



Eastern Mediterranean University

"Virtue, Knowledge, Advancement"



FACULTY OF ENGINEERING

MECHANICAL ENGINEERING DEPARTMENT

MECHANICAL ENGINEERING PROGRAM

me.emu.edu.tr



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Welcome Note by Head of Department

Dear Students,

I would like to welcome you to the Department of Mechanical Engineering. I am pleased that you have chosen our department and I hope that you would find the university experience in our department exceedingly rewarding. Our department has a distinguished record in both teaching and research. Our Mechanical and Mechatronics Engineering BS programs are accredited by ABET. Faculty members have excellent academic credentials and are highly regarded. Our distinguished faculty and well equipped modern laboratories cover all the core disciplines of Mechanical Engineering. Thanks to several generous endowments provided to us from the industry, business sector, equipment, and scholars on our campus each year.

Together we strive to provide you with high-quality engineering education and hope that all our graduates have a strong education and practical background, with teaming and leadership skills. We believe in a broad education which instills a sense of lifelong learning, community and leadership values in students, together with an appreciation of global issues. We encourage students to express and improve themselves with their knowledge and skills to respond to engineering problems in wide range of areas. We are dedicated to prepare our graduates to be leading contributors in response to the dire needs of industry, academia, and government, by providing them high quality education through continuous improvement of the program. Our curriculum undergoes regular revisions to ensure local relevance with a global perspective. Our vision is to graduate creative problem-solvers who can tackle issues from a variety of perspectives. Our mission is to empower you with sound knowledge of the foundations of mechanical engineering along with effective communication, analytical, and problem-solving skills and thus prepare you as competent engineers who can adapt to new circumstances in professional life.

As a department our vision is to be recognized nationally and internationally for excellence in mechanical engineering education, graduating world-class mechanical engineers, and supporting innovative research. We aim to be the first choice in the Middle East region for students starting their engineering education, and for employers that hire mechanical engineers.

On extra-curricular activities level, the department has two student organizations (Society of Mechanical Engineering Students , SMES and a student chapter of American Society of Mechanical Engineers, ASME) through which we urge our family of students, faculty, staff, teaching assistants, and lab technicians to get actively involved and to act together and share their knowledge and experiences.

We aim to provide academic guidance to help you with program requirements, course prerequisites, course sequencing, etc., as well as provide career guidance to help you choose a meaningful and gratifying job after graduation. All our faculty members, staff and I look forward to working closely with you during your education here in the Mechanical Engineering Department. You will notice that our department has a very friendly atmosphere and we always promote a close knit community of students and faculty. Please make good use of this document and I encourage you to contact our faculty and staff if you have any questions regarding the department and our programs.

Sincerely

Prof. Dr. Hasan HACIŞEVKİ
Chair of Department



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1- GENERAL INFORMATION

1.1 Mechanical Engineering Department

The Department of Mechanical Engineering (ME) is one of the first three departments established in this University. The graduate program of the department was started in 1990. The Department offers programs of study leading to the degrees of Bachelor of Science (B.S.) in Mechanical & Mechatronics Engineering, Master of Science (M.S.), and Doctor of Philosophy (Ph.D.) in Mechanical Engineering. The Mechanical Engineering Department has the largest population of international students in EMU at present. In 2011, the Mechanical Engineering program was fully accredited by ABET (Accreditation Board for Engineering and Technology). ABET is a non-profit organization and accreditation board that accredits programs in engineering, applied science, computing etc. ABET assures the quality of university programs, college or institutions. It is required by ABET that our engineering programs meet the quality standards set by ABET. ABET accreditation provides vast number of opportunities to students, institutions, programs and employers, for example, it helps students and parents to choose among quality assured programs. Engineers, graduated from an ABET accredited engineering program, are distinguished from others as employers seek for well-prepared engineers. Institutions or colleges continuously improve quality of their programs for better outcomes.

1.2 Eastern Mediterranean University Mission Statement

The Eastern Mediterranean University has set as a mission becoming a university acting in line with universal values, guided by internationally recognized academic educational criteria, providing solutions for regional and international problems with a sense of social responsibility, raising graduates who have internalized multiculturalism, free thought, tolerance and participation as well as carrying out work to make international improvements in the fields of production, science, arts and sports. This statement is published in the University website: <http://www1.emu.edu.tr/en/about-emu/mission-and-vision/c/594>

1.3 Faculty of Engineering Mission Statement

- Contribute to the betterment of our society through the pursuit of innovative education, active learning and cutting edge scientific research.
- Maintain our regional leadership in engineering education and research, and develop close relationships with and provide knowledge, services and technology to all related communities in its area.
- Provide opportunities and create an esteemed academic environment for the exchange of diversity of cultures, social, political and ideological knowledge and professional talents among the students as well as the faculty.
- Assure quality and foster systematic pursuit of improvement in quality of education to graduate engineers with abilities to analyze and interpret data, design and conduct experiments, apply knowledge to solve engineering problems in a global, economic, environmental, societal context with focus on social, political, ethical, health and safety, manufacturability, and sustainability in a life-long learning capacity.

This statement is published in the Faculty website: <http://eng.emu.edu.tr/>

1.4 Departmental Mission Statement

The mission of the Mechanical Engineering Department is to cultivate on the creation integration, transfer and application of knowledge relevant to the disciplines of Mechanical and Mechatronics Engineering. The aim of the Mechanical and Mechatronics Engineering programs is to encourage students to express and improve themselves with their knowledge and skills to respond to engineering problems in wide range of areas. The programs are dedicated to prepare the graduates to be leading contributors in response to the needs of industry and society. Also, the purpose of the post graduate programs is to contribute to the technological improvement to serve national and international communities. Through continuously developing our educational and research programs, students graduating as engineers become professional leaders who can apply their knowledge and skills to work on the engineering problems encountered by community and industry. This statement is published in the Department website. <https://me.emu.edu.tr/en/about-us/mission-and-vision>

1.5 Mission of the Program

The mission of the BS in Mechanical Engineering program is to cultivate on the creation, integration, transfer and application of knowledge relevant to the discipline of Mechanical Engineering. The aim of the program is to encourage students to express and improve themselves with their knowledge and skills to respond to engineering problems in wide range of areas. The aim of the program is to empower the graduates with sound knowledge of the foundations of mechanical engineering along with effective communication, analytical, and problem-solving skills. The program is dedicated to prepare the graduates to be leading contributors

in response to the dire needs of industry, academia, and government, by providing them high quality education through continuous improvement of the program.

1.6 Program Educational Objectives

The educational objectives of the undergraduate program in Mechanical Engineering are to provide a high-standard education and training to its students so that beyond 3 to 5 years after graduation will enable the graduates to

PEO1: Work successfully in Mechanical Engineering- related fields and demonstrate professional engineering competence via attaining positions of increasing responsibility

PEO2: Engage in activities that foster professional growth and learning

PEO3: Exhibit effective leadership in multicultural and multidisciplinary settings of a competitive global work environment

PEO4: Fulfill professional responsibilities, conforming to ethical and environmental values

1.7 Student Outcomes

The ME program ensures the student outcomes ‘1’ through ‘7’ in its curriculum, and the outcomes are evaluated through direct and indirect assessments. Upon completion of the BS in Mechanical Engineering Program at the Department of Mechanical Engineering, Eastern Mediterranean University, the graduates have the following knowledge, understanding, and capabilities:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

1.8 Department Website

The following information is made available on the department’s homepage (<https://me.emu.edu.tr/en>):

- Program Educational Objectives
- Student Outcomes
- Enrollment Statistics
- News
- Mission and Vision
- Facilities
- Laboratories
- Academic Calendar
- Information Booklet
- Semester Course List
- Honor and High Honor List
- Curriculum
- Course Descriptions
- Capstone Team Projects
- Academic Staff
- Administrative Staff
- Technician Staff
- Research Assistants
- Student Survey Outcomes

2- STAFF

2.1. Academic Staff

Full Time Faculty Members



Hasan HACISEVKI

Chair of the Department, Professor of Mechanical Engineering. Dr. Hacisevki received his B.S, M.S and Ph.D. degrees from Eastern Mediterranean University. Dr. Hacisevki's research interests include Experimental studies in Fluid Dynamics, Automotive Engineering and Mechanical Design.

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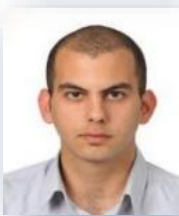
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Murat ÖZDENEFİ

Vice Chair of the Department, Associate Professor of Mechanical Engineering. Dr. Özdenefe gained his BSc. from Mechanical Engineering Department, Çukurova University. Dr. Özdenefe then received his MSc. in Mechanical Engineering Department, Eastern Mediterranean University. He completed His PhD in School of Mechanical, Aerospace and Civil Engineering, The University of Manchester with the PhD. project "Phase Change Materials and Thermal Performance of Buildings in Cyprus". Dr. Özdenefe's research interests are: Building Heat Transfer, Building Thermal Performance Simulation, Phase Change Materials, Energy Auditing, Passive Buildings.

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Devrim AYDIN

Vice Chair of the Department, Assistant Professor of Mechanical Engineering. Dr. Aydin gained his BSc. and MSc. from Mechanical Engineering Department, Yıldız Technical University. He completed His PhD. in Institute of Sustainable Energy Technology, Engineering Faculty, The University of Nottingham with the PhD. project "Investigation of innovative thermochemical energy storage processes and materials for building applications". Dr. Aydin's research interests are: Thermal energy storage, adsorption/absorption materials and processes, evaporative cooling, desiccant systems, power cycles, low carbon buildings, drying systems, solar energy systems and water harvesting technologies.

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Uğur ATIKOL

Professor of Mechanical Engineering. Dr. Atikol is a Professor of Mechanical Engineering. He received his B.S degree from the University of Leicester and M.Sc. degree from the University of Manchester. He completed his Ph.D. in Eastern Mediterranean University. Dr. Atikol's research interests are Energy Management, Planning and Utilization, Solar Energy and Desalination. He has been the director of EMU Energy Research Center since 2004.

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Associate Professor of Mechanical Engineering. Dr. Qasim Zeezhan received his B.E. Mechanical Degree from National University of Sciences and Technology (NUST), Pakistan. He received his MS and PhD in Flight Vehicle Design from Beihang University (BUAA), China. His research interests include Multidisciplinary Design and Optimization (MDO), Systems Engineering, Industry 4.0, Machine Learning and application of Modern Meta-Heuristic Optimization Techniques.

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Mohammed ASMAEL

Assistant Professor of Mechanical Engineering. Dr Mohammed his BSc. From faculty of mechanical engineering, AL-TAHDI University-Libya. Dr Mohammed then received his MSc. in Mechanical-Advanced manufacturing technology from faculty of Mechanical Engineering, University Technology Malaysia (UTM). He completed his PhD in faculty of Mechanical And Manufacturing Engineering, University Tun Hussein Onn Malaysia (UTHM). Dr Mohammed research interests are: Aluminum alloys, Magnesium alloys, Casting, Solidification, Phase transformation, Thermal analysis, welding, Materials Engineering and Performance.

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Babak SAFAEI

Assistant Professor of Mechanical Engineering. Dr. Babak Safaei received his Bachelor and Master degree in Mechanical Engineering from Iran. He received his PhD. degree in Mechanical Engineering from Department of Mechanical Engineering at Tsinghua University. Dr. Babak's research interests are: Micro and Nano Mechanics, Computational Mechanics, Advanced Manufacturing, Design of Lightweight Structures, Composite Materials, Mechanical Vibration, Biomechanics and Drug Delivery, Nonlocal Theory, Finite Element and Mesh-Free Method.

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Emeritus Faculty Members



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Part Time Faculty Members



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Part time Lecturer in Mechanical Engineering. Ms. Nursel Talhaoğlu completed her Bachelor of Science in Mechanical Engineering from Eastern Mediterranean University, North Cyprus in 2012. She joined the Department of Mechanical Engineering at EMU as a part time instructor. She has work experience in CAD, Design of Plumbing Systems, and Heating, Ventilation and Air Conditioning Systems.

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2.3. Administrative and Technical Staff

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Habibe ÖĞÜT	ME 007	2185	
Zehra EKİZ	ME 007	2185	

3- FACILITIES

3.1 American Society of Mechanical Engineers (ASME) Student Section

ASME is a non-profit educational and technical organization of professional mechanical engineers. ASME Student Section, in EMU, has been established since March 1997. EMU is one of the four universities in North Cyprus and Turkey having ASME Student Section. The main purpose of ASME Student Section is to organize conferences relating to mechanical engineering topics and to share views and ideas between prospective mechanical engineers and industry.

3.2 Departmental Library & Reading Area

Departmental library in ME018 consists of nearly 350 books, M.S. and PhD. theses (submitted by mechanical engineering graduate students), and undergraduate project reports.

3.3 Conference Room

Conference room (MESEM2) is located within the department building at the ground floor. It is equipped with the instructional technology in order to have an excellent teaching environment. This unit is also used for national/international seminars and presentations.

3.4 Laboratories

The department has extensive, well equipped modern laboratories that cover all the core disciplines of Mechanical Engineering. The department has separate laboratories for ME008 Mechanical Workshop, ME014 Mechanics of Materials Lab., ME016 Electric Vehicle Development Center, ME018 Library & Reading Area, ME020 Fluid Mechanics & Automotive Lab., ME024B Manufacturing Lab., ME024C Material Science Lab., ME024D Metrology and Quality Control Lab., ME025 Thermal Sciences Lab. ME028 Mechatronics Lab., ME029 CNC Workshop, and a separate room ME001 for Capstone Team Projects. The laboratories are equipped with apparatus ranging from basic instrumentation for fundamental exercises to more advanced experiments using its state-of-the-art equipment. A variety of modern engineering tools and software are available for teaching and research. The laboratories provide undergraduate level instruction to meet the requirements of the industry and also serve as a platform for graduate level research.

