Course Catalogue | 2023-2024 | دليل المواد الدراسية

UNIVERSITY of Thi-Qar
جامعة ذي قار

Bachelor of Science Honours (B.Sc. Honours) – Mechanical Engineering

بكالوريوس علوم - هندسة ميكانيكية

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1. Overview

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

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الهندسة الكهربائية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (48) مادة دراسية مع ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

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Code	Course/Module Title	ECTS	Semester
ER 101	Calculus	7.00	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	4	52	123
Description			
The Calculus for Mechanical Engineering module provides students with a solid foundation			

in calculus and its practical applications within mechanical engineering. This module covers fundamental concepts such as limits, rates of change, and optimization through differentiation. Integration techniques for areas, volumes, and centroids are explored. Additionally, students learn how to model and analyze dynamic systems using ordinary differential equations. Through practical exercises and real-world case studies, students develop critical thinking skills and the ability to apply calculus principles in solving engineering problems. This module prepares students to tackle advanced topics in mechanical engineering, enabling them to excel in dynamics, thermodynamics, fluid mechanics, and control systems.

Code	Course/Module Title	ECTS	Semester
UR 101	Arabic language skills	2.00	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	1	17	33
Description			
The Arabic Language Skills for Mechanical Engineering module enhances the language proficiency of mechanical engineering students in Arabic. This module focuses on developing reading, writing, listening, and speaking skills tailored to the field. Students learn technical vocabulary, grammar, and terminology relevant to mechanical engineering. They practice reading and comprehending technical documents, research papers, and engineering manuals in Arabic. Writing skills are honed through composing reports, summaries, and technical descriptions. Listening comprehension is enhanced through audiovisual materials and lectures in Arabic. Speaking skills are developed through discussions, presentations, and role-plays. By the module's end, students will have improved their Arabic language proficiency, enabling effective communication in engineering contexts and access to Arabic resources, research, and professional networks, fostering global engineering perspectives.			

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Code	Course/Module Title	ECTS	Semester
ME101	Principle of production processes	7.00	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	3	81	94
Description			
The Principles of Production Processes module equips mechanical engineering students with a deep understanding of the foundational principles governing various production processes. This module delves into the methodologies, technologies, and strategies employed in manufacturing and production within the mechanical engineering field.Students will explore essential concepts such as production planning, process optimization, quality control, and resource management. They will gain insights into diverse manufacturing techniques, including machining, casting, welding, and additive manufacturing, examining their applications, strengths, and limitations.Through practical exercises and case studies, students will develop skills in process design, analysis, and enhancement. They will also acquire knowledge of production systems encompassing automation, robotics, and computer-integrated manufacturing.			

Code	Course/Module Title	ECTS	Semester
ER 102	Principles of computer science	4.00	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	36	64

Description
The Principles of Computer Science module introduces mechanical engineering students to the foundational principles and concepts of computer science. This module explores the application of computer science in solving engineering problems, enhancing efficiency, and enabling innovation within the mechanical engineering field.Students will learn essential programming concepts, algorithms, and data structures. They will develop skills in programming languages commonly used in mechanical engineering, such as MATLAB and Python. The module covers topics including control structures, functions, arrays, and object-oriented programming.Through practical exercises and projects, students will gain hands-on experience in applying computer science principles to solve mechanical engineering challenges. They will learn to analyze data, perform simulations, and develop computational models.By the end of the Principles of Computer Science module, students will have a solid understanding of computer science fundamentals and their relevance in mechanical engineering. They will possess the skills to design and implement computational solutions, leveraging programming and data analysis techniques. This knowledge will empower them to tackle complex engineering problems, optimize processes, and contribute to cutting-edge advancements in the field.

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Code	Course/Module Title	ECTS	Semester
ER 103	Physics	4.00	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	67	33
Description			
The Physics for Mechanical Engineering module provides students with a comprehensive understanding of the fundamental principles of physics and their applications in mechanical engineering. This module covers key topics including mechanics, thermodynamics, fluids, and electromagnetism.Students will delve into the principles of classical mechanics, studying concepts such as motion, forces, energy, and momentum. They will explore thermodynamics and gain knowledge of the laws governing energy transfer, heat, and work in mechanical systems. The module will also cover fluid mechanics, including fluid dynamics and the behavior of gases and liquids.Additionally, students will study electromagnetism, learning about electric and magnetic fields, circuits, and electromagnetic waves. They will develop a strong foundation in the principles of physics through theoretical analysis and practical experiments.By the end of the Physics for Mechanical Engineering module, students will have a deep understanding of the laws and principles governing the behavior of mechanical systems. They will be able to apply their knowledge to analyze and design mechanical components and systems, and make informed decisions regarding material selection, energy efficiency, and system optimization. This module prepares students for advanced topics in mechanical engineering, such as dynamics, vibrations, control systems, and renewable energy technologies.			

