

University of Mosul

جامعة الموصل



First Cycle – Bachelor's Degree (B.Sc.) – Mechanical Engineering
بكالوريوس - هندسة ميكانيك



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1. Overview

This catalogue is about the courses (modules) given by the program of Mechanical Engineering to gain the Bachelor of Science degree. The program delivers (48) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامة

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الهندسة الميكانيكية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (48) مادة دراسية، مع (6000) إجمالي ساعات حمل الطالب و 240 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2025-2026

Module 1

Code	Course/Module Title	ECTS	Semester
ME101	Engineering Mechanics-Statics I	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
The applied force is entirely characterized by its magnitude, direction, and point of application. Introduction of engineering mechanics and Newton's three laws of motion, Force system, Scalars and Vectors operation, Moments and Couple, Resultants, Equilibrium, Structures, Plane Trusses.			

Module 2

Code	Course/Module Title	ECTS	Semester
ME102	Mathematics I	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
Coordinates and Graphs in the Plane, Directions and Quadrants, Distance between Points, Graphs of Equations, Intercepts and More about Graphing, Slope and Equations for Lines, Slope of Non – vertical Lines, Lines That are Parallel or Perpendicular, Point – Slope Equations, Slope – Intercept Equations, Definition of functions, domain and range of functions, graph of functions, symmetry analysis.			

Module 3

Code	Course/Module Title	ECTS	Semester
ME103	Manufacturing Processes I	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	4	93	57
Description			
Manufacturing can be basically defined as an addition process by which raw materials of low utility and value due to its inadequate material properties and poor or irregular size, shape and finishing are converted into high utility and valued products with definite dimensions, forms and finish imparting some functional ability. An introduction to the principle of the manufacturing processes, properties of materials, types of materials, types of manufacturing processes, general consideration of manufacturing, selection methods of production, casting processes and production of ferrous metals in addition to workshop laboratory will be covered.			

Module 4

Code	Course/Module Title	ECTS	Semester
ME104	Engineering Drawing	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	5	93	57
Description			
The course will cover the fundamentals of engineering drawing, such as how to draw a line, circle, curve, and angle. This is one section of the course that will concentrate on engineering drawing.			

Module 5

Code	Course/Module Title	ECTS	Semester
ME105	Physics 1	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
Determine whether a physical quantity is a vector or a scalar. Distinguish between kinematic and kinetic energy. State, explain, and apply Newton's three laws of motion. Differentiate between static and kinetic friction. Apply the principle of conservation of mechanical energy to solve problems in mechanics. Calculate both kinetic and potential energy. Define linear momentum, and calculate and compare momenta of various objects. Express Newton's laws in terms of rates of change of linear momentum. Define and calculate impulse. State, explain, and			

apply the simple harmonic motion. Solve problems using Newton's law of universal gravitation and calculate the gravitation for different locations. Explain the Hydrostatic Pressure. Explain Pascal's principle and the operation of a hydraulic lift. Define and describe the buoyant forces and Archimedes's principle, furthermore, weighing an object immersed in a fluid. Derive the equation of continuity for fluids. Use Bernoulli's equation to calculate flow speed and pressure of a moving fluid for simple situations. Define and describe the flow of heat through a material by direct molecular contact (conduction). Define and describe the transfer of heat by the movement or flow of molecules -liquid or gas (convection). Define and describe the transfer of heat by electromagnetic waves through a gas or vacuum (Radiation). Define and describe the Bohr model of an atom. Explain and calculate the energy levels. Define valence electron, free electron and ions. Define valence band and conduction band, and compare between the semiconductor atom and the conductor atom. Explain the electrical symbols for diodes and transistors, as well as their fundamental operations. Define the bias and its effect on the depletion region. Define the barrier potential and its effects. Define Ohm's law, and calculate power and energy. Analyze the electric circuits in both parallel and series connections. Define Kirchhoff's law, and analysis the electrical circuits using Kirchhoff's law.