Mechanical Workshop - ME008



The workshops include well-equipped machining, sheet metal working and welding sections. The machining section is equipped with various sized lathes, milling machines, drilling machines, shaper, and grinding machines including tool, surface and cylindrical grinders. The welding section has a number of arc and gas welding equipment including TIG and MIG welding sets and a Plasma Cutting Machine. These sections are available for use by staff and students under supervision. The workshop staff also undertakes industrial work and projects.



Mechanics of Materials Laboratory - ME014



Mechanics of Materials Laboratory provides testing facilities for Strength of Materials, Engineering Dynamics and Vibrations. Whirling of shafts apparatus, Coriolis acceleration apparatus, gyroscopes, inertia wheels, and balancing equipment are available for tests. Moreover, other equipment is also available for stress analysis experimentation, including thin/thick walled cylinders for experiments, beam deflections experiments with strain gages, torsion testing machine, and a 50 ton hydraulic press for tension & compression experiments. A vibration bench is also available to study the effects of various vibration parameters.



Electric Vehicle Development Center - ME016



Dedicated laboratory reserved for research and development purposes of electric vehicle technologies. Mechanical parts, electrical circuits and mechatronic systems are designed, developed and manufactured in this facility.

Aerodynamics Laboratory - ME017



In the Aerodynamics Laboratory, there are two wind tunnels. Wind tunnels are used to study aerodynamics, effect of air, aerodynamic forces and how air flows through the tunnel. One of the wind tunnels has maximum capacity of 50 m/s with 10x40 cm test section and the other wind tunnel has the maximum capacity of 30 m/s with 50x50 test section.



Fluid Mechanics and Automotive Laboratory - ME020



Fluid Mechanics Laboratory contains following setups for demonstration and study of basic fluid mechanics principles as flow measuring apparatus, Heleshaw apparatus, pipe friction loss, vortex motion apparatus, water jets, etc. In addition, small compact wind tunnel and air bench enable students to perform experiments on compressible fluids. This laboratory also contains Francis and Pelton turbines, axial and radial flow pump-turbine test rigs, and pumps of various sizes for experimentation.

Automotive Laboratory is equipped for performance tests on petrol/diesel, two and four stroke engines. A variable compression ratio I.C. engine test bed is used for the study of compression ratio and timing effects on petrol and diesel engine performance.



Manufacturing Laboratory - ME024B



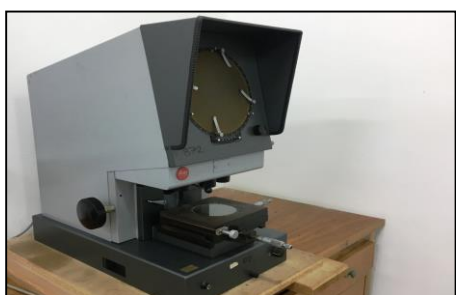
The Manufacturing laboratory seeks to establish a rational foundation for manufacturing based on a systematic understanding of the complex interactions among the many areas of manufacturing like process planning, design, simulation, and control. The facilities include Programmable Logic Controllers (PLC) and software programs for Manufacturing Lifecycle Management (MLM), G-Code programming, industrial robot programming, material resource planning and ergonomic analysis.

Materials Science Laboratory - ME024C



Materials Science Laboratory provides testing facilities for determining various properties of engineering materials, such as strength & hardness, and testing for creep and impact. Available equipment includes optical microscopes, hardness tester, impact tester, tensile testing apparatus, corrosion test apparatus and furnaces for heat treatment.

Metrology and Quality Control Laboratory - ME024D



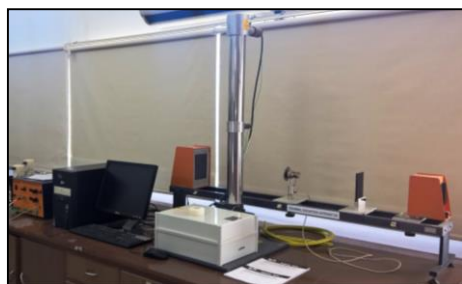
The equipment in the Quality Control laboratory enables students to perform roundness, flatness, and straightness tests as well as the tests for checking accuracy of the measuring instruments and machine tools. Optical instruments such as autocollimator, angle decor, interferometer, alignment telescope, and optical microscope are also available. The laboratory is also equipped with digital instruments and printer for statistical process control.

Thermal Sciences Laboratory - ME025



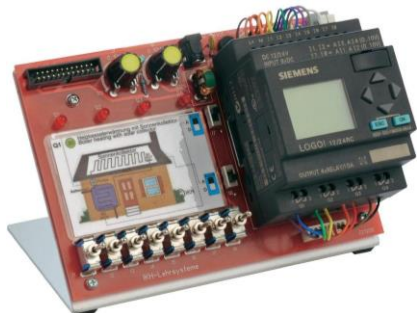
In the Thermodynamic Section, facilities are available for experimentation and demonstration of practical concepts to undergraduate students. These experimentations include steam bench, steam engine, air compressor, bomb calorimeter, flash point apparatus and converging-diverging nozzle, and ram-jet.

In the Heat Transfer Section, various tests can be conducted on conduction, free and forced convection and radiation heat transfer apparatus. Heat exchanger equipment is used to investigate the performance of parallel- and counter-flow configurations. The laboratories are also equipped with a hot wire anemometer and data loggers.



Refrigeration and Air Conditioning Section contains test and demonstration equipment on refrigeration ranging from small scale to industrial scale. Some benches are modular and allow connection of different modules for comparative studies. Tools necessary for servicing a refrigeration system are also available. An air conditioning bench with pre-heaters, after-heaters and humidifiers, enables psychometric processes to be studied. An experimental cooling tower is also available for tests.

Mechatronics Laboratory – ME028



The Mechatronics Lab provides state of the art facilities and experimental setups to learn and enjoy the field of mechatronics. These experiments cover the function of basic devices for measuring and acquiring data of different kinds of variables in mechatronic systems with emphasis on analog electronics, digital electronics, sensors and transducers, actuators, microprocessors and PLCs.

CNC Workshop – ME029



This laboratory is used for undergraduate and graduate studies, as well as research. The hardware and software available at the laboratory include: Master-CAM Mill version 7.0, Pro-Model, Mechanical Desktop, Mill-CAM Designer, Lathe CAM Designer, Genius, AutoCAD, Master-CAM, Solid Works etc., and the hardware such as CNC turning and milling machines.

Computer Laboratories - ME116



There are three computer laboratories in addition to a CAD/CAM Lab. Of these labs, two are AUTOCAD labs, with each one having 30 computers and a plotter. These equipment are used, primarily, for engineering graphics and engineering drawing courses. The Computer Laboratory is an internet laboratory facilitated with 30 computers.



Capstone Team Project Room - ME001



This is a reserved workplace is a space dedicated for prototype assembly. The capstone project teams regularly comes together to finalize their design at this facility, which also serves as a storage space for project components and tools for each individual group. The facility offers various hand tools, working desk area, storage cupboards and internet access.



4- PROGRAM CURRICULUM

4.1 Courses

The Bachelor of Science (B.S.) program offers a wide range of courses in the curriculum which cover all the key areas of mechanical engineering. The coursework covers the core subjects in thermal and fluid science, material science, mechanics, design and manufacturing. A wide range of area elective courses offered to students in their *senior* year enables them to specialize in their areas of interest. According to the requirement, courses are supplemented with tutorials and experimental work. Moreover, students are required to spend a total of *eight weeks* in industry to gain practical experience. The breadth and depth of the mechanical engineering program curriculum enables our graduates to choose from a variety of career options in research, development, design, production, sales, and management in the industry.

Subject Areas in Mechanical Engineering

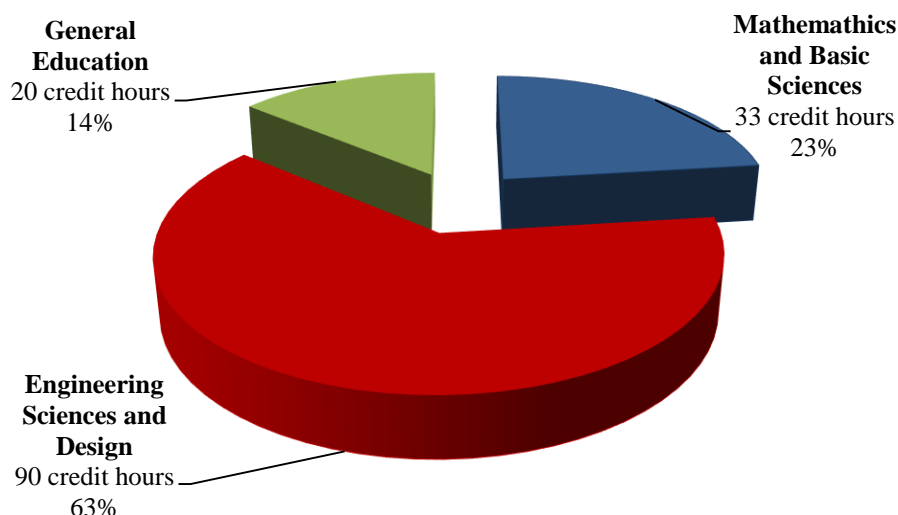
Consistent with the other engineering programs at Eastern Mediterranean University, Mechanical Engineering BS curriculum begin with studies in basic science and mathematics. These basic science and mathematics courses are applied in engineering sciences and design courses. Ability of communication; oral and written, understanding ethical and professional issues and working in multicultural environment are mostly gained with general education courses. Engineering design activities start during the second year in various courses, progressing in-depth during the third and fourth years as the student's technical skill increases. The design experience culminates with a Capstone Design sequence, which builds upon the fundamentals of engineering, mathematics, science, communication skills, humanities and social sciences, economics, ethics, safety, reliability, industrial applicability, ergonomics and social impact as well as engineering standards. This helps the students to prepare themselves to their future career. Mechanical Engineering curriculum includes four area elective courses i.e. Area Elective that are specially designed, aiming to give profound knowledge in particular areas.

Curriculum Course Categories

Courses in Mechanical Engineering Program curriculum is sub grouped under three subject areas namely:

- Mathematics and Basic Sciences
- Engineering Sciences and Design
- General Education

Mathematics and Basic Sciences courses comprise 23% of the total credit hours, Engineering Sciences and Design courses constitute 63% of the total credit hours and the General Education courses are 14% of the total credit hours in the Mechanical Engineering Program. Total credit hours and percentages of each subject area can be seen in Figure.



Total credit hours and percentages of each subject area of Mechanical Engineering Program

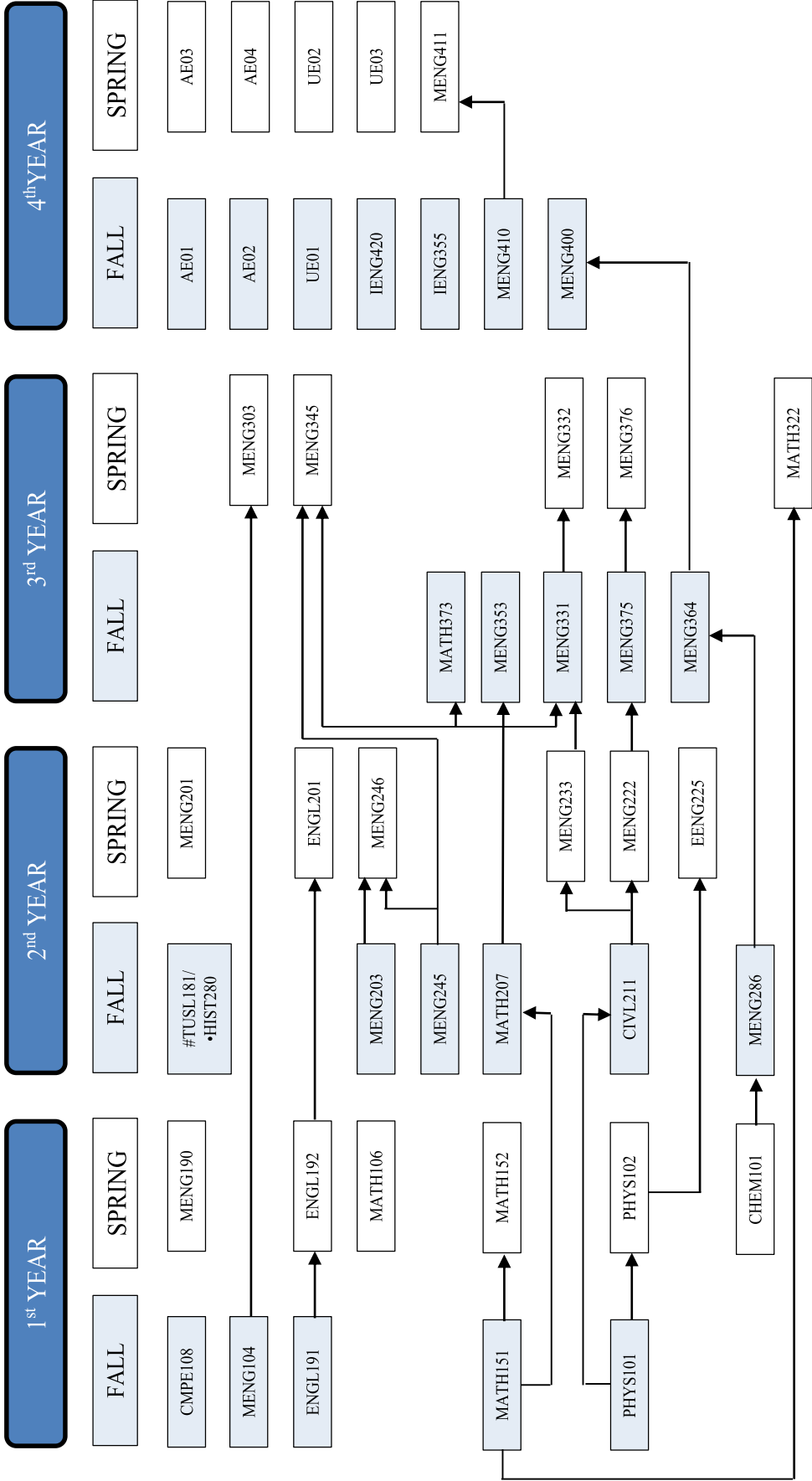
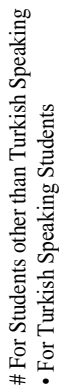
The following list provides information on each course in the following order: Semester, Reference Code, Course Code, Full Course Title, Credit (weekly lecture hours, laboratory hours and tutorial hours) and Prerequisite Courses.

