

MIME 2101	Applied Mechanics I	3 Credit Hours
Prerequisites:	PHYS 1200	
Goal	To provide the student with the basic knowledge that underlines the static's aspects of applied mechanics.	
Objectives	Outcomes	
<p>This course should enable the student to:</p> <ol style="list-style-type: none"> 1. Understand the laws and the principles that govern static. 2. Perceive the basic concept in the field of this subject. 3. Model and analyze static engineering problems. 4. Lay the ground for various courses in engineering. 	<p>A student who satisfactorily complete the course should be able to:</p> <p>Static's</p> <ol style="list-style-type: none"> 1. Recognize common equilibrium problems. 2. Grasp the condition for translational and rotational equilibrium and form the proper equation of equilibrium 3. Use the pictorial representation of equilibrium situation in terms of free-body diagram. 4. Realize the difference between equilibrium force and the resultant force. 5. Distinguish between the various forces and stresses arising in a problem such as the internal, external, tensile, compressive, direct, shear and other loading conditions, etc. 6. Define centroid, center of gravity and center of mass of a rigid body and appreciate their location and significances. 7. Define moment of inertia of mass and area and grasping methods of computing each about any axis. 8. Handle various structural problems and utilizing sections and joint methods. 9. Distinguish between various types of friction. 10. Analyze beams in terms of shearing forces and bending moment under various boundary conditions. 11. Carry out laboratory experiment to verify the conditions of equilibrium of forces, analyze beams, determine coefficient of static and kinetic friction and other topics related to the static's of bodies, frames, etc. 	



MIEE 2110	Electrical Technology	3 Credit Hours
Prerequisites:	PHYS 1210	
Goal	To provide the student with the practical knowledge of electrical principles reinforced by basic foundation of electrical technology.	
Objectives	Outcomes	
<p>This course should enable the student to:</p> <ol style="list-style-type: none"> 1. Understand the basic laws and principles that embody the subject of electricity. 2. Have a working knowledge of the instrumentation and electrical machines. 3. Grasp the techniques of electrical measurements and know the range and limitations of measuring instruments. 4. Realize the interfere with the system or the electrical variable being measured. 5. Know the principle of operation of various types of electrical transducers. 	<p>A student who satisfactorily complete the course should be able to:</p> <ol style="list-style-type: none"> 1. Get acquainted with the principle of operation and construction of cathode ray oscilloscope. 2. Use cathode ray oscilloscope as a multipurpose instrument to measure various electrical quantities such as current, voltage, frequency, and phase. 3. Identify various types of electrical transducers and able to use them in industrial control systems. 4. Recognize the advantage of poly-phase system over single-phase systems. 5. Use skillfully the delta-star connection. 6. Comprehend the principles and operation of a single and three phase transformer. 7. Perform testing of transformers. 8. Handle three phases to two-phase conversion and vice versa. 9. Aware of the principles and the construction of D.C machines. 10. Relate the electromotive force (E.M.F) with simple armature windings. 11. Realize the armature reaction and commutation. 	



MIME 2220	Machine Drawing	3 Credit Hours
Prerequisites:	CECE1100	
Goal	To provide the students with the basic knowledge of engineering drawing which enable him/her to produce high quality engineering drawings.	
Objectives	Outcomes	
<p>The course should enable the student to:</p> <ol style="list-style-type: none"> 1. Understand the concepts of the curves and loci of moving points on various mechanisms. 2. Understand the graphical representation of threads, threaded fasteners and welded joints. 3. Learn to sketch machine elements such as bearings, couplings and keys. 4. Understand the concept of indicating the dimensional and geometrical tolerances on machined components. 5. Learn to construct the profiles for the different types of gears and cams. 	<p>The student who satisfactory complete the course should be able to:</p> <ol style="list-style-type: none"> 1. Understand the concepts and perform basics of the curves and loci of the moving points on various mechanisms. 2. Practice graphical representation of threads, threaded fasteners, pipe and welded joints. 3. Draw machine elements such as gears, cams, shafts, pulleys, bearings, couplings and keys. 4. Understand and practice the concept of indicating the dimensional and geometrical tolerances on machined components. 5. Understand the various symbols used in machine drawing for representing the Drawing information such as Surface roughness, surface relationship and tolerances. 6. Draw, read and modify assembly and working drawings. 	



