



Course Specifications of: Experiments on Pumps MEP 524

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: Experiments on Pumps

Credit Hours: 3

Tutorial:

Practical:

Code: MEP 524

Lecture: 3

Total: 3

B- Professional Information

1- Overall aims of course:

This course introduces students to:

- 1- Discuss the fundamentals of Turbo-machine.
- 2- Demonstrate principles of operation, performance, testing and selection of pumps.
- 3- Recognize of all types of losses in pumps and method of calculations.
- 4- Research skills are developed through search for some pump applications in different industries.

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 and specialized knowledge in experiments on pumps and categorize sciences related to professional practice. (2.1.1)
- a2. List principles of professional practice in experiments on pumps. (2.1.2)

2.2 Intellectual skills

- b1. Analyze the problems in experiments on pumps and categorize them according to their priority. (2.2.1)
- b2. Solve specialized problems in experiments on pumps.(2.2.2)
- b3. Critically and analytically read research papers and topics related to pumps. (2.2.3)

2.3 Professional and practical skills

- c1. Apply professional skills in experiments on pumps.(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. Work in a group and manage time effectively. (2.4.5)
- d4. Lead a team in familiar professional contexts. (2.4.6)

Topic No.	Content	Week No.	hours
1	Classifications of pumps (axial - radial - mixed flow)	1	3
2	Types of pumps - Performance curves	3	9
3	Pump losses	2	6
4	Cavitation in pumps, blades and its impact on pump performance.	2	6
5	Pump selection	3	9
6	Control the speed of rotation and its measurement – lift measurement – discharge measuring	2	6
7	Pressure sensors - determination of losses in the pumps Pump testing	1	3
	Total	15	45

3- Contents

4- Course Matrix

ILO's code number	Teaching/learning methods and strategies	Assessment methods and strategies
2.1.1 2.1.2	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 2.2.3	Analysis and problem-solving skills are developed through tutorial	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 2.4.5 2.4.6	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

- Pump user's handbook
- Centrifugal Pump Handbook – Sulzer LTD
- Hydrodynamics Handbook – RuhRPumpen GmbH
- International standard ISO 9906, “ Rotodynamic pumps-hydraulic performance acceptance tests

7.2 Recommended books; Periodicals & Websites.

- 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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Matrix of course content and ILO's

Course Title: Experiments on Pumps

Code: MEP 524

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

Department offering the course: Mechanical Engineering / Power

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

Course contents	ILO's A	ILO's B	ILO's C	ILO's D
Classifications of pumps (axial - radial - mixed flow)	a1, a2			d1
Types of pumps - Performance curves	a2	b1, b2		d2
Pump losses	a2	b1