Module 6

Code	Course/Module Title	ECTS	Semester
UOM1031	Computer 1	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	27
Description			
Introduction to Matlab. Supporting Windows (Creating/Editing Variables, Matlab editor and m-files). Numbers representation. Formats, Variables rules, listing variables in the workspace, testing variable name validity, types of data. Preparing the workspace and command window. Scalar arithmetic. built-in functions. Square brackets, array size, ones and zeros array, matrices concatenations, matrices replication. Column vectors. Row vectors, shifting between column and re-vectors, creating vectors, Matrices indexing, accessing a single element, Accessing multiple elements. Logical and relational expressions. Conditional statement if....elseif.....else...end, looping with for.....end. Disp, Fprint. Numeric Display Formats. More examples on how to use fprintf in MATLAB.			

Module 7

Code	Course/Module Title	ECTS	Semester
UOM1011	Arabic language 1	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	-	33	17
Description			
1. النحو والصرف			

أ. أقسام الكلام : الفعل وانواعه ، كان واخواتها ، إن واخواتها ، الفاعل ونائبه ، الحال ، العدد ، تذكيره وتأنيثه وتمييزه ، تعريفه وتنكيره ، قواعد كتابة الهمزة .
 ب. الإملاء : علامات الترقيم ، الظاء والضاد ، كتابة الهمزة .
 ت . الإنشاء: اختيار موضوع ما يتم من خلاله التعرف على قدرة الطالب على تطبيق ما تعلمه من درس النحو مع التركيز على الجوانب البلاغية .
 2. النصوص
 أ. القرآن الكريم اختيار قصتين من سورة الكهف ومن سورة مريم مع بيان القيم الفنية والجمالية واللغوية للقصتين محفظ (10 آيات)
 ب. نص نثري : دراسة نص نثري كحطبة الوداع ، مع بيان القيم الفنية والجمالية .
 ت. مختارات من الشعر العربي :
 1. قصيدة نهج البردة لكعب بن زهير (10-1).
 2. القصيدة الزينية لإمام علي (كرم الله وجهه) ، (1- 10). مع دراسة القصيدة دراسة فنية. ث . الشعر العربي الحديث ، :
 1. ارادة الحياة ابو القاسم الشابي
 2. غريب على الخليج بدر شاكر السياب .
 ج . النثر :
 عرض مقطع من كتاب
 أ. البخلاء للجاحظ .
 ب . التعبير القرآني ، فاضل السامرائي .
 ملاحظة : يراعى التركيز على جمالية النصوص المشروحة، مع الالتفات الى الجوانب البلاغية واللغوية والفنية فيها، بمعنى انه يمكن ان تكون محاضرة العربية اتلعة محاضرة حافلة بالحو والبلاغة على حد سواء .
 *ملاحظة / الأرقام بين الأقواس تشير إلى ساعات (نظري / عملي / تطبيقي)

Module 8

Code	Course/Module Title	ECTS	Semester
ME151	Engineering Mechanics-Statics II	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
Moment of a force - Scalar and vector formulation. Principle of transmissibility and equivalent system. Simplification of a force and couple system. Two- and Three-Force Members. Simple Trusses. The Method of Joints. Zero-Force Members. The Method of Sections. Frames and Machines. Center of gravity, the center of mass and centroid of a body. Centroid of composite area. Definition of moments of inertia for areas, the radius of gyration. Moment of inertia of composite area. Types of Friction. Characteristics of Dry Friction.			

Module 9

Code	Course/Module Title	ECTS	Semester
ME152	Mathematics II	4	2

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
At the end of this course, the student will be able to find the following topics: Area and Estimating with Finite Sums, The Definite Integral, The Fundamental Theorem of Calculus, Indefinite Integrals and the Substitution Method, Definite Integral Substitutions and the Area between Curves, Volumes Using Cross-Sections, Volumes Using Cylindrical Shells, Arc Length., Areas of Surfaces of Revolution, Using Basic Integration Formulas, Integration by Parts, Trigonometric Integrals, Trigonometric Substitutions, Integration of Rational Functions by Partial Fractions.			