MIEE 2210	Engineering Instrumentation & Industrial Control	3 Credit Hours
Prerequisites:	PHYS 1200 , PHYS 1210, and MIEE 2110	
Goal	To provide the student with full coverage of the principles and applications of instrumentation and industrial control	
Objectives	Outcomes	
<p>This course will prepare students who are able to:</p> <ol style="list-style-type: none"> 1. Understand the operation principles and characteristics of functional elements in engineering measurement systems. 2. Perceive the principle of operation of control systems, open & closed, loop control system. 3. Know how to maintain and test engineering measurement system. 	<p>The students should be able to:</p> <ol style="list-style-type: none"> 1. Define the functional elements of a typical measurement system. 2. Identify various types of sensors and transducers. 3. Be acquainted with all common analogue and digital devices for data presentation 4. Distinguish between open and closed loop control systems. 5. Define basic element of a control system. 6. Be familiar with system control strategies and techniques used in engineering. 7. Deal with all types of signal processing and conditioning 8. Employ different control methods, which are suitable for different types of systems. 9. Deal with operational amplifier controllers and programmable logic controllers. 10. Determine the transfer function of open and closed loop control system 11. Perform laboratory experiments on instrumentation with open and closed loop control systems. 12. Maintain and test engineering measurements systems. 13. Evaluate the performance of a given control system. 	



MIME 2230	Workshop Technology	3 Credit Hours
Prerequisites:	EEPW 1240	
Goal	<p>To allow the student to gain an appreciation of the principles of operations in a mechanical workshop and to get a feel for industrial application, and to provide the student with progressive hands-on structured experience of industrial environment.</p> <p>To develop an understanding of the basics of maintenance of machinery and equipment</p>	
Objectives	Outcomes	
<p>The course should enable the student to:</p> <ol style="list-style-type: none"> 1. Know how to function and operate in a workshop environment and grasp the principles underlying the work being done 2. Effectively use various measuring tools and instruments commonly used in Mechanical workshops 3. Make simple parts using common workshop machinery 4. Carry out first-line maintenance of common workshop machines using the technical manuals 5. Understand the basics of planned/scheduled and unscheduled maintenance 	<p>The students should be able to:</p> <ol style="list-style-type: none"> 1. Operate/use all common tools and basic machines 2. Read, understand and interpret engineering drawings 3. Make three dimensional sketches 4. Handle marking-out and precision measuring instruments 5. Carry out basic metal cutting tasks 6. Be familiar with use of common workshop machines: Lathe, Bench Drill, Grinder and shaper. 7. Perform first-line maintenance of workshop machines 8. Be a productive contributor to scheduled maintenance tasks 	



MIME 2240	Fluid Mechanics I	3 Credit Hours
Prerequisites:	PHYS 1200	
Goal	To expose the student to fundamental aspects of fluid mechanics	
Objectives	Outcomes	
<p>The course should enable the student to :</p> <ol style="list-style-type: none"> 1. Understand the basic laws and the principles that govern the behavior of fluids . 2. Perceive the basic concept of ideal and real fluids. 3. Realize the similarity between model and prototype. 4. Model and analyze a common fluid engineering problems. 5. Lay the ground for various courses related to fluid mechanics aspects. 	<p>Upon completion of the course, the student will be able to</p> <ol style="list-style-type: none"> 1. Grasp the concepts of a fluid and basic flow analysis techniques . 2. Deal with continuity and Bernoulli's equations in various fluid flow problems 3. Treat fluid flow in pipe network with full consideration of pipe losses. 4. Interpret the fluid pressure variation in static's and dynamic situations. 5. Estimate the fluid forces on surfaces and submerged bodies. 6. Apply effectively energy and linear momentum equations in fluid flow. 7. Distinguish between laminar and turbulent flow. 8. Carry out fluid flow measurements such as pressure, speed, flow rate and be familiarized with the relevant measuring devices, transducers and measurement techniques 9. Perform experimental work including hydrostatic force on surfaces, flow of fluid through pipes and other topics related to the applications of fluid mechanics in mechanical engineering. 	



