objectives	Encourage students to participate in trainings and hone critical thinking skills through interactive lessons and simple experiences relevant to their interests

9.Teaching and Learning Strategies

Strategy	Encourage students to participate in exercises, and expand their critical thinking skills through interactive classroom lessons and simple experiences related to their interests.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Understand digital techniques and number systems	Intro to digital techniques, number systems	Theory + Tutorial	Quiz
2	5	Apply number base conversion and Boolean algebra	Base conversion, Boolean algebra	Theory + Tutorial	Assignment
3	5	Use canonical forms, logic gates, Karnaugh maps	Logic gates, Karnaugh maps	Theory + Tutorial	Assignment
4	5	Perform arithmetic operations, code conversion	Adders, code conversion	Theory + Tutorial	Assignment
5	5	Understand basic sequential circuit design	Sequential logic, latches	Theory + Tutorial	Assignment

6	5	Explore Flip-Flops and their characteristics	Flip-Flops: JK, D, edge-triggered	Theory + Tutorial	Assignment
7	5	Implement shift registers	Shift registers	Theory + Tutorial	Assignment
8	5	Midterm Exam	Midterm Exam	Theory + Tutorial	Midterm Exam
9	5	Classify types of shift registers and ring counters	Shift registers & ring counters	Theory + Tutorial	Assignment
10	5	Analyze state machines	State machine models	Theory + Tutorial	Assignment
11	5	Apply asynchronous (ripple) counters	Ripple counters	Theory + Tutorial	Assignment
12	5	Apply synchronous binary counters	Synchronous binary counters	Theory + Tutorial	Assignment
13	5	Apply BCD counters	BCD counters	Theory + Tutorial	Assignment
14	5	Apply up/down counters	Up/down counters	Theory + Tutorial	Assignment
15	5	Design synchronous counters	Synchronous counter design	Theory + Tutorial	Assignment
16	5	Final exam preparation	Final exam review	Theory + Tutorial	Final

11. Course Evaluation

Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources

Required textbooks (curricular books, if any)	"Digital Basics", Thomas L. Floyd, 11th ed., Pearson, 2015. "Introduction to Boolean Algebra and Logical Design", Gerhard and Melvin

Course Description Form

Course Title:
Physics of electronics
Course Code:
EE112
Semester/Year:
Second Semester 2024-
Description setting date:
01/06/2023
5. Available attendance forms:
theoretical, and seminar
6. Number of credit hours (total) / number of units (total)
Number of Credit Hours (Total) / Number of Units (Total): 75 Credit Hours / 3 Credits
7. Course administrator name (mention all, if more than one)

Name: Shamil Hamza Hussain
Email Shamil_alnajjar84@uomosul.edu.iq

8.Course Objectives	
Course Objectives	1. Develop electronic circuit problem solving skills by understanding the solid state of components. 2. Understand the theory of the energy range of materials. 3. Identify electrical conductivity and material properties (Fermi levels, occupancy function, electronic emission). 1. Understand the current-voltage characteristics of diodes and transistors. 2. Understand small and large signals and model active electronic devices.

9.Teaching and Learning Strategies	
Strategy	Encourage students to participate in exercises and hone critical thinking skills through interactive classes and simple experiments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Understand digital techniques and number systems	Intro to digital techniques, number systems	Theory + Tutorial	Quiz

2	5	Apply number base conversion and Boolean algebra	Base conversion, Boolean algebra	Theory + Tutorial	Assignment
3	5	Use canonical forms, logic gates, Karnaugh maps	Logic gates, Karnaugh maps	Theory + Tutorial	Assignment
4	5	Perform arithmetic operations, code conversion	Adders, code conversion	Theory + Tutorial	Assignment
5	5	Understand basic sequential circuit design	Sequential logic, latches	Theory + Tutorial	Assignment
6	5	Explore Flip-Flops and their characteristics	Flip-Flops: JK, D, edge-triggered	Theory + Tutorial	Assignment
7	5	Implement shift registers	Shift registers	Theory + Tutorial	Assignment
8	5	Midterm Exam	Midterm Exam	Theory + Tutorial	Midterm Exam
9	5	Classify types of shift registers and ring counters	Shift registers & ring counters	Theory + Tutorial	Assignment
10	5	Analyze state machines	State machine models	Theory + Tutorial	Assignment
11	5	Apply asynchronous (ripple) counters	Ripple counters	Theory + Tutorial	Assignment
12	5	Apply synchronous binary counters	Synchronous binary counters	Theory + Tutorial	Assignment
13	5	Apply BCD counters	BCD counters	Theory + Tutorial	Assignment
14	5	Apply up/down counters	Up/down counters	Theory + Tutorial	Assignment
15	5	Design synchronous counters	Synchronous counter design	Theory + Tutorial	Assignment
16	5	Final exam preparation	Final exam review	Theory + Tutorial	Final

11. Course Evaluation

Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources

Required textbooks (curricular books, if any)	**"Fundamentals of Electronics: Circuits, Devices, and Applications",** Thomas L. Floyd, Prentice-Hall, 2006
Websites	Nashelsky & Boylestad – Electronic Devices and Circuit Theory, Issue 11, 2021.

Course Description Form

Course Title:
Democracy and Human Rights
Course Code:
UOM104
Semester/Year:
Second Semester 2024-
Description setting date:
01/06/2023
5. Available attendance forms:
theoretical
6. Number of credit hours (total) / number of units (total)
Number of Credit Hours (Total) / Number of Units (Total): 50 Credit Hours / 2 Credits
7. Course administrator name (mention all, if more than one)
Name: Eng. Rashad Aided Al-Sayegh Email: rashad.alsaigh@uomosul.edu.iq

8.Course Objectives	
Course Objectives	1. Define administrative corruption, explore its types, and understand its harmful effects on society 2. Study methods of combating administrative corruption and enhancing transparency, accountability and good governance 3. Track the historical development and evolution of human rights, examining key milestones and movements 4. Distinguish between different categories of human rights, including civil and political, economic, social, environmental, cultural and developmental rights 5. Explore legal, institutional, and societal safeguards to prevent abuses, including in Islam at the national and international level

9.Teaching and Learning Strategies	
Strategy	1-Interactive discussions: Encourage participation in group dialogues to promote critical thinking 2-Case studies: analysis of factual cases of human rights violations or achievements. 3- Research projects: Assigning students to analytical research on human rights and democracy issues 4- Cooperative learning: Implement group activities to promote joint action 5- Diversity of assessment methods: the use of essays, presentations, debates and tests to assess understanding and application

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject Name**	**Learning Method**	**Evaluation Method**
1	3	Define human rights and identify their sources	Sources of human rights	Theory	Lecture
2	3	Explain the characteristics of human rights	Human rights characteristics	Theory	Lecture
3	3	Analyze the emergence and historical evolution of human rights	History of human rights	Theory	Assignment
4	3	Differentiate between categories of human rights	Types of human rights	Theory	Assignment
5	3	Evaluate Islamic guarantees for human rights	Human rights in Islam	Theory	Assignment
6	3	Understand national-level human rights protections	National protection of human rights	Theory	Assignment
7	3	Understand international human rights protections	International protection of human rights	Theory	Assignment
8	3	Define democracy and its principles	Democracy: concept and principles	Theory	Assignment
9	3	Discuss democratic system characteristics	Democratic system features	Theory	Assignment
10	3	Compare forms of democratic governance	Forms of governance	Theory	Assignment
11	3	Explain digital democracy and its implications	Digital democracy	Theory	Assignment
12	3	Analyze Islamic perspectives on democracy	Islam and democracy	Theory	Assignment
13	3	Critique the democratic system	Critique of democracy	Theory	Assignment
14	3	Define administrative corruption and its types	Administrative corruption	Theory	Assignment
15	3	Identify methods to combat administrative corruption	Combating corruption	Theory	Assignment
16	3	Final exam preparation	Final review	Theory	Final

11. Course Evaluation	
Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5
Midterm exam: 1	10

Final exam	50
Total	100

12-Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Human rights guarantees and protection in accordance with international law and national legislation / Nabil Abd1- Rahman Nasser El-Din • Democracy and Human Rights / Dr. Amir Abdul Aziz 2-

Course Description Form

Course Title:
English 1
Course Code:
UOM1021
Semester/Year:
Second Semester 2024-
Description setting date:
01/06/2023
5. Available attendance forms:
theoretical, and seminar
6. Number of credit hours (total) / number of units (total)
Number of Credit Hours (Total) / Number of Units (Total): 50 Credit Hours / 2 Credits
7. Course administrator name (mention all, if more than one)

Name: Shamil Hamza Hussain
Email Shamil_alnajjar84@uomosul.edu.iq

8.Course Objectives

Course Objectives	1. Develop English communication skills. 2. Enable students to read and write in a correct grammatical language. 3. Developing professional writing skills. 4. Develop the skills of writing emails for engineers.