Mechanical Engineering Curriculum

Sem #	Ref Code	Course Code	Course Name	(Lecture, Lab/ Tutorial) Total Credit Hours	ECTS Credits	Pre-Requisites
1	23710	MENG104	Engineering Graphics	(2,3)3	7	
1	23734	CMPE108	Algorithms & Programming	(2,3)3	6	
1	23712	ENGL191	Communication English-I	(3,1)3	4	
1	23713	MATH151	Calculus-I	(4,1)4	6	
1	23714	PHYS101	Physics-I	(4,1)4	6	
1 st Semester Total Credits				17/17		
2	23720	MENG190	Introduction to Mechanical Engineering	(1,1)1	4	
2	23721	CHEM101	General Chemistry	(4,1)4	6	
2	23722	ENGL192	Communication English-II	(3,1)3	4	ENGL191
2	23723	MATH152	Calculus-II	(4,1)4	6	MATH151
2	23724	PHYS102	Physics-II	(4,1)4	6	PHYS101
2	23726	MATH106	Linear Algebra	(3,1)3	5	
2 nd Semester Total Credits				19/36		
3	23730	MENG203	Experimental Methods for Engineers	(2,1)2	4	
3	23731	MENG286	Materials Science	(3,1)3	5	CHEM101
3	23732	MENG245	Thermodynamics-I	(3,1)3	6	
3	23733	CIVL211	Statics	(4,1)4	6	PHYS101
3	23725	TUSL181	Turkish as a Second Language*	(2,0)2	2	
3	23725	HIST280	History of Turkish Reforms #	(2,0)2	2	
3	23735	MATH207	Differential Equations	(4,1)4	6	MATH151
3 th Semester Total Credits				18/54		
4	23740	MENG201	Mechanical Workshop Practice	(1,3)2	4	
4	23741	MENG246	Thermodynamics-II	(3,1)3	6	MENG245 & MENG203
4	23742	MENG222	Strength of Materials	(4,1)4	6	MENG231 or CIVL211
4	23743	MENG233	Rigid Body Dynamics	(4,1)4	6	MENG231 or CIVL211
4	23744	EENG225	Fundamentals of EEE	(3,1)3	5	PHYS102
4	23745	ENGL201	Communication Skills	(3,0)3	4	ENGL192
4 th Semester Total Credits				19/73		
5	23750	MENG353	Fluid Mechanics	(4,1)4	7	MATH207
5	23751	MENG364	Manufacturing Technology	(4,1)4	6	MENG286
5	23752	MENG331	Dynamics of Machinery	(4,1)4	6	MENG231 OR MENG233 AND MATH241 OR MATH207
5	23753	MENG375	Machine Elements-I	(3,1)3	6	MENG222
5	23754	MATH373	Numerical Analysis for Engineers	(3,1)3	5	MATH207
5 th Semester Total Credits				18/91		
6	23760	MENG332	Systems Control	(4,1)4	7	MENG331
6	23761	MENG345	Heat Transfer	(4,1)4	6	MENG245, MATH207
6	23762	MENG376	Machine Elements-II	(3,1)3	6	MENG375
6	23763	MENG303	Principles of Computer Aided Engineering	(2,3)3	6	MENG104
6	23764	MATH322	Probability & Statistical Methods	(3,1)3	5	MATH151
6 th Semester Total Credits				17/108		
7	23770	MENG400	Summer Practice	(0,0)0	1	MENG364
7	23771	MENG410	Introduction to Capstone Design	(1,1)1	2	Min 100 credit hrs completed. Subject to Supervisor's Approval
7	23772	AE-1	Area Elective-1**	(4,1)4	7	
7	23773	AE-2	Area Elective-2**	(4,1)4	7	
7	23711	UE-01	University Elective-01	(3,0)3	4	
7	23775	IENG355	Ethics in Engineering	(3,0)3	5	
7	23776	IENG420	Engineering Economy	(3,0)3	5	
7 th Semester Total Credits				18/126		
8	23780	MENG411	Capstone Team Project	(1,4)3	7	MENG410
8	23781	AE-3	Area Elective-3**	(4,1)4	7	
8	23782	AE-4	Area Elective-4**	(4,1)4	7	
8	23774	UE-02	University Elective-02	(3,0)3	4	
8	23784	UE-03	University Elective-03	(3,0)3	4	
8 th Semester Total Credits				17/143		

*For Foreign Students # For Turkish Students ** Departmental Consent

Table 4.1 Prerequisite Flowchart for the Mechanical Engineering Curriculum



4.2 Course Descriptions

Engineering Sciences and Design: Area Core Courses

1.	MENG104 Engineering Graphics Principles of engineering graphics with the emphasis on laboratory use of AUTOCAD software. Plane Geometry, geometrical constructions, joining of arcs, Dimensioning principles, principles of orthographic projection, isometric and oblique drawing, principles of sectioning, reading engineering drawing from blueprints. Credits: (2 / 3 / 0) 3 Prerequisites: None Abbreviated Title: Engineering Graphics Category: Area Core Course Teaching Language: English Keywords: ACAD, Orthographic, Sectioning, dimensioning
2.	MENG190 Introduction to Mechanical Engineering This course aims to familiarize first year mechanical engineering students by introducing them to the fundamentals of discipline; job opportunities for mechanical engineers; basic study skills; an overview of fundamentals laws and principles of mechanical engineering; introduction to problem layout and problem solving methods; simplified engineering modeling and analysis of mechanical systems; collection, manipulation and presentation of engineering data; ethical issues; and the importance of computers and language skills for effective communication. Credits: (1 / 0 / 1) 1 Prerequisites: None Abbreviated Title: Int to Mechanical Engineering Category: Area Core Course Teaching Language: English Keywords: Introduction to Mechanical engineering, standards, ethics, communication.
3.	MENG286 Materials Science Crystal structure and crystal geometry phase diagrams of alloy systems, heat treatments applied to metallic materials and plain-carbon steels. Mechanical properties of metals stress-strain in metals, tensile test, hardness and hardness testing, fatigue and fracture of metals, impact test, creep of metals and creep test. Strengthening and plastic deformation of metals. Mechanical properties of ceramics, glasses, polymers and composites. Corrosion of metals. Material selection based on mechanical properties. Credits: (3 / 1 / 0) 3 Prerequisites: CHEM101 Abbreviated Title: Materials Science Category: Area Core Course Teaching Language: English Keywords: Crystal Structure, Mechanical Testing, Hardening of Steels, Heat Treatment
4.	MENG203 Experimental Methods for Engineers Principles and methods of experimentation. Sensing devices, measuring devices and their limitations. Designing and planning experiments; data analysis, error analysis and uncertainty analysis. Performing and reporting of experiments. Credits: (2 / 1 / 0) 2 Prerequisites: None Abbreviated Title: Experimental Methods for Engineers Category: Area Core Course Teaching Language: English Keywords: Analysis of Experimental Data, Displacement and Area Measurement, Pressure Measurement, Flow Measurement
5.	MENG245 Thermodynamics-I Basic concepts and definitions. Properties of pure substances. The first law of thermodynamics: closed and open systems. The second law of thermodynamics. Entropy. Second-Law analysis of engineering systems. Credits: (3 / 1 / 0) 3 Prerequisites: None Abbreviated Title: Thermodynamics-I Category: Area Core Course Teaching Language: English Keywords: Basic Concepts of Thermodynamics, First Law of Thermodynamics, Second Law of Thermodynamics, entropy
6.	MENG246 Thermodynamics-II Gas power cycles. Vapor and combined power cycles. Refrigeration cycles. Thermodynamic property relations. Gas mixtures. Gas-vapor mixtures and air conditioning. Chemical reactions. Chemical and phase equilibrium. Thermodynamics of high speed fluid flow. Credits: (3 / 1 / 0) 3 Prerequisites: MENG245 & MENG203 Abbreviated Title: Thermodynamics-II Category: Area Core Course Teaching Language: English Keywords: Power generation, Refrigeration and Air conditioning, Combustion, Entropy
7.	MENG222 Strength of Materials Review of Statics. Stress and strain, and Hooke's law. Constitutive relations. Analysis of stress and strain. Axially loaded members. Torsion. Stress in beams. Combined stress. Deflection of members. Design of beams and shafts. Columns. Credits: (4 / 1 / 0) 4 Prerequisites: MENG231 or CIVL211 Abbreviated Title: Strength of Materials Category: Area Core Course Teaching Language: English Keywords: Axial stress, shear stress, torsion, bending, beams, buckling
	MENG233 Rigid Body Dynamics

8.	<p>Kinematics of rigid bodies. 2-D rigid body dynamics, D'Alembert's principle. Energy Methods. Principle of impulse and momentum Angular momentum in 3-D Motion about a fixed axis. Un-damped vibration of rigid bodies.</p> <p>Credits: (4 / 0 / 1) 4 Abbreviated Title: Rigid Body Dynamics Keywords: Particle And Rigid Body Dynamics, Impact, Relative Motion, Momentum, Work And Energy</p> <p>Prerequisites :MENG231 or CIVL211 Category: Area Core Course Teaching Language: English</p>
9.	<p>MENG201 Mechanical Workshop Practice This is to be conducted in the Mechanical Engineering Department's workshops by all Mechanical Engineering students who have completed a minimum of three semesters in the program. Students will perform various hand and machine tool operations under staff supervision. It includes introduction to engineering materials, and selected practices on laying-out and setting out a job, using measuring devices. At the end of the training students will be required to complete a report regarding their training.</p> <p>Credits: (1 / 3 / 0) 2 Abbreviated Title: Workshop Practice Keywords: Workshop</p> <p>Prerequisites: None Category: Area Core Course Teaching Language: English</p>
10.	<p>MENG353 Fluid Mechanics Fluid statics and forces on submerged bodies Introduction to kinematics of fluid flow. Energy, continuity and momentum equations. Navier-Stokes equations. Viscous flow through closed conduits. Fundamentals of boundary layer analysis. Dimensional analysis. Potential flow. Introduction to hydraulic machinery.</p> <p>Credits: (4 / 1 / 0) 4 Abbreviated Title: Fluid Mechanics Keywords: Fluid Mechanics</p> <p>Prerequisites: MATH207 Category: Area Core Course Teaching Language: English</p>
11.	<p>MENG364 Manufacturing Technology Fundamentals and principles of major manufacturing processes: casting, bulk deformation, sheet metalworking, powder metallurgy. Processing of polymers, ceramics, glass, rubber and composites. Metal cutting: cutting conditions, forces, temperatures, tool life, surface finish, coolants. Cutting tool materials. Principles, tools and process capabilities of basic machining operations: turning, milling, drilling, planning, shaping, boring, broaching. Gear manufacturing. Abrasive operations: grinding, finishing operations. Non-traditional processes. Basics of joining and assembling. Fusion and solid-state welding. Essentials of computer numerical control.</p> <p>Credits: (4 / 1 / 0) 4 Abbreviated Title: Manufacturing Technology Keywords: Machining, Casting, Sheet Metal Forming, Bulk Forming, Plastics</p> <p>Prerequisites: MENG286 Category: Area Core Course Teaching Language: English</p>
12.	<p>MENG331 Dynamics of Machinery Mechanical vibrations: 2-DOF vibrating systems, vibration measuring instruments, numerical methods for multi-degree of freedom systems, Dunkerley's equations, vibration of continuous systems, random vibrations. Balancing of machinery: rigid rotors, reciprocating machines, flywheels, planar linkages, balancing machines and instrumentation. Cam dynamics, gyroscope and governors.</p> <p>Credits: (4 / 1 / 0) 4 Abbreviated Title: Dynamics of Machinery Keywords: Vibration, Mechanisms, Rigid Body Dynamics, Frequency Analysis</p> <p>Prerequisites: (MENG233 or MENG231) and (MATH207 or MATH241) Category: Area Core Course Teaching Language: English</p>
13.	<p>MENG332 Systems Control Control engineering mathematics, complex variables and Laplace transforms. Initial and final value theorems. Introduction to practical controllers and control principles. Mathematical modeling of dynamic systems, transfer functions and block diagrams, transient response analysis, stability analysis. Analysis of systems, deviation of transfer function and frequency response for various systems, devices and elements.</p> <p>Credits: (4 / 1 / 0) 4 Abbreviated Title: Systems Control Keywords: Mechanical Engineering Control, Mechanical Engineering Controllers, Control Principles, Mechanical Devices And Elements</p> <p>Prerequisites: MENG331 Category: Area Core Course Teaching Language: English</p>
14.	<p>MENG345 Heat Transfer Introduction, Conservation Laws, Introduction to conduction, One-dimensional steady state conduction, thermal generation, and extended surface, Two-dimensional and transient conduction, Introduction to convection, External Flow, Internal Flow, Free Convection, Boiling and Condensation, Heat Exchangers, Thermal Radiation, Absorption, reflection, and transmission, Radiation exchange, Mass Transfer.</p> <p>Credits: (4 / 1 / 0) 4 Abbreviated Title: Heat Transfer Keywords: Conduction, Convection, Radiation, Heat Exchangers</p> <p>Prerequisites: MENG245 and MATH207 Category: Area Core Course Teaching Language: English</p>