Module 10

Code	Course/Module Title	ECTS	Semester
ME153	Physics2	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	72
Description			
In this course, students will learn how bonding of metals occurs, how to classify the metals and alloys with its properties and microstructures, the defects occurred in the metals and alloys, types of thermal equilibrium diagrams, also the students will learn about the steels, cast irons with their properties/applications/microstructures and finally the heat treatments of steels.			

Module 11

Code	Course/Module Title	ECTS	Semester
ME154	Introduction to Electrical Engineering	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	72
Description			
Resistance calculation, Connection of resistance, Ohms law, Krichhoff's laws, DC network theorems, AC fundamental wave from equations average and PMS values from reactors/peek factor, Vector representation of AC sine, Application of network theorems in AC circuits, Resonance (series and parallel), three phase AC calculations, Magnetic circuits, Transformers single phase transformers, three phase transformers.			

Module 12

Code	Course/Module Title	ECTS	Semester
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ME155	Energy & Sustainability	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	87
Description			
Energy and Sustainability is a comprehensive course designed to explore the complex relationship between energy production, consumption, and the pursuit of environmental sustainability. In an era marked by climate change, resource depletion, and growing concerns about environmental degradation, this course equips students with the knowledge and tools to address these pressing challenges.			

Module 13

Code	Course/Module Title	ECTS	Semester
UOM1021	English Language I	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	-	33	17
Description			
This course emphasizes the fundamental language skills of reading, writing, speaking, thinking, viewing and presenting. The course includes studies of various literary genres: short story, novel, and non-fiction. The course also helps students to improve their listening and speaking abilities, and becoming more effective use of grammar and natural self-expression in English.			

Module 14

Code	Course/Module Title	ECTS	Semester
UOM1040	Democracy and Human Rights	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	-	33	17
Description			
حرية الرأي، حق المساواة أمام القانون، الحق في إلغاء الرق والعبودية، الحق في الجنسية، الحق في تقرير المصير، الحقوق الثقافية والاجتماعية والاقتصادية، الحق في الرعاية الخاصة للأمومة والطفولة، الضمانات لمنع الاعتداء على حقوق الإنسان، تأثير ظاهرة الفساد الإداري على حقوق الإنسان والمجتمع. حقوق الإنسان بين الشريعة الإسلامية والفكر القانوني العربي، حقوق الإنسان في الوثائق الدولية، الاختلاف في الأرض وكرامة الإنسان، الحقوق المدنية والسياسية، الحق في حماية خصوصيات الإنسان، الحقوق والحريات الفكرية.			

Module 15

Code	Course/Module Title	ECTS	Semester
ME151	Engineering Mechanics-Dynamics	7	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	78	97
Description			
This course introduces the fundamentals of Engineering Mechanics – Dynamics. Topics include kinematics and kinetics of particles and rigid bodies, rectilinear and curvilinear motion, relative motion, rotational motion, Newton’s second law applications, work and energy, impulse and momentum. Emphasis is placed on analytical and problem-solving skills essential for mechanical engineering practice.			

Module 16

Code	Course/Module Title	ECTS	Semester
ME202	Fluid Mechanics I	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
Provides a comprehensive introduction to the fundamental principles governing fluid behavior and their applications in mechanical engineering. The course covers fluid properties, pressure and pressure measurement, hydrostatics, forces on submerged surfaces, buoyancy, and stability of floating bodies. It also introduces fluid kinematics. Special emphasis is given to the Bernoulli equation and its engineering applications in pipe flow and fluid systems.			

Module 17

Code	Course/Module Title	ECTS	Semester
ME203	Thermodynamics I	2	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	33	17
Description			

Module 18

Code	Course/Module Title	ECTS	Semester
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ME204	Mechanics of Materials I	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
The study of mechanics of materials is the study of the behavior of solid bodies under load. The way in which they react to applied forces, the deflections resulting and the stresses and strains set up within the bodies are all considered in an attempt to provide sufficient knowledge to enable any component to be designed such that it will not fail within its service life. Typical components considered in detail in this volume include beams, shafts, cylinders, struts, diaphragms and springs and, in most simple loading cases, theoretical expressions are derived to cover the mechanical behavior of these components. Because of the reliance of such expressions on certain basic assumptions, the text also includes a chapter devoted to the important experimental stress and strain measurement techniques in use today with recommendations for further reading.			