9.Teaching and Learning Strategies

Strategy	Encourage students' participation in exercises, with a focus on refining and expanding their critical thinking skills, through interactive classes and language activities.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Introduction to course and basic orientation	Introduction	Theory	Lecture
2	3	Learn present tense verb usage	Parts of Speech: Present Verbs	Theory	Assignment
3	3	Learn past tense verb usage	Parts of Speech: Past Verbs	Theory	Assignment
4	3	Understand perfect tenses	Perfect Tenses	Theory	Assignment

5	3	Review nouns and their usage	Parts of Speech: Nouns	Theory	Assignment
6	3	Use prepositions accurately	Parts of Speech: Prepositions	Theory	Assignment
7	3	Understand adverbs in context	Parts of Speech: Adverbs	Theory	Assignment
8	3	Midterm exam	Midterm Exam	Theory	Exam
9	3	Differentiate active and passive voice	Voice: Passive and Active	Theory	Assignment
10	3	Use of 'since' and 'for'	Prepositions: Since and For	Theory	Assignment
11	3	Understand definite and indefinite articles	Parts of Speech: Articles	Theory	Assignment
12	3	Use of conjunctions in writing	Parts of Speech: Conjunctions	Theory	Assignment
13	3	Write professional emails	Writing an Email	Theory	Assignment
14	3	Email writing exercises	Email Writing Practice	Theory	Assignment
15	3	Techniques to improve grammar	Grammar Correction Techniques	Theory	Assignment
16	3	Final exam preparation	Final Exam Review	Theory	Final

11. Course Evaluation

Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8
In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

12-Learning and Teaching Resources

Required textbooks (curricular books, if any)	**New Headway – Intermediate**
Websites	English for Engineers – Udemy

Course Description Form

1. Course Name:
Electrical Circuits Analysis I
2.Course Code:
EEPM201
3. Semester / Year
First semester / 2024-2025
4.Description Preparation Date:
22/4/2025
5.Available Attendance Forms:
Theory, Tutorial
6.Number of Credit Hours (Total) / Number of Units (Total)
150/6
7.Course administrator's name (mention all, if more than one name)
Name: Dr. Omar Mowaffaq Mahmoud **Email :** omer_alyousif@uomosul.edu.iq

8.Course Objectives	
Course Objectives	1.Ability to understand the AC Circuit Power Analysis and Poly-phase Circuits 2.Ability to determine the Transient Response of RL /RC Circuit and the Transient Response of RLC Circuit 3.Ability to analysis Magnetically Coupled Circuits and Ideal Transformers 4.Ability to solve the mathematical equations for Complex Frequency, Laplace Transform, Frequency Response and Fourier Circuit Analysis 5.Ability to synthesize the Circuit Analysis in the s-Domain and Two-Port Networks
9.Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

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

1	6	Understand the course content and objectives and the importance of electrical networks	Introduction; syllabus; Advantages and Disadvantages of Electrical Networks as a different circuits .	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
2	6	Analyze transient response of RL circuits	Transient Response of RL Circuit	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
3	6	Analyze transient response of RC circuits	Transient Response of RC Circuit	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
4	6	Understand and apply step function concepts	Unit step functions	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
5	6	Analyze complete response of RL and RC circuits	Complete response of RL and RC Circuits	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
6	6	Analyze parallel RLC circuits	Transient Response of RLC Circuit / Parallel connection	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
7	6	Analyze series RLC circuits	Transient Response of RLC Circuit / Series connection	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
8	6	Distinguish complete responses in series and parallel RLC circuits	Complete response of RLC Circuit / Parallel and Series connections	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
9	6	Understand and apply three-phase analysis	Mid-term Exam	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
10	6	Analyze balanced three-phase systems	Poly-phase Circuits	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
11	6	Analyze unbalanced three-phase systems	Three phase circuit analysis / Balance load	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
12	6	Understand power measurement in 3-phase systems	Three phase circuit analysis / Un-Balance load	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
13	6	Understand magnetic coupling concepts	Three phase wattmeter's	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
14	6	Analyze the performance of linear and ideal transformers	Magnetically Coupled Circuits	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz
15	6	General review and preparation for final exam	Linear and Ideal Transformers	Lecture in classroom	In-class and homework assignments, and end-of-lecture quiz

11. Course Evaluation

Evaluation type	Degree
Daily quizzes: 3	15
Homework assignments: 3	12
Reports: 1	8

In-class assignments: 1	5
Midterm exam: 1	10
Final exam	50
Total	100

Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering Circuit Analysis Eight Edition (William H. Hayt) 2012 Fundamentals of Electric Circuits (Charles K. Alexander)2009
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Electric Circuits Tenth Edition (James W. Nilsson) 2015
Electronic References, Websites	https://www.pdfdrive.com/schaums-outline-of-electric-circuits-e185851170.html

Course Description Form

1. Course Name:	
Numerical Analysis	
2. Course Code:	
ENGE320	
3. Semester / Year:	
2024-2025	
4. Description Preparation Date:	
March 2025	
5. Available Attendance Forms:	
On-Campus Lectures	
6. Number of Credit Hours (Total) / Number of Units (Total):	
3 (2 Theoretical + 0 Practical + 1 Tutorial)	
7. Course administrator's name (mention all, if more than one name)	
Name: Farhad E. Mahmood Email: farhad.m@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	This course covers the basic concepts and techniques of numerical analysis applied to engineering problems. Topics include error analysis, solutions of algebraic and transcendental equations, systems of linear equations, curve fitting, numerical differentiation and integration, and solutions of ordinary differential equations. To introduce the fundamentals of numerical methods used for solving engineering problems and to enhance students' computational skills.
9. Teaching and Learning Strategies	
Strategy	-Active Learning: Through class discussions and real world problems. - Coordination with lab classes to provide a parallel hands-on experience. -Use google classroom platform to enhance learning and provide supplementary material.

10. Course Structure					
Week	**Hours**	**Learning Outcomes**	**Unit or Subject Name**	**Learning method**	**Evaluation Method**
1	3	OC1	Concepts and role of numerical methods	Lecture	Exam HW
2	3	OC1	approximations, round-off/truncation errors, absolute/relative error	Lecture – tutorial	Exam Quiz
3	3	OC1/OC3	Bisection, False-Position methods	Lecture	Exam
4	3	OC3	Open Methods (Newton-Raphson, Secant methods	Lecture Tutorial	Exam HW
5	3	OC2	Linear Algebraic Systems: Direct vs. Iterative Methods, Pivoting, Convergence	Lecture	Exam Quiz
6	3	OC2	Gauss-Seidel Method, Relaxation Techniques	Lecture	Exam
7	3		Review TEST	Tutorial Class Discussion	
8	3	OC4	, Tri-diagonal Systems	Lecture Tutorial	Exam Quiz
9	3	OC5	Curve Fitting: Regression, Interpolation,	Lecture	Exam
10	3	OC5	Least Square Method	Lecture Tutorial	Exam HW
11	3	OC6	Nonlinear Regression Models,	Lecture	Exam Quiz
12	3	OC7	Polynomial Regression	Lecture Tutorial	Exam
13	3	OC7	Numerical Integration: Trapezoidal Rule, Simpson’s Rule	Lecture	Exam

14	3	OC6-OC7	Review and Advanced Topics ب	Lecture Tutorial	Exam/Quiz
15	3		Revision	Group discussion	

11. Course Evaluation
• Mid term examinations: 30% • Quizzes & Assignments: 10% • Final examination: 60%

12. Learning and Teaching Resources	
Required textbook	*Numerical Methods for Engineers* by Steven C. Chapra & Raymond P. Canale
Main references	*Applied Numerical Methods with MATLAB* by Steven C. Chapra
Recommended books and references	*An Introduction to Numerical Analysis* by Kendall Atkinson
Electronics References	*Google Classroom Page: NUMARICAL ANALYSIS* *Class code: ap4vdbs*

Google Classroom Page: NUMARICAL ANALYSIS
Class code:
ap4vdbs

Course Description Form

1. Course Name:
Engineering Analysis II
2. Course Code:
EEP 312
3. Semester / Year:
2/ 2024-2025
4. Description Preparation Date:
April 2025
5. Available Attendance Forms:
On-Campus Lectures
6. Number of Credit Hours (Total) / Number of Units (Total):
4/4
7. Course administrator's name (mention all, if more than one name)
Name: Riyadh Zaki Sabry Email: riyadhzaki@uomosul.edu.iq Name: Huda Aqeel Ahmed Al-Tayyar Email: huda.aqeel@uomosul.edu.iq
8. Course Objectives

Course Objectives	*The course **EEP 312 - Engineering Analysis II** aims to provide students with a comprehensive understanding of analytical and computational techniques used in engineering. By the end of the course, students will be able to:* *OC 1. Understand and apply fundamental concepts of engineering mathematics, including differential equations, linear algebra, and complex variables.*

	OC 2. Formulate and solve engineering problems using numerical methods such as finite difference, finite element, and iterative techniques. *OC 3. Evaluate the accuracy, stability, and convergence of numerical algorithms in engineering applications.* *OC 4. Design and implement computational models using programming tools and software to simulate real-world engineering systems.* *OC 5. Apply mathematical and scientific principles to analyze complex engineering systems and propose solutions.* *OC 6. Work collaboratively in teams to conduct simulations and practical computational experiments, including interpreting data and validating models.* *OC 7. Undestand the most powerful numerical analysis methods for solving complex system*

9. Teaching and Learning Strategies

Strategy	-Active Learning: Through class discussions and real-world problems. -Use of Simulation Software like MATLAB to enhance the theoretical study. -Use google classroom platform to enhance learning and provide supplementary material.

