Tikrit University

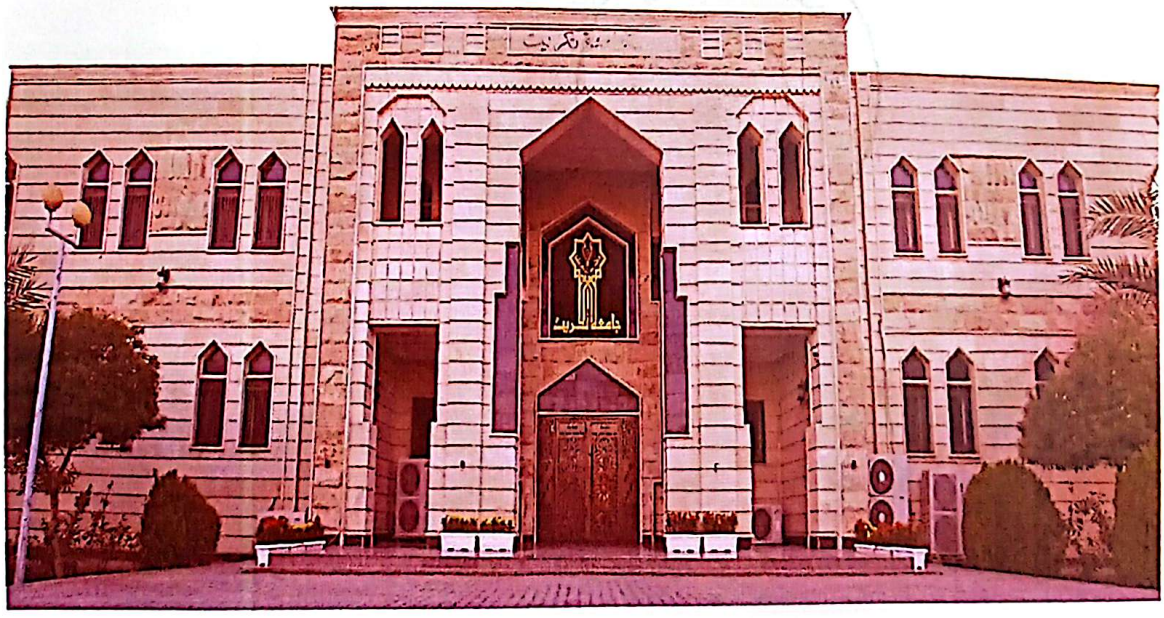
جامعة تكريت

جامعة تكريت
كلية هندسة الشرقاط
TU - ENGINEERING COLLEGE - ALSHIRQAT

First Cycle – Bachelor's Degree (B.Sc.)

Mechanical Engineering (General Mechanical Eng.)

بكالوريوس علوم هندسة ميكانيكية (تخصص ميكانيك عام)



Academic Program Description Form

University Name: Tikrit

Faculty/Institute: Shirqat Engineering College

Scientific Department: Mechanical Engineering Department

Academic or Professional Program Name: B.Sc. in Mechanical Engineering

Final Certificate Name: Bachelor of Science in Mechanical Engineering

Academic System: Bologna and Coursed Based

Description Preparation Date:

File Completion Date:

Signature:

Head of Department Name:

Asst Prof. Dr. Harith Abdulla Ali

Date: 2-9-2025

Signature:

Scientific Associate Name:

Asst Prof. Dr. Alaa Yousif Ali

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 8/9/2025

Signature:

Approval of the Dean

Prof. Dr. Khamis Khalaf Hassan

Table of Contents

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 (44) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظره عامة

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الهندسة الميكانيكية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (٤٤) مادة دراسية، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
TKSHME1100	Mathematics I	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	-	93	57
Description			
Mathematical with emphasis on solution techniques and Engineering applications. Topics include Algebraic, non-algebraic functions, Polar coordinates, Integration, Vectors, Matrix, Numerical methods, Numerical Integrations			

Module 2

Code	Course/Module Title	ECTS	Semester
TKSHME1101	Engineering Drawing	6	1
Class (hr/w)	**Lect/Lab./Prac. /Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
6	0	93	57

Description
An engineering drawing course focuses on usage of drawing instruments, lettering, construction of geometric shapes, etc. Students study use of dimensioning, shapes and angles or views of such drawings. Dimensions feature prominently, with focus on interpretation, importance and accurate reflection of dimensions in engineering drawing. Other areas of study in this course may include projected views and development of surfaces..