Module 19

Code	Course/Module Title	ECTS	Semester
ME205	Physics3	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
In this course students will study the types of reactions occurs in iron carbon thermal equilibrium diagram also the no equilibrium with equilibrium heat treatments of steels , Hardenability ,ruling section, Surface hardening are taken. Binary alloy systems with examples, Ternary alloy systems with examples are studied, Alloy steels (elements- types-applications), Nonferrous metals and alloys (nonferrous metals, Al-Cu system-Brass-Bearing metals), Failures of materials (fatigue and creep), International specifications of metals and alloys. Semiconductor atom and the conductor atom. Explain the electrical symbols for diodes and transistors, as well as their fundamental operations. Define the bias and its effect on the depletion region. Define the barrier potential and its effects. Define Ohm's law, and calculate power and energy. Analyze the electric circuits in both parallel and series connections. Define Kirchhoff's law, and analysis the electrical circuits using Kirchhoff's law.			

Module 20

Code	Course/Module Title	ECTS	Semester
ME206	Mechanical Drawing	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	48	52
Description			

Module 21

Code	Course/Module Title	ECTS	Semester
UOM2050	Crimes of the defunct Ba'ath party	2	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	-	33	17
Description			

Module 22

Code	Course/Module Title	ECTS	Semester
UOM2022	English Language II	2	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	-	33	17
Description			
English Language II is designed to strengthen students' English skills with a balanced Focus on writing, reading, listening, and speaking. In writing, students learn to distinguish between different types of essays, identify thesis statements, outline ideas, and build Coherent paragraphs using supporting details and transitions. Reading activities emphasize extracting main ideas, identifying supporting evidence, and improving comprehension of short texts. Listening practice helps students understand the main message, supporting details, and Context of spoken English in both academic and everyday settings. Speaking activities encourage learners to express ideas clearly, engage in discussions, and respond to questions With accuracy and fluency. The course adopts an interactive approach through lectures, assignments, class Discussions, and practice tasks. Assessment consists of quizzes, homework, term exams, Participation, and a final exam. By the end of the course, students will be able to read and comprehend texts effectively, listen with understanding, communicate ideas orally, and write well-structured Essays. The main textbook is New Headway Pre-Intermediate Student's Book, supported by English Grammar in Use and online resources.			

Module 23

Code	Course/Module Title	ECTS	Semester
ME251	Fluid Mechanics II	4	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			

Module 24

Code	Course/Module Title	ECTS	Semester
ME252	Thermodynamics II	6	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	87
Description			
Students will Understand Vapor Power Cycles , Students should comprehend the principles of vapor power cycles, such as the Rankine cycle, and its variations with superheat and reheat. They should be able to analyze the efficiency and Understanding of Isentropic Processes			

Module 25

Code	Course/Module Title	ECTS	Semester
ME253	Mechanics of Materials II	4	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
The study of mechanics of materials is the study of the behavior of solid bodies under load. The way in which they react to applied forces, the deflections resulting and the stresses and Strains set up within the bodies are all considered in an attempt to provide sufficient knowledge to enable any component to be designed such that it will not fail within its service life. Typical components considered in detail in this volume include beams, shafts, cylinders, struts, diaphragms and springs and, in most simple loading cases, theoretical expressions are derived to cover the mechanical behavior of these components. Because of the reliance of such expressions on certain basic assumptions, the text also includes a chapter devoted to the important experimental stress and strain measurement techniques in use today with recommendations for further reading.			

Module 26

Code	Course/Module Title	ECTS	Semester
ME254	Mathematics3	8	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	93	107
Description			
For Engineering Math Student will learn How to solve PDE's, How to solve ODE's, Partial Derivatives, Multiple Integrals problem solving techniques, Fourier Series, Laplace Transformation ,and Vectors and geometry in Space.			