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Code	Course/Module Title	ECTS	Semester
Me 102	Engineering Mechanics (Static)	6.00	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	72	78
Description			
The Engineering Mechanics (Static) module provides mechanical engineering students with a solid understanding of the principles of statics. This module focuses on the analysis and design of mechanical systems at rest or in equilibrium. Students learn the concepts of forces, moments, and structural stability.Through the module, students study vector algebra, free-body diagrams, and equilibrium conditions to analyze and solve engineering problems involving trusses, frames, beams, and machines. They develop skills in determining support reactions, calculating internal forces, and assessing the stability of mechanical components.By completing the Engineering Mechanics (Static) module, students gain the necessary foundation to analyze and design mechanical systems that maintain equilibrium, setting the stage for advanced topics in structural analysis and machine design within mechanical engineering.			

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Code	Course/Module Title	ECTS	Semester
Me 103	Engineering mechanics (Dynamics)	5.00	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	62	63
Description			

The Engineering Mechanics (Dynamics) module provides mechanical engineering students with a comprehensive understanding of the principles of dynamics. This module focuses on the analysis and design of mechanical systems in motion. Students learn about the kinematics and kinetics of particles and rigid bodies.Through the module, students study concepts such as velocity, acceleration, Newton's laws of motion, and energy methods to analyze the motion of mechanical systems. They explore topics including impulse and momentum, work and energy, and vibrations.By completing the Engineering Mechanics (Dynamics) module, students gain the necessary foundation to analyze and design mechanical systems in dynamic motion. This prepares them for advanced topics in robotics, vehicle dynamics, machinery design, and other areas within mechanical engineering.

Code	Course/Module Title	ECTS	Semester
ER 104	Engineering drawing	7.00	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	5	67	108
Description			
The Engineering Drawing module is designed to equip mechanical engineering students with the fundamental skills necessary to create and interpret technical drawings. This module focuses on the principles, techniques, and standards involved in generating accurate and detailed engineering drawings.Students will learn the fundamentals of orthographic projection, isometric projection, and sectioning to represent three-dimensional objects on two-dimensional paper. They will study various drawing conventions, including dimensioning, tolerancing, and symbols used in mechanical engineering.Through practical exercises and hands-on projects, students will develop proficiency in creating engineering drawings for components, assemblies, and machine parts. They will learn to communicate design specifications, manufacturing instructions, and tolerances effectively.By the end of the Engineering Drawing module, students will possess the necessary skills to read and create engineering drawings, which are essential for mechanical engineering design, manufacturing, and documentation. They will be able to accurately communicate their design ideas, collaborate with other engineers, and understand technical drawings in various mechanical engineering applications.			

Code	Course/Module Title	ECTS	Semester
ME104	Principles of Electrical Engineering	6.00	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	86	64
Description			
The Principles of Electrical Engineering module provides mechanical engineering students with a foundational understanding of electrical principles and their applications within the field. This module focuses on essential concepts such as circuit analysis, electrical components, and electromechanical systems.Students will study fundamental electrical laws, including Ohm's law and Kirchhoff's laws, and learn how to analyze and design basic electrical circuits. They will gain knowledge of electrical components such as resistors, capacitors, and inductors, and explore their behavior in circuits.Through practical exercises and laboratory work, students will gain hands-on experience with electrical measurements, circuit simulations, and the operation of electromechanical devices. They will learn to apply electrical principles to solve problems related to motor control, sensors, and power distribution.By the end of the Principles of Electrical Engineering module, students will have a solid understanding of electrical principles and their application to mechanical systems. They will be equipped to integrate electrical components and systems into mechanical designs, contributing to the development of advanced technologies and the efficient operation of mechanical engineering systems.			

Code	Course/Module Title	ECTS	Semester
UR 102	Basics of english language	2.00	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	1	17	33
Description			
The Basics of English Language module is designed to provide mechanical engineering students with the foundational skills necessary to communicate effectively in English. This module focuses on developing essential language skills, including reading, writing, listening, and speaking, tailored specifically to the context of mechanical engineering.Students will learn basic grammar, vocabulary, and sentence structure to enhance their reading and writing abilities. They will practice listening comprehension through engineering-related audio materials, lectures, and presentations. Speaking skills will be honed through discussions, presentations, and role-plays, focusing on engineering topics.By the end of the Basics of English Language module, students will have improved their English language proficiency, enabling them to communicate confidently and fluently in professional settings within the mechanical engineering industry. They will be better equipped to collaborate with international colleagues, access English-language resources, and present their ideas effectively, enhancing their career prospects and facilitating their participation in a global engineering community.			