Module 3

Code	Course/Module Title	ECTS	Semester
TKSHME1102	Physics I	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	78	47
Description			
The central point of this course is to provide a physical basis that links the structure of materials with their properties, focusing primarily on metals. With this understanding in hand, the concepts of alloy design and microstructural engineering are also discussed, linking processing and thermodynamics to the structure and properties of metals.			

Module 4

Code	Course/Module Title	ECTS	Semester
UOTOO1	Arabic Language	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	33	17
Description			
يوفر المقرر معلومات عامة عن قواعد اللغة العربية وكيفية صياغة الجمل ويطور مهارات الطلبة على التحدث باللغة العربية من ناحية صياغة الجمل واللفظ والكتابة الصحيحة باقل الاخطاء.			

Module 5

Code	Course/Module Title	ECTS	Semester
UOTOO3	computer Programming 1	3	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	12
Description			

Computer Proficiency is an inevitable part of engineering as well as other education sectors. The course is aiming to equip all the commerce aspirants to have basic skills as well as hands on experience on word processing, for creating excel spreadsheets, for building databases and preparing presentations, through the use of Microsoft Office Word, Excel, and PowerPoint programs, MS Windows, Internet and E-mail

Module 6

Code	Course/Module Title	ECTS	Semester
UOTOO4	Human rights and Democracy	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	33	17
Description			
يوصف هذا المقرر حقوق الانسان والتحسيس بأهميتها ، وكيفية الدفاع عن الحقوق واالمطالبها بها. كذلك يهتم هذا المقرر بتدريس مادة . حقوق االنسان والتعريف باهم خصائص حقوق الانسان من المنظور المحلي والدولي والعرف االأجتماعي			

Module 7

Code	Course/Module Title	ECTS	Semester
TKSHME1201	Workshop Skills	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	93	57
Description			
The engineering workshop course focuses on identifying risks in the work environment and industrial safety guidelines. And training on how to measure and determine, and the use of filing tools and their work. Learn about the types of wood used in carpentry, the process of shaping it, and the use of carpentry tools and machines. Training in welding work, its types, and the process of joining metals by welding. Training on various casting works and training on mechanical operation, which includes turning, milling, and grinding. Training on pipe knowledge, how to connect, sanitary engineering works, and training on the basics of electrical workshops.			

Module 8

Code	Course/Module Title	ECTS	Semester
TKSHME1206	Engineering Mechanics /Statics	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	62	63

Description
During the course, students will learn the description of Newton's, laws. Topics covered: Equilibrium of particles and rigid body in two dimensions and three dimension, study equilibrium of some practical structures such as truss, frame and machines also study friction force and some its application as in screw and belts. While in dynamic analyses the kinematics and kinetics of particles in 2and 3 dimensions and rigid body in two dimension, The course is designed to provide a background to higher level courses involving forces, stress analysis and dynamic.

Module 9

Code	Course/Module Title	ECTS	Semester
TKSHME1205	Physics II	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	62	63
Description			
1.Cost, Efficiency, Health, Safety, Quality: overview process costs; component rationalization to process; feature based decisions; material, energy, time, and other metrics; health and safety comments; quality programs 2. Markets and Applications: introduce competitive aspects; show examples – captive, competitive; emphasize range of applications; example design for application Mo-Cu 3. Process and Design Trends: overview directions; show growth examples – materials, applications, processes; quickly examine properties, performance, cost			

Module 10

Code	Course/Module Title	ECTS	Semester
TKSHME1201	Electrical Engineering	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	37	63
Description			
The A.C. Machines module provides you with a detailed understanding of how alternators, induction motor and synchronous motors work, from theoretical concepts through to the design of practical alternators and motors. This module will introduce the fundamentals of principle operation of A.C. machines. Specifically, the module elaborates on the fundamentals of three phase induction motor, single phase induction motor, synchronous generators and synchronous motor and begins to introduce detail characteristics, performance of each machine and, towards the end of the module highlighting the reasons A.C. machines importance. Students are introduced to current standard induction machines as well as the benefits synchronous generator can provide. A laboratory element provides students with hands-on and practical understanding in this field and expands the understanding of its applicability to real-world problems.			