MIME 2350	Diploma Project	3 Credit Hours
Prerequisites:	None	
Goal	To expose each student to the situation where he/she works individually or on a team in a project in the field of mechanical engineering.	
Objectives	Outcomes	
<p>The course should enable the student to:</p> <ol style="list-style-type: none"> 1. Integrate the various areas of knowledge he/she gained through the program 2. Consolidate personal confidence in working independently or on a team and improve his/her spirit of performance 	<p>The students should be able to:</p> <ol style="list-style-type: none"> 1. Apply the knowledge he/she gained through the program into an integrated project 2. Demonstrate communication effectiveness through oral presentations and written reports 3. Present the results of work in a seminar and submit a properly written and edited final report 4. Manage his/her time to achieve a time-constrained target 5. Solve engineering problems 	

Introduction

This project is carried out by the student in the summer term of the Diploma program.

This may be:

- A. One which is based on practical work
- B. One, which is mostly theory based, such as design, case study, computer programming, etc.
- C. A combination of A and B



PHIL 2108	Business Ethics	3 Credit Hours
Prerequisites:	None	
Goal	To equip the student with the highest ethical standards that will guide him/her through real life dilemmas.	
Objectives	Outcomes	
<p>The course should enable the student to:</p> <ol style="list-style-type: none"> 1. Understand the concept of value 2. Understand Islamic and Omani values 3. Understand, appreciate and respect ethnic and cultural diversity 4. Gain the highest work ethics 	<p>The students should be able to:</p> <ol style="list-style-type: none"> 1. Define the concept of values 2. Define how values develop 3. Understand the effects of religion and society on values 4. Understand the effects of Islamic and Omani values on work ethics 5. Define the concept of ethnic and cultural diversity 6. Understand the importance of ethnic and cultural diversity for society and the world 7. Work with people from different ethnicities/cultures 8. Function in a moral and ethical manner in his/her life 	



EERE2201	Introduction to Renewable Energy		3 Credit Hours
Prerequisites	Physics II and Chemistry	Co - Requisites	
Goal	To understand the importance of renewable energy resources and its utilization for the thermal and electrical energy needs and also the environmental aspects of these resources.		
Objectives		Outcomes	
<p>The course should enable the students to :</p> <ol style="list-style-type: none"> 1. Understand the various forms of conventional energy resources. 2. Learn the present energy scenario and the need for energy conservation 3. Explain the concept of various forms of renewable energy 4. Outline division aspects and utilization of renewable energy sources for both domestics and industrial application 5. Analyse the environmental aspects of renewable energy resources. 		<p>Upon completion of the course, the student will be able to:</p> <ol style="list-style-type: none"> 1. Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations. 2. Know the need of renewable energy resources, historical and latest developments. 3. Describe the use of solar energy and the various components used in the energy production with respect to applications like - heating, cooling, desalination, power generation, drying, cooking etc. 4. Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications. 5. Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications 6. Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations. 7. Acquire the knowledge of fuel cells, wave power, tidal power and geothermal principles and applications. 	



ACT
English Language Center
Course Outline
Technical Communication (ENGL 2100)
Credit Hours 3
Lecture Hours 3

1. Course Description

At the end of this course, the students will have learned to write on technical subjects for the practical needs of a special audience. They will also have learned to process information, objectively and persuasively, making use of information and communication technologies.

2. General Aims

- ♣ Develop clear and accurate written and oral presentation of business,
- ♣ technical and scientific information.
- ♣ Promote critical thinking, continuous self- assessment and peer review.
- ♣ Encourage independent research skills.
- ♣ Prepare students for their professional environment.