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Code	Course/Module Title	ECTS	Semester
ER 105	Chemistry	4.00	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	67	33
Description			
The Chemistry module for Mechanical Engineering provides students with a foundational understanding of the principles and applications of chemistry within the field. This module focuses on essential concepts such as atomic structure, chemical bonding, thermodynamics, and materials science.Students will study the properties and behavior of matter, including gases, liquids, and solids, as well as the principles of chemical reactions and equilibrium. They will explore the role of chemistry in corrosion, material selection, and environmental impact.Through practical exercises and laboratory work, students will gain hands-on experience with chemical analysis techniques and material characterization. They will learn to apply chemical principles to solve engineering problems related to materials selection, surface treatments, and environmental sustainability.By the end of the Chemistry module, students will have a solid understanding of the chemical principles relevant to mechanical engineering. They will be equipped to make informed decisions regarding material choices, process optimization, and environmental considerations, contributing to the development of sustainable and innovative mechanical engineering solutions.			

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Code	Course/Module Title	ECTS	Semester
ME105	Properties of Materials	6.00	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	86	64
Description			
The Properties of Materials module provides mechanical engineering students with a comprehensive understanding of the properties and behavior of materials commonly used in the field. This module focuses on the relationship between material composition, structure, processing, and performance.Students will study the mechanical, thermal, electrical, and chemical properties of metals, polymers, ceramics, and composites. They will learn about material characterization techniques, such as microscopy and spectroscopy, to analyze and evaluate material properties.Through practical exercises and laboratory work, students will gain hands-on experience in testing and analyzing the mechanical and physical properties of materials. They will learn to interpret material property data and make informed decisions regarding material selection for specific engineering applications.By the end of the Properties of Materials module, students will have a solid understanding of the relationship between material properties and performance. They will be equipped to select appropriate materials for mechanical design, assess material behavior under different conditions, and optimize material selection to meet engineering requirements. This knowledge will enable them to make informed decisions and contribute effectively to the design and development of innovative mechanical engineering solutions.			

Code	Course/Module Title	ECTS	Semester
ER 201	Applied Mathematics	7.00	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	4	52	123
Description			
The Applied Mathematics module is designed to equip mechanical engineering students with the mathematical tools and techniques necessary to solve engineering problems encountered in the field. This module focuses on the application of mathematical concepts in areas such as mechanics, thermodynamics, fluid dynamics, and control systems.Students will study topics including calculus, linear algebra, differential equations, and numerical methods. They will learn to apply mathematical modeling and analysis techniques to solve engineering problems, optimize designs, and predict system behavior.Through practical exercises and computational simulations, students will gain hands-on experience in applying mathematical principles to real-world mechanical engineering scenarios.By the end of the Applied Mathematics module, students will have developed the proficiency to analyze and solve complex engineering problems using mathematical methods. They will be able to apply mathematical models and techniques to optimize mechanical designs, predict system performance, and make informed engineering.			

Code	Course/Module Title	ECTS	Semester
ME201	Strength of materials	6.00	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	71	79

Description
The Strength of Materials module provides mechanical engineering students with a comprehensive understanding of the behavior and strength of materials under various loads and conditions. This module focuses on analyzing and predicting the mechanical response of materials to external forces and stresses.Students will study topics such as stress and strain analysis, material properties, and failure criteria. They will learn about different types of loading, including axial, bending, and torsional loads, and their effects on material behavior.Through practical exercises and laboratory work, students will gain hands-on experience in testing and analyzing material properties, as well as predicting structural performance.By the end of the Strength of Materials module, students will have a solid understanding of the principles and techniques used to analyze the strength and structural integrity of mechanical components and systems. They will be equipped to make informed design decisions, assess material suitability, and ensure the safety and reliability of mechanical engineering applications.

Code	Course/Module Title	ECTS	Semester
ME202	Thermodynamics	6.00	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	71	79
Description			
The Thermodynamics module provides mechanical engineering students with a comprehensive understanding of the principles and applications of thermodynamics. This module focuses on the study of energy transfer, heat, and work in mechanical systems.Students will explore topics including the laws of thermodynamics, properties of substances, energy analysis, and thermodynamic cycles. They will learn to analyze and calculate properties such as temperature, pressure, and entropy, and understand their impact on system performance.Through practical exercises and simulations, students will gain hands-on experience in analyzing thermodynamic processes and evaluating system efficiency.By the end of the Thermodynamics module, students will have a solid understanding of thermodynamic principles and their application in mechanical engineering. They will be equipped to analyze and optimize energy conversion systems, design heat transfer equipment, and contribute to sustainable and efficient engineering solutions.			

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Code	Course/Module Title	ECTS	Semester
ME203	Static Fluid	5.00	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	61	64
Description			
The Static Fluids module provides mechanical engineering students with a comprehensive understanding of the behavior and properties of static fluids. This module focuses on the principles and applications of fluid statics.Students will study topics such as pressure, hydrostatic forces, buoyancy, and fluid equilibrium. They will explore the behavior of fluids at rest, analyzing fluid pressure distribution and its effects on submerged objects and fluid containers.Through practical exercises and laboratory work, students will gain hands-on experience in measuring pressure, calculating forces, and analyzing fluid statics scenarios.By the end of the Static Fluids module, students will have a solid understanding of the principles governing the behavior of static fluids. They will be equipped to analyze and design fluid systems, such as tanks, dams, and hydraulic systems, ensuring structural stability and efficient operation within mechanical engineering applications.			