Module 11

Code	Course/Module Title	ECTS	Semester
UOTOO2	English Language	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	33	17
Description			
This course is designed to give the students the opportunity to practice different language skills like reading, listening, speaking, and writing			

Module 12

Code	Course/Module Title	ECTS	Semester
TKSHME1203	Manufacturing process I	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	63	12
Description			
The main goal of this course is to develop the student's knowledge and introduce him to the importance of engineering materials in industry. The physical and mechanical properties of some important tests that are carried out on engineering materials such as the tensile test, Shock resistance test and hardness test, in addition to methods of nailing and identifying metals for forming or forming operations.			

Module 13

Code	Course/Module Title	ECTS	Semester
TKSHME1200	Mathematics II	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	-	93	32
Description			
Mathematical with emphasis on solution techniques and engineering applications. Topics include Function of several variables, double and triple integrals, Center of mass, Divergence theorems, Power series, Ordinary differential , equations, Linear system of differential and Numerical solutions O.D.E			

Module 14

Code	Course/Module Title	ECTS	Semester

TKSHME1204	Thermodynamics I	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	63	12
Description			
This course introduces the basics of thermodynamics. Topics covered: Basic principles and definitions; Heat, Work, Power, Internal Energy, Enthalpy, Zeroth Law Of Thermodynamic, Temperature And Its Measurements, 1st Law Of Thermodynamic, Boyle 's Law, Charles's Law, Perfect Gas Law, Closed Systems Processes, Open Systems Processes, Energy Equation For Steady Flow And Its Applications, Reversible And Irreversible Processes, Heat Engine And Reversible Heat Engine, 2nd Law Of Thermodynamic, Carnot Cycle And Reversed Carnot Cycle, Entropy, Clauses Inequality, Gases Mixtures, Cycles. The course is taught through 4 hrs per week, 2 theories, 1 tutorial, and 1 experimental.			

Module 15

Code	Course/Module Title	ECTS	Semester
TKSHME1202	Engineering Drawing	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	27
Description			
This course introduces the description of mechanical drawing principles .Topics covered :Auxiliary view,bolts & nut,key, rivet, spring , welding ,fit & tolerance , gears ,cams , assembly,dis assembly, by using AutoCAD program. The course is designed to provide a background to higher level of mechanical drawing. The course is Taught through 3 hours a week.			

Module 16

Code	Course/Module Title	ECTS	Semester
TKSHME2100	Engineering Analysis	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	63	62
Description			
This course will cover a range of engineering analysis techniques related to the first and second differential and then utilizes it to solve problems in mechanical engineering applications, methods for solving differential equations are discussed. the course also includes power series solutions,			

special functions, and Laplace transforms and utilizes it to solve the differential equation. Fourier series and separation of variables are also introduced.

Module 17

Code	Course/Module Title	ECTS	Semester
TKSHME2102	Fluid Mechanics I	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	78	47
Description			
During the semester, students will learn the fundamental knowledge of fluid, its Properties: density, viscosity, surface tension. Fluid in statics and pressure applications. Forces on submerged surfaces. - Also for dynamic Fluid: Applications of continuity mass, momentum and energy conservation equations. Stability of floating bodies.			

Module 18

Code	Course/Module Title	ECTS	Semester
TKSHME2104	Strength of Materials	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	62	63
Description			
1-Engineering design in the field of mechanical engineering requires a deep knowledge of the nature of the behavior of the different mechanical parts under the influence of the different types of loads that they are exposed to during use, hence the importance of studying the resistance of materials for the purpose of preparing the mechanical engineer and placing him on the first thresholds of the mechanical design of structures and mechanical parts. 2-This topic studies a lot of engineering applications that are affected by a lot of distorted loads that have an application in engineering reality.			

Module 19

Code	Course/Module Title	ECTS	Semester
UOTO31	computer programming	3	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	48	27

Description
The course provides a gentle introduction to the MATLAB computing environment, and is intended for beginning users and those looking for a review. It is designed to give students a basic understanding of MATLAB, including popular toolboxes. The course consists of interactive lectures and sample MATLAB problems given as assignments and discussed in class. No prior programming experience or knowledge of MATLAB is assumed. Concepts covered include basic use, graphical representations and tips for designing and implementing MATLAB code.