10. Course Structure

Week	Hours	Learning Outcomes	Unit or Subject Name	Learning method	Evaluation Method
1	4	OC1	Partial differential Equations, One dimensional wave equation Separation of variables Telephone equation the potential equation Laplace equation	Lecture	Exam HW

2	4	OC1	Concepts and role for the numerical method in engineering, approximations, and errors, the definition of Round-off error and truncation error, absolute and relative true/approximation error.	Lecture – tutorial	Exam Quiz
3	4	OC1/OC3	Numerical Solution of Nonlinear Algebraic Equations (Roots of Equations):Bracketing Methods (Bisection, and False-Position method)	Lecture	Exam
4	4	OC3	Open Methods Newton-Raphson and secant method).	Lecture Tutorial	Exam HW
5	4	OC2	Numerical Solution of linear algebraic equations (system): the difference benveen the direct and indirect methods, Singular and ill/wel1-conditioned system, Parlial and complete Pivoting, Convergence Criteria, Jacobi iterative method.	Lecture	Exam Quiz
6	4	OC2	The gauss-Seidel iterative method, Gauss-Seidel iterative with the relaxation factor method. Tri-diagonal systems and its solution.	Lecture	Exam
7	4	OC2	Curve Fitting: Classification of Curve Fitting (Regression and Interpolation), the concepts of regression, and Least Square Criterion, Linear Regression.	Tutorial Class Discussion	
8	4	OC4	Nonlinear Regression, popular nonl inear regression models (Exponential, Power, Growth, and Polynomial model), the Linearization of the first three nonlinear models, Polynomial Regression	Lecture Tutorial	Exam Quiz
9	4	OC5	Cubic spline Interpolation (Chene.v and Kincaid Fonnula), Tri-diagonal systems and its solution.	Lecture	Exam

10	4	OC5	Numerical Integration: Trapezoidal Rule (equal and non-equal segment width), Simpson's 1/3 Rule (equal and non-equal segment width).	Lecture Tutorial	Exam HW
11	4	OC6	Numerical Differentiation: Tayler series and truncation error	Lecture	Exam Quiz
12	4	OC7	Numerical Solutions of Ordinary Differential Equation (ODE)	Lecture Tutorial	Exam
13	4	OC7	Fourth-order Runge-Kutta method for solving the IVP	Lecture	Exam
14	4	OC6-OC7	The numerical methods for solving the BVP	Lecture Tutorial	Exam/Quiz
15	4		Revision	Group discussion	

11. Course Evaluation

- Mid term examinations: 25%
- Quizzes & Assignments: 15%
- Final examination: 60%

12. Learning and Teaching Resources

Required textbook	*Numerical Methods for Engineers: V/ith Software and Programming Applications, Steven C. Chapra and Raymond P. Canale, Fourth Edition. 2003*
Main references	*Numerical Methods in Engineering with Matlab, JaanKiusalaas, 2005.*
Recommended books and references	*Numerical Analysis Using Matlab and Excel, Steven T. Karris, Third Edition, 2007.*
Electronics References	*Google Classroom Page:* تحليالت هندسية2)الفصل الربيعي(*2025-2024* المستوى الثالث *Class code:* *qxovt43*

Google Classroom Page: Power Electronics

Class code:

qxovt43

Course Description Form

1. Course Name:
Power& Machines LabII
2. Course Code:
PLAB358
3. Semester / Year:
2nd Semester / 3rd Year (Power and Machines)
4. Description Preparation Date:
25/1/2024
5. Available Attendance Forms:
On-Campus Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
90Hrs/2 Unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Yasir M. Y. Ameen (Supervisor) Email: yasir_752000@uomosul.edu.iq Name: Omar Turath Tawfeeq Email: omartawfeeq_1981@uomosul.edu.iq Name: Marwan H. Mohammed Email: marwan.alibraheem@uomosul.edu.iq Name: Dr. Mohamad N . Abdul Kadir Email: makadr@uomosul.edu.iq Name: Abdulhakeem Nabeel Yahya Email: abdulhakeem.nabeel@uomosul.edu.iq Name: Ahmed Bassam Aziz Email: ahmed.aziz@uomosul.edu.iq Name: Fawaz Yaseen Abdullah Email: fawaazyasen@uomosul.edu.iq Name: Amina A. Fadhil Email: aminaalrawy@uomosul.edu.iq Name: Omar nazar hassun Email: Umornazar80@uomosul.edu.iq Name: saoud maan Email: saoud.maan@uomosul.edu.iq

8. Course Objectives

This course focuses on the working principle of some AC rotating machines, such as: synchronous and asynchronous machines, as well as the testing of DC machines and transformers. In addition to some tests on electronics and power electronics circuits.

The course learning objectives are as follows:

1- Understand parallel operation and zig-zeg connection of transformer. 2- Understand how the speed of dc motors can be controlled.

3- Understand the load test of dc motors.

4- Understand how to find Induction motor parameters.

5- Understand the triggering approaches of MOSFET transistor and learning the basic of the chopper and inverter circuits.

6- Apply the principles of electrical drives to real-world applications in industrial and commercial settings

7- Understand the basic of: Integrating and differentiating circuit., Shift Registers. Op-Amp and PLC.

9. Teaching and Learning Strategies

Strategy	1. Hands-On Laboratory Experiments: Conduct practical experiments to understand transformer and DC motor operations. 2. Interactive Demonstrations: Use real-life demonstrations for SCRs, TRIACs, and rectifiers. 3. Collaborative Learning: Group work to conduct experiments, analyze data, and discuss results. 4. Problem-Based Learning (PBL): Solve real-world problems related to power electronics and motor control. 5. Simulations: Use software like MATLAB or Multisim to simulate circuits. 6. Industry Visits: Arrange field trips to factories for practical exposure. 7. Self-Assessment: Students write lab reports analyzing their performance and results

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	6	Study and Analysis	Speed control of D.C, shunt motor by using armature voltage control method. Or (Three Phase Induction Motor (Direction control & Star-Delta Starting))	Practical Experiments in the Laboratory	Quiz and Reports

2	6	Study and Analysis	Parallel operation of two single-phase transformers. Or (starting of synchronous motor)	Practical Experiments in the Laboratory	Quiz and Reports
3	6	Study and Analysis	Three Phase Transformer zig-zag connection . Or (Induction generator).	Practical Experiments in the Laboratory	Quiz and Reports
4	6	Study and Analysis	Arduino PWM Tutorial.	Practical Experiments in the Laboratory	Quiz and Reports
5	6	Study and Analysis	AC Motor Drive (Frequency converter ACH550).	Practical Experiments in the Laboratory	Quiz and Reports
6	6	Study and Analysis	Integrating and differentiating circuit.	Practical Experiments in the Laboratory	Quiz and Reports
7	6	Design	Shift Registers.	Practical Experiments in the Laboratory	Quiz and Reports
8	6	Mid Term Exam	Theory and Practical		
8	6	Study and Analysis	Load test of a D.C. series generator. Or (load and no-load test of synchronous generator)	Practical Experiments in the Laboratory	Quiz and Reports
9	6	Study and Analysis	Voltage regulation of an alternator.	Practical Experiments in the Laboratory	Quiz and Reports
10	6	Study and Analysis	Three-phase induction motor no-load and blocked rotor test.	Practical Experiments in the Laboratory	Quiz and Reports
11	6	Study and Analysis	Digital control of a half bridge inverter	Practical Experiments in the Laboratory	Quiz and Reports
12	6	Study and Analysis	Speed control of induction motor drive system by external signals	Practical Experiments in the Laboratory	Quiz and Reports

13	6	Design	Application of Op-Amp.	Practical Experiments in the Laboratory	Quiz and Reports
14	6	Design	PLC applications.	Practical Experiments in the Laboratory	Quiz and Reports
15	6	Final Exam	Theory and Practical		

11. Course Evaluation

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 Marking:

Evaluation type	**Degree**
Quizzes	10pts
Homework+ Report	10pts
Term Exam	30pts
Final Exam	50pts
Total	100pts

12. Learning and Teaching Resources

References:

1- Power & Machines Lab Manual, Department of ELECTRICAL ENG. , Mosul University.

2- P. C. Sen, “Principles of Electrical machines and power electronics”, 2nd edition, John Wiley & Sons.

3- M H Rashid, “Power Electronics – circuits, devices and applications”, 3rd edition, Pearson Education.

4- Robert L. Boylestad , Louis Nashelsky Electronic Devices and Circuit Theory 10th Edition.

https://classroom.google.com/c/NjYxOTEyNDYxNTM4

Course Description Form

1. Course Name:	
Instrumentation Systems	
2. Course Code:	
EEC 317	
3. Semester / Year:	
2nd Semester / 3rd Year	
4. Description Preparation Date:	
25/2/2023	
5. Available Attendance Forms:	
On-Campus Lectures	
6. Number of Credit Hours (Total) / Number of Units (Total):	
30Hrs/ 2Unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Wael H. Hamdon Email: waelhashem_67@uomosul.edu.iq Name: Noor Thamer Mohammed Fidhil Email: noor.almalah@uomosul.edu.iq	
8. Course Objectives	
Course Objective	This course focuses on construction, operation, analysis and control of an Instrumentation Systems. Topics discussed include principle of Transducers and there types and application , principle of bridges and there types and application ,electronic and digital instruments. **The course learning objectives are as follows:** 1 Understand the concept of AC indicating instruments 2. Understand the concept of DC bridges 3. Understand and know how to use the AC bridges. 4. Understand the Instrumentation systems. 5. Be able to use the Oscilloscope. 6. Understand the transducers 7. Understand the Instrument transformers. 8. Understand the Electronic measurements. 9. Understand the Digital instruments.

9. Teaching and Learning Strategies

Strategy	The teaching and learning strategies for EEC 317- Instrumentation Systems are designed to ensure students achieve the course objectives and develop a strong understanding of instrument devices and circuits. The strategies include: Lectures and Theoretical Instruction. 2.Practical Laboratory Work. 3.Use of Simulation Software. 4.Assessment and Feedback. 5.Continuous Improvement. These strategies aim to provide a balanced approach to learning, combining theoretical knowledge with practical application, collaboration, and ethical considerations, ensuring students are well-prepared for professional engineering practice..