15.	<p>MENG375 Machine Elements-I</p> <p>The course covers fundamentals of machine design which include: general design rules, load analysis, materials selection, stress, strain and deflection analysis, failure theories, the concepts of reliability and safety, tolerances and fits; and introduces design guidelines.</p> <p>Credits: (3 / 0 / 1) 3 Prerequisites: MENG222</p> <p>Abbreviated Title: Machine Elements-I Category: Area Core Course Teaching Language: English</p> <p>Keywords: Design of Machine Elements, Strength Of Materials, Stress, Deflection, Strength, Material Selection, Failure Theories, Reliability, Safety, Tolerance and Fits</p>
16.	<p>MENG376 Machine Elements-II</p> <p>Mathematical models and equations for: fasteners and power screws, springs, bearings, gears, shafts, clutches and brakes, belt and chain drives. Force and stress analysis of gears and gear systems. Cam and follower systems. Systematic approach to design. Student s will have an opportunity to work on a design project using learned knowledge.</p> <p>Credits: (3 / 0 / 1) 3 Prerequisites: MENG375</p> <p>Abbreviated Title: Machine Elements-II Category: Area Core Course Teaching Language: English</p> <p>Keywords: Design of Machine Parts, Machine Elements, Components Design, Mechanical Engineering Design</p>
17.	<p>MENG303 Principles of Computer Aided Engineering</p> <p>Integration of computers into the design cycle. Interactive computer modeling and analysis. Geometrical modeling with wire frame, surface, and solid models. Finite element modeling and analysis. Curves and surfaces and CAD/CAM data exchange. The integration of CAD, CAE and CAM systems.</p> <p>Credits: (2 / 3 / 0) 3 Prerequisites: MENG104</p> <p>Abbreviated Title: Principles of CAE Category: Area Core Course Teaching Language: English</p> <p>Keywords: Mechanical Engineering Design, CAE, CAD, CAM</p>
18.	<p>CMPE108 Algorithms and Programming</p> <p>Introduction to Fortran, Visual Basic (VB) and Matlab programming languages: data types, constants and variables; program structures. Selection, and repetition structures and functions. Concepts of Object Oriented programming. Loops and Multi dimensional arrays. File processing. Formatted I/O. Random file access. Index structures, file organization and database applications.</p> <p>Credits: (2 / 3 / 0) 3 Prerequisites: None</p> <p>Abbreviated Title: Algorithms and Programming Category: University Core Course Teaching Language: English</p> <p>Keywords: Algorithms, Programming, Fortran</p> <p>Department offering the course: CMPE Department</p>
19.	<p>CIVL211 Statics</p> <p>Basic definitions, concepts and principles. Statics of particles, resultant of forces in space, equilibrium and free-body concept. Statics of rigid bodies, moments, force couples and equivalent force systems. Equilibrium of rigid bodies. Distributed forces, centroids and centers of gravity. Definition of determinacy of structures, analyses of statically determinate structures including trusses, beams, frames and arches. Analysis of cables. Shear force and bending moment diagrams. Friction. Moment of inertia.</p> <p>Credits: (4 / 0 / 1) 4 Prerequisites: PHYS101</p> <p>Abbreviated Title: Statics Category: Area Core Course Teaching Language: English</p> <p>Keywords: Forces, resultant, component, equilibrium, moment, rigid bodies, centroid, statically determinacy, moment of inertia</p> <p>Department offering the course: Civil Engineering</p>

20.	<p>EENG225 Fundamentals of Electrical Engineering</p> <p>This course provides the basic phenomenon of Electrical Engineering to Industrial and Mechanical Engineering students. Topics covered are: Basic electrical quantities, fundamental circuit laws, sinusoidal steady-state analysis and transformers, three-phase circuits, principles of electromechanical energy conversion, DC and AC machines.</p> <p><i>Credits: (3 / 1 / 0) 3</i> <i>Prerequisites: PHYS102</i></p> <p><i>Abbreviated Title: Fundamentals of Electrical Eng</i> <i>Category: Area Core Course</i> <i>Teaching Language: English</i></p> <p><i>Keywords: Circuit laws, transformers, electromechanical</i></p> <p><i>Department offering the course: 21 – Department of Electrical and Electronics Engineering</i></p>
21.	<p>IENG420 Fundamentals of Engineering Economy</p> <p>An introduction to the basics of economic analysis for decisions in engineering design, in manufacturing, in manufacturing equipment, and in industrial projects. Time value of money. Cash flow analysis. Cost of capital. Return on investment. Elements of cost and cost estimation. Break-even analysis. Decision making among alternatives. Effects of depreciation. Taxes. Replacement analysis. Inflation.</p> <p><i>Credits: (3 / 0 / 0) 3</i> <i>Prerequisites: None</i></p> <p><i>Abbreviated Title: Fundamentals of Engineering Economy</i> <i>Category: Area Core Course</i> <i>Teaching Language: English</i></p> <p><i>Keywords: Financial Decision Making, Cost, Cost-Benefit, Interest, Capital Budgeting, Rate-of-return. Replacement</i></p> <p><i>Department offering the course: 26 – Department of Industrial Engineering</i></p>
22.	<p>IENG355 Ethics in Engineering</p> <p>This course is designed to introduce moral rights and responsibilities of engineers in relation to society, employers, colleagues and clients. Analysis of ethical and value conflict in modern engineering practice. Importance of intellectual property rights and conflicting interests. Ethical aspects in engineering design, manufacturing, and operations. Cost-benefit-risk analysis and safety and occupational hazard considerations.</p> <p><i>Credits: (3 / 0 / 0) 3</i> <i>Prerequisites: None</i></p> <p><i>Abbreviated Title: Ethics in Engineering</i> <i>Category: Area Core Course</i> <i>Teaching Language: English</i></p> <p><i>Keywords: Ethical issues, moral values, morality, professional responsibility, code of ethics, conflict of interest, engineering practice</i></p> <p><i>Department offering the course: 26 – Department of Industrial Engineering</i></p>
23.	<p>MENG410 Introduction to Capstone Design</p> <p>The course aims to prepare the senior year students for their capstone design projects, and to provide guidance with the selection of their project advisors, topics and teams. The students are introduced to the basic features of the Capstone Design process, elements of a Capstone Project Report and written oral presentation techniques.</p> <p><i>Credits: (1 / 0 / 1) 1</i> <i>Prerequisites: Min 100 credit hrs complete & subject to supervisor's approval according to the requirement of project</i></p> <p><i>Abbreviated Title: Int to Capstone Design</i> <i>Category: Area Core Course</i> <i>Teaching Language: English</i></p> <p><i>Keywords: Design Process, Teamwork, Capstone Team Design Project, Senior Design Introduction</i></p>
24.	<p>MENG400 Summer Practice</p> <p>This is a period comprising a minimum of 40 days' training to be completed in an industrial organization by all students who are effectively in their junior or senior year. Students should obtain approval of the Department before commencing training. Following this training, students will be required to write a formal report and give a short presentation before a committee regarding their training.</p> <p><i>Credits: (0 / 0 / 0) 0</i> <i>Prerequisites: MENG364</i></p> <p><i>Abbreviated Title: Summer Practice</i> <i>Category: Area Core Course</i> <i>Teaching Language: English</i></p> <p><i>Keywords: Practical Training, Summer Practice, Industrial Organization, Summer Training</i></p>
25.	<p>MENG411 Capstone Team Project</p> <p>The purpose of the course is to develop an understanding of independent research through the study of a particular Mechanical Engineering topic of interest. The special project is an exercise in the professional application of specialist skills and experience developed in Mechanical Engineering program. Research topics, which may be principally experimental, theoretical or applied, will be chosen in consultation with a project supervisor.</p> <p><i>Credits: (1 / 4 / 0) 3</i> <i>Prerequisites: MENG410</i></p> <p><i>Abbreviated Title: Capstone Team Project</i> <i>Category: Area Core Course</i> <i>Teaching Language: English</i></p> <p><i>Keywords: Capstone Team Design, Special Project, Graduation Project</i></p> <p>Departmental Consent**</p>

Engineering Sciences and Design: Area Elective Courses

In order to register for the Area Elective Courses with no Pre-requisites (i.e., Pre-requisites: None), minimum number of attended semesters is required to be 6.

1.	<p>MENG421 Finite Element Analysis Analysis of stress and strain; constitutive equations; plane problems of elasticity; the finite element concept; one- and two-dimensional finite element formulation techniques; transformations, assembly and solution techniques; introduction to three-dimensional finite elements; project assignments of one-and two-dimensional problems.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Finite Element Analysis Keywords: Finite Element, stress, strain</p> <p>Prerequisites: MENG375 Category: Area Elective Course Teaching Language: English</p>
2.	<p>MENG422 Automotive Engines Internal combustion engines; two stroke and four stroke engines; spark ignition engines; compression ignition engines; basic engine parts; valve trains and timing diagrams; lubrication systems; cooling systems; fuel injection systems and ignition systems; advanced engineering- materials in automotive field.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Automotive Engines Keywords: Engine, piston, valve, spark plug</p> <p>Prerequisites: MENG246 or MENG244 Category: Area Elective Course Teaching Language: English</p>
3.	<p>MENG423 Automotive Systems Power train; gear box; clutch; drive shafts; differential; steering systems; directional stability; tires and thread patterns; suspension and intelligent suspension; chassis and body; body structure; aerodynamics; automobile air conditioning; airbag; brake systems and EBD; ABS; alternative fuel; electrical and electronic circuits; charging; lighting.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Automotive Systems Keywords: Gearbox, steering, suspension, brake</p> <p>Prerequisites: None Category: Area Elective Course Teaching Language: English</p>
4.	<p>MENG424 Reliability Engineering Probability concept and probability distribution functions. Probability distributions for describing failures. Failure data. Reliability of simple system. Reliability and availability of system with repair. Redundancy. Fault tree and event tree analysis. Risk concept and risk assessment.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Reliability Engineering Keywords: Probability, Reliability, Risk</p> <p>Prerequisites: MATH322 Category: Area Elective Course Teaching Language: English</p>
5.	<p>MENG441 Internal Combustion Engines Air standard cycle analysis; chemical stoichiometry and dissociation, chemical equilibrium; calculation of temperature rise in a combustion reaction with dissociation; combustion in SI engines; combustion in diesel engines; mixture requirements for SI and diesel engines; performance characteristics of internal combustion engines; turbocharging; supercharging of internal combustion engines.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : I. C. Engines Keywords: Spark ignition, Diesel engines, combustion</p> <p>Prerequisites: MENG246 or MENG244 Category: Area Elective Course Teaching Language: English</p>
6.	<p>MENG442 Solar Engineering Introduction to solar energy; sun-earth geometric relations; solar radiation; energy requirements in buildings; solar energy collectors; energy storage; solar energy process economics; solar cooling processes; passive solar gain systems; solar thermal power; photovoltaic convertors.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Solar Engineering Keywords: Energy, radiation, collector</p> <p>Prerequisites: MENG345 Category: Area Elective Course Teaching Language: English</p>
7.	<p>MENG443 Heating, Ventilation and Air Conditioning Psychrometrics and elementary psychrometric processes; simultaneous heat and mass transfer in external flows; direct contact transfer devices; heating and cooling coils-compact heat exchangers; thermal comfort; hot water heating systems; heating and cooling load calculations; vapor compression refrigeration cycles.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Heating, Ventilation & Air Conditioning Keywords: Heating, Cooling, Flow</p> <p>Prerequisites: MENG345 Category: Area Elective Course Teaching Language: English</p>

8.	MENG445 Thermal System Design Analysis, design and optimization of thermal systems using microcomputers; modeling of thermal systems and components; analysis of thermal system component characteristics and their effect on overall system performance; relationship among thermal sciences in design process; safety, reliability and economic considerations of thermal system. Credits: (4 / 1/ 0) 4 Abbreviated Title : Thermal System Design Keywords: Thermal System, Analysis Prerequisites: MENG345 Category: Area Elective Course Teaching Language: English
9.	MENG446 Thermal Power Engines Application of the basic principles of thermodynamics, fluid mechanics and heat transfer; fuels, combustion, nuclear reactors, steam generating units; steam and gas turbines, pumps, blowers and compressors; design of power cycles and the associated component parts. Credits: (4 / 1/ 0) 4 Abbreviated Title : Thermal Power Engines Keywords: Power, Engines Prerequisites: MENG246 Category: Area Elective Course Teaching Language: English
10.	MENG449 Introduction to Energy Management Fundamentals of energy; energy audit and energy audit report; energy auditing on mechanical and electrical systems; energy efficiency in buildings with an emphasis on passive and active solar energy use; project work on energy audit/energy-efficient design of buildings. Credits: (4 / 1/ 0) 4 Abbreviated Title : Introduction to Energy Management Keywords: Energy, Audit Prerequisites: None Category: Area Elective Course Teaching Language: English
11.	MENG452 Hydraulic Machinery Similarity relations and general theory; Pelton wheel; Francis turbine and propeller turbine; centrifugal pumps; axial and mixed pumps; pump combination; cavitation in hydraulic machines. Credits: (4 / 1/ 0) 4 Abbreviated Title : Hydraulic Machinery Keywords: Pump, turbine, cavitation Prerequisites: MENG353 Category: Area Elective Course Teaching Language: English
12.	MENG453 Gas Dynamics Introduction; integral forms of conservation equations; differential forms of conservation equations; one-dimensional flow; oblique shock and expansion waves; quasi one-dimensional flow; unsteady wave motion; linearized flow; numerical techniques. Credits: (4 / 1/ 0) 4 Abbreviated Title : Gas Dynamics Keywords: Shock wave, nozzle Prerequisites: MENG246 Category: Area Elective Course Teaching Language: English
13.	MENG454 Fundamentals of Flow Measurement Fluid properties; measurement and accuracy; influence quantities; flow-meter selection; introduction to differential producers; differential producers design information; linear flow-meters. Credits: (4 / 1/ 0) 4 Abbreviated Title : Fundamentals of Flow Measurement Keywords: Flow meter, orifice Prerequisites: MENG353 Category: Area Elective Course Teaching Language: English
14.	MENG461 Injection Mold Design Classification of tools; plastic materials; injection mold design for thermo multi-plastics; injection and feed system; mold cooling; worked example of simple injection molds; molding internal undercuts and threaded components; introduction of multi-daylight and runnerless molds; molds for thermo-setting materials: compression, transfer and injection mold tools; extrusion and blow molding dies. Credits: (4 / 1/ 0) 4 Abbreviated Title : Injection Mold Design Keywords: Mold, Injection, dies Prerequisites: MENG364 Category: Area Elective Course Teaching Language: English
15.	MENG462 Metrology and Quality Control Basic consideration of measurement and review of standards; geometric and kinematic principles of instrument design; magnification systems; sources of error in measurement; interferometry and interferometers; flatness and surface texture; machine tool alignment; measurement of gears and screw threads; control of quality; factors affecting quality; statistical methods; sampling schemes; control charts and their interpretations; sampling techniques. Credits: (4 / 1/ 0) 4 Abbreviated Title : Metrology and Quality Control Keywords: measurement, quality control Prerequisites: MATH322 Category: Area Elective Course Teaching Language: English