Code	Course/Module Title	ECTS	Semester
UR 201	Human right and democracy	2.00	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	1	17	33

Description
The Human Rights and Democracy module introduces mechanical engineering students to the fundamental concepts and principles of human rights and democracy. This module focuses on raising awareness and fostering a sense of responsibility in future engineers towards social justice, inclusivity, and ethical practices.Students will study topics such as universal human rights, democratic principles, social equality, and ethical decision-making. They will explore the intersection between engineering and human rights, considering the impact of engineering projects on individuals, communities, and the environment.Through case studies and discussions, students will examine real-world engineering challenges, addressing issues related to safety, sustainability, and the rights of workers and communities affected by engineering projects.By the end of the Human Rights and Democracy module, students will have a broader perspective on their role as engineers in society. They will be equipped to approach their work with a deeper understanding of the social and ethical implications, striving to promote human rights, social justice, and democratic values in their professional practice.

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Code	Course/Module Title	ECTS	Semester
ER 202	Computer programming	4.00	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	36	64
Description			
The Computer Programming module introduces mechanical engineering students to the foundations of computer programming and its applications within the field. This module focuses on developing programming skills and problem-solving techniques using a language commonly used in engineering applications.Students will learn programming concepts such as variables, loops, conditionals, functions, and data structures. They will gain proficiency in writing code to solve engineering problems, perform data analysis, and automate repetitive tasks.Through practical exercises and projects, students will apply programming principles to simulate mechanical systems, analyze experimental data, and control devices.By the end of the Computer Programming module, students will possess the skills to develop software solutions for engineering challenges. They will be able to write, debug, and optimize code, enhancing their ability to design innovative mechanical systems, perform simulations, and automate processes within the field of mechanical engineering.			

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Code	Course/Module Title	ECTS	Semester
ME204	Stresses analysis	6.00	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	71	79

Description
This course on stresses analysis in mechanical engineering provides a comprehensive understanding of stress-related phenomena in materials and structures. Students will explore fundamental concepts like stress, strain, and material properties, along with various types of stresses and measurement techniques. The course covers stress concentration, failure criteria, and methods for stress analysis, including analytical and numerical approaches. Practical applications in structural design and load-bearing systems will be discussed. By the end of the course, students will have the necessary knowledge and skills to analyze and predict the behavior of materials under different loading conditions, making them proficient in stress analysis within mechanical engineering.

Code	Course/Module Title	ECTS	Semester
ME205	Thermodynamics applications	6.00	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	71	79
Description			
This course explores the practical applications of thermodynamics in the field of mechanical engineering. Students will delve into the fundamental principles of thermodynamics, including energy, entropy, and heat transfer. The focus will be on applying these principles to real-world scenarios encountered in mechanical engineering, such as power generation, refrigeration, and heat exchangers. Through a combination of theoretical discussions and problem-solving exercises, students will gain a comprehensive understanding of thermodynamic cycles, thermodynamic properties of substances, and energy conversion processes. By the end of the course, students will be equipped with the knowledge and skills to analyze and optimize thermodynamic systems within mechanical engineering applications.			

Code	Course/Module Title	ECTS	Semester
ME206	Mechanical Drawing	7.00	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	3	82	93
Description			
This course on mechanical drawing in mechanical engineering focuses on developing essential skills for creating detailed and accurate technical drawings. Students will learn to communicate design ideas effectively through the use of engineering drawings, including orthographic projections, sections, and auxiliary views. The course covers topics such as dimensioning, tolerancing, and geometric dimensioning and tolerancing (GD&T). Students will gain proficiency in using drafting tools and computer-aided design (CAD) software to create 2D and 3D drawings. Emphasis will be placed on understanding industry standards and conventions for mechanical drawings. By the end of the course, students will be equipped with the necessary skills to produce professional-grade mechanical drawings for engineering applications.			

Code	Course/Module Title	ECTS	Semester
ME207	Fluid Dynamics with applications	6.00	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	71	79
Description			
This course on fluid dynamics with applications in mechanical engineering provides a comprehensive understanding of fluid behavior and its practical implications. Students will explore the fundamental principles of fluid mechanics, including fluid properties, conservation laws, and flow characteristics. The course covers topics such as fluid statics, flow measurements, and fluid dynamics analysis techniques. Emphasis will be placed on applying fluid dynamics principles to real-world engineering applications, such as pumps, turbines, and pipe networks. Students will gain hands-on experience through laboratory experiments and computational fluid dynamics (CFD) simulations. By the end of the course, students will have the knowledge and skills to analyze and design fluid systems, making them proficient in fluid dynamics within mechanical engineering.			