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Analysis	Introduction	Theory	Home Work
2	3	Analysis	AC indicating instruments	Theory	Quiz
3	3	Analysis	DC bridges	Theory	Reports
4	3	Analysis	AC bridges	Theory	Class Work
5	3	Analysis	Instrumentation systems	Theory	Home Work
6	3	Analysis	Oscilloscope	Theory	Quiz
7	3	Analysis	Transducers	Theory	Reports
8	2	Mid Term Exam			
	1	Analysis	Transducers	Theory	Home Work
9	3	Analysis	Transducers	Theory	Home Work
10	3	Analysis	Transducers	Theory	Quiz
11	3	Analysis	Instrument transformers	Theory	Reports
12	3	Analysis	Electronic measurements	Theory	Class Work
13	3	Analysis	Digital instruments	Theory	Home Work
14	3	Analysis	Telemeter instruments	Theory	Quiz
15	3	Final 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 Marking:

Evaluation type	**Degree**
Quizzes	10pts
Homework+ Report	10pts
Term Exam	30pts
Final Exam	50pts
Total	100pts

12. Learning and Teaching Resources
References:
1- *Electronic instrumentation and measurement technology by Cooper*
2- Lecture Notes
3- Electronic measurement systems by U. A. Bakashi 2008
4- Electrical measurements and measuring instruments by A. K. Sawhney 2008.
5- Electrical and electronic measurements by Ahmed A. Montaser 1999
6- القياسات الكهربائية ل د. مظفر النعمة و د. سنان عطار باشي1988
https://classroom.google.com/c/NzE4NjU1MDc0MjUw

Course Description Form

1. Course Name:	
Programmable Controller	
2. Course Code:	
PCON362	
3. Semester / Year:	
2nd Semester / 3rd Year (P&M) / 2023-2024	
4. Description Preparation Date:	
March 2025	
5. Available Attendance Forms:	
On-Campus Lectures	
6. Number of Credit Hours (Total) / Number of Units (Total):	
30Hrs/2 Unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Fawaz Yaseen Abdullah Email: fawaazyasen@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	*OC 1. Study of the principles and application of Programmable Logic Controllers* *OC 2. ladder logic, program control, data manipulation, math instructions, sequencers, shift registers,* *OC 3. PLC-mechanism interfacing* *OC 4. Understand concepts of PLC, its uses & applications.* *OC 5. ▪ Develop PLC ladder programs for simple industrial applications.*
9. Teaching and Learning Strategies	
Strategy	-Active Learning: Through class discussions and real-world problems. - Coordination with lab classes to provide a parallel hands-on experience. -Use google classroom platform to enhance learning and provide supplementary material.

10. Course Structure

Week	Hours	Learning Outcomes	Unit or Subject Name	Learning method	Evaluation Method
1	2	OC1	Introduction to PLCs	Lecture	Exam HW
2	2	OC1	PLC basics	Lecture – tutorial	Exam Quiz
3	2	OC1/OC3	PLC Addressing and Basic Instructions	Lecture	Exam
4	2	OC3	Basic Ladder Logic Programming	Lecture Tutorial	Exam HW
5	2	OC2	Programming word level logic instructions, Relation of digital gate logic to contact/coil logic, Relay logic, Relay Sequencers	Lecture	Exam Quiz
6	2	OC2	PLC Timer Functions	Lecture	Exam
7	2		Review TEST	Tutorial Class Discussion	
8	2	OC4	ladder diagram elements. Instructions: Relay type instructions, Instruction addressing, Branch Instructions, Internal Relay Instructions, Programming	Lecture Tutorial	Exam Quiz
9	2	OC5	Data Handling and Program Control Flow Instructions	Lecture	Exam
10	2	OC5	Shift and Sequencer Instructions	Lecture Tutorial	Exam HW
11	2	OC6	PLC I/O Module Types and and PLC Trainer Configuration	Lecture	Exam Quiz
12	2	OC7	Interrupts	Lecture Tutorial	Exam
13	2		Revision	Group discussion	Exam
14	2		Exam #1		
15	2		Exam #2		

11. Course Evaluation

• Mid term examinations: 30% • Quizzes & Assignments: 10% • Final examination: 60%	
12. Learning and Teaching Resources	
Required textbook	*Gary Dunning, "Introduction to Programmable Logic Controllers", Thomson, 2nd Edition*
Main references	*John R. Hackworth, Frederick D., Hackworth Jr., "Programmable Logic Controllers Programming Methods and Applications", PHI Publishers*
Recommended books and references	*John W. Webb, Ronald A. Reis, "Programmable Logic Controllers: Principles and Application", PHI Learning, New Delhi, 5th Edition*
Electronics References	*Google Classroom Page: PLC (P&M)* *Class code:* ***5ufsx2d***

Course Description Form

1. Course Name:
Transmission Systems II
2. Course Code:
PECT315
3. Semester / Year:
2/ 2024-2025
4. Description Preparation Date:
March 2025
5. Available Attendance Forms:
On-Campus Lectures
6. Number of Credit Hours (Total) / Number of Units (Total):
3
7. Course administrator's name (mention all, if more than one name)
Name:Yousif Mohamad Younes Email: yousif1969@uomosul.edu.iq
8. Course Objectives

Course Objectives	*OC 1.* *Representation of OHTL. (GO-i). .....* *OC 2.* *general circuit constant, (GO-i). .....* *OC 3.* *power circle diagram. (GO-ii).* *OC 4.* *electric power cables. (GO-i)* *OC 5.* *Earthling Systems. (GO- iv).* *OC 6.* *D.C. Transmission systems. (GO-i)* *OC 7.* *Flexible A.C.*

	Transmission. GO-i, GO-iv).

9. Teaching and Learning Strategies

Strategy	-Active Learning: Through class discussions and real world problems. - Coordination with lab classes to provide a parallel hands-on experience. -Use google classroom platform to enhance learning and provide supplementary material.

10. Course Structure

Week	Hours	Learning Outcomes	Unit or Subject Name	Learning method	Evaluation Method
1	3	OC1	*Representation of OHTL.*	Lecture	HW
2	3	OC1	*Representation of OHTL.*	Lecture – tutorial	Exam Quiz
3	3	OC1	*Representation of OHTL.*	Lecture	HW
4	3	OC1	*Representation of OHTL.*	Lecture Tutorial	HW
5	3	OC2	*general circuit constant,*	Lecture	HW
6	3	OC2	*general circuit constant,*	Lecture	Exam
7	3	OC3	*power circle diagram.*	Lecture	HW
8	3	OC4	*electric power cables.*	Lecture Tutorial	Exam Quiz
9	3	OC4	*electric power cables.*	Lecture	
10	3	OC4	*electric power cables.*	Lecture	
11	3	OC5	*Earthling Systems*	Lecture	
12	3	OC6	*D.C. Transmission systems.*	Lecture	
13	3	OC7	*Flexible A.C. Transmission.*	Lecture	HW
14	3	OC7	*Flexible A.C. Transmission.*	Lecture Tutorial	Quiz
15	3		Review TEST		

11. Course Evaluation	
• Mid term examinations: 30% • Quizzes & Assignments: 10% • Final examination: 60%	
12. Learning and Teaching Resources	
Required textbook	*basic electrical engineering bakshi*
Main references	*ELECTRICAL POWER ENGINEERING Dr. Mammoon ALKABABAJJI. MOSUL UNIVERSITY.*
Recommended books and references	*Power SYSTEM, GUPTA*

Course Description Form

1. Course Name:
Synchronous Machines
2. Course Code:
SYMA356
3. Semester / Year:
2nd Semester / 3rd Year (Power and Machines)
4. Description Preparation Date:
25/2/2023
5. Available Attendance Forms:
On-Campus Lectures
6. Number of Credit Hours (Total) / Number of Units (Total):
45Hrs/3 Unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Yasir M. Y. Ameen Email: yasir_752000@uomosul.edu.iq Name: Marwan H. Mohammed Email: marwan.alibraheem@uomosul.edu.iq
8. Course Objectives

Course Objective	This course focuses on the design, operation, analysis and control of AC rotating machines. Topics covered include three-phase synchronous machines operating as synchronous generators, synchronous motors, and synchronous compensators. **The course learning objectives are as follows:** 1- Understand the equivalent circuit of a synchronous machine, and be able to sketch phasor diagrams for a synchronous machine. 2- Know the equations for power and torque in a synchronous machine, and understand how terminal voltage varies with load in a synchronous generator operating alone. 3- Understand the conditions required to parallel two or more synchronous generators, and understand the operation of synchronous generators in parallel with infinite bus. 4- Understand the static stability limit of a synchronous generator. 5- Understand synchronous machine ratings, and what condition limits each rating value. 6- Understand how and why power factor varies as synchronous motor load increases. 7- Understand how and why power factor varies as synchronous motor field current varies as synchronous motor load increases 8- Understand how and why power factor varies as synchronous motor field current varies

	-the "V" curve. 9- Understand how synchronous motors can be started. 10- Be able to tell whether a synchronous machine is acting as a motor or a generator and whether it is supplying or consuming reactive power by examining its phasor diagram.