3. Learning Outcomes

At the end of the course, students should be able to:

- ♣ Analyze, synthesize, evaluate and interpret information and ideas.
- ♣ Write in a style appropriate to the technical purpose and audience.
- ♣ Identify and write various kinds of business and technical documents.
- ♣ Plan and manage writing projects in terms of drafting, designing, revising and editing documents.
- ♣ Write collaboratively, providing peers with constructive feedback on their work.
- ♣ Develop effective style and tone, following businesses and technical writing guidelines.
- ♣ Analyze charts, graphs, specifications, diagrams, etc. and respond orally and in writing.
- ♣ Design visually effective documents (e.g. layouts, formatting, incorporating graphics and visuals into documents)
- ♣ Prepare and deliver an effective mixed media presentation.

4. Resources

- a. McMurry, D.A. (2002). *Power Tools for Technical Communication*, Harcourt College Publishers.

Web sites

www.-unix.oit.umass.edu/~pwtc/tw/lonks.html
<http://techpubs.com/resources.html>
<http://garnet.indstate.edu/kliener/eng305t/lessons/04html>
<http://www.prenhall.com/pfiefer>
<http://www.english.vt.edu/~toomy/research.html>



5. Content Outline

- ♣ Written communication in a variety of formats (reports, business letters, memos, employment letters, resumes)
- ♣ Technical text such as definition, description, comparison, classification, instructions and cause and effect

- ♣ Making oral presentations.

6. Learning Activities

- ♣ Discussion: one-to-one, group
- ♣ Listen and take notes
- ♣ Speak to an audience
- ♣ Write formal reports, letters etc.
- ♣ Read and respond orally and in writing.

7. Assessment Outline

- ♣ Quizzes 5%
- ♣ Mid-semester Exam 20%
- ♣ Assignment (Report and Presentation) 25%
(Report 20% and Presentation 5%)
- ♣ Final Exam 50%

TOTAL 100%



Final grades will be based on the following scale:

Letter Grade	Percentage Range	Grade Point
A	90-100	4.0
A-	85-89	3.7
B+	80-84	3.3
B	76-79	3.0
B-	73-75	2.7
C+	70-72	2.3
C	67-69	2.0
Major Requirement		
C-	60-66	1.7
Major Elective		
D	55-59	1.0
F	54 and below	0.0

8. Assessment Specifications

8.1 Quiz (5%)

There will be 1 quiz per semester. The quiz should be answered on the standard paper provided on a topic provided by the tutor. The approximate length of the quiz shall be 250 words, and written in 30 minutes of class time. Printed or electronic dictionaries can be used to minimize spelling mistakes.

8.2 Mid-semester Exam (20%)

Time: 1 hour

Content: One writing task of 300 words covering any topic covered up to the MSE. Refer to the delivery plan.

8.3 Final Exam (50%)

Time: 2 hours

Content: Q 1. A guided task based on an item that was taught during the course.

Q 2. Free writing. The nature of the task determines the length.

8.4 Assignment (25%)

Assignment shall be research-based and can be done by individual students or by a group. The outcome shall be a written report and an oral presentation.

The assignment should include the following:

1. *Secondary Research*: Literature review using books and the internet to discuss the research topic. The literature review should include student's own words, direct quotes, and paraphrasing of the information s/he has searched.

Written Report (20%)

- The report must consist of:
 - Title page (Cover page)
 - Introduction, Body, Conclusion, and Recommendation
 - References & Appendixes
- The Body of the report should be approximately 500 words. The Introduction, Conclusion and Recommendations sections are additional.
- An outline of the report is due 2 weeks after the topic is issued.
- The first draft is due 2 weeks after that.
- The final draft is due before their presentation.
- The reference list should include at least three sources.
- The report must be word-processed, double-spaced on A4 paper with one inch margins and size 12 Times New Roman or Arial font.

Grade Criteria:

- A) Report (20%)
- B) Oral Presentation (5%)

See also the appendix on marking criteria



9. Course Policies

Attendance: Attendance and active participation in class activities are required. Irregular attendance will be dealt with according to item 75 in section 8 of the "College Bylaws for Technical Colleges" (Ministerial Order No. 72/2004). Students must have an official sick leave

from a government hospital or written, signed permission from the HoD/HoC. Three incidences of lateness (exceeding 5 minutes) will be considered one absence.