Module 20

Code	Course/Module Title	ECTS	Semester
TKSHME2101	Engineering Mechanics / Dynamic	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0	63	62
Description			
In this course, the students will be introduced to the fundamentals of Dynamics of Engineering Mechanics. The topics will cover a wide range of applications that, collectively, form building blocks of the dynamics world for an everyday mechanical engineer. Typically, the course starts with the behavior and properties of particles and the fundamental relationships of distance, velocity, and acceleration. There is a broad spectrum to cover to accommodate most of the applications in more than one coordinate system. The analysis of particle dynamics forms the basis for the rigid body mechanics.			

Module 21

Code	Course/Module Title	ECTS	Semester
TKSHME2103	**Engineering Metallurgy**	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	78	47
Description			
The central point of this course is to provide a physical basis that links the structure of materials with their properties, focusing primarily on metals. With this understanding in hand, the concepts of alloy design and microstructural engineering are also discussed, linking processing and thermodynamics to the structure and properties of metals.			

Module 22

Code	Course/Module Title	ECTS	Semester
UOTOO4	جرائم نظام البعث في العراق	2	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	48	2

Description
جرائم حزب البعث: هي الجرائم التي ارتكبها الحزب بأبناء الشعب العراقي والتي ادت الى اثار سلبية على المستوى النفسي والاجتماعي والثقافي والاقتصادي والبيئي وعسكرة المجتمع.

Module 23

Code	Course/Module Title	ECTS	Semester
TKSHME2203	Fluid Mechanics II	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	3	93	57
Description			
This course introduces the description of phenomena associated with fluid flow. Topics covered: dimensional analysis and similitude; viscous flow in pipes; laminar and turbulent flow; boundary layer theory; Moody diagram; pipe problems; flow and fluid measurements; analysis of pipes and pumps networks. Physical understanding of fluid flows and applications to practical problems will be stressed. The course is designed to provide a background to higher level courses involving fluid flow and heat transfer.			

Module 24

Code	Course/Module Title	ECTS	Semester
TKSHME2201	Engineering Mechanics /rigid Dynamic	5	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0	78	47
Description			
In this course, the students will be introduced to the fundamentals of Dynamics of Engineering Mechanics. The topics will cover a wide range of applications that, collectively, form building blocks of the dynamics world for an everyday mechanical engineer. Typically, the course starts with the behavior and properties of rigid body dynamics and the fundamental relationships of distance, velocity, and acceleration. There is a broad spectrum to cover to accommodate most of the applications in more than one coordinate system. The analysis of the rigid body motion depends on the background of the particle dynamics.			

Module 25

Code	Course/Module Title	ECTS	Semester
UOTO21	English Language	2	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**

2	0	48	2
Description			
This course is designed to give the students the opportunity to practice different language skills like reading, listening, speaking, and writing			

Module 26

Code	Course/Module Title	ECTS	Semester
TKSHME2202	Strength of Materials II	5	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	63	62
Description			
This course aims to establish fundamental knowledge of Strength of Materials. Presentation of the course starts by introducing simple stress and simple strain utilizes it to solve problems in beams and columns and rivets.			

Module 27

Code	Course/Module Title	ECTS	Semester
TKSHME2204	Applied thermodynamics II	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	93	57
Description			
Thermodynamics is an exciting and fascinating subject that deals with energy, which is essential for sustenance of life, and thermodynamics has long been an essential part of engineering curricula all of the world. It has a broad application area ranging from microscopic organisms to common household appliances, transportation vehicles, power generation systems, this course contains sufficient material for fundamental and principles of thermodynamics.			

Module 28

Code	Course/Module Title	ECTS	Semester
TKSHME2205	Computer Aided Drawing	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	93	7
Description			

In Solidworks course, you will learn the fundamental tools and concepts for the Solidworks engineering and design software. You will learn how to use the Solidworks software to build parametric models of parts and assemblies, and how to make drawings of those parts and assemblies.

Module 29

Code	Course/Module Title	ECTS	Semester
UOTOO1	Arabic Language 2	2	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	48	2
Description			
اللغة العربية: هي ما نطق به العرب، أو هي لغتهم، وهي اللغة السامية التي حفظت وجودها، وهي لغة عالمية وإنسانية حية تتميز بنظام صوتي وصرفي ونحوي وتركيبي، ولألفاظها مدلولات مختلفة، فهي اللسان الذي تكلمه العرب، ونزل به القرآن الكريم الذي لا يمكن فهمه إلا من خلال فهم اللغة العربية.			