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Code	Course/Module Title	ECTS	Semester
ME208	Engineering of Metallurgy	5.00	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	61	64
Description			
This course on the engineering of metallurgy provides a comprehensive understanding of the properties and behavior of metals in mechanical engineering applications. Students will explore the principles of metallurgy, including crystal structure, phase transformations, and mechanical properties of metals. The course covers topics such as alloy design, heat treatment, and metal processing techniques. Emphasis will be placed on the practical application of metallurgical principles in engineering design, materials selection, and manufacturing processes. Through laboratory experiments and case studies, students will gain hands-on experience in analyzing and optimizing the performance of metallic materials. By the end of the course, students will have the knowledge and skills to engineer and utilize metallurgical principles in mechanical engineering practice.			

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Code	Course/Module Title	ECTS	Semester
ME301	Engineering and numerical Analyses	8.00	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	4	77	123
Description			

This course on engineering and numerical analyses equips students with essential skills for solving complex engineering problems using numerical methods. Students will explore the principles and techniques of numerical analysis, including finite element analysis (FEA), computational fluid dynamics (CFD), and numerical optimization. The course covers topics such as numerical modeling, solution algorithms, and result interpretation. Emphasis will be placed on applying numerical methods to solve engineering challenges in areas like structural analysis, heat transfer, and fluid flow. Through hands-on projects and simulations, students will develop proficiency in utilizing engineering software and analyzing results to make informed design decisions. By the end of the course, students will be well-equipped to employ numerical analyses in various mechanical engineering applications.

Code	Course/Module Title	ECTS	Semester
ME302	Conduction Heat Transfer	4.00	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	36	64
Description			
This course on conduction heat transfer focuses on understanding the principles and applications of heat conduction in mechanical engineering. Students will explore the fundamental concepts of conduction, including Fourier's law, thermal conductivity, and the heat diffusion equation. The course covers topics such as steady-state and transient conduction, one-dimensional and multi-dimensional heat transfer, and thermal resistance networks. Emphasis will be placed on solving conduction problems using analytical and numerical methods. Students will learn how to analyze heat conduction in various engineering systems, including heat exchangers, electronic devices, and insulation materials. By the end of the course, students will possess the knowledge and skills to analyze and design heat transfer systems involving conduction in mechanical engineering.			

Code	Course/Module Title	ECTS	Semester
ME303	Manufacturing Processes	6.00	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	71	79
Description			
This course on manufacturing processes explores the fundamental techniques and technologies used in the production of mechanical components and products. Students will delve into various manufacturing methods, including casting, forming, machining, and joining processes. The course covers topics such as material selection, process planning, and quality control in manufacturing. Emphasis will be placed on understanding the principles behind each manufacturing process and their applications in different industries. Students will gain hands-on experience through laboratory exercises and industry visits, enhancing their knowledge of process optimization, automation, and sustainability in manufacturing. By the end of the course, students will possess a comprehensive understanding of manufacturing processes, enabling them to contribute effectively to the field of mechanical engineering.			

Code	Course/Module Title	ECTS	Semester
ME304	Fundamentals of Internal Combustion Engines	4.00	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	64	36
Description			
This course on the fundamentals of internal combustion engines provides a comprehensive understanding of the principles and operations of these crucial power sources. Students will explore the working principles of both spark ignition (SI) and compression ignition (CI) engines, including the thermodynamics of the air-fuel mixture, combustion processes, and power generation. The course covers topics such as engine cycles, fuel systems, ignition systems, and emissions control. Emphasis will be placed on understanding the performance parameters, efficiency optimization, and technological advancements in internal combustion engines. By the end of the course, students will have a solid foundation in internal combustion engines and be equipped with the knowledge to contribute to their design, analysis, and optimization in mechanical engineering applications.			

Code	Course/Module Title	ECTS	Semester
ME305	Gas dynamics	4.00	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	36	64
Description			
This course on gas dynamics explores the behavior and characteristics of compressible fluids, focusing on their applications in mechanical engineering. Students will delve into the fundamental principles of gas dynamics, including the equations of motion, conservation laws, and thermodynamic properties of compressible fluids. The course covers topics such as one-dimensional flow, shock waves, nozzle design, and supersonic and hypersonic flows. Emphasis will be placed on understanding the effects of compressibility on fluid flow and its implications for engineering systems. Through theoretical analysis and practical examples, students will gain a deeper understanding of gas dynamics and its significance in mechanical engineering applications.			