16.	<p>MENG463 Tool Drawing and Design Principles of tool design; location systems; principles and methods of clamping; cutting tool guidance; fool-proofing; swarf removal; table fixing; ejection; jig feet; trunnions and indexing mechanisms; the use of standard parts; jig and fixtures construction; cutting tools: types, geometry, and important features; press tool design; design assignments on jigs and fixture.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Tool Drawing and Design Keywords: Jig, fixture, fool proof</p> <p>Prerequisites: MENG364 Category: Area Elective Course Teaching Language: English</p>
17.	<p>MENG464 Computer Integrated Manufacturing What is CIM; CIM definition; CIM environment; CIM benefits; Business perspectives for CIM; objectives of manufacturing business; the business characteristics of CIM systems; components of a CIM architecture; simulation, group technology; networks; concurrent engineering; decision support systems; expert system; CAD/CAM; information and material flow in manufacturing; modeling methodology and related tools in analysis and design of CIM for medium size companies.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Computer Integrated Manufacturing Keywords: CIM, Manufacturing, CAD/CAM</p> <p>Prerequisites: None Category: Area Elective Course Teaching Language: English</p>
18.	<p>MENG471 Mechanisms Mobility and structural analysis; kinematic analysis of planar mechanisms; kinematic analysis and synthesis of linear mechanical systems; direct rolling and sliding contact; involute and cycloidal curves; speed ratios; simple and compound gear trains; kinematic analysis of four-link mechanisms; kinematic synthesis of planar mechanisms; two and three positions of a plane; designing with four positions; cam mechanisms and design; intermittent motion mechanisms; introduction to spherical mechanisms; Hooke's joint; the rotary step mechanisms.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Mechanisms Keywords: Linkages, Mechanisms, Kinematics</p> <p>Prerequisites: MENG233 or MENG231 Category: Area Elective Course Teaching Language: English</p>
19.	<p>MENG472 Machine Design Concepts of design and engineering design; design process; modeling and simulation; use of computers in engineering design; introduction to CAD; design optimization; reliability; case studies in machine design; special topics in machine design.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Machine Design Keywords: Design, software, modelling</p> <p>Prerequisites: MENG233 or MENG231 Category: Area Elective Course Teaching Language: English</p>
20.	<p>MENG473 Mechanical Vibrations Undamped and damped free vibration; forced vibrations with harmonic excitation; transient vibrations; systems with two degrees of freedom; vibration of continuous systems and Modal Analysis.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Mechanical Vibrations Keywords: Vibration, excitation, Modal Analysis</p> <p>Prerequisites: MENG331 Category: Area Elective Course Teaching Language: English</p>
21.	<p>MENG475 Biomechanics Introduction to Mechanics and Biomechanics. Statics, Kinematics and Dynamics. Coordinate Systems. Musculoskeletal Tissues and Biomaterials. Stress-Strain Analysis and Joint Contact Problems. Software for Biomechanical Analysis.</p> <p>Credits: (4 / 0 / 1) 4 Abbreviated Title: Biomechanics Keywords: Musculoskeletal, Biomechanics, Material, Tissue</p> <p>Prerequisites: (MENG233 or MENG231) and (MENG286 or CIVL283) Category: Area Elective Course Teaching Language: English</p>
22.	<p>MENG481 Engineering Fracture Mechanics Griffith energy balance approach; Irwin's modification to the Griffith theory; stress intensity approach; crack tip plasticity; fracture toughness; elastic stress field approach; finite specimen width for the stress intensity factor; centered crack specimen; edge-notched specimen; elliptical cracks; fatigue factors affecting crack propagation; prediction of fatigue crack growth; SN curves; cyclic stresses; fatigue life calculations; materials design for fracture toughness; failure analysis.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title: Engineering Fracture Mechanics Keywords: Fracture, fatigue, failure analysis</p> <p>Prerequisites: MENG375 Category: Area Elective Course Teaching Language: English</p>
23.	<p>MENG482 Engineering Metallurgy Mechanical and non-destructive tests; equilibrium diagrams and their interpretation; hardening of metals; deformation and annealing of metals; heat treatment of steels; corrosion and oxidation phenomena; alloy steels; non-ferrous metals and alloys; cast irons.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Engineering Metallurgy Keywords: Material Testing, Microstructure, Heat Treatment</p> <p>Prerequisites: MENG286 Category: Area Elective Course Teaching Language: English</p>

24.	<p>MENG483 Mechanical Metallurgy Elastic and plastic behavior; engineering stress-strain curve; true stress-true strain curve; yielding criteria for ductile metals; combined stress tests; torsion test; strengthening mechanisms: strengthening from grain boundaries; solid-solution hardening; strengthening from fine particles; fiber strengthening; martensite strengthening; fracture mechanics; Griffith theory; strain-energy release rate; fracture toughness and design; toughness of materials; transition-temperature curve; fatigue of materials; creep and stress rupture.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Mechanical Metallurgy Keywords: Material Loading, Failure, Fatigue, Creep</p> <p>Prerequisites: MENG286 Category: Area Elective Course Teaching Language: English</p>
25.	<p>MENG485 Fatigue Failure Factors affecting fatigue behavior; fatigue analysis of combined stress systems; cyclic material behavior; formation of fatigue cracks; low cycle fatigue (LCF); high cycle fatigue (HCF); failure mechanisms in practice; materials aspects of fatigue; assessment of crack formation life; determination of stress and strain at a concentration; predicting crack formation life; fracture mechanics and fatigue crack propagation; critical flaw size in fatigue; factors influencing crack propagation life.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Fatigue Failure Keywords: Fatigue, Failure, Crack</p> <p>Prerequisites: MENG286 Category: Area Elective Course Teaching Language: English</p>
26.	<p>MENG486 Fracture Mechanics Elements of fracture mechanics; transition temperature approach to fracture control; micro-structural aspects of fracture toughness; environment-assisted cracking and metallurgical embrittlement; fatigue crack propagation; analysis of engineering failures.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Fracture Mechanics Keywords: Fracture, crack propagation, fatigue</p> <p>Prerequisites: MENG222 Category: Area Elective Course Teaching Language: English</p>
27.	<p>MENG487 Elasticity and Plasticity Theory of deformation, stress and strain; three-dimensional equations of elasticity; plane theory of elasticity; prismatic bar subjected to end load; thermal stress; yield criteria of beams, rings, plates; mechanics of metal forming.</p> <p>Credits: (4 / 1/ 0) 4 Abbreviated Title : Elasticity and Plasticity Keywords:</p> <p>Prerequisites: MENG222 Category: Area Elective Course Teaching Language: English</p>
28.	<p>MENG488 Welding Technology Types of welding, welding of stainless steel, welding of aluminum alloys, solid state welding processes, advanced welding processes, inspection procedures, heat flow in welding, weld quality, economics of welding and cutting.</p> <p>Credits: (4/0/1) 4 Abbreviated Title: Welding Technology Keywords: Welding, joint designs, heat flow, arc welding, inspection procedures, welding metallurgy, TIG/MIG welding</p> <p>Prerequisites: MENG364 Category: Area Elective Teaching Language: English</p>
29.	<p>MENG489 Corrosion of Materials Electrochemical mechanisms of corrosion of metals, corrosion cells, partial corrosion reactions, corrosion of materials in natural environments, corrosion failure of ceramic materials, environmental degradation and corrosion of polymer materials, stray current corrosion, prevention strategies, cathodic protection, corrosion control and monitoring.</p> <p>Credits: (4/0/1) 4 Abbreviated Title: Corrosion of Materials Key words: corrosion, polarization, materials damage, electrochemical mechanisms, environmental degradation, protection, passivity</p> <p>Prerequisites: MENG286 or CIVL 283 or IENG 263 Category: Area Elective Teaching Language: English</p>

** Departmental Consent

Mathematics and Basic Sciences Courses	
1.	<p>MATH151 Calculus – I Limits and continuity. Derivatives. Rules of differentiation. Higher order derivatives. Chain rule. Related rates. Rolle's and the mean value theorem. Critical Points. Asymptotes. Curve sketching. Integrals. Fundamental Theorem. Techniques of integration. Definite integrals. Application to geometry and science. Indeterminate forms. L'Hospital's Rule. Improper integrals. Infinite series. Geometric series. Power series. Taylor series and binomial series</p> <p><i>Credits: (4 / 0 / 1) 4</i> <i>Prerequisites: None</i> <i>Abbreviated Title: Calculus -I</i> <i>Category: Faculty Core Course</i> <i>Teaching Language: English</i> <i>Keywords: Limits, Continuity, Derivatives, Differentiation, Chain Rule, Rolle's Theorem, Mean Value, Integrals, Taylor Series</i> <i>Department offering the course: 41 – Department of Applied Mathematics & Computer Science</i></p>
2.	<p>MATH152 Calculus-II Vectors in R³. Lines and Planes. Functions of several variables. Limit and continuity. Partial differentiation. Chain rule. Tangent plane. Critical Points. Global and local extrema. Lagrange multipliers. Directional derivative. Gradient, Divergence and Curl. Multiple integrals with applications. Triple integrals with applications. Triple integral in cylindrical and spherical coordinates. Line, surface and volume integrals. Independence of path. Green's Theorem. Conservative vector fields. Divergence Theorem. Stokes' Theorem.</p> <p><i>Credits: (4 / 0 / 1) 4</i> <i>Prerequisites: MATH151</i> <i>Abbreviated Title: Calculus-II</i> <i>Category: Faculty Core Course</i> <i>Teaching Language: English</i> <i>Keywords: Vectors, Planes, Lagrange Multipliers, Gradient, Volume, Greene's Theorem, Divergence, Stoke's Theorem</i> <i>Department offering the course: 41 – Department of Applied Mathematics & Computer Science</i></p>
3.	<p>CHEM101 General Chemistry Atoms, molecules and ions; Mass relations in chemistry, stoichiometry; Gasses, the ideal gas law, partial pressures, mole fractions, kinetic theory of gases; Electronic structure and the periodic table; Thermo chemistry, calorimetry, enthalpy, the first law of thermodynamics; Liquids and Solids; Solutions; Acids and Bases; Organic Chemistry.</p> <p><i>Credits: (4 / 0 / 1) 4</i> <i>Prerequisites: None</i> <i>Abbreviated Title: General Chemistry</i> <i>Category: Area Core Course</i> <i>Teaching Language: English</i> <i>Keywords: chemical terms, nomenclature, chemical bonds, polarity, states of matter, chemical formulas, measurements, natural science, basic science</i> <i>Department offering the course: 43 – Department of Chemistry</i></p>
4.	<p>PHYS101 Physics I Families of physical quantities having different dimensions, units and rules of mathematics. Vector mathematics and calculus, their applications to motion. Newton's laws. Integrals of the second law, work-energy, impulse-momentum, conservation of energy and momentum, applications. Rotations. Static equilibrium.</p> <p><i>Credits: (4 / 1 / 0) 4</i> <i>Prerequisites: None</i> <i>Abbreviated Title: Physics I</i> <i>Category: Faculty Core Course</i> <i>Teaching Language: English</i> <i>Keywords: Physical Quantities, Vectors, Motion, Second Law, Work, Energy, Impulse, Momentum, Rotations</i> <i>Department offering the course: 42 – Department of Physics</i></p>
5.	<p>PHYS102 Physics-II Kinetic theory of ideal gases. Equipartition of energy. Heat, heat transfer and heat conduction. Laws of thermodynamics, applications to engine cycles. Coulombs law and electrostatic fields. Gauss's law. Electric potential. Magnetic field. Amperes law. Farada ys law.</p> <p><i>Credits: (4 / 1 / 0) 4</i> <i>Prerequisites: PHYS101</i> <i>Abbreviated Title: Physics-II</i> <i>Category: Faculty Core Course</i> <i>Teaching Language: English</i> <i>Keywords: Charge, Electromagnetic Induction</i> <i>Department offering the course: 42 – Department of Physics</i></p>

