



University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Mechanical Engineering

Form no. (12): **Course Specification**

1- Course Data

Course Code: ME 423	Course Title: Steam Plant Engineering	Academic Year/Level: 4th year / 8th semester
Specialization: Mechanical	No. of Instructional Units 3 credits	Lecture 2 hrs.
		Practical 2 hrs.

2- Course Aim

- Studying steam power plant performance and the needs of high power units (Propulsion or Electric Generation). Design of components. Safety aspects of pressure vessels. Calculation of geat balance for huge power plants

3- Intended Learning Outcomes

a- Knowledge and Understanding	<p>Through knowledge and understanding, students will be able to:</p> <p>a.4) Principles of design including elements design, process and/or a system related to specific disciplines.</p> <p>a.8) Current engineering technologies as related to disciplines</p> <p>a.12) Contemporary Engineering Topics</p> <p>a.p.1) Fundamentals of thermal and fluid processes</p> <p>a.p.4) The constraints which mechanical power and energy engineers have to judge to reach at an Optimum solution</p> <p>a.p.6) Mechanical power and energy engineering contemporary issues</p> <p>a.p.7) Basic theories and principles of some other engineering and mechanical engineering disciplines</p> <p>Providing support to mechanical power and energy disciplines.</p>
b- Intellectual Skills	<p>Through intellectual skills, students will be able to:</p> <p>b.1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems.</p> <p>b.12) Create systematic and methodic approaches when dealing with new and advancing technology.</p>
c- Professional Skills	<p>Through professional and practical skills, students will be able to:</p>
d- General Skills	<p>Through general and transferable skills, students will be able to:</p> <p>d.9) Refer to relevant literature</p>

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4- Course Content

Week No.1	Introduction, Characteristics of Steam Power Plants. Main Components Real Cycle Representation.
Week No.2	Thermodynamics of Vapours Superheating, Reheating. Regeneration, Supersaturating and Under Cooling.
Week No.3	Boilers: Types, Classification of Pressure Vessels
Week No.4	Mountings, Fittings, Heating Surfaces & Tubing
Week No.5	Efficiency Calculations & Equivalent Evaporation
Week No.6	Combustion & Combustion Equipment Insulation Control
Week No.7	Desuper Heaters Steam to Steam Generators- 7th week evaluation / 7th week evaluation
Week No.8	Steam Turbines: Types & Theory of Action
Week No.9	Flow of Steam through Nozzles Power Calculation
Week No.10	Turbine Efficiency Calculation Velocity Diagrams
Week No.11	Turbine Design (Casing, Rotors and Blading)
Week No.12	Glands, Bearings, and Governing- 12th week evaluation / 12 th week evaluation
Week No.13	Steam Plant Systems, Performance & Heat Balance.
Week No.14	Condensers & Air Ejectors
Week No.15	Dearators & Evaporators
Week No.16	Final Examination

5- Teaching and Learning Methods

<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Seminars

6-Teaching and Learning Methods for Students with Special Needs

<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Seminars <p><u>Engineering Requirements and Design Considerations in college Buildings and its Leading Passages</u></p> <ul style="list-style-type: none"> • The design of college buildings and pedestrian passages leading to it are sloppy to allow the transportation of the handicapped;
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- Doors are wide enough to let wheel chairs pass through easily and conveniently.
- Lifts are provided for movement between floors.
- Doors are made from light weight materials to make it easy for the handicapped suffering from weakness in limb muscles or those handicapped using prosthetic limbs to deal with them with the least muscular effort.
- Class floors are made from non-slippery materials to prevent falls on the part of the handicapped.
- Sudden changes in the floor level are prevented.

Design Considerations of the Classes

- Class boards are placed at 60 cm high to allow wheeled chair users or those suffering from limited arm mobility use them.
- Enough spaces are left between seats and benches to prevent hindering the movement of wheeled chairs between them.
- Handicapped students sit among normal people in class to be able to interact with them. Nevertheless, in urgent cases according to the nature of the disability, the handicapped students sit in fixed suitable places whether at the front or the back of the class.
- Handicapped students sit close to the main exits of the class to be able to evacuate in case of emergencies.

Academic Support:

- The general academic advisor appoints an academic supervisor for handicapped students.
- Continuous follow ups are made for handicapped students after each assessment to evaluate their academic level of achievement

7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes.	
	2-Class Activities (Reports, Discussions, -----) to assess The Intellectual Skills.	
b- Schedule:	Assessment 1	7 th Week Assessment
	Assessment 2	12 th Week Assessment
	Assessment 3	Continuous Assessments
	Assessment 4	16 th Week Final Written Exam
c- Weighing of Assessment	7 th Week Evaluation	30 %
	12 th Week Evaluation	20 %
	Final-term Examination	40 %
	Oral Examination	00 %
	Practical Examination	00 %
	Semester Work	10 %
	Total	100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	<ul style="list-style-type: none"> • Thomas D. Morton, "Reed's Steam Engineering Knowledge for Marine Engineers", A&C Black Publishers, latest edition.
c- Recommended Books	<ul style="list-style-type: none"> • Kostyuk and V. Frlov, "Steam and Gas Turbines", Mir Publishers, 1988.
d- Periodicals, Web Sites, etc.	N/A

Course Instructor: Prof. Mohamed Teamah

Head of Department: Prof. El-Sayed Saber

Program Manager: Prof. El-Sayed Saber

**Dean of College of Engineering and Technology
of AASTMT**

Name: **Prof. Moustafa Hussein Aly**

Signature:

**Executive Manager of Quality Assurance
Center of AASTMT**

Name: **Prof. Aziz Ezzat**

Signature:

