



## *Course Specifications of: Theory of Rotating Machinery MEP523*

**Program(s) on which the course is given:** Diploma in Mechanical Power Engineering  
(Pumping and Pipe Networks Engineering)

**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:** *Theory of Rotating Machinery*

**Code:** MEP 523

**Credit Hours:** 3

**Lecture:** 3

**Tutorial:**

**Practical:**

**Total:** 3

### B- Professional Information

#### 1- Overall aims of course:

This course introduces students to:

- 1- Understand the energy equation for different devices such as turbines, compressors, nozzles and diffusers.
- 2- Demonstrate principles and practice for the different types of rotating machines.
- 3- Recognize the physical principles and the most important techniques of rotating machines.
- 4- Research skills are developed through a small subject oriented research project.

#### 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 fundamentals and specialized knowledge in theory of rotating machinery and categorize sciences related to professional practice. (2.1.1)
- a2. List principles of professional practice in theory of rotating machinery. (2.1.2)
- a3. Represent methodologies and computer tools for analysis, design and operation of rotating machines. (2.1.5)

##### 2.2 Intellectual skills

- b1. Critically read research papers and topics related to theory of rotating machinery. (2.2.3)
- b2. Make professional decisions in the light of available information. (2.2.5)

##### 2.3 Professional and practical skills

- c1. Apply professional skills in the area of rotating machinery. (2.3.1)
- c2. Prepare professional reports. (2.3.2)

##### 2.4 General and transferable skills



- d1. Communicate effectively using different means. (2.4.1)  
 d2. Use information technology in order to serve the development of professional practice. (2.4.2)  
 d3. Use different sources for obtaining information and knowledge. (2.4.4)

### 3- Contents

Topic No.	Topic	No. of weeks	No. of hours
1	Introduction to rotating machinery & Basic Definition	2	6
2	Energy equation	1	3
3	Adiabatic flow through nozzles and diffusers	2	6
4	Equation of work done and efficiency in single stage turbine and compressor	2	8
5	Turbines , Gas turbine , Steam turbine , Wind turbine	3	9
6	Dimensional analysis & similarity	2	6
7	Unstable flow through series of blades	2	6
	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 2.1.2 2.1.5	Formal lectures	Individual coursework assignments, quizzes, oral discussions and reports. Mid-year and /or final written examination is given.
2.2.3 2.2.5	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.
2.4.1 2.4.2	Those skills are not explicitly taught; however, along the course of study the student will acquire	Project presentation



2.4.4	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.	
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### 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

- Fundamentals of Fluid Mechanics,
- Turbines, Compressors and Fans
- Fundamentals of Turbomachinery
- Basic concepts of Turbomachinery

#### 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

**Prepared by: Dr. Mohamed Hassan**

**Head of Department: Prof. Osama Ezzat Abdellatif**




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## Matrix of course content and ILO's

**Course Title: Theory of Rotating Machinery****Code: MEP 523****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 rotating machinery & Basic Definition	a1		c1	d1
Energy equation	a1	b1	c1	
Adiabatic flow through nozzles and diffusers	a2			d1
Equation of work done and efficiency in single stage turbine and compressor	a1,a3	b2	c2	
Turbines , Gas turbine , Steam turbine , Wind turbine	a1			d2
Dimensional analysis & similarity	a1		c1	d3
Unstable flow through series of blades			c1	d2



## Matrix of course aims and ILO's

**Course Title: Theory of Rotating Machinery**

**Code: MEP 523**

**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	ILO's	ILO's	ILO's
	A	B	C	D
1- Understand the energy equation for different devices such as turbines, compressors, nozzles and diffusers.	a1, a2			d1
2- Demonstrate principles and practice for the different types of rotating machines.	a2	b1	c1	
3- Recognize the physical principles and the most important techniques of rotating machines.	a1,a3	b1		
4- Research skills are developed through a small subject oriented research project.			c2	d2