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Code	Course/Module Title	ECTS	Semester
ME306	Theory of Machine	4.00	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	36	64
Description			
This course on the theory of machines provides a comprehensive understanding of the principles and analysis of mechanical systems. Students will explore the fundamentals of machine design, kinematics, and dynamics. The course covers topics such as mechanisms, linkages, cams, gears, and robotic systems. Emphasis will be placed on analyzing the motion, forces, and energy transfers in mechanical systems. Students will learn about mechanisms' synthesis, design considerations, and optimization techniques. Through practical examples and hands-on projects, students will gain proficiency in analyzing and designing machines that meet desired performance requirements. By the end of the course, students will possess the knowledge and skills to tackle complex engineering challenges related to the theory of machines in mechanical engineering.			

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Code	Course/Module Title	ECTS	Semester
ME307	Convection Heat Transfer	5.00	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	61	64
Description			

This course on convection heat transfer focuses on understanding the principles and applications of heat transfer through fluid flow in mechanical engineering. Students will explore the fundamentals of convection, including boundary layers, forced convection, and natural convection. The course covers topics such as heat transfer coefficients, correlations, and heat exchangers. Emphasis will be placed on analyzing convective heat transfer in various engineering systems, such as cooling of electronic devices, heat exchangers, and HVAC systems. Students will learn how to apply empirical and analytical methods to solve convection heat transfer problems. By the end of the course, students will possess the knowledge and skills to analyze and design heat transfer systems involving convection in mechanical engineering applications.

Code	Course/Module Title	ECTS	Semester
ME308	Electrical Machinery	5.00	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	61	64
Description			
This course on electrical machinery explores the principles, design, and applications of electrical machines in mechanical engineering. Students will delve into the fundamentals of electrical machines, including generators, motors, and transformers. The course covers topics such as electromagnetism, machine construction, operating principles, and performance characteristics. Emphasis will be placed on understanding the interaction between electrical and mechanical systems, energy conversion, and control of electrical machines. Students will gain hands-on experience through laboratory experiments and projects, enhancing their knowledge of machine operation, efficiency optimization, and troubleshooting. By the end of the course, students will possess the knowledge and skills to analyze, design, and apply electrical machinery in mechanical engineering applications.			

Code	Course/Module Title	ECTS	Semester
ME309	Computer Aided Design (CAD/CAM)	6.00	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	4	56	94
Description			
This course on computer-aided design (CAD) and computer-aided manufacturing (CAM) focuses on utilizing advanced software tools for efficient product design and manufacturing in mechanical engineering. Students will explore the principles and techniques of CAD/CAM, including 3D modeling, assembly design, virtual prototyping, and simulation. The course covers topics such as geometric modeling, parametric design, finite element analysis (FEA), and computer numerical control (CNC) machining. Emphasis will be placed on hands-on experience using industry-standard CAD/CAM software to develop design solutions, optimize manufacturing processes, and integrate engineering analysis. By the end of the course, students will possess the skills to apply CAD/CAM technologies effectively in mechanical engineering practice, enhancing productivity and innovation.			

Code	Course/Module Title	ECTS	Semester
ME312	Design of Internal Combustion Engines	6.00	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	4	56	94

Description
This course on the design of internal combustion engines provides a comprehensive understanding of the principles and methodologies involved in developing efficient and high-performance engines. Students will explore the key aspects of engine design, including combustion processes, intake and exhaust systems, fuel injection, and engine dynamics. The course covers topics such as cylinder design, piston and crankshaft analysis, valve mechanisms, and emissions control. Emphasis will be placed on integrating theory, analysis, and practical considerations to optimize engine performance, efficiency, and reliability. Through design projects and case studies, students will gain hands-on experience in designing and evaluating internal combustion engines. By the end of the course, students will possess the knowledge and skills to contribute to the design and development of internal combustion engines in mechanical engineering applications.

Code	Course/Module Title	ECTS	Semester
ME310	Turbo machinery	6.00	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	71	79
Description			
This course on turbomachinery focuses on understanding the principles and applications of various turbomachines in mechanical engineering. Students will explore the fundamentals of turbomachinery, including turbines, compressors, and pumps. The course covers topics such as fluid mechanics, thermodynamics, and performance characteristics of turbomachines. Emphasis will be placed on analyzing the flow behavior, energy conversion, and efficiency optimization in turbomachinery. Students will gain hands-on experience through laboratory experiments and simulations, enhancing their knowledge of machine operation, performance assessment, and troubleshooting. By the end of the course, students will possess the knowledge and skills to analyze, design, and apply turbomachinery in mechanical engineering applications, such as power generation, propulsion systems, and fluid transport.			

Code	Course/Module Title	ECTS	Semester
UR 301	English language skills	2.00	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	1	17	33
Description			
This course on English language skills is designed to enhance communication abilities specifically for mechanical engineering professionals. Students will develop proficiency in technical writing, reading comprehension, oral presentations, and professional correspondence. The course covers topics such as technical vocabulary, grammar and syntax, effective communication strategies, and cross-cultural communication. Emphasis will be placed on acquiring the language skills necessary for writing reports, research papers, and project documentation. Students will also practice delivering technical presentations and participating in discussions related to mechanical engineering. By the end of the course, students will have the linguistic competence required to effectively communicate ideas, collaborate with colleagues, and succeed in their careers in the field of mechanical engineering.			