9. Teaching and Learning Strategies

Strategy	1. **Practical Training:** Conduct real-life tests on synchronous machines to understand their behavior under different operating conditions. 2. **Project-Based Learning:** Assign small projects where students design and analyze synchronous generators or motors for industrial applications. 3. **Group Analysis:** Collaborate with peers to discuss and interpret the performance and characteristics of synchronous machines. 4. **Software Simulation:** Use programs like **MATLAB/Simulink** to simulate dynamic performance and analyze time response. 5. **Problem Solving and Analysis:** Solve mathematical problems related to power, torque, and power factor correction, followed by analyzing and discussing the solutions. 6. **Analytical Assessment:** Write detailed reports on experiments, providing critical analysis of results and comparing them to theoretical standards.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Analysis	Introducing to synchronous machines and their constructions	Theory	Home Work
2	3	Analysis	Derive of the equivalent circuit	Theory	Quiz
3	3	Analysis	Power and torques in synchronous machines	Theory	Reports
4	3	Analysis	Phasor diagram of synchronous machines	Theory	Class Work
5	3	Analysis	Voltage regulation	Theory	Home Work
6	3	Analysis	Open and short circuit tests	Theory	Quiz
7	3	Analysis	Operating synchronous generator alone(P-F and Q-V characteristics)	Theory	Reports
8	2	Mid Term Exam			
	1	Analysis	Conditions and advantages of parallel operation of S.G	Theory	Home Work
9	3	Analysis	Rating Limitations of Synchronous Machine	Theory	Home Work
10	3	Analysis	Synchronous motors	Theory	Quiz
11	3	Analysis	Starting of Synchronous motors	Theory	Reports

12	3	Analysis	V-curves	Theory	Class Work
13	3	Analysis	Speed control of synchronous motors	Theory	Home Work
14	3	Analysis	synchronous compensators	Theory	Quiz
15	3	Final 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 Marking:

Evaluation type	Degree
Quizzes	10pts
Homework + Report	10pts
Term Exam	20pts
Final Exam	60pts
Total	100pts

12. Learning and Teaching Resources

References:

1- Stephan J. Chapman., Electric Machinery Fundamentals, (5th Edition), McGraw-Hill, New York,2012.

2- J. Hindmarsh, Electrical Machines and their applications, (4th Edition), Pergamon Press, Oxford. New York. 1977.

3- V.K Mehta and Rohit Mehta, principles of electrical machines, 2nd edition 2008, S.Chand &company LTD

4- د باسل محمد سعيد و د ضياء علي النعمة." مكائن التيار المتناو ب" مطبعة جامعة الموصل 1989

https://classroom.google.com/c/NzQ3NjIzNDQ2NzYx?cjc=r3yfeye

Course Description Form

1. Course Name:	
Transmission Systems I	
2. Course Code:	
PECT305	
3. Semester / Year:	
1/ 2024-2025	
4. Description Preparation Date:	
March 2025	
5. Available Attendance Forms:	
On-Campus Lectures	
6. Number of Credit Hours (Total) / Number of Units (Total):	
3	
7. Course administrator's name (mention all, if more than one name)	
Name:Yousif Mohamad Younes Email: yousif1969@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	*OC 1.* Supply sources, *(GO-i).* *OC 2.* sub-stations choice of transmission voltage.*(GO-i).* *OC 3.* supporting structures. *(GO-ii).* *OC 4.* *overhead transmission lines, (OHTL). (GO-i)* *OC 5.* electrical design of OHTL. *(GO-iv).* *OC 6.* mechanical design of OHTL. *(GO-i)* *OC 7.* Corona. *GO-i, GO-iv).* *OC 8.* insulators of OHTL.

9. Teaching and Learning Strategies	
Strategy	-Active Learning: Through class discussions and real world problems. - Coordination with lab classes to provide a parallel hands-on experience. -Use google classroom platform to enhance learning and provide supplementary material.

10. Course Structure

Week	Hours	Learning Outcomes	Unit or Subject Name	Learning method	Evaluation Method
1	3	OC1	Supply sources.	Lecture	
2	3	OC2	sub-stations choice of transmission voltage.	Lecture	
3	3	OC3	supporting structures.	Lecture	
4	3	OC4	*overhead transmission lines, (OHTL)..*	Lecture	
5	3	OC4	electrical design of OHTL.	Lecture	HW
6	3	OC5	electrical design of OHTL.	Lecture	Exam
7	3	OC5	electrical design of OHTL.	Lecture	HW
8	3	OC5	electrical design of OHTL.	Lecture Tutorial	Exam Quiz
9	3	OC5	electrical design of OHTL.	Lecture	
10	3	OC6	mechanical design of OHTL.	Lecture	HW
11	3	OC7	Corona	Lecture	HW
12	3	OC7	Corona.	Lecture	Quiz
13	3	OC8	insulators of OHTL.	Lecture	HW
14	3	OC8	insulators of OHTL.	Lecture Tutorial	Quiz
15	3		Review TEST		

11. Course Evaluation	
• Mid term examinations: 30% • Quizzes & Assignments: 10% • Final examination: 60%	
12. Learning and Teaching Resources	
Required textbook	*basic electrical engineering bakshi*
Main references	*ELECTRICAL POWER ENGINEERING Dr. Mammoon ALKABABAJJI. MOSUL UNIVERSITY.*
Recommended books and references	*Power SYSTEM, GUPTA*

Course Description Form

1. Course Name:
Control System Analysis
2. Course Code:
COSA402
3. Semester / Year:
1/ 2023-2024
4. Description Preparation Date:
March 2025
5. Available Attendance Forms:
On-Campus Lectures
6. Number of Credit Hours (Total) / Number of Units (Total):
4
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed Obaid Mustafa Email: mohammed.obaid@uomosul.edu.iq
8. Course Objectives

Course Objectives	The objective of control system analysis is to understand how a system behaves under various inputs and conditions, and to evaluate whether it meets the desired performance and stability requirements. Specifically, the key objectives include: **1.** Understanding System Behavior Analyze how the system responds to different types of inputs (step, ramp, sinusoidal, etc.). Examine time-domain and frequency- domain responses. **2.** Determining Stability • Identify whether the system will remain bounded and predictable for all bounded inputs. • Use methods like: o Routh-Hurwitz criterion o Nyquist plot o Bode plot o Root locus 3. Control System Design (GO -2)

	• Provide a foundation for designing controllers (PID, fuzzy, optimal, etc.) to achieve desired dynamic behavior.

9. Teaching and Learning Strategies

Strategy	-Active Learning: Through class discussions and real world problems. - Coordination with lab classes to provide a parallel hands-on experience. -Use google classroom platform to enhance learning and provide supplementary material.

10. Course Structure

Week	Hours	Learning Outcomes	Unit or Subject Name	Learning method	Evaluation Method
1	2	OC1	Review … Basic fundamental of control systems	Lecture	HW
	2	OC1	Stability of Linear Control Systems Methods of Determining Stability Routh-Hurwitz Criterion	Lecture	HW
2	2	OC1	Routh-Hurwitz Criterion	Lecture – tutorial	Exam Quiz
	2	OC3	State feedback	Lecture	HW
3	2	OC2	Root Locus Analysis Basic Properties of the Root Loci (RL)	Lecture	HW
	2	OC2	Design Aspects of the Root Loci	Lecture	HW
4	2	OC2	Examples about Root Locus	Tutorial Class Discussion	HW
	2	OC2	Root Locus Analysis	Lecture Tutorial	Exam
5	4	OC2	Frequency-Domain Analysis	Lecture	HW
6	4	OC2	Nyquist Stability concept	Lecture Tutorial	HW
7	4	OC2	Nyquist Stability - examples	Lecture Tutorial	Exam Quiz
8	4	OC2	Nyquist Stability	Lecture Tutorial	Exam
9	2	OC2	Boele Plot Analysis	Lecture	Exam
9	2	OC2	Stability Analysis with the Magnitude-Phase Plots	Lecture Tutorial	HW

10	4	OC2	Boele Plot Analysis With Logarithmic Graph Paper	Lecture Tutorial	Exam Quiz
11		OC4	Design of Control System	Exam Quiz	HW
12		OC4	Design of PID	Exam Quiz	HW
13		OC4	P, PI, PD , PID Controller	Lecture Tutorial	Exam Quiz
14		OC4	ziegler-nichols Method	Lecture	HW
15		OC4	ziegler-nichols Examples	Lecture Tutorial	Exam Quiz

11. Course Evaluation

- Mid term examinations: 30%
- Quizzes & Assignments: 10%
- Final examination: 60%

12. Learning and Teaching Resources

Required textbook	Automatic Control Systems 9th edition, BENJAMIN C. KUO
Main references	Modern Control Engineering 5th edition, Katsuhiko Ogata
Recommended books and references	
Electronics References	*Google Classroom Page: Power Electronics* *Class code:* *bism4ey*

Google Classroom Page: Power Electronics
Class code:

bism4ey

Course Description Form

1. Course Name:
Engineering Economics
2. Course Code:
ENGC 426
3. Semester / Year:
Second Semester / 2024/2025
4. Description Preparation Date:
19/4/ 2025
5. Available Attendance Forms:
Theoretical Lecturers and Tutorials
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours / 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Rakan Farooq Qasim Email: **Ra_fa99@yahoo.com**
8. Course Objectives

Course Objectives	1- ntroducing the student to the importance studying the engineering economics cours 2- Introducing the student to the importan of controlling costs Engineering projects. 3- Training students to conduct econo studies Comparisons and alternatives.
9. Teaching and Learning Strategies	
Strategy	Theoretical , Practical , Tutorial and Field lecturers
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Learning	General concepts of engineering economics and sustainability	Learning and discussion	Discussion
2,3,4	2 for each week	Learning and solving problems	Costs, annual cost bonus and inflation	Learning and discussion	Discussion and homework
5,6	2 for each week	Learning and solving problems	Compound interest and economic relations	Learning and discussion	Discussion and homework
7,8	2 for each week	Learning and solving problems	Analysis of cash flow and time value of capital	Learning and discussion	Discussion and homework
9,10,11	2 for each week	Learning and solving problems	Comparisons and alternatives - present value - future value - internal rate of return	Learning and discussion	Home works
12,13	2 for each week	Learning and solving problems	Consumption - ways to find extinction	Learning and discussion	Home works
14,15	2 for each week	Learning	Economic feasibility of projects and sensitivity analysis	Learning and discussion	Discussion and homework

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)	**Engineering economics**
Main references (sources)	**Project Evaluation**

Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Ethics
2. Course Code:
UNOM104
3. Semester / Year:
1/ 2023-2024
4. Description Preparation Date:
March 2025
5. Available Attendance Forms:
On-Campus Lectures
6. Number of Credit Hours (Total) / Number of Units (Total):
2
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Saad Enad Mohammed Email: saadmohamed@uomosul.edu.iq
8. Course Objectives

Course Objectives	*OC 1. The role of engineering in improving society and its ethical responsibilities. (GO-i).* *OC 2. Fundamental ethical concepts, including morality, professional conduct, and social responsibility. (GO-i).* *OC 3. Engineering as an ethical profession, covering legal, economic, and environmental impacts. (GO-ii).* *OC 4. Ethical dilemmas in engineering, the engineer's role in maintaining public safety, environmental responsibility, and sustainable development. (GO- iii).* *OC 5. Commitments of engineers to their profession, society, and colleagues. (GO-i, GO-iv).*

9. Teaching and Learning Strategies	
Strategy	-Active Learning: Through class discussions and real-world problems. -Use google classroom platform to enhance learning and provide supplementary material.

