Course Specifications of: Steam Power Plants MEP 510

Program(s) on which the course is given: Diploma in Mechanical Power Engineering (Conventional and Renewable Power Plants)
Compulsory or Elective element of program: Compulsory
Department offering the program: Mechanical Engineering/ Power
Academic year / Level: year/ 2014/2015
Date of specification approval: 2012

A. Basic Information

Title: ***Steam Power Plants*** **Code:** ***MEP 510***
Credit Hours: 3 **Lecture: 3**
Tutorial: **Practical:** **Total; 3**

B- Professional Information

1- Overall aims of course:

This course introduces students to:

1- Recognize the fundamentals background in the steam power plants and its performance in Conventional and Renewable Power Plants.

2- Convey the principles and practice for the different steam power plants and gas turbines stations, including the control systems of boilers, condensers and fuel combustion and its applications in mechanical engineering.

3 - Establish the physical principles and the most important techniques in the steam power stations and its applications in mechanical engineering.

2- Intended learning outcomes of course (ILOs)

By completion of the course, the student should be able to:

2.1 Knowledge and understanding

a1. Review theories, fundamentals and knowledge in the study of steam power plants. (2.1.1)
a2. Describe principles of quality in steam power plants. (2.1.3)
a3. Represent computer tools available for analysis, design and operation of steam power plants. (2.1.5)

2.2 Intellectual skills

b1. Analyze the information in steam power plants. (2.2.1)
b2. Solve study of steam power plants problems. (2.2.2)

b3. Ability to evaluate data sources and make judgments in the absence of complete data. (2.2.2).

2.3 Professional and practical skills

c1. Apply professional skills in the area of study of steam power plant plants. (2.3.1)
c2. Prepare professional reports. (2.3.2)

2.4 General and transferable skills

d1. Communicate efficiently in oral, written and with drawing. (2.4.1)
d2. Use information technology to improve steam power plants. (2.4.2)
d3. Work in a group and manage time effectively. (2.4.5)
d4. Lead a team in familiar professional contexts. (2.4.6)
d5. Conduct self-learning and continuous education practices. (2.4.7)

3- Contents

Topic No.	Topic	No. of weeks	Total no. of hours
1	Introduction to steam power station	1	3
2	Steam boilers- fire tube boilers - water tube boilers - water circulation	2	6
3	Steam collectors- steam super heaters - economizers – air preheaters- chimney	4	12
4	The control systems of steam boilers	2	6
5	Fuels and combustion – condensers	2	6
6	Steam and gas turbine stations - multiple pressures plants	1	3
7	Multiple pressures plants - peak load plants - thermal energy storage - introduction to economics of power plants.	2	6
8	Exam	1	3
	Total	15	45

4- Course Matrix

ILO's code number	Teaching/learning methods and strategies	Assessment methods and strategies
2.1.1 2.1.3 2.1.5	Formal lectures	Individual coursework assignments, quizzes, oral discussions and reports. Mid-year and /or final written examination is given.
2.2.1 2.2.2	Analysis and problem-solving skills are developed through tutorial/problem sheets	Analysis and problem-solving skills are assessed through oral and

2.2.6	and small group exercises. Research skills are developed through a small subject oriented research project.	written examinations. Design and research skills are assessed through project write-ups, coursework and project reports.
2.3.1 2.3.2	Experiments demonstrations, practical work, laboratory visits.	Practical skills are assessed through laboratory experimental write-ups, coursework exercises and reports, project reports and presentations.
2.4.1 2.4.2 2.4.5 2.4.6 2.4.7	Attendance of seminars, workshops or conferences will help the student in developing those skills. Presentation by students (either group or individual) will train students for those skills.	Project presentation

5- Assessment schedule

Assessment 1	Assignments	on weeks	1, 3, 6, 11
Assessment 2	Quizzes	on weeks	2, 4, 9,13
Assessment 3	Mid-term exam	on weeks	8
Assessment 3	Oral exam	on week	14
Assessment 4	Final exam	on week	15

6- Weighting of assessments

20% (60 marks) Home assignments, Quizzes, and reports
20% (60 marks) Mid-term examination and Oral examination
60% (180 marks) Final-term examination
100% (300 marks) Total

7- List of References

7.1 Text books

* Course notes Prepared by the instructor:
* Steam Plant Operation, Ninth Edition
by: Everett B. Woodruff, Herbert B. Lammers, Thomas F. Lammers

7.2 Websites

* Yahoo mail group
* Yahoo scribd.com
* www.sciencedirect.com

8- Facilities required for teaching and learning

Presentation board, computer and data show
Laboratory

Prepared by: Assoc. Prof. Dr. Aly Abdelaziz

Head of Department: Prof. Dr. Osama Ezzat Abdellatif

Matrix of course content and ILO's

Course Title: **Steam Power Plants** **Code**: **MEP 510**
Lecture: 3 **Tutorial**: --- **Practical**: ---- **Total:** 3
Program on which the course is given: Diploma in Mechanical Power Engineering.
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Department offering the program Mechanical Engineering / Power
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Course content	ILO's A	ILO's B	ILO's C	ILO's D
Introduction to steam power station	a1			
Steam boilers- fire tube boilers - water tube boilers - water circulation	a1	b2	c1	
Steam collectors- steam super heaters - economizers – air preheaters- chimney	a1	b1		d1
The control systems of steam boilers	a1	b1		d3
Fuels and combustion – condensers	a1	b1	c2	
Steam and gas turbine stations - multiple pressures plants	a1	b2	c1	d4
Multiple pressures plants - peak load plants - thermal energy storage - introduction to economics of power plants.	a2,a3	b2	c2	d5

Matrix of course aims and ILO's

Course Title: Steam Power Plants **Code**: **MEP 510**
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Course aims	ILO's A	ILO's B	ILO's C	ILO's D
1- Understand the fundamentals background in the steam power plants and its performance in Conventional and Renewable Power Plants.	a1	b1	c1	
2- Capable of conveying the principles and practice for the different steam power plants and gas turbines stations, including the control systems of boilers, condensers and fuel combustion and its applications in mechanical engineering.	a2	b1,b3	c1	d2
3- Establishing the physical principles and the most important techniques in the steam power stations and it applications in mechanical engineering.	a2,a3	b2	c1	d3