6.	<p>MATH106 Linear Algebra Matrices, systems of Equations and Inevitability, Diagonal, Triangular and Symmetric Matrices, The Determinant Function, Evaluating Determinants by Row Reduction, Properties of the Determinant Function, Cofactor Expansion; Cramer's Rule, Euclidean n-space, Linear Transformation, Properties of Linear Transformations, Real Vector Spaces, Subspaces, Linear Independence, Basis and Dimension, Row Space, Column Space and Nullspace, Rank and Nullity, Inner Products, Angle and Orthogonality in Inner product Spaces, Orthogonal Bases; Gram-Schmidt Process, Eigenvalues and Eigenvectors, Diagonalization.</p> <p><i>Credits: (3 / 1 / 0) 3</i> <i>Abbreviated Title: Linear Algebra</i> <i>Keywords: Matrix, determinant, vector spaces, eigenvalues</i> <i>Department offering the course: 41 – Department of Applied Mathematics & Computer Science</i></p> <p><i>Prerequisites: None</i> <i>Category: Area Core Course</i> <i>Teaching Language: English</i></p>
7.	<p>MATH207 Differential Equations First-order differential equations. Higher order homogeneous linear differential equations. Solution space. Linear differential equations with constant coefficient. Non-homogeneous linear equations; variation of parameters, operator methods. System of linear differential equations with constant coefficients. Laplace transforms. Power series solutions. Bessel and Legendre equations. Orthogonal functions and Fourier expansions. Introduction to partial differential equations. First- and second-order linear PDE's. Separation of variables. Heat and wave equations.</p> <p><i>Credits: (4 / 1 / 0) 4</i> <i>Abbreviated Title: Differential Equations</i> <i>English</i> <i>Keywords: Matrix, determinant, vector spaces, eigenvalues</i> <i>Department offering the course: 41 – Department of Applied Mathematics & Computer Science</i></p> <p><i>Prerequisites: MATH151</i> <i>Category: Area Core Course</i> <i>Teaching Language: English</i></p>
8.	<p>MATH373 Numerical Analysis for Engineers Numerical error. Solution of nonlinear equations, and linear systems of equations. Interpolation and extrapolation. Curve fitting. Numerical differentiation and integration. Numerical solution of ordinary differential equations.</p> <p><i>Credits: (3 / 0 / 1) 3</i> <i>Abbreviated Title: Numerical Analysis for Eng</i> <i>Keywords: Numerical Analysis, Interpolation, Extrapolation</i> <i>Department offering the course: 41 – Department of Applied Mathematics & Computer Science</i></p> <p><i>Prerequisites: MATH207 or MATH241 or MATH203</i> <i>Category: Faculty Core Course</i> <i>Teaching Language: English</i></p>
9.	<p>MATH322 Probability and Statistical Methods Introduction to probability and statistics. Operations on sets. Counting problems. Conditional probability and total probability formula, Bayes' theorem. Introduction to random variables, density and distribution functions. Expectation, variance and covariance. Basic distributions. Joint density and distribution function. Descriptive statistics. Estimation of parameters, maximum likelihood estimator. Hypothesis testing.</p> <p><i>Credits: (3 / 0 / 1) 3</i> <i>Abbreviated Title: Prob & Statistical Methods</i> <i>Keywords: Probability, Statistics, Bayes' Theorem, Hypothesis Testing</i> <i>Department offering the course: 41 – Department of Applied Mathematics & Computer Science</i></p> <p><i>Prerequisites: MATH151</i> <i>Category: Faculty Core Course</i> <i>Teaching Language: English</i></p>

General Education Courses

1.	<p>ENGL191 Communication in English I ENGL 191 is a first semester freshman academic English course The purpose of this course is to consolidate and develop students' knowledge and awareness of academic discourse, language structures and lexis. The prime focus will be on the further development of writing, reading, speaking and listening skills in academic settings, and on improving study skills in general.</p> <p>Credits: (3 / 1 / 0) 3 Prerequisites: None Abbreviated Title: Communication in English I Category: University Core Course Teaching Language: English Keywords: Language, English, Reading, Writing, Speaking Department offering the course: Department of General Education</p>
2.	<p>ENGL192 Communication in English II ENGL 192 is a second semester freshman academic English course The purpose of this course is to further consolidate and develop students' knowledge and awareness of academic discourse, language structures and lexis. The prime focus will be on the further development of writing, reading, speaking and listening skills in academic settings, and on improving study skills in general.</p> <p>Credits: (3/ 1/ 0) 3 Prerequisites: ENGL191 Abbreviated Title: Communication in English II Category: University Core Course Teaching Language: English Keywords: Language, English, Reading, Writing, Speaking Department offering the course: Department of General Education</p>
3.	<p>TUSL181 Turkish as a Second Language TUSL181 is a Basic Turkish course introducing the Turkish language. It incorporates all four language skills and provides an introduction to basic grammar structures. Students will be encouraged to develop their writing skills through a variety of tasks. The aim of this course is for students to be able to understand and communicate in everyday situations, both in the classroom and in a Turkish-speaking environment.</p> <p>Credits: : (2 / 0 / 0) 2 Prerequisites: None Abbreviated Title: Turkish as a second Language Category: University Core Course Teaching Language: Turkish Keywords: Turkish, grammar, writing, speaking Department offering the course: Department of General Education</p>
4.	<p>HIST280 History of Turkish Reforms 19. century state of the Ottoman Empire (Constitutional Period), Tripoli and the Balkan Wars, World War II and the results, the Guilds, the War of Independence, Cease Fire Ant., Lausanne, Ant.</p> <p>Credits: (2 / 0 / 0) 2 Prerequisites: None Abbreviated Title: General Education VI Category: University Core Course Teaching Language: Turkish Keywords: History, Ottoman Empire, Wars Department offering the course: HC – ATATÜRK Research Center</p>
5.	<p>ENGL201 Communication Skills ENGL 201 is a second year Mainstream Communication Skills course for students at the Faculty of Engineering. The course aims to introduce a range of skills, including effective written and oral communication, research skills and study skills. Throughout the course the students will be involved in project work intended to help them in their immediate and future academic and professional life. This will include library research, technical report writing and an oral presentation. By investigating a topic of their own choice, students will develop their understanding of independent research skills. During the report writing process, students will improve their writing and develop the ability to produce organized, cohesive work. The oral presentation aims to enhance spoken fluency and accuracy and provide training in the components of a good presentation.</p> <p>Credits:(3 / 0 / 0) 3 Prerequisites: ENGL192 Abbreviated Title: Communication Skills Category: Faculty Core Course Teaching Language: English Keywords: Communication Skills, Report Writing, Oral Presentation, Independent Research, Department offering the course: Department of General Education</p>

University Elective Courses (Non-Technical Courses Offered by other Departments)

A list of non-technical electives is announced at the beginning of the each semester by the Department. This list contains courses offered by the Faculty of Business and Economics, the School of Tourism and Hospitality Management, Departments of Communication and Media Studies etc. University elective courses taken by Mechanical and Mechatronics Engineering students must satisfy the ABET criteria.

5- UNIVERSITY and ACADEMIC REGULATIONS

Academic Regulations have been laid down by the Northern Cyprus Educational Trust to govern and guide the functioning of Eastern Mediterranean University. The rules and regulations are available at <http://mevzuat.emu.edu.tr/>. Students should refer to the given internet address for the Regulations for Students. **In case of any conflict, the regulations in Turkish will supersede.** Some regulations are presented below.

5.1. Conditions for Taking Courses from Another Institution

- Department and/or Faculty/School board determines whether the student can take courses outside the university or not and/or whether the courses to be taken outside the University are the equivalents of courses in the student's own program in terms of content and credits.
- Duration of studies at another institution is included in the period of study specified in the Eastern Mediterranean University Education, Examinations and Success By-law, regardless of the difference of the institution and the number of courses to be taken.
- Total credits of courses taken from another institution of higher education cannot exceed 25% of the course credits the student has to take during the school/undergraduate specified program period.
- The student keeps his/her student rights in EMU, however, s/he cannot benefit from the student rights regarding diploma or student status in the higher education institution s/he takes course from.
- A student who wishes to take courses from another higher education institution should apply to the relevant department head in writing and attach a formal and certified document summarizing the titles, credits and content of the courses to be taken as well as the weekly course timetable no later than the relevant semester or summer school registration renewal period.
- Equivalency of the grades obtained at another higher education institution is determined by the faculty/school board decisions based on the Senate decisions and relevant by-laws.
- Students who take courses at another higher education institution continue to pay full tuition fee or the course(s) fees in EMU. However, if the student needs to pay for the courses to be taken at another institution of higher education, fees to be paid in EMU are determined by the University Executive Board.
- In order to be eligible to take courses from another higher education institution, a student should attend the registered program in EMU for at least one academic year and should have a minimum CGPA of 2.00.
- Those who do not meet the requirements of article (h) can take courses from another institution of higher education with the approval of the University Executive Board and positive views of the department and faculty boards.

5.2. Student Advisor

For each registered student, a student advisor who is a member of the academic staff is appointed by the Department Chair. The student advisor has the obligation of guiding the student in course registration, or in other academic, administrative and social matters. Students must obtain their advisors' approval for the following transactions: registration, selection of core and elective courses, adding courses to their schedules, dropping courses from their schedules, and/or withdrawing from a course. Students are encouraged to meet regularly with their advisors to review their academic performance and progress, discuss problems or get scholarly advice.

5.3 Course Registration

A student registration is done according to his/her academic status as follows:

- Registration of students with "Honor and High Honor Status": Students who are in "High Honor" or "Honor" status can optionally register for one more course in addition to the normal course load of the semester.
- Registration of students with "Successful Status": Students who are in "Successful" status can register for at most the normal course load of the semester.
- Registration of students with "on Probation Status": Students who are "on probation" are obliged to repeat failed courses before registering for the new ones. The students are allowed to register for two new courses at most, on the condition that they do not exceed normal course load. A student who receives "on probation" status will remain in this status until his CGPA is raised above the limits indicated in Table 5.4. In the semester following the on probation, the student is not allowed to register for more than two new courses. The student will be asked to repeat some of the courses which he had already taken in previous semesters with priority given to courses with grades F, NG and D-.
- Registration of students with "Unsuccessful Status": Students who are in "unsatisfactory" status are not allowed to register for any new course. These students will be asked to repeat courses already taken in the previous semesters, with priority given to the grades F, NG and D-. However, in the case that the courses from which (F), (NG) or (D-) grades were obtained are not offered, or the student's course load being under the specified limit, the student can repeat courses from which a (D), (D+) or (C-) grade was obtained until the normal course load is met.
- Registration of students with "Graduating Status": Students who are in "Successful" status are considered to be in "Graduating Status" if and only if the remaining credited courses for their graduation is less than or equal to 7 courses (including courses with F, NG and D- grades). Such students are allowed to register for the whole remaining courses provided that they fulfil the prerequisite rules.

5.4 Registration Procedure

Immediately prior to the commencement of classes for each semester, certain days are designated for formal registration, as indicated on the academic calendar. At this time, all newly admitted students are advised and given class schedules. Students must register for all mandatory courses offered in the regular semesters (Fall and Spring) of the first (freshmen) year. All registration activities must be performed by the students concerned. Registration by proxy or mail is not accepted.

- a) After making the payment the students can select courses online through their student portal.
- b) The student must visit his /her Advisor's Office in order to confirm the registration. The advisor helps the students in selecting appropriate courses, and finalizes their weekly class schedule/time table for that semester based on the vacancy availability in groups.
- c) After the advisor finishes the registration process, the students can see their courses registered and weekly class schedule.
- d) Two days are dedicated for registration at the start of every semester.

5.5 Academic Term

Academic term" of a student refers to total number of registered courses in relation to the number of listed courses in the department's published program of study (curriculum). Non-credit courses and courses that are not included in the normal course load upon Senate's decision are not taken into account in determining a student's academic term.

5.6 Course Load

For every semester, the number of specified credit courses of a registered program makes up the semester course load. Non-credit courses are not taken into account in the computation of the course load. However, upon the recommendation of the student advisor and the approval of the Department Chair:

- a) a maximum of two courses can be reduced from the normal course load of a semester. In this case, the student must register for the untaken courses at the nearest next semester the courses are offered.
- b) a student's semester course load can be increased by one course at most. In order to do this,
 1. The student's Cumulative Grade Point Average (CGPA) should not be below 3.00, or
 2. The student has to be designated a 'High Honor' or an 'Honor' at the end of the previous academic term.
- c) Course load of graduating students with no academic warnings can be increased by two courses. A student at the graduation semester is the student who is given the right to graduate upon the successful completion of all projected courses at the end of the last semester of an academic program in addition to at most two remaining courses in all other programs (except LAW). Non-credit courses and courses that are not included in the normal course load upon Senate's decision are not taken into account in determining course load.

5.7 Prerequisite Courses

- a) In order to register for a course that has a pre-requisite, a student must have obtained at least a D- grade from the related pre-requisite course.
- b) Graduating students are allowed to register for courses with pre-requisites even if they score a F grade from the pre-requisite course.
- c) At all semesters (including the graduation semester), a prerequisite course and the course following it cannot be taken within the same semester if the prerequisite course has never been taken before or if the student obtained an (NG) or a (W) grade from it.
- d) Faculty or School Councils have the authority to take decisions concerning the requirements for prerequisite courses.

5.8 Repeating a Course

The following provisions are applied in repeating a course:

- a) A student who obtains a (W), (D-), (F), (NG) or (U) grade from a course must register for the course at the first available opportunity.
- b) If the course to be repeated is Area Elective of Engineering courses, University Elective of General Education courses or has been excluded from the program, the student is required to take another appropriate course specified by the Department.
- c) If a student wishes to improve his/her previously obtained grades, s/he can repeat a course in which s/he previously passed in the last 2 years.

The grade obtained from the repeated course takes the place of the previous grade. However, the first grade still appears on the transcript.

5.9 Course Selection

Priorities in course selection are as follows:

- a) Courses with (W), (F), (NG), (U) or (D-) grades.
- b) Courses of previous semesters that have not been taken yet.
- c) Courses of the current semester that have not been registered yet.
- d) Other appropriate courses.

5.10 Course Times / Hours

In order to enable the students to attend classes regularly, course hour clashes are avoided. The advisor may approve if there is a maximum of a two-hour clash. However, in special and mandatory conditions, upon Department Chair's consent, clashes exceeding two hours may be approved, if the student accepts the clashes.