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Code	Course/Module Title	ECTS	Semester
ME311	Summer training		
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
Description			
This summer training course in mechanical engineering offers students the opportunity to gain practical industry experience and apply their theoretical knowledge in real-world scenarios. Participants will engage in hands-on training and work on projects related to various mechanical engineering disciplines. The training covers topics such as manufacturing processes, CAD/CAM, automation, and maintenance. Emphasis will be placed on developing technical skills, problem-solving abilities, and teamwork. Students will have the chance to work closely with professionals in the field, learn about industry standards and practices, and enhance their professional networks. By the end of the training, students will have valuable experience and be better equipped for their future careers in mechanical engineering.			

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Code	Course/Module Title	ECTS	Semester
ME401	Mechanical Vibrations	5.00	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	0	62	63
Description			

This course on mechanical vibrations provides a comprehensive understanding of the principles and analysis of vibrations in mechanical systems. Students will explore the fundamentals of vibrations, including single-degree-of-freedom and multi-degree-of-freedom systems. The course covers topics such as free and forced vibrations, damping, resonance, and vibration isolation. Emphasis will be placed on analyzing and predicting the behavior of mechanical systems under different vibration conditions. Students will learn techniques for vibration measurement, analysis, and control. Through theoretical concepts and practical examples, students will gain a deeper understanding of mechanical vibrations and their implications in engineering design and performance evaluation. By the end of the course, students will possess the knowledge and skills to analyze and mitigate vibrations in mechanical engineering applications.

Code	Course/Module Title	ECTS	Semester
ME402	Air Conditioning	5.00	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	61	64
Description			
This course on air conditioning focuses on the principles, design, and applications of heating, ventilation, and air conditioning (HVAC) systems in mechanical engineering. Students will explore the fundamentals of psychrometrics, heat transfer, and fluid flow in HVAC systems. The course covers topics such as cooling load estimation, air distribution, refrigeration cycles, and energy efficiency. Emphasis will be placed on understanding the design considerations, equipment selection, and control strategies for effective air conditioning. Students will gain hands-on experience through practical projects and simulations, enhancing their knowledge of HVAC system design, operation, and maintenance. By the end of the course, students will possess the knowledge and skills to design and analyze air conditioning systems for various mechanical engineering applications.			

Code	Course/Module Title	ECTS	Semester
ME403	Engineering Materials	4.00	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0	52	48
Description			
This course on engineering materials provides a comprehensive understanding of the properties, selection, and applications of materials in mechanical engineering. Students will explore the fundamentals of material science, including the structure-property relationships, mechanical behavior, and manufacturing processes of engineering materials. The course covers topics such as metals, polymers, ceramics, and composites. Emphasis will be placed on material selection based on mechanical, thermal, and chemical requirements. Students will gain hands-on experience through laboratory experiments and case studies, enhancing their knowledge of material characterization and failure analysis. By the end of the course, students will possess the knowledge and skills to make informed decisions regarding material selection and utilization in mechanical engineering applications.			

Code	Course/Module Title	ECTS	Semester
ME404	Machine Design	6.00	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	1	72	78

Description

This course on machine design focuses on the principles, methodologies, and techniques involved in the design of mechanical systems and components. Students will explore the fundamentals of machine design, including load analysis, stress and deflection calculations, and material selection. The course covers topics such as design for static and dynamic loading, power transmission, and mechanism synthesis. Emphasis will be placed on applying engineering principles to develop robust and reliable machine designs. Students will gain hands-on experience through design projects and simulations, enhancing their knowledge of design optimization, safety considerations, and manufacturing constraints. By the end of the course, students will possess the knowledge and skills to design innovative and functional machines in mechanical engineering applications.

Code	Course/Module Title	ECTS	Semester
ME405	Industrial Engineering and quality control	4.00	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0	52	48
Description			
This course on industrial engineering and quality control explores the principles and techniques for optimizing industrial processes and ensuring high-quality products in mechanical engineering. Students will delve into the fundamentals of industrial engineering, including work analysis, production planning, and facility layout. The course covers topics such as statistical quality control, process optimization, and lean manufacturing principles. Emphasis will be placed on understanding the concepts of total quality management, Six Sigma, and continuous improvement in industrial settings. Students will gain hands-on experience through case studies and industry projects, enhancing their knowledge of process optimization, defect prevention, and quality assurance. By the end of the course, students will possess the knowledge and skills to optimize industrial processes and implement effective quality control measures in mechanical engineering applications.			