Module 30

Code	Course/Module Title	ECTS	Semester
TKSHME3104	Gys Dynamics	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	63	62
Description			
The student will prove, mostly during the oral test, his capacity of describing the operation and functioning of fluid machines, convening of the knowledge developed. The student will get familiar with the schematization of practical problems, mostly during the development of his skills for the written test. This mainly concerns fluid machines (e.g. wind turbines, steam turbines, hydraulic turbines, hydraulic pumps, gas compressors, etc) and the systems connected to the machines (e.g. hydraulic power plants, pumping systems, air distribution systems, etc).			

Module 31

Code	Course/Module Title	ECTS	Semester
TKSHME3101	Engineering management and Ethics	4	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	48	52
Description			

The essential point in this coarse is to give the basics of engineering management and ethics, starting with the concepts of engineering management, industrial engineering functions, characteristics of construction, project phases, resource learning technique in addition to economic and technical feasibility studies. And then focus on The relationship between cost, profit and volume of production, project management, operation management and types of productivity .

Module 32

Code	Course/Module Title	ECTS	Semester
TKSHME3100	Numerical Analysis	4	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	52
Description			
This course will cover a range of numerical analysis techniques related to matrix problems, solving systems of linear algebraic equations, solving nonlinear equations, Curve Fitting, polynomial approximation and interpolation, numerical integration and differentiation, and ordinary and partial differential equations. All of these numerical problems will be programmed, debugged, and executed.			

Module 33

Code	Course/Module Title	ECTS	Semester
TKSHME3103	Heat Transfer conduction	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	3	93	57
Description			
This is the first course in heat transfer, with an emphasis on understanding the fundamental physics underlying different heat transfer processes, making proper approximations for analytical heat transfer calculations and numerical methods for engineering heat transfer analysis. Topics include: introduction to three modes of heat transfer, thermal resistance network analysis, steady-state conduction, transient conduction, numerical methods for heat conduction .			

Module 34

Code	Course/Module Title	ECTS	Semester
TKSHME3105	Manufacturing Processes II	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	63	62
Description			

Mathematical analysis with emphasis on solution techniques and engineering applications. Topics include ordinary differential equations (ODEs), Laplace transformations, initial and boundary value problems, Fourier series and partial differential equations. Numerical differentiation, numerical integration.

Module 35

Code	Course/Module Title	ECTS	Semester
TKSHME3102	Theory of Machines	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	3	93	57
Description			
This course introduces the description of phenomena associated with vibration analysis and theory of machine. Topics covered physical properties of vibration [oscillatory motion, Free vibration, harmonically forced vibration of single degree of freedom system, transient vibration of single degree of freedom systems, multi-degree of freedom system vibrations] and theory of machine [gear, gear train, gyroscopic couple, governors, balancing of rotating masses, balancing of reciprocating masses]. Physical understanding of vibration and theory of machine and applications to practical problems will be stressed. The course is designed to provide a background to higher level courses involving vibration.			

Module 36

Code	Course/Module Title	ECTS	Semester
TKSHME3101	Machine Design I	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	93	57
Description			
Procedures for the practice of mechanical design, Factor of safety and design codes, concepts of axial, radial, circumferential location, basic bearing design, lubrication, static and dynamic theories of failure. Selection of component bought out from specialist suppliers, design and validation of components, selection of materials, manufacturing methods or systems concepts that are related to more than component. Use of appropriate software in the design process.			

Module 37

Code	Course/Module Title	ECTS	Semester
TKSHME3203	Internal Combustion Engines	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	93	57

Description
1- Developing and developing the student's ability and ability to use computer programs in the field of specialization. 2- Developing and developing the student's ability and ability to deal with modern techniques related to the course vocabulary. 3- Developing and developing the student's ability and ability to face problems and dilemmas and find appropriate solutions to them. 4- Developing and developing the student's ability and ability to translate academic information into practical reality

Module 38

Code	Course/Module Title	ECTS	Semester
TKSHME3205	Energy conversion	4	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	48	52
Description			
The course is to introduce fundamentals of generation technologies to convert various kinds of energy into electric energy. It also explores the operating principles of a range of conventional and renewable energy technologies. Furthermore, it devoted to discuss strategies for increased energy efficiency and more environmentally sound operation.			