10. Course Structure

Week	Hours	Learning Outcomes	Unit or Subject Name	Learning method	Evaluation Method
1	2	OC1	Introduction to professional ethics and historical perspectives.	Lecture	Exam HW
2	2	OC1	Ethical concepts, including moral values and decision-making frameworks.	Lecture	Exam Quiz
3	2	OC1/OC3	Professions and ethical principles, covering legal obligations and responsibilities.	Lecture	Exam
4	2	OC3	Ethics in professional practice, including integrity, honesty, and social responsibility.	Lecture	Exam HW
5	2	OC2	Engineering ethics, including decision-making and compliance with regulations.	Lecture	Exam Quiz
6	2	OC2	Global dimensions of engineering ethics, covering multinational corporations and technology transfer.	Lecture	Exam
7	2	OC4	Principles of engineering ethics, focusing on professional codes of conduct.	Class Discussion	
8	2	OC4	Personal commitments of engineers, including professional integrity and transparency.	Lecture	Exam Quiz
9	2		EXAM		Exam
10	2	OC4	Responsibilities toward employers, maintaining confidentiality and professionalism.	Lecture	Exam HW
11	2	OC5	Social responsibilities, including environmental sustainability and public safety.	Lecture	Exam Quiz

12	2	OC5	Commitment to the profession, promoting ethical standards and continuing education.	Lecture	Exam
13	2	OC5	Commitment to colleagues, including teamwork, knowledge sharing, and fair competition.	Lecture	Exam
14	2	OC3-OC5	Environmental ethics, sustainable resource management, and eco-friendly engineering.	Lecture	Exam/Quiz
15	2		Revision	Group discussion	

11. Course Evaluation

- Mid term examinations: 30%
- Quizzes & Assignments: 10%
- Final examination: 60%

12. Learning and Teaching Resources

Required textbook	*Ethics in the Workplace: Selected Readings in Business Ethics by Joseph A. Petrick and John F. Quinn*
Main references	*Professional Ethics: A First Course by David A. Rennie*
Recommended books and references	*The Role of Ethics in Professional Decision Making*
Electronics References	*Google Classroom Page: Power System Analysis* *Class code:* w7utcrf

Google Classroom Page: Ethics
Class code:
w7utcrf

Course Description Form

1. Course Name:
Power and Machines Lab-4
2. Course Code:
MLAB456
3. Semester / Year:
2nd Semester / 4th Year (Power and Machines)
4. Description Preparation Date:
20-3-2025
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total):
90Hrs/6 Unit
7. Course administrator's name (mention all, if more than one name)

1- Prof. Dr. Ahmed Nasser B. Alsammak (Supervisor)
Email:-ahmed_alsammak@uomousl.edu.iq

2- Asst. Prof. Dr. Omer Sharaf Alden Yehya
Email:- o.yehya@uomosul.edu.iq

3- Dr. Wael Hashim Hamdoon
Email:- waelhashem_67@uomosul.edu.iq

4- Name: Dr. Hasan Adnan Mohammed
Email:- hasan82adnan@uomosul.edu.iq

5- Dr. Dawood Najem Saleh
Email:- dnsaij@uomosul.edu.iq

6- Ibrahim Isamel abdulhameed
Email:- ibrahim- 85353@uomosul.edu.iq

7- Dr. Saad Enad Mohammed Email:-
saadmohamed@uomosul.edu.iq

8- Shaker Mahmood Khudher Email:-
shakeralhyane@uomosul.edu.iq

9- Ammar shamil Ghanim
Email:- ammarshamilhanon@uomosul.edu.iq
Dr. Ryadh Zaki Sabry
Email:- Riyadhzaki@uomosul.edu.iq

10- Raghad Adeeb Othman
Email:- raghadeeb@uomosul.edu.iq

11- Asst. Prof. Dr. Shamil H. Hussein
Email: shamil_alnajjar84@uomosul.edu.iq

12 - Ali Abbawi Mohammed Alabbawi Email -
ali.abbawi@uomosul.edu.iq

13- Ghassan Mohsin Ahmed
Email:- ghassab208@uomosul.edu.iq

8. Course Objectives

Course Objective	1- Machines Laboratory: - In this lab. student can performed sum of experiments that related with different types of machines. 2- Control Laboratory:- Demonstrate his/her understanding of the basics of control system laboratory including: Basics of transfer function of any control system and represented in MATLAB software, realization and implementation of control system in time domain and frequency domain response such step response, bode plot response, Nichols. PID controller. State space model represents for transfer function of control system. Implement some controller such state variable feedback design and root locus design for speed control of dc servo motor. Principle of Arduino microcontroller with many applications. 3- AC Motor Drives:-To study the methods of controlling the three-phase induction motor, as well as the use of modern methods to start the induction motor and the use of modern methods of dynamic braking of the motor. Renewable Energy Laboratory: - Recently, renewable energy has been more popular in the household and rarial locations application due to reduction of the conventional energy sources. This laboratory helps the student to understand, test and design different types of renewable energy such as photovoltaic energy system, wind energy system and etc. 4- High Voltage Laboratory: - The second course provides principle knowledge associated with high voltage engineering methods, techniques and equipment. It is divided into two sections. The first section presents fundamentals of the failure mechanisms gaseous insulation at high voltages. It also discusses consequent design principles for high-voltage equipment; of the generation of high direct, alternating and impulse voltages for testing high-voltage equipment.

9. Teaching and Learning Strategies

Strategy	Focus on hands-on experiments that reinforce theoretical concepts. Use a combination of demonstrations, simulations, and real-world case studies to illustrate the functioning of machines and power systems. Encourage problem- solving and data analysis during experiments to foster critical thinking. Incorporate safety protocols and real-time troubleshooting to prepare students for industrial applications. Finally, assess learning through practical reports, quizzes, and project-based assignments.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject name	Learning method	Evaluation method
1	6	Design	State Variable Feedback design	Practical Experiments	Quiz
2	6	Analysis	Breakdown voltage for DC Field	Practical Experiments	Reports
3	6	Analysis	Speed Control of Universal motor	Practical Experiments	Quiz and Reports

4	6	Analysis	Modern Methods to Control the Starting and Braking of a Three Phase Induction Motor / part 1	Practical Experiments	Reports
5	6	Design	Soil resistivity test	Practical Experiments	Quiz and Reports
6	6	Design	PID Controller	Practical Experiments	Reports
7	6	Analysis	Speed Control of Stepper motor	Practical Experiments	Reports
8	6	Mid Derm Exam	Theory and Practical		
9	6	Analysis	Modern Methods to Control the Starting and Braking of a Three Phase Induction Motor / part 2	Practical Experiments	Quiz
10	6	Design	State Space Mode	Practical Experiments	Reports
11	6	Analysis	Servo motor	Practical Experiments	Quiz and Reports
12	6	Study	polarity effects on breakdown voltage	Practical Experiments	Reports
13	6	Design	Root Locus Design In Matlab	Practical Experiments	Quiz and Reports
14	6	Study	High Voltage safety	Practical Experiments	Reports
15	6	Final Exam	Theory and Practical		

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 Marking:

Quizzes	10pts
Homework+ Report	20pts
Term Exam	30pts
Final Exam	40pts
Total	100pts

12. Learning and Teaching Resources

References:

1- Rotating electrical machine, S.K. Sen, 1975

2- Alternating current machines, M.G. Say, 1984

3- Electric Machinery and their Application, J.Hindmarsh 3rd, 1979

4- Electrical Machinery, A. E. Fitzgerald, Charles Kingsley, Jr., Stephen D. Umans, 2003.
5- 1989 مكائن التيار المتناوب ، د.باسل محمد و د.ضياء علي،
6- Electric Machinery Fundamentals, Stephen J. Chapman, 2005
7- Feedback Group Company. www.feedback.group.com.
8- Roland S. Burns, " Advanced Control Engineering", University of Plymouth. UK. 2021.
9- B.M. Weedy, Electric Power System, 5th edition, John Wiley and Sons, 2012.
10- William D. Stevenson, Jr, Elements of Power System Analysis, 4th Edition, McGraw Hill, 1982.
11- Wim Turkenburg "Renewable Energy".
12- John Twidell and Tony Weir "Renewable Energy Resources " second edition.
https://classroom.google.com/c/NzE4OTQ2ODg5MDQ3

Course Description Form

1. Course Name:
Special Electrical Machines
2. Course Code:
SPEM458
3. Semester / Year:
Semester
4. Description Preparation Date:
1/9/2023
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
30/2
7. Course administrator's name
1- Dr. Ahmed Alsammak, Email: ahmed_alsammak@uomosul.edu.iq 2- 2- Mr. Omar Turath, Email: omartawfeeq_1981@uomosul.edu.iq
8. Course Objectives

Course Objectives	Introduction about Special Electrical Machines SPEM, Single phase synchronous motors: Variable reluctance type motors, Switched reluctance motors, hysteresis motor. Single phase AC series commutator motor. The universal motor. The repulsion motor. Stepper motors: Types, construction, characteristics, and applications. Linear induction machines: Types and characteristics and applications. Three-phase ac commutator machines. Schrage motor. Permanent Magnet Synchronous Motor (PMSM). The rotating frequency changer. AC shunt commutator motor. AC Drives. Static frequency changers. Generator excitation and voltage control.