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Code	Course/Module Title	ECTS	Semester
ME406	Engineering project	6.00	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	2	102	48
Description			
This course on engineering project provides students with practical experience in executing real-world projects within the field of mechanical engineering. Students will apply their knowledge and skills to undertake engineering projects from conception to completion. The course covers topics such as project management, feasibility analysis, design, prototyping, testing, and documentation. Emphasis will be placed on teamwork, problem-solving, and effective communication throughout the project lifecycle. Students will gain hands-on experience in project planning, resource allocation, risk management, and project evaluation. By the end of the course, students will have developed the abilities to successfully manage and execute engineering projects, preparing them for their future careers in mechanical engineering.			

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Code	Course/Module Title	ECTS	Semester
ME407	Engineering project	6.00	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	2	102	48
Description			

This course on engineering project provides students with practical experience in executing real-world projects within the field of mechanical engineering. Students will apply their knowledge and skills to undertake engineering projects from conception to completion. The course covers topics such as project management, feasibility analysis, design, prototyping, testing, and documentation. Emphasis will be placed on teamwork, problem-solving, and effective communication throughout the project lifecycle. Students will gain hands-on experience in project planning, resource allocation, risk management, and project evaluation. By the end of the course, students will have developed the abilities to successfully manage and execute engineering projects, preparing them for their future careers in mechanical engineering.

Code	Course/Module Title	ECTS	Semester
ME408	Refrigeration	5.00	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	61	64
Description			
This course on refrigeration focuses on the principles, design, and applications of refrigeration systems in mechanical engineering. Students will explore the fundamentals of thermodynamics, heat transfer, and fluid mechanics as they relate to refrigeration. The course covers topics such as refrigeration cycles, refrigerants, compressors, heat exchangers, and system components. Emphasis will be placed on understanding the design considerations, energy efficiency, and environmental impact of refrigeration systems. Students will gain hands-on experience through practical projects and laboratory experiments, enhancing their knowledge of refrigeration system operation, troubleshooting, and maintenance. By the end of the course, students will possess the knowledge and skills to design, analyze, and optimize refrigeration systems for various mechanical engineering applications.			

Code	Course/Module Title	ECTS	Semester
ME409	Design of Machine Systems	6.00	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	1	72	78
Description			
This course on the design of machine systems provides a comprehensive understanding of the principles and methodologies involved in developing efficient and functional machine systems. Students will explore the fundamentals of system design, including system integration, kinematics, dynamics, and control. The course covers topics such as mechanical power transmission, motion control, and system optimization. Emphasis will be placed on applying engineering principles to design machine systems that meet specific performance requirements. Students will gain hands-on experience through design projects and simulations, enhancing their knowledge of system modeling, analysis, and validation. By the end of the course, students will possess the knowledge and skills to design innovative and reliable machine systems in mechanical engineering applications.			

Code	Course/Module Title	ECTS	Semester
ME410	Power plants	7.00	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	2	82	93
Description			
This course on power plants focuses on the principles, design, and operation of power generation systems in mechanical engineering. Students will explore various types of power plants, including thermal, hydroelectric, nuclear, and renewable energy systems. The course covers topics such as energy conversion, thermodynamics, power generation technologies, and environmental considerations. Emphasis will be placed on understanding the design and performance optimization of power plants for efficient and sustainable electricity generation. Students will gain hands-on experience through case studies and analysis of power plant components and systems. By the end of the course, students will possess the knowledge and skills to analyze, design, and operate power plants in mechanical engineering applications.			

Code	Course/Module Title	ECTS	Semester
ME411	Control and measurements	4.00	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	36	64

Description
This course on control and measurements focuses on the principles and techniques for controlling and measuring mechanical systems in engineering applications. Students will explore the fundamentals of control theory, including feedback control, system dynamics, and stability analysis. The course covers topics such as sensors and transducers, data acquisition, signal conditioning, and instrumentation. Emphasis will be placed on understanding the design and implementation of control systems and measurement techniques for accurate system monitoring and regulation. Students will gain hands-on experience through laboratory experiments and practical projects, enhancing their knowledge of system behavior, control algorithms, and measurement accuracy. By the end of the course, students will possess the knowledge and skills to design and optimize control and measurement systems in mechanical engineering applications.

Code	Course/Module Title	ECTS	Semester
ER 401	Ethics	2.00	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	1	17	33

Description
This course on ethics explores the ethical considerations and responsibilities in the field of mechanical engineering. Students will examine the ethical principles and values that guide professional conduct and decision-making. The course covers topics such as integrity, accountability, sustainability, and social impact of engineering projects. Emphasis will be placed on understanding the ethical dilemmas and challenges faced by mechanical engineers in their professional practice. Students will engage in case studies and discussions to develop critical thinking and ethical reasoning skills. By the end of the course, students will possess the knowledge and skills to make ethically informed decisions and contribute responsibly to society as mechanical engineering professionals.