Module 39

Code	Course/Module Title	ECTS	Semester
TKSHME3200	Statistics and probability	3	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	48	27
Description			
The course covers the following topics; statistics of applications: Data collection, Data representation, Central measurements, comparisons between central measurements, Variation measurements, comparisons between Variation measurements Sampling and Estimation, Principles of probability theory, Probability Distributions, Correlation and Regression, Hypotheses and Fitness tests, Test of variation, one-way test, Test of variation, two-way test, method of virtual work.			

Module 40

Code	Course/Module Title	ECTS	Semester
TKSHME3204	Engineering Materials	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**

2	0	48	77
Description			
The engineering materials course provides a comprehensive understanding of various materials used in engineering. It covers alloy steel, cast iron, titanium, low-melting alloys, heat balance diagrams, plastics, ceramics, composite materials, conductors, semiconductors, and insulators. The course focuses on the properties, applications, and significance of these materials in engineering. Although there is no practical part, students will gain theoretical knowledge on material selection, characterization, and the factors influencing material performance in engineering applications.			

Module 41

Code	Course/Module Title	ECTS	Semester
TKSHME3202	Heat Transfer convection and radiation	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	93	57
Description			
The course considers the analysis of heat transfer by convection using empirical and boundary layer approximations. Both forced and natural convection are considered. Force convection deals in two ways which are external and internal. Natural convection from the solid surfaces is taken into account. The Radiation heat transfer is considered with applications to multi-body radiation. In addition, the properties of thermal radiation, Radiation heat transfer between solids and shape factor is taken in consider			

Module 42

Code	Course/Module Title	ECTS	Semester
TKSHME4101	Machine Design II	6	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	63	87
Description			
Procedures for the practice of mechanical design, basic gearing design, lubrication, screws, belt and chain drives. Selection of component bought out from specialist suppliers, design and validation of components, selection of materials, manufacturing methods or systems concepts that are related to more than component. Use of appropriate software in the design process.			

Module 43

Code	Course/Module Title	ECTS	Semester
TKSHME4105	Power Plants	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**

2	2	93	32

Description

1- To study the power generation scenario and the components of power plant.
2- To understand details of steam plant, analysis of condenser and, heat exchangers of thermal power plant, method to reduce various pollution from thermal power plant.
4. To understand components; layout of diesel power plant, components; different cycles; methods to recognize the layout, performance and improving the thermal efficiency of the gas power plant
5. To study the working principle, construction of power generation from non-conventional sources of energy such as solar energy and wind energy.
3- To learn the different instrumentation in power plant and basics of economics of power generation.

Module 44

Code	Course/Module Title	ECTS	Semester
TKSHME4100	Graduation Project I	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	63	37

Description

The preparatory studies involve conducting a literature review and collecting data for the graduation project within a specific area of concentration. These activities are carried out under the guidance of an academic staff member. The course encompasses directed readings in Mechanical Engineering literature, an introduction to research methods, and seminar discussions focused on current engineering topics of interest. Additionally, it entails planning, designing, constructing, and managing an engineering project, followed by the task of writing a technical report.

Module 45

Code	Course/Module Title	ECTS	Semester
TKSHME4104	Principle of air Conditioning Systems	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	78	47

Description

This course aims to establish fundamental knowledge of Air-Conditioning design and engineering. To achieve this goal, fundamentals of thermodynamics, heat transfer, and transport physics applied to Air-Conditioning systems. Topics include design temperature and outdoor and indoor room temperatures, Introduction, governing equations of heating load calculation, heat loss through building structure, Infiltration and space heating, cooling load calculation, heat sources. Also, this course discusses Pressure drop of internal fluid flow through circular and rectangular duct and fittings. Design and selection of Air- Conditioning systems. All the numerical examples will be in SI units.

Module 46

Code	Course/Module Title	ECTS	Semester
TKSHME4102	Vibration I	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	78	47
Description			
This course introduces the description of phenomena associated with vibration analysis and theory of machine. Topics covered physical properties of vibration [oscillatory motion, Free vibration, harmonically forced vibration of single degree of freedom system, transient vibration of single degree of freedom systems, multi-degree of freedom system vibrations] and theory of machine [gear, gear train, gyroscopic couple, governors, balancing of rotating masses, balancing of reciprocating masses]. Physical understanding of vibration and theory of machine and applications to practical problems will be stressed. The course is designed to provide a background to higher level courses involving vibration.			