Module 27

Code	Course/Module Title	ECTS	Semester
UOM2032	Computer 2	3	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	4	48	27
Description			

Module 28

Code	Course/Module Title	ECTS	Semester
ME256	Mechanical Engineering Laboratory I	3	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	45	30
Description			
Students are highly encouraged to maintain a separate lab notebook for recording any observations, results, or comments while performing the experiments. You will also find it helpful to carry a USB drive to download data, or a camera to record images. To ensure that there are no injuries or accidents, lab safety training is mandatory. Lab attire includes close-toed shoes; no shorts or loose clothing/hair. Follow common sense in the lab-running around, jumping, etc. can be potentially dangerous. Each lab module requires a lab report, in which the students complete the lab write-up questions within the module reader, due at the beginning of the laboratory session for the subsequent lab module. Late submission of reports/assignments will lead to a 10% decrease in points per day.			

Module 29

Code	Course/Module Title	ECTS	Semester
UOM2012	Arabic Language II	2	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	33	17

Description
This course develops students' proficiency in Arabic language skills with emphasis on academic and technical communication. It covers advanced grammar, writing techniques, reading comprehension, and effective oral presentation. Students practice preparing scientific and professional reports using proper Arabic language standards. The course also enhances critical reading, vocabulary development, and communication skills. Upon completion, students will be able to communicate clearly and accurately in academic and professional contexts

Module 30

Module 50			
Code	Course/Module Title	ECTS	Semester
ME301	Theory of Machines	7	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	82
Description			
This course introduces the principles of machine kinematics and dynamics. Students study mechanisms, gear trains, cams, flywheels, and balancing of rotating and reciprocating masses. The course emphasizes velocity and acceleration analysis of machine components. Practical applications of mechanical power transmission are also discussed. Upon completion, students will be able to analyze and design common machine mechanisms			

Module 31

Module 51

Code	Course/Module Title	ECTS	Semester
ME302	Conductive Heat Transfer	4	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
This course covers the fundamentals of heat conduction in solids under steady-state and transient conditions. Students learn analytical and numerical methods for one-, two-, and three-dimensional heat conduction. The course includes thermal resistance networks and conduction through composite materials. Engineering applications involving insulation and heat transfer enhancement are examined. Students will develop the ability to solve practical conduction problems			

Module 32

Code	Course/Module Title	ECTS	Semester
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ME303	Manufacturing Processes II	6	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	72
Description			
This course focuses on advanced manufacturing techniques used in modern engineering industries. Topics include welding, casting, forming, machining, additive manufacturing, and surface finishing processes. Students evaluate process selection based on material properties, quality, and production requirements. Practical aspects of manufacturing efficiency and process optimization are emphasized. The course prepares students for industrial manufacturing applications			

Module 33

Code	Course/Module Title	ECTS	Semester
ME304	Combustion and Pollution	4	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
This course introduces the principles of combustion and pollutant formation in engineering systems. Students study combustion chemistry, flame characteristics, fuels, and combustion efficiency. The course examines major air pollutants, emission control technologies, and environmental regulations. Sustainable and clean combustion technologies are also discussed. Students will understand methods for reducing environmental impacts of combustion systems.			

Module 34

Code	Course/Module Title	ECTS	Semester
ME305	Gas Dynamics	4	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
This course presents the fundamentals of compressible fluid flow and gas dynamics. Students study shock waves, expansion waves, nozzles, diffusers, and compressible flow equations. The course emphasizes applications in aerospace and mechanical engineering. Analytical methods			

are used to evaluate high-speed flow behavior. Students gain the ability to analyze engineering systems involving compressible gases.