5.11 Late Registration

Late registration is possible during the period specified in the academic calendar. Late registration penalty are determined by the Rectors' office in accordance with the principles set concerning this issue.

5.12 Adding or Dropping Courses

From the first day of the commencement of the classes until the deadline specified on the academic calendar, students are allowed to change their course schedule by adding a new course or dropping a registered course. These changes must be made upon the recommendation of the student's advisor.

5.13 Course Withdrawal

- In a semester, a student is allowed to withdraw from two registered courses at most, provided that the student does not get into part-time status. Course withdrawal should be done between the set dates specified on the academic calendar through using online application in student portal. Online approval of the Advisor and Department Chair is necessary. A student who withdraws from a course will receive the grade 'W'. This grade is not taken into consideration during the calculation of the CGPA and the GPA, but appears on the transcript.
- A student cannot withdraw from a course that was withdrawn before, a course that is repeated (a different course with the same reference code) or a course that has no credit.
- Full time students can not withdraw from courses which may change the status "Part-Time".

5.14 Course Evaluation

Student course performance is evaluated by using continuous assessment mechanisms that include midterm and final examination(s), quizzes, homework, laboratory study, and course projects etc. These mechanisms are organized in order to check the students' ability in meeting the Course Learning Outcomes (CLO) and Student Outcomes (SO). During the evaluation process, the students are given a mark which is typically out of 100 and then at the end of the semester the cumulative average mark of the student is converted to a letter grade by the course instructor.

The letter grades are organized on a 4.00 point grading scale. The letter grades, their grade point equivalence and respective descriptions are given in Table 5.1.

Table 5.1 The Letter Grades

Grade	Grade Point Equivalent	Description
A	4.0	Superior Pass in a credit-course
A-	3.7	Superior Pass in a credit-course
B+	3.3	Very Good Pass in a credit-course
B	3.0	Very Good Pass in a credit-course
B-	2.7	Very Good Pass in a credit-course
C+	2.3	Pass in a credit-course
C	2.0	Pass in a credit-course
C-	1.7	Conditional Pass in a credit-course
D+	1.3	Conditional Pass in a credit-course
D	1.0	Conditional Pass in a credit-course
D-	0.7	Failure in a credit-course
F	0.0	Failure in a credit-course
NG	0.0	Failure in a credit-course due to disinterest of the student
S	-	Satisfactory (Pass in a non-credit-course)
U	-	Unsatisfactory (Failure in a non-credit-course)
I	-	Incomplete (work with excuse, grade to be given later)
W	-	Withdrawal from a course

Grades A, A-, B+, B, B-, C+, and C are issued to indicate varying levels of unconditional "Pass" status for the successful scores. Grades C-, D+, and D indicate the "Conditional Pass" status, where the students with these grades are regarded as successful given that the Cumulative Grade Point Average (CGPA) is above or equal to 2.00. Grades D- and F indicate "Failure" and the students with these grades have to repeat the course in the proceeding semester. Students who do not comply with the required level attendance and/or not fulfilling the requirements for the evaluation of the

course are given the “NG” (Nill-Grade) grade by the Instructor of the Course based on the criteria determined by the Faculty/School Academic Council.

The grades “S” or “U” are given to students who are registered to non-credit courses. “S” indicates satisfactory and “U” indicates unsatisfactory completion of the non-credit course. “I” grade is given to students who have not sat the end of semester exam and/or has not completed some of the projects/ laboratory work which contributes to the end-of-semester grade because of a valid reason that can officially be proved if required. Such students are obliged to sit for the missed exam and/or complete the project/laboratory work at least one week before the registration period of the following semester. Failure to comply with this will result in an automatic F grade being given for the concerned course. However, students whose reason for absenteeism continues at the end of the above indicated deadline, must apply to the Department with official certification indicating the continuation of the reason for absenteeism. The Mechanical Engineering Department Chair then takes the issue to the Faculty Academic Council where a decision will be taken on the period for the completion of the “I” grade. The period of completion requirement mentioned above is not valid for graduating students. Faculty Academic Councils determine these students’ situations. An “I” grade is not taken into account in the computation of the Grade Point Average (GPA) or Cumulative Grade Point Average (CGPA). A student who thinks is eligible for “I” grade, must apply to the Course Instructor together with official documentation supporting the case, at most 3 working days following the final examination date of the course. The grade “W” is given to students who were allowed to withdraw from a registered course between the 3rd and 11th weeks of the semester. The “W” grade is shown on the transcript of the student.

5.15 Mid-term Examinations

In every academic semester, a minimum of 1 and a maximum of 3 mid-term exams are given to students in each course. No mid-term examinations can be administered during the final week of the semester or the week before the end-of-classes.

5.16 Final Examinations

Final examinations are administered on the dates specified in the Academic Calendar.

Letter grades are announced by the Registrar’s Office at a date determined by the Rector’s Office.

5.17 Other Criteria to be Considered for Assessment

- a. Quizzes which are prepared and evaluated by the course instructor can be administered without prior notice.
- b. In applied courses, evaluation can be based on projects, workshops, laboratory reports, presentations and /or examinations. Examinations can have written or oral format. Either the course instructor or another academic member of the staff assigned by the Course Coordinator is entitled to make the workshop/lab evaluations.
- c. Homework prepared during the term can be included in the overall evaluations. Homework is assessed by the course instructor or a faculty member assigned by the course instructor.

5.18 Make-up Examinations

- a. A student who fails to sit for an examination for a valid reason is given a make-up exam. Within **three working days** after the examination, students who wish to take a make-up must submit a written statement to the course instructor or the course coordinator explaining the reason(s) for his/her request. Student must secure a “Make-Up Exam Form” from the department Office and must secure the approval from the instructor for taking the Make-Up Exam.
- b. Make-up exams for the mid-term and final exams may take place after the final exam.
- c. If the cause of the student’s absence persists during the time allocated for the make-up examination, a new make-up is given. However, if the make-up examination is not taken by the student ten days before the registration period for the new term begins, the situation is brought to the attention of the Faculty/School Academic Council and decided on accordingly.

5.19 Resit Examinations

- a. RESIT EXAMINATION is an additional examination right granted to students studying at undergraduate and associate programs.
 - It is administered at the end of each term (excluding the summer term) following the announcement of the letter grades.
 - Taking a resit examination requires online registration (no fees are applied for online registration).
 - No Resit Examinations are available for application/practice courses.
 - No Resit Examinations are applied for the courses of the English/Turkish Preparatory School.
 - No Resit Examinations are applied for graduate courses (even if registered by a student studying at an undergraduate/associate program).
 - There is no Resit Examination for students studying at graduate programs (including registered deficiency courses, language support courses and undergraduate courses)
- b. Resit Examination covers all topics of that course (all topics included in midterm and final examinations.)
 - Online registration is required.
 - Online registration will be carried out via the Student’s Portal, after the final exams.
 - Weight of the Resit Examination will be equal to the total weight of mid-term and final examinations of a specific course.
 - The letter grade of the course will be assigned according to the RESIT score (if there are any other scores obtained from other forms of assessment than midterm and final examinations, they will also be considered in the letter grade calculation)
 - There is NO MAKE-UP examination for the RESIT EXAMINATION

- c. The following are the conditions for registering for the resit examination of a course:
- Students, may register for the RESIT EXAMINATION of the courses with “D-” or “F” grades obtained within that term,
 - Students with a “WARNING”, “UNSATISFACTORY” or “ON PROBATION” status may register for the RESIT EXAMINATIONS of all (possible) courses, excluding those with “NG” grades, at the end of the relevant term.
- In the event of not sitting for a registered resit examination, students will be assigned “0”.

5.20 Graduation Make-up

Any student who is at the graduation semester but fails to fulfill all requirements is eligible to take the graduation make-up examination under the following circumstances:

- Students who fail to meet the graduation requirements due to F and/or D- grades are allowed to sit the exam for up to 2 courses with previously obtained grades of F and/or D- provided that these courses were taken within the last two semesters.
- Students who fail to meet the graduation criteria due to low CGPA (less than 2.00) are allowed to take the graduation make-up examination for up to 2 courses with D, D+, C- grades.
- A student who fails a graduation make-up of a specific course must register for that course again. A graduation make-up cannot be given for courses with NG grades. Grades obtained from the graduation make-ups are evaluated as term letter grades.

5.21 Appeals

- A student has the right to ask the relevant academic staff member to see all documents involved in the determination of the semester grade no later than a week following the publication of the letter grades.
- Any appeal against the marks of a mid-term examination or any other assessment components must be made to the course instructor within one week following the announcement of the marks. The relevant course instructor is required to evaluate the appeal within one week. If the student is not satisfied with the instructor’s evaluation, s/he has the right to appeal in writing to the relevant department chair within 3 days following the instructor’s evaluation date. The department chair will form a committee of instructors to finalize the student’s appeal within one week. The decision of the committee is final.
- Any appeal concerning a letter grade must be made to the relevant course instructor no later than the end of the registration period of the following semester. Appeals against semester grades are finalized based on the principles laid out in ‘b’.
- In cases where the letter grades have been assigned inaccurately and/or an administrative/calculation mistake has been made, taking the relevant course instructor’s application for a grade change into consideration, the relevant grade change takes place with the decision of the Department Council, Faculty Council and the University Executive Board, on the condition that the mistake has been supported by evidence, the relevant student has not graduated and/or the period between the announcement of the end of semester letter grades and the application for a grade change has not exceeded one calendar year.

5.22 Semester Evaluation by GPA

A student's academic achievement for each term is expressed numerically by an index referred to as the "Grade Point Average" (GPA). When calculating the GPA, mid-term exam(s), the final exam, lab/workshop reports and/or exams (if applicable), tests, projects, and/or homework are taken into consideration. Credit received from a course is found by multiplying the credit hours by the coefficient corresponding to the grade received. The GPA is then found by dividing the sum of the credits received from all courses registered during the semester by the total credit hours of the same courses. All grades from A to NG are included in the calculation of the Grade Point Average (GPA). An example of GPA calculation is illustrated in Table 5.2 below.

Table 5.2 GPA Calculation

Course Code	Letter Grade Received	Grade Point Equivalent		Credit Hours		Total Credits
MLDE118	B-	2.70	x	3	=	8.10
MATH106	C	2.00	x	3	=	6.00
ENGL191	B	3.00	x	3	=	9.00
PHYS101	A	4.00	x	4	=	16.00
MATH151	D-	0.70	x	4	=	2.80
TOTAL=17						41.90

$$\text{GPA} = (41.90/17) = 2.46$$

5.23 Overall Evaluation by CGPA

A Student’s overall academic achievement is expressed by a real number called the “Cumulative Grade Point Average” (CGPA). The CGPA is calculated by dividing the total credits received from all courses the student has completed since joining the program by the sum of the credit hours of these courses. In cases when a course is repeated, the last grade is included in the CGPA computations. In this case, the student whose GPA is given as an example above will have the following calculation for his/her GPA and CGPA for the following semester (Table 5.3).

Table 5.3 CGPA Calculation

Course Code	Letter Grade Received	Grade Point Equivalent		Credit Hours		Total Credits
MENG233	B+	3.30	x	4	=	13.20
ENGL192	C	2.00	x	3	=	6.00
MATH151	C	2.00	x	4	=	8.00
PHYS102	A	4.00	x	4	=	16.00
HIST280	B	3.00	x	2	=	6.00
				TOTAL=17		49.20

$$\text{GPA} = (49.20/17) = 2.89$$

$$\text{CGPA} = ((41.90+49.20-2.80) / (17+17)-4)$$

$$\text{CGPA} = 88.30 / 30 = 2.94$$

In Table 5.3, as MATH 151 course is repeated, the last grade obtained is calculated instead of the previous grade given in Table 5.2. Therefore, the 4 credits and the 2.80 credit-hour value belonging to the previous term are not included to calculation of the CGPA.

5.24 Scholastic Standing

- Satisfactory Students: A student is considered successful if the required CGPA for a particular semester is achieved as given in Table 5.4.
- Honor and High Honor Students: Students who (with a full course load, and with maximum number of course) obtain a GPA between 3.00 and 3.49 are designated an "Honor Student". Students who obtain a GPA between 3.50 and 4.00 are designated a "High Honor Student" status.
- Success for Undergraduate Programs (registered after 2007-08): Academic standing of the students is monitored and regulated according to the Table 5.4 which relates End of Academic Term (EAT) with the obtained CGPA. Students enrolled in an undergraduate program whose CGPA's are specified in Table 5.4 are considered to be "successful", "on probation" or "unsuccessful".

Table 5.4 The Active Standing

End of Academic Term (EAT)	Successful Student	Students On Probation	Unsuccessful Student
1 st EAT	-	-	-
2 nd EAT	CGPA \geq 1.50	1.00 \leq CGPA < 1.50	CGPA < 1.00
3 rd EAT	CGPA \geq 1.50	1.00 \leq CGPA < 1.50	CGPA < 1.00
4 th EAT	CGPA \geq 1.50	1.00 \leq CGPA < 1.50	***
5 th EAT	CGPA \geq 1.80	1.50 \leq CGPA < 1.80	CGPA < 1.50
6 th EAT	CGPA \geq 1.80	1.50 \leq CGPA < 1.80	CGPA < 1.50
7 th EAT	CGPA \geq 1.80	1.50 \leq CGPA < 1.80	CGPA < 1.50
8 th and more EAT	CGPA \geq 2.00	1.80 \leq CGPA < 2.00	CGPA < 1.80

*** Students who completed a minimum of 4 academic semesters (if the fourth semester is Spring Semester, then at the end of the Summer School) and who have a CGPA below 1.00 are dismissed from the program.