Late Assignment: For late submission of assignments, students need a legitimate reason and they need to inform the instructor in advance of the reason. Otherwise, assignments will be marked down by 5% (e.g. 80% will be 75%).

Plagiarism and Cheating: Plagiarism is the presentation of another person's work, words, or ideas as if they were one's own. It ranges from an entire assignment which is not the student's own work to specific passages within an assignment which are not the student's own work but taken from a source without acknowledgement. Students are responsible for ensuring that they understand and follow the principles of proper documentation and scholarship.

Cheating is usually understood as copying from another student. However, it also includes a student or a group of students, using or attempting to use unauthorized aids, assistance, material, or methods in assignment, reports, presentations and/or examinations. If an instructor determines that the student has cheated and /or plagiarized, the college will take punitive action and a grade of zero will be assigned for the affected assignment, report, presentation, or examination.



MIME 2120	Engineering Materials	3 Credit Hours
Prerequisites:	CHEM 1101 & PHYS 1200	
Goal	To introduce to the students the basics of engineering materials.	
Objectives	Outcomes	
<p>This course should enable the student to :</p> <ol style="list-style-type: none"> 1. Familiarize with classification of engineering materials 2. Understand the basic properties of materials and structure of materials. 3. Study the application of materials 4. Understand the selection of materials, selection procedure including design specifications, criteria for selection etc. 5. Understand various tests to study the properties of materials 	<p>A student who satisfactorily complete the course should be able to:</p> <ol style="list-style-type: none"> 1 Explain the importance of material study and state the type of material such as metals, polymers, ceramics, composites and semiconductors and also their applications. 2 Describe the properties of various materials such as mechanical, electrical, thermal, physical and chemical properties of materials. 3 Recognize the crystal and non-crystalline structures of materials. 4 Distinguish between the properties of amorphous and crystalline materials 5 Apply the generalized form of hooks law to predict the elastic behavior of the different materials. Characterize materials by stress and strain curves. Carryout laboratory tests on the above. 6 Carryout destructive and non-destructive tests in the laboratory. 7 Select a suitable material for any given product based on the design specifications and selection criteria. 8. Refer to the standard data sources to find the properties of the suitable material and selection. 	



MIME 2130	Manufacturing Processes	3 credit hours
Pre requisite	PHYS 1200	
Co requisite	MIME 2120	
Goal	To introduce to the students the basics of manufacturing processes.	
Objectives	Outcomes	
<p>This course should enable the student to :</p> <ol style="list-style-type: none"> 1. Understand how the manufacturing processes are classified. 2. Conceptualize with basics of metal shaping techniques like casting and forming 3. Study various machining, metal joining and surface finishing process. 4. Understand the basics of heat treatment of metals. 5. Understand the basics of CNC machines and FMS. 	<p>A student who satisfactorily complete the course should be able to:</p> <ol style="list-style-type: none"> 1. State various manufacturing processes like material shaping, material removal, joining and assembly processes 2. Describe casting techniques like sand casting and die-casting. State their applications 3. Distinguish between hot and cold working of metals. 4. Describe forming operations like forging, rolling, extrusion, drawing, bending. 5. Illustrate the basic features of machine tools like lathe machines, drilling machines, milling machines, grinding machines and their applications. 6. Describe the salient features of joining operations like arc welding, gas welding, brazing, soldering and their applications. 7. Describe various heat treatment processes for metals specifically for steel like annealing, normalizing, hardening and tempering. 8. Explain the main features of various surface finish operation like electroplating, galvanizing, anodizing. Surface coating techniques like plastic coating and painting. 9. Elucidate the basic features of CNC machines and FMS. Basic components of CNC machines, input devices and basics of part programming. 10. Study various types of tools used in metal cutting machines. Understand the design and fabrication of jigs and fixtures. 	

