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## ***Course Specifications of: Gas and Steam Turbines MEP 518***

**Program(s) on which the course is given:** Diploma in Mechanical Power Engineering  
(Conventional and Renewable Power Plants)

**Compulsory or Elective element of program:** Elective

**Department offering the program:** Mechanical Engineering / Power

**Academic year / Level:** year / 2014/2015

**Date of specification approval:** 2012

### **A. Basic Information**

**Title:** *Gas and Steam Turbines*

**Code:** MEP 518

**Credit Hours:** 3

**Lecture:** 3

**Tutorial:**                      **Practical:**

**Total:** 3

### **B- Professional Information**

#### **1- Overall aims of course:**

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

- 1- Classify all types of turbines.
- 2- Demonstrate principles and practice for the different types of turbines.
- 3- Recognize the physical principles for part load operation.

#### **2- Intended learning outcomes of course (ILOs)**

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

##### **2.1 Knowledge and understanding**

- a1. Identify theories and specialized knowledge in the area of Gas and Steam Turbines study and categorize sciences related to professional practice.(2.1.1)
- a2. Describe fundamentals of quality in professional practice in the area of Gas and Steam Turbines study.( 2.1.3)
- a3. Explain the effect of professional practice on the environment and work towards its conservation and maintenance. (2.1.4)

##### **2.2 Intellectual skills**

- b1. Discern and analyze the problems in the area of Gas and Steam Turbines and categorize them according to their priority. (2.2.1)
- b2. Analysis and criticize research papers and topics related to gas and steam turbines. (2.2.3)
- b3. Make a good judgments in the absence of complete data with the available sources. (2.2.6)



### 2.3 Professional and practical skills

- c1. Apply professional skills in Gas and Steam Turbines.(2.3.1)  
c2. Prepare professional reports. (2.3.2)

### 2.4 General and transferable skills

- d1. Assess him/her self and identify his/her own personal learning needs. (2.4.3)  
d2. Use different sources for obtaining information and knowledge. (2.4.4)

## 3- Contents

Topic No.	Content	No. of weeks	Total no. of hours
1	Introduction to thermodynamics & Basic Definition	1	3
2	Gas turbine cycles	1	3
3	combined cycle (gas and steam)	1	3
4	Turbines	1	3
5	turbine jet aircraft	1	3
6	jet turbine and propeller turbine	2	6
7	Lift increasing factors	2	6
8	Centrifugal compressors	1	3
9	Axial compressor	1	3
10	Axial turbines	1	3
11	Moving and stationary blades and their distribution	1	3
12	Operation at partial loads	1	3
	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 2.1.4	Formal lectures	Individual coursework assignments, quizzes, oral discussions and reports. Mid year and /or final written examination is given.
2.2.1 2.2.3 2.2.6	Analysis and problem-solving skills are developed through tutorial/problem sheets and small group exercises. Research skills are developed through a small subject oriented research project.	Analysis and problem-solving skills are assessed through oral and 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.
2.4.3 2.4.4	Those skills are not explicitly taught; however, along the course of study the student will acquire those skills to be able to perform his obligations. 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
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

- Turbomachinery: Design and Theory, Rama S.R. Gorla (Marcell Dekker), 2001
- Fundamentals of Fluid Mechanics, Bruce R. Munson, Donald F. Young, Theodore H. Okiishi; Wiley; 4 edition,(November 29, 2001).

#### 7.2 Recommended books; Periodicals & Websites.

- Yahoo mail group
- www.sciencedirect.com
- www.4shared.com

### 8- Facilities required for teaching and learning

Lecture room equipped with overhead projector  
 Presentation board, computer and data show  
 Laboratory

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Head of Department: Prof. Dr. Osama Ezzat Abdellatif



## Matrix of course content and ILO's

**Course Title:** *Gas and Steam Turbines*

**Code:** MEP 518

**Lecture:** 3.

**Tutorial:** ----

**Practical:** ----

**Total:** 3

**Program on which the course is given:** Diploma in Mechanical Power Engineering.

**Major or minor element of program:** Elective

**Department offering the program:** Mechanical Engineering / Power

**Department offering the course:** Mechanical Engineering / Power

**Academic year / level:** 2014/2015. **Date of specifications approval:** 2012

Course content	ILO's A	ILO's B	ILO's C	ILO's D
Introduction to thermodynamics & Basic Definition	a1			d1
Gas turbine cycles	a1	b1		
combined cycle (gas and steam)	a2			d2
Turbines	a1	b2		
turbine jet aircraft	a3			d1
jet turbine and propeller turbine	a1	b2,b3		
Lift increasing factors			c1	d2
Centrifugal compressors	a1	b1		
Axial compressor	a2	b1		
Axial turbines	a1	b1,b3		
Moving and stationary blades and their distribution			c1	d1
Operation at partial loads			c1	d1



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## Matrix of course aims and ILO's

**Course Title:** Gas and Steam Turbines**Code:** MEP 518**Lecture:** 3**Tutorial:****Practical:****Total:** 3**Program on which the course is given:** Diploma in Mechanical Power Engineering**Major or minor element of program:** Elective**Department offering the program:** Mechanical Engineering / Power**Department offering the course:** Mechanical Engineering / Power**Academic year / level:** 2014/2015. **Date of specifications approval:** 2012

Course aims	ILO's A	ILO's B	ILO's C	ILO's D
1- Classify all types of turbines.	a1			d1
2- Demonstrate principles and practice for the different types of turbines.	a1	b1,b3	c2	
3- Recognize the physical principles for part load operation.	a1			d2