The starting semester of students transferring from one program to another internally or externally is accepted as an Academic Term. However, transfer students are considered as successful at the new program at the end of the first semester of the transferred program. Based on the Student Exchange Program framework, every semester spent out of the University is considered as an Academic Term. Unless there is a valid reason specified in By-Laws and Regulations, students are required to finish four-year programs at most in 8 years. Periods of leave of absence are not taken into consideration in the specified periods above. Students who fail to graduate within the specified period are dismissed from the University. However, graduating students who meet specific requirements may be given an additional time period. Requirements, additional time period and rules concerning graduating students are regulated by the 'Course Registration By-Law'.

5.25 Leave of Absence

- Students may request online for a leave of absence on the understanding that they will return to the program of study and subject to permission being granted by the University.
- Application for leave of absence should be made in writing to the Registrar's office. Such applications made from abroad must be certified by a Commissioner of Oaths.

- c. Students can apply for leave of absence with a valid reason within the first 5 weeks of the semester starting from the first day of the commencement of classes. Decision on these applications is given, by the Rector, upon the proposal of the Dean who has considered the advice of the Department Chair.
- d. Students can apply for leave of absence only with the report of an official Health Council certifying the nature of illness or other official documentation certifying the reason put forward in the application. Such applications must be submitted within the first 5 weeks of the semester starting from the first day of the commencement of classes. In overseas applications the date of official certification is taken into consideration. Decision on all such applications is given, by the Rector upon the proposal of the Dean based on **the recommendation of the Department Academic Council**.

5.26 Returning from Leave of Absence

At the end of the 'leave of absence' period, students can simply continue their education by following the routine registration procedure. Students, who were granted 'leave of absence' on health grounds, must provide a certificate approved by the Health Council indicating their fitness for continuing their studies. Students granted two semesters of 'leave of absence' and who wish to return to their studies at the end of the first semester, should apply in writing to the Registrar's Office. Each such application is considered according to the procedure followed in the evaluation of applications for leave of absence.

5.27 Cancelling Registration from the University and Refunding

A student can cancel registration from the University by applying in writing to the Registrars' Office and completing the necessary process. Following the completion of the process, the student will be entitled to a refund of the tuition fee based on the principles determined by the Board.

5.28 Attendance Requirements

Students are required to attend the registered courses, laboratory, studio, tutorial, practice, other academic studies and examinations required by the related course instructor. Student attendance is monitored and assessed by the course instructor. A student who fails to meet the requirements of a course or who is absent more than the limit specified by the Faculty or School is considered to be unsuccessful in that course.

5.29 Student Status

Students can be categorized as *full-time*, *part-time*, *special* and *visiting*.

- a. Students have the full-time status provided that they take 3/5 or more of the total credit hours per semester at an undergraduate or school program.
- b. Students who take less than 3/5 of the total credit hours per semester upon the recommendation of the student advisor and consent of the department head/school director are considered as part-time at an undergraduate or school program.
- c. A student who is not registered to any program, but who is permitted to attend the lectures of some courses, is given the status of Special Student. No diploma or degree is conferred upon such students, but a certificate showing the courses completed and student performance is prepared by the Registrar's Office. Applications for Special Student status are evaluated and decided on by the Department Chair or the School Director. Registration of accepted special students is carried out by the Registrar's Office according to the rules stated in these regulations. Such students are required to possess at least a Secondary School Diploma.
- d. Students who receive undergraduate or postgraduate education at an institution within the country or abroad and, upon their institution's consent, who take courses at the Eastern Mediterranean University with the aim of credit transfer are considered as visiting students. No diploma or degree is conferred upon such students, but a transcript summarizing the courses taken and credits earned is issued.

5.30 Student Portal Service

A student portal service is provided by the university Registration Office to help the students follow their letter grades for the respective courses, grade point average (GPA) of the respective semester and cumulative GPA (CGPA) for all of the completed semesters. The portal provides a solid foundation for students and their advisors in following the students' progress through their degree study. The student performance and progress are continuously monitored and managed with the student advising system.

5.31 Summer School

Summer school is organized mainly to help students with low scholastic achievement, and may be registered to for credit with the approval of the Department. These sessions are normally held before the Fall semester and form periods of intensive study which last for eight weeks. Any number of courses may be offered, although this is based on student demand, as reflected by pre-registration procedures. A student may register for a maximum of two courses offered during the summer school through the registration procedure outlined above for a normal term. The scholastic achievement is graded in the same way and included in the CGPA calculations at the end of the summer session.

6- CODE OF ETHICS for STUDENTS

Students are expected to adhere to and practice the following Code of Ethics

Honest and Respectful Representation

Every student of the department is expected to represent him or herself honestly and respectfully in all situations, whether orally or in written statements. Honest and respectful representation includes, but is not limited to:

- Providing only truthful material information on all University applications, financial aid forms, waivers, and any other official document.
- Students are also expected to behave respectfully to all administrators, faculty, staff, students, and visitors within the Department or campus environment and to behave respectfully when representing the Department or EMU at on- or off-campus events.

Acting with Academic Honesty

Students are expected to maintain the highest standards of academic integrity.

- Work that is not of the student's own creation will receive no credit. If a student is uncertain of what these standards are, he or she may consult his or her instructor for appropriate counsel, but a student's ignorance is no legitimate defense for academic dishonesty.
- Academic dishonesty includes lying, cheating, stealing, and using unauthorized materials on any assignment, quiz or exam.
- The act of lying is to intentionally provide false information or a false statement with the purpose of misleading or with irresponsible regard of the truth. Lying, in both academic and non-academic activities, is impermissible.
- Cheating is acting dishonestly in order to gain an unfair advantage. Cheating includes giving or receiving unauthorized aid on any assignment, quiz, or exam. Instructors must be consulted regarding which materials are acceptable for students to use on any assignment, quiz, or exam.
- Cheating also includes using the same material of work previously used for another course unless the student has permission from the instructor to do so.
- Cheating furthermore includes plagiarism, which is when a student uses the ideas of another and declares it as his or her own.
- Students are required to properly cite the original source of the ideas and information used in his or her work.
- Stealing is the act of taking without permission and without intention to return. The prohibition of stealing includes property of any nature as well as academic work.

Respect for University Rules and Regulations

Students of the EMU are expected to adhere to the rules and regulations set by the University.

Respect and Care for University Property

- Damaging of University property is unacceptable and a violation of EMU Rules and Regulations. Students shall be responsible for the costs of the damages resulting from their behavior.
- Students are also expected to report instances of any damage to University property immediately; as well as consciously account for or dispose properly of their belongings.

Avoiding the Use of Illegal Substances

- The use of illegal drugs and alcohol is not permitted on Campus as well as the abuse or misuse of prescription drugs.

Refraining from any Assault and Harassment

- Students shall refrain from using language or acting in a manner that is disrespectful or inappropriate towards other students and members of the EMU community.
- Sexual assault and harassment is inexcusable and shall result in disciplinary action in accordance with the University policy.

Respectful Classroom Conduct

- Students must behave respectfully toward their peers and professors.
- In the classroom setting, students may not interrupt their classmates or professor, make fun of them or their expressed views, or disrupt the learning environment.
- It is important to maintain the best learning environment for all students and professors.
- Not complying with the restrictions of the instructor will result in appropriate discipline, as decided by the instructor or department.

Respect for the Open Exchange of Ideas

- Students shall be guaranteed that their right of Freedom of Speech will be observed by all faculty and EMU members, including other students.
- Students are encouraged to engage others in thoughtful and meaningful dialogue while refraining from acting or using language with malicious intent.

7- DEPARTMENTAL COMMITTEES

Departmental council establishes working committees and assigns faculty members to the committees. Each committee is responsible for one subject and carries out necessary work regarding the subject.

8- APPENDIX: CAPSTONE TEAM PROJECTS

Capstone Team Projects

Every student in Mechanical Engineering Department must take MENG410 and MENG411 courses for Capstone Team Project. These courses are designed as the ‘capstone’ of the educational program for mechanical engineering students, allowing seniors to integrate their acquired knowledge and apply it to a real world problem. In solving such a problem, students are required: to utilize creative processes and inductive reasoning in one or more departmental areas of specialization; to develop, evaluate and recommend alternative solutions to an open-ended problem; to satisfy realistic constraints, such as time, cost, availability, and ethical; and to demonstrate capabilities to cooperate in a small project team. Project topics may be principally experimental, theoretical or applied, and will be authorized by the project supervisor.

Project Team

Senior students will be part of a project team for the semester. Project teams will typically consist of two or three individuals. Teams will be formed by the course coordinator, in conjunction with the supervisors during the first week of the semester. Individuals will be assigned to teams taking into account their common technical interests, skills and abilities, and expressed personal preferences. A team assignment form is filled in by the supervisor and passed on to the course coordinator. Each team will select a project (either from the industry or from the ones announced by the faculty members) and operate as an engineering group that has been organized specifically to solve that particular problem. The team will be responsible for the design of its internal organization, establishment of internal responsibilities, determination of project goals and objectives, overall management of project activities, performance analysis, achievement of results, development of recommendations, and preparation of all oral and written reports. In addition, project teams are expected to consult relevant books, standards, technical journals, websites, vendor catalogues, and any other media as dictated by the project. The communications component of this course, both written and oral, represents a significant proportion of the learning experience. Student teams will be asked to present current and final project results in both a written and oral format and to have frequent interaction with the faculty project supervisor regarding the status of project progress. The format of the reports can be seen on the department website. me.emu.edu.tr

Project Supervisor

Each team will be assigned a project supervisor among the faculty members of the department. Team will report to the project supervisor on a regular basis according to the course semester schedule.

Learning Outcomes:

1. Learn how to establish team and team work
2. Learning how to deal with a design problem
3. Making detailed research about certain topics
4. Learning the importance of standards and applications
5. Learning the planning stages of design procedure

Requirements for project approval:

1. Engineering analysis (mathematical or experimental)
2. Design on paper (using technical drawing tools)
3. Fabrication (preferably in the workshop)
4. Operation and testing
5. Technical Report, Presentation and Demonstration

The details are available on Capstone Design and Projects page <https://me.emu.edu.tr/en/students/capstone-design-and-projects>

Table A1. List of Some Capstone Team Projects

Supervisor	Project Title
Prof. Dr. Hasan Hacisevki	Designing and simulating a wind tunnel drag force measuring system
Prof. Dr. Hasan Hacisevki	Designing and simulating an engine analyser
Prof. Dr. Uğur Atikol	Solar Air Heater Demonstration Unit – Previously manufactured solar air heater is to be used as a part of a demonstration unit for training technicians and architects. It is required to mount the whole apparatus on the roof of the solar lab and have controls and digital displays of temperature, flow rate and pressure.
Prof. Dr. Uğur Atikol	Ice Thermal Storage Tank – Ice thermal storage is now more and more interesting as multi tariff system is in force in N: Cyprus. In this project it is required to design the storage tank of the ice thermal storage system.
Assoc. Prof. Dr. Murat Özdenefe	Inclined Solar Water Distillation System with Solar Pre-Heater and Nozzle Spray: To design and manufacture a water distillation system that employs solar energy as the input. The system will involve a solar pre-heater, shall be tilted in order to exploit solar energy to the outmost, and will employ nozzles for vaporizing the water for the maximum production of potable water.
Assoc. Prof. Dr. Murat Özdenefe	Radiant Cooling System Incorporated with Cooling Tower: To design and manufacture a radiant cooling system which incorporates cooling tower. Radiant cooling systems provide cooling predominantly by radiation. Since the system requires cooling the occupants radiantly there is no need for cooling the air in the space. This enables to employ higher temperatures for the working fluid paving way for energy saving. In this project, students will employ cooling tower in addition to conventional system for cooling the working fluid and chilled beams as the
Asst. Prof. Dr. Devrim Aydin	Investigation of evaporative cooling assisted building heat recovery unit
Asst. Prof. Dr. Devrim Aydin	Investigation of a biomass driven combined heat and power generation system.
Assist. Prof. Dr. Mohammad Asmael	Redsign the Universal Tensile Test Machine with 10kN Load
Assist. Prof. Dr. Mohammad Asmael	Design and Development of Deep Drawing Sheet Metal Bending Machine
Assist. Prof. Dr. Babak Safaei	Vibration analysis of porous CNT-reinforced smart lightweight sandwich plate
Assist. Prof. Dr. Babak Safaei	Effect of porous and CNT on Buckling behavior of an advanced smart lightweight sandwich plate
Assoc. Prof. Dr. Qasim Zeeshan	Digitization of Universal Vibration Apparatus – TM16 - TM16 series is a range of products that teach different aspects of vibrations and oscillations in mechanical systems. These include pendulums, mass-springs systems and shafts and beams. The TM16 series is a modular system, based around a Frame and Cupboard. The aim of the project is to digitize the apparatus by integrating it with digital sensors and a digital display unit with data transmission to a PC. The work will cover several key areas of mechanical and mechatronics engineering.
Assoc. Prof. Dr. Qasim Zeeshan	Design and Development of a Smart Factory Model - Smart Factory Model enables people, machinery and resources to communicate as in a social network. With the introduction of CPS technology, robots can autonomously correct a mistake by isolating the defective part without stopping the entire production process. Through smart interconnection of the independent production elements, manufacturing of parts has been revolutionized and optimized. In this project the students will design, develop and test a small scale prototype of a Smart Factory. The work will cover several key areas of manufacturing and mechatronics engineering.
Assoc. Prof. Dr. Qasim Zeeshan	Design and Development of Micro Vertical Axis Wind Turbine (VAWT) - The objective of this project is to design and develop a Bio-inspired Wind Turbine. The sub systems: rotor blades, transmission (gear box), braking and control system, Inverter and storage system (battery) must be configured to achieve the performance requirements. The data acquisition system must be an integral part of the design. The static & dynamic balancing is mandatory. The work will cover several key areas of mechanical and mechatronics engineering.
Sn. Lec. Cafer Kızılörs	Corn Seed planting machine
Sn. Lec. Cafer Kızılörs	Red pepper grinding machine