Module 35

Code	Course/Module Title	ECTS	Semester
ME306	Non-Destructive Testing	3	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	42
Description			
This course introduces methods for inspecting materials and components without causing damage. Topics include ultrasonic, radiographic, magnetic particle, liquid penetrant, and eddy current testing. Students learn defect detection, evaluation techniques, and inspection standards. Practical applications in manufacturing and structural integrity assessment are emphasized. The course develops skills for quality assurance and safety inspection			

Module 36

Code	Course/Module Title	ECTS	Semester
ME307	Mechanical Considerations	2	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
This course provides an overview of mechanical engineering principles applied in engineering design and operation. Students study material behavior, mechanical loading, design considerations, and system reliability. The course emphasizes engineering judgment in selecting appropriate mechanical solutions. Practical case studies illustrate real-world engineering challenges. Students develop problem-solving skills for mechanical engineering applications			

Module 37

Code	Course/Module Title	ECTS	Semester
ME351	Machine Element Design	6	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	3	108	42
Description			

This course covers the design and analysis of mechanical machine elements. Students study shafts, gears, bearings, springs, fasteners, and power transmission components. Emphasis is placed on strength, fatigue, failure analysis, and design standards. Engineering design calculations are supported by practical examples. Students gain the ability to design safe and reliable mechanical components

Module 38

Code	Course/Module Title	ECTS	Semester
ME352	Convective and Radiative Heat Transfer	4	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
This course examines heat transfer by convection and thermal radiation. Students study forced and natural convection, heat exchangers, radiation laws, and radiation exchange between surfaces. Analytical and empirical methods are used to evaluate heat transfer performance. Engineering applications in thermal systems are emphasized. Students learn to design and analyze combined heat transfer processes.			

Module 39

Code	Course/Module Title	ECTS	Semester
ME353	Numerical Analysis	6	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	72
Description			
This course introduces numerical methods used to solve engineering and scientific problems. Topics include root-finding techniques, numerical integration, interpolation, matrix methods, and numerical solutions of differential equations. Students implement numerical algorithms using computational tools. Accuracy, stability, and computational efficiency are emphasized. The course develops practical skills in engineering computation			

Module 40

Code	Course/Module Title	ECTS	Semester
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ME354	Engineering Management and Economics	2	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
This course introduces management principles and economic analysis for engineering projects. Students study project planning, cost estimation, budgeting, investment evaluation, and decision-making techniques. Engineering ethics and resource management are also discussed. The course emphasizes economic feasibility and project performance evaluation. Students develop managerial skills for engineering practice.			

Module 41

Code	Course/Module Title	ECTS	Semester
ME355	Internal Combustion Engines	4	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
This course covers the operating principles and performance analysis of internal combustion engines. Students study spark-ignition and compression-ignition engines, combustion processes, fuel systems, and engine cycles. Performance characteristics, emissions, and efficiency improvement techniques are discussed. Laboratory demonstrations support theoretical concepts. Students gain knowledge of engine design and operation.			

Module 42

Code	Course/Module Title	ECTS	Semester
ME356	Mechanical Engineering Laboratories II	4	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
	3	48	52
Description			
This laboratory course provides practical experiments related to mechanical engineering subjects. Students perform tests involving thermal systems, fluid mechanics, machine elements, and material behavior. Experimental procedures, data acquisition, and result analysis are emphasized. Laboratory reports develop technical writing and analytical skills. The course strengthens the connection between theory and engineering practice.			

Module 43

Code	Course/Module Title	ECTS	Semester
ME357	Applied Chemistry	2	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
This course introduces chemical principles relevant to mechanical engineering applications. Students study material composition, corrosion, fuels, lubricants, polymers, and industrial chemical processes. The course emphasizes the relationship between chemistry and engineering materials. Practical applications in manufacturing and energy systems are discussed. Students develop a fundamental understanding of chemical behavior in engineering environments			

Module 44

Code	Course/Module Title	ECTS	Semester
ME358	Engineering Project ,Design and Planning	2	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
This course integrates engineering design methodology with project planning and management. Students identify engineering problems, develop design solutions, and prepare technical documentation. Project scheduling, risk assessment, teamwork, and professional communication are emphasized. Modern engineering standards and design practices are applied throughout the project. Upon completion, students will be capable of planning, designing, and presenting engineering projects effectively			

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