Machine Design

Basic Course Specification		
Course Title	**Course Code**	**Program on which the course is given**
Machine design	ME 454 T	Bachelor
Academic Year	**Specialization** (hr/week)	**Pre-Requisites**
2020/21	• Theoretical (2) • Application (2) • Credit (3Cr.)	ME252T - ME375T

Overall Course Objectives

This syllabus covers the requirements of the STCW-78, as amended. In particular Chapter III, Section A-III/2 for the function "Marine Engineering at the Management Level", STCW-78, as amended. The syllabus is so designed with the guide of IMO Model course 7.02, version 2014, function 1. It also provides sufficiently advanced understanding of machine design concept and to enable students to be creative in mechanical, marine and industrial applications.

Course Learning Outcomes. By successful completion of the course each student will be able to:

Topic	Linking to PLOs	7th Week Assessment	12th Week Assessment	Class Activities	Final Exam
1. Use a wide range of analytical and technical tools, techniques and equipment including pertinent software.	a, e			X	
2. Apply theories and concepts of mathematics and engineering principles to mechanical power systems.	c, f	X	X	X	X
3. Design and execute a project in the field of mechanical power engineering.	d, k, h			X	
4. Evaluate the sustainability and environmental issues related to mechanical power systems.	g,i, h			X	
5. Apply industrial safety	b,d			X	

Course Content

Lec./ Week #	Topic	Hrs. #	Theoretical	Application
1	- Introduction to Stresses in machine parts - Introduction to Stresses in machine parts using Matlab software Revision	4	2	2
2	- Stresses in machine parts (cont.) - Stresses in machine parts (cont.) using Matlab software	4	2	2
3	- Screws - Screws using Matlab software	4	2	2
4	- Fasteners and connections - Fasteners and connections using Matlab software	4	2	2
5	- Welded joints - Welded joints using Matlab software	4	2	2

Course Content				
Lec./ Week #	**Topic**	**Hrs. #**	**Theoretical**	**Application**
6	- Welded joints (cont). - Welded joints (cont.) using Matlab software	4	2	2
7	**7th Week Exam** Flexible mechanical elements (belts)	**4**	**2**	2
8	- Flexible mechanical elements (chains & wire ropes)	4	2	2
9	- Sliding bearings	4	2	2
10	- Sliding bearings (cont.)	4	2	2
11	- Roller bearings	4	2	2
12	**12th Week Exam** -Gears (introduction)	**4**	**2**	2
13	- Gears (spur gears & helical gears) - Gears (spur gears & helical gears) using Matlab software	4	2	2
14	- Gears (bevel gears & worm gears) - Gears (bevel gears & worm gears) using Matlab software	4	2	2
15	- Shafts - Shafts using Matlab software	4	2	2
16	**Final Assessment**			
Total Hours		**60**	**30**	**30**

Teaching & Learning Methods	Facilities Required for Teaching & Learning Methods
• Lectures • Tutorials • Reports & sheets	• White board and data show • Workshop

Students Assessment Methods	
Assessment Schedule	
Assessment#1	Week 7
Assessment#2	Week 12
Assessment#3	Class Activities
Assessment#4	Week 16

Grading Method		
7th Week Assessment	Written Exam	**30%**
12th week Assessment	Written Exam	**20%**
Class Activities	Assignments + Tutorials + Quizzes	**10%**
Final Exam	Written Exam	**40%**
	Total	**100 %**

* Assessment criteria meets the standards of the STCW 78 convention "as amended" and in the light of the related IMO model courses.	
Staff Requirements	
Marine Chief Engineer/ Ph.D.	
List of References	
Course Notes	**Essential Books**
None	Shigley and Mischke "Mechanical Engineering design", McGraw Hill, 2018. 9789814595285.
Recommended Books	**Periodicals and Publications**
• Black & Adams "Machine design", McGraw Hill, latest edition	None
IMO References	
None	

Accreditation Bodies
*Egyptian Authority for Maritime Safety (EAMS)
* European Commission (E.C)
*ISO (9001 – 2015) DNV-GL
*Central Evaluation and Accreditation Agency Hanover, Germany (ZEVA)
*Ministry of Education (KSA)
*Ministry of Higher Education (Greece)
*Ministry of Higher Education (Oman)
*Commission for Academic Accreditation (CAA), Ministry of higher Education (UAE)
*University of Plymouth, United Kingdom (dual degree)

Prepared by: Course Coordinator **Reviewed by: Head of Department**

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