Module 47

Code	Course/Module Title	ECTS	Semester
TKSHME4103	Control Engineering I	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	78	47
Description			
A classical control system course is a specialized field of study that focuses on the principles, theories, and techniques used in the design and analysis of control systems. Classical control refers to the traditional methods and tools used before the advent of modern control theory, which typically includes techniques such as proportional-integral-derivative (PID) control, root locus analysis.			

Module 48

Code	Course/Module Title	ECTS	Semester
TKSHME4204	Electrical Machines I	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	1	63	62
Description			
The A.C. Machines module provides you with a detailed understanding of how alternators, induction			

motor and synchronous motors work, from theoretical concepts through to the design of practical alternators and motors. This module will introduce the fundamentals of principle operation of A.C. machines. Specifically, the module elaborates on fundamentals of three phase induction motor, single phase induction motor, synchronous generators and synchronous motor and begins to introduce detail characteristics, performance of each machine and, towards the end of the module highlighting the reasons A.C. machines importance. Students are introduced to current standard induction machines as well as the benefits synchronous generator can provide. A laboratory element provides students with hands-on and practical understanding in this field and expands the understanding of its applicability to real-world problems.

Module 49

Code	Course/Module Title	ECTS	Semester
TKSHME4200	Air Conditioning Systems	6	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	78	72
Description			
The course introduces Heating, Ventilation and Air Conditioning and its constitutive equations. The physical concepts, basic concepts of Heating, Ventilation and Air Conditioning, Duct design by constant and regain method, duct design by velocity method, physical differences between flow types. This course aims to establish fundamental knowledge of Heating, Ventilation and Air Conditioning design and engineering. To achieve this goal, fundamentals of thermodynamics, heat transfer, and transport physics applied to Heating, Ventilation and Air Conditioning systems. Analysis of Heating, Ventilation and Air Conditioning in thermal Air-Conditioning systems will be offered. Topics include Fans performance, Fan system characteristics curves, Fan system characteristics curves, fan similarity laws. Also, this course discusses Heating, Ventilation and Air Conditioning: Thermally activated absorption technology. Design and selection of Heating, Ventilation and Air Conditioning systems. All the numerical examples will be in SI units.			

Module 50

Code	Course/Module Title	ECTS	Semester
TKSHME4201	Control Engineering II	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	63	62
Description			
A modern control system course is an advanced field of study that focuses on the principles, theories, and techniques used in the design and analysis of control systems using modern control theory. It typically covers topics such as frequency response analysis, state space analysis of continuous systems, controllability and observability, eigenvalues, eigenvectors, and modern control design. Let's explore each of these components in more.			

Module 51

Code	Course/Module Title	ECTS	Semester
TKSHME4200	Graduation Project II	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0	63	37
Description			
The preparatory studies involve conducting a literature review and collecting data for the graduation project within a specific area of concentration. These activities are carried out under the guidance of an academic staff member. The course encompasses directed readings in Mechanical Engineering literature, an introduction to research methods, and seminar discussions focused on current engineering topics of interest. Additionally, it entails planning, designing, constructing, and managing an engineering project, followed by the task of writing a technical report.			

Module 52

Code	Course/Module Title	ECTS	Semester
TKSHME4205	Industrial engineering	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	63	62
Description			
The engineering workshop course focuses on identifying risks in the work environment and industrial safety guidelines. And training on how to measure and determine, and the use of filing tools and their work. Learn about the types of wood used in carpentry, the process of shaping it, and the use of carpentry tools and machines. Training in welding work, its types, and the process of joining metals by welding. Training on various casting works and training on mechanical operation, which includes turning, milling, and grinding. Training on pipe knowledge, how to connect, sanitary engineering works, and training on the basics of electrical workshops.			

Module 53

Code	Course/Module Title	ECTS	Semester
TKSHME4203	Vibration II	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	63	62
Description			
This course aims to establish fundamental knowledge of mechanical vibrations. Presentation of the course starts by applying Newton's second law to derive the equation of motion and then utilizes it to find the natural frequency and mode shapes if the system is two degree of freedom.			

Module 54

Code	Course/Module Title	ECTS	Semester
TKSHME4205	Elective Course - Department	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0	48	52
Description			

*This is an elective course.

Contact

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