9. Teaching and Learning Strategies	
Strategy	The teaching for SPEM starts with fundamental concepts like AC motors and rotating magnetic fields. Use active learning strategies, such as class discussions, problem-solving, and hands-on lab work, to engage students. Incorporate visual aids, simulations, and real-world case studies to enhance understanding. Teach the theoretical models and performance parameters like torque and efficiency. Conclude with assessments, including quizzes, projects, and feedback, to ensure students can apply their knowledge effectively.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Understanding the principle of operation of SPEM	Introduction about Special Electrical Machines: Principal of operations, Types of Special Electrical Machines	Lecture using the whiteboard and PowerPoint on Datashow and sometimes Using clarifications and practical applications	-
2	2	Understanding the Single phase synchronous motors: Variable reluctance type motors	Single phase synchronous motors: Variable reluctance type motors including: Types, construction, characteristics, and applications.+ Examples	=	Homework
3	2	Understanding and analysis switched reluctance motors	Switched reluctance motors including: Types, construction, characteristics, and applications.+ Examples	=	Quiz
4	2	Understanding and analysis Hysteresis motor.	Hysteresis motor including: Types, construction, characteristics, and applications.+ Examples	=	-
5	2	Study the Single phase AC series commutator motor. The universal motor+ Examples	Single phase AC series commutator motor. The universal motor, including: Types, construction, characteristics, and applications.+ Examples	=	Homework

6	2	Study the The repulsion motor + Examples	The repulsion motor + Examples	=	Quiz
7	2	Study the Stepper motors: Types, construction, characteristics, and applications.+ Examples	Stepper motors: Types, construction, characteristics, and applications.+ Examples	=	Quiz
8	2	Study the Linear induction machines: Types and characteristics and applications + Examples.	Linear induction machines: Types and characteristics and applications + Examples	=	-
9	2	Study the three-phase AC commutator machines	Three-phase ac commutator machines	=	Quiz
10	2	Review the Schrage motor + Examples	Schrage motor + Examples	=	Homework
11	2	Review the Permanent Magnet Synchronous Motor (PMSM) + Examples	Permanent Magnet Synchronous Motor (PMSM) + Examples	=	-
12	2	-	Course Exam	=	Course Exam

13	2	Review on the rotating frequency changer. AC shunt commutator motor. AC Drives. Static frequency changers	The rotating frequency changer. AC shunt commutator motor. AC Drives. Static frequency changers	=	Homework
14	3	Review on the types of generator excitation and voltage control.	Generator excitation and voltage control.	=	Quiz
15	3	-	Final Exam	=	Final Exam

11. Course Evaluation

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 Marking:

Evaluation type	Degree
Quizzes	10pts
Homework+ Report	10pts
Term Exam	20pts
Final Exam	60pts
Total	100pts

12. Learning and Teaching Resources

References:

1- Rotating electrical machine, S.K. Sen, 1975

2- Alternating current machines, M.G. Say, 1984

3- Electric Machinery and their Application, J.Hindmarsh 3rd, 1979

4- Electrical Machinery, A. E. Fitzgerald, Charles Kingsley, Jr., Stephen D. Umans, 2003.

5- **مكائن التيار المتناوب ، د.باسل محمد و د.ضياء علي، 1989**

6- Electric Machinery Fundamentals, Stephen J. Chapman, 2005

7- Electric Motors and Drives, Austin Hughes, 3rd, 2006

8- Electromechanical Motion Devices, Second Edition,

9- Paul Krause, Oleg Wasynczuk, Steven Pekarek, Wiley-IEEE Press, Year: 2012

10- P. C. Sen, Principles of Electric Machines and Power Electronics, Third Edition, Wiley, 2014.

https://classroom.google.com/c/NzI1NzYyNjAyNjgy?cjc=u4236yb

1. Course Name:
Single Phase Induction Motors
2. Course Code:
SPIM404
3. Semester / Year:
Semester
4. Description Preparation Date:
1/9/2023
5. Available Attendance Forms:
On-campus Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
45/3
7. Course administrator's name
1- Dr. Ahmed Alsammak, Email: ahmed_alsammak@uomosul.edu.iq 2- 2- Mr. Omar Turath, Email: omartawfeeq_1981@uomosul.edu.iq
8. Course Objectives

Course Objectives	Introduction about the Single Phase Induction Motors (SPIM), also included Principal of operations, Types of SPIM, Motors with main winding only, Cross field theory, Rotating field theory (Double-field revolving theory), Transformer voltage, Rotational voltage, Torque speed characteristic, Fields in SPIM, Equivalent circuit, Power diagram, Two phase induction motor, Symmetrical two-phase motor supplied from two-phase balance system, Symmetrical two-phase motor supplied from two phase unbalance system, Unsymmetrical two-phase motor supplied from two phase unbalance system, Special cases, Single phase motors with main and auxiliary windings, Improvement of torque production in single-phase induction motor.
9. Teaching and Learning Strategies	
Strategy	The teaching for SPIM starts with fundamental concepts like AC motors and rotating magnetic fields. Use active learning strategies, such as class discussions, problem-solving, and hands-on lab work, to engage students. Incorporate visual aids, simulations, and real-world case studies to enhance understanding. Teach the theoretical models and performance parameters like torque and efficiency. Conclude with assessments, including quizzes, projects, and feedback, to ensure students can apply their knowledge effectively.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3	Understanding the principle of operation of a single-phase induction motor	Introduction, Single phase induction motors: Principal of operations, Types of SPIM	Lecture using the whiteboard and PowerPoint on Datashow and sometimes Using clarifications and practical applications	-
2	3	Understanding the main theory for operation SPIM	Motors with main winding only, Cross field theory, Rotating field theory (Double-field revolving theory)	=	Homework
3	3	Understanding the Transformer voltage, Rotational voltage, Torque speed characteristic	Transformer voltage, Rotational voltage, Torque speed characteristic	=	Quiz
4	3	Study the fields, performance and equivalent Circuit of single-phase induction motor	Fields in SPIM, Equivalent circuit	=	-
5	3	Study the SPIM Power Diagram + Examples	SPIM Power Diagram + Examples	=	Homework
6	3	Study the Two-phase induction motor	Two-phase induction motor	=	Quiz

7	3	Study the symmetrical two-phase motor supplied from a two-phase balance system + Examples	Symmetrical two-phase motor supplied from two-phase balance system + Examples	=	Quiz
8	3	Study the symmetrical two-phase motor supplied from two-phase unbalance system + Examples	Symmetrical two-phase motor supplied from two-phase unbalance system + Examples	=	-
9	3	Study the unsymmetrical two-phase motor supplied from two phase unbalance system + Examples	Unsymmetrical two-phase motor supplied from two-phase unbalance system + Examples	=	Quiz
10	3	Review the special cases1 + Examples	Special cases1 + Examples	=	Homework
11	3	Review the special cases2 + Examples	Special cases2 + Examples	=	-
12	3	-	Course Exam	=	Course Exam
13	3	Determine the best starting condition for SPIM	Improvement of torque production in single-phase induction motor 1 + Examples	=	Homework

14	3	Determine the best starting condition for SPIM	Improvement of torque production in single-phase induction motor 2 + Examples	=	Quiz
15	3	-	Final Exam	=	Final Exam

11. Course Evaluation

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 Marking:

Evaluation type	Degree
Quizzes	10pts
Homework+ Report	10pts
Term Exam	20pts
Final Exam	60pts
Total	100pts

12. Learning and Teaching Resources

References:

1- Rotating electrical machine, S.K. Sen, 1975
2- Alternating current machines, M.G. Say, 1984
3- Electric Machinery and their Application, J.Hindmarsh 3rd, 1979
4- Electrical Machinery, A. E. Fitzgerald, Charles Kingsley, Jr., Stephen D. Umans, 2003.
5- مكائن التيار المتناوب ، د.باسل محمد و د.ضياء علي، 1989
6- Electric Machinery Fundamentals, Stephen J. Chapman, 2005
7- Electric Motors and Drives, Austin Hughes, 3rd, 2006
8- Electromechanical Motion Devices, Second Edition,
9- Paul Krause, Oleg Wasynczuk, Steven Pekarek, Wiley-IEEE Press, Year: 2012

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Course Description Form

1. Course Name:
Power System Analysis
2. Course Code:
PSAN400
3. Semester / Year:
1/ 2023-2024
4. Description Preparation Date:
March 2025
5. Available Attendance Forms:
On-Campus Lectures
6. Number of Credit Hours (Total) / Number of Units (Total):
4
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Saad Enad Mohammed & Dr. Shaker Mahmood Khudher Email: saadmohamed@uomosul.edu.iq shakeralhyane@uomosul.edu.iq
8. Course Objectives

Course Objectives	*OC 1. An introduction to Single Line Diagram Simulation (GO-i).* *OC 2. Mathematical Simulation of Power System (GO-i).* *OC 3. Load Flow Analysis (GO- ii).* *OC 4. Short Circuit Study, Symmetrical Short-Circuit, Symmetrical Component, Unsymmetrical Fault (GO-iii)* *OC 5. Short Circuit Analysis using Computer (GO-iv).* *OC 6. Economical Operation of Power System. (GO-i)* *OC 7. Transient Analysis Stability, Solving of Equations in Power System Using Computer. (GO-i, GO-iv).*

9. Teaching and Learning Strategies

Strategy	-Active Learning: Through class discussions and real-world problems. - Coordination with lab classes to provide a parallel hands-on experience. -Use google classroom platform to enhance learning and provide supplementary material.

10. Course Structure

Week	Hours	Learning Outcomes	Unit or Subject Name	Learning method	Evaluation Method
1	4	OC1	Introduction; Syllabus; basic components of a power system, single line diagram	Lecture	Exam HW
2	4	OC1	Per unit analysis, generator, transformer, transmission line and load representation for different power system	Lecture – tutorial	Exam Quiz
3	4	OC1/OC3	Construction of Y-bus and Z-bus	Lecture	Exam
4	4	OC3	Load Flow Analysis using GS, NR, FDC part1	Lecture	Exam HW
5	4	OC2	Load Flow Analysis using GS, NR, FDC part2	Lecture	Exam Quiz
6	4	OC2	Short Circuit Study, Symmetrical Short-Circuit, Symmetrical Component	Lecture	Exam
7	4	OC4	Unsymmetrical Fault part1	Tutorial Class Discussion	
8	4	OC4	Unsymmetrical Fault part2	Lecture Tutorial	Exam Quiz
9	4	OC5	EXAM	Lecture	Exam
10	4	OC5	Economical Operation of Power System part1	Lecture Tutorial	Exam HW
11	4	OC6	Economical Operation of Power System part2	Lecture	Exam Quiz
12	4	OC7	Stability Analysis, Steady State Stability	Lecture Tutorial	Exam
13	4	OC7	Transient Analysis Stability part1	Lecture	Exam

14	4	OC6-OC7	Transient Analysis Stability part2	Lecture Tutorial	Exam/Quiz
15	4		Revision	Group discussion	

11. Course Evaluation

- Mid term examinations: 30%
- Quizzes & Assignments: 10%
- Final examination: 60%

12. Learning and Teaching Resources

Required textbook	*POWER SYSTEM ANALYSIS by William D. Stevenson*
Main references	*POWER SYSTEM ANALYSIS and design by Glover*
Recommended books and references	*Power System Analysis by Hadi Saadat*
Electronics References	*Google Classroom Page: Power System Analysis* *Class code: irllyqj*

Google Classroom Page: Power System Analysis
Class code:
irllyqj

Course Description Form

1. Course Name:
Power System Protection & Operation
2. Course Code:
PSPR405
3. Semester / Year:
2nd Semester / 4th Year (Power and Machines)
4. Description Preparation Date:
20-3-2025
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
45Hrs/3 Unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Shaker Mahmood Khudher Email: shakeralhyane@uomosul.edu.iq

8. Course Objectives

Course Objectives	1. Provide an in-depth understanding of power system protection requirements; 2. Describe the operational principle of the main components of a protection system; 3. Describe the fundamental principle of various protection methods for the main power system components including transmission and distribution networks, rotating machinery including generators and motors, transformers, and busbars 4. Explain the advantages and disadvantages of various protection methods for each power system component and specify the proper protection method for the component in any given power system.

9. Teaching and Learning Strategies

Strategy	The main strategy for delivering this module is to encourage students' participation in the exercises while refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	3	Analysis and Design	**Introduction to power system protection, Fundamental of power system protection**	Theoretical	Quizzes & home works
Week 2	3	Analysis and Design	**Introduction to power system protection, Fundamental of power system protection**	Theoretical	Quizzes & home works
Week 3	3	Analysis and Design	**Fuse ,circuit breakers, and Instrument transformers**	Theoretical	Quizzes & home works
Week 4	3	Analysis and Design	**Fuse ,circuit breakers, and Instrument transformers**	Theoretical	Quizzes & home works
Week 5	3	Analysis and Design	**Fuse ,circuit breakers, and Instrument transformers**	Theoretical	Quizzes & home works
Week 6	3	Analysis and Design	**Types of relays and its operation principle**	Theoretical	Quizzes & home works
Week 7	3	Analysis and Design	**Types of relays and its operation principle**	Theoretical	Quizzes & home works
Week 8	3	Analysis and Design	**Overcurrent protection and coordination**	Theoretical	Quizzes & home works
Week 9	3	Analysis and Design	**Directional overcurrent protection**	Theoretical	Quizzes & home works
Week 10	1.5		**Mid-Semester Exam**	Theoretical	Theoretical
Week 11	3	Analysis and Design	**Differential protection**	Theoretical	Quizzes & home works
Week 12	3	Analysis and Design	**Protection of busbar**	Theoretical	Quizzes & home works
Week 13	3	Analysis and Design	**Transformer protection**	Theoretical	Quizzes & home works
Week 14	3	Analysis and Design	**Generator protection, *Motors protection***	Theoretical	Quizzes & home works
Week 15	3	Analysis and Design	**Distance protection; Summarization on course**	Theoretical	Quizzes & home works

11. Course Grading Policy

Grading Policy:

Quizzes	5pts
Homework	5pts
Report	5pts
Term Exam	25pts
Final Exam	60pts
Total	100pts

12. Learning and Teaching Resources

References:

حماية نظم القدرة /د عبدالغني عبدالرزاق

1- FUNDAMENTALS OF POWER SYSTEM PROTECTION by Y.G. Paithankar and S.R. Bhide ,2003.
2- Transmission Network Protection: Theory and Practice by Yeshwant G. Paithankar.
3- Practical Power System Protection by Hewitson ,L.G., M. and Balakrishnan , R, Newness, New york ,2004

Electronics References	*Google Classroom Page:* *POWER SYSTEM PROTECTION* *Class code:* *bfcbj5w*

Course Description Form

1. Course Name:
Electrical Drives
2. Course Code:
ELDR462
3. Semester / Year:
2nd Semester / 4rd Year (Power and Machines)
4. Description Preparation Date:
25/2/2023
5. Available Attendance Forms:
On-Campus Lectures
6. Number of Credit Hours (Total) / Number of Units (Total):
30Hrs/2 Unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Yasir M. Y. Ameen Email: yasir_752000@uomosul.edu.iq
8. Course Objectives

Course Objective	The course on Electrical Drives is designed for B.Sc. Electrical Engineering students to learn about the various types of electrical drives, their construction, operation, and control. It is assumed that the students have prior exposure to Electrical Machines and Power Electronics. The control principles of various DC and AC motors using solid state converters are discussed. Principles of selection of Electric Motors are introduced. Some of the applications of Electrical Drives are also highlighted. Course learning methods and activities include Lectures, Quiz, compulsory exercises, and project works. **The course learning objectives are as follows:** 1. to introduce students to the principles of power electronics and their applications in the control of electrical drives. 2. To develop the ability of students to analyze the performance of electrical drives and design control systems to improve their efficiency and performance. 3. To provide hands-on experience to students with practical examples to enhance their understanding of electrical drives and their control systems. 4. To encourage students to develop creative thinking skills and innovative ideas for the improvement of electrical drives in various applications.

9. Teaching and Learning Strategies

Strategy	1. Active Learning: Through class discussions and real-world problems. 2. Coordination with lab classes to provide a parallel hands-on experience. 3. Use google classroom platform to enhance learning and provide supplementary material.

10. Course Structure

Week	Hour	Required learning outcome	Unit or subject name	Learning method	Evaluation method
1	2	Analysis	Overview for electrical drives, concept, classification, parts and advantages of electrical dives, applications of electrical drives in electrical vehicles	Theory	Home Work
2	2	Analysis	Dynamic of the motor load system, components of load toques, electrical braking, steady state stability, ratings of converters and motors, speed control and Mult quadrant operation, drive specifications	Theory	Quiz
3	2	Analysis	Characteristics of dc motors, types of dc motors, steady-state speed torque relations, methods of speed control, starting, braking, Mult quadrant operation of separately excited dc motor	Theory	Reports
4	2	Analysis	Power electronics drives classification, overview of semiconductor switching devices, single-phase dc drive (half-wave converter, semi converter, full-converter, dual converter)	Theory	Class Work
5	2	Analysis	Three-phase dc drives (half-wave converter, semi converter, full-converter)	Theory	Home Work
6	2	Analysis	Chopper drives (principle of power control, principle of regenerative control, principle of rheostatic brake control, principle of combined regenerative and rheostatic brake control)	Theory	Quiz
7	2	Analysis	Chopper drives(two and four quadrant drives)	Theory	Reports
8	2	Mid Term Exam			
9	2	Analysis	AC dives (classifications, induction motor drives, speed control methods, stator voltage control	Theory	Home Work

10	2	Analysis	Induction motor drives, rotor voltage control (static rotor resistance control by dc converter, tatic Kramer drive)	Theory	Quiz
11	2	Analysis	Induction motor drives (frequency control, V/f control,	Theory	Reports
12	2	Analysis	Course projects about Synchronous Motor Drives (speed control and instructions to types of SM, cylindrical rotor, salient-pole, reluctance, permanent-magnet, switched reluctance, brushless dc and ac motors), and steeper motor control	Theory	Class Work Reports
13	2	Analysis	Projects discussion	Theory	Discussion
14	2	Analysis	Projects discussion	Theory	Discussion
15	3	Final 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 Marking:

Quizzes	10pts
Homework + Report	10pts
Term Exam	20pts
Final Exam	60pts
Total	100pts

12. Learning and Teaching Resources

References:

- "Power Electronics", P.S. Bimbhra

2- "Power Electronics", M. H. Rashid

3- "Fundamentals of Electric Drives", Gopal K Dubey, Narosa

4- "Electric Motor Drives – Modeling, Analysis and Control," R. Krishnan, Prentice-Hall of India.

5- "Electric Drives – Concepts and Applications", Vedam Subrahmanyam, Tata McGraw Hill

https://classroom.google.com/c/NjUzMTc2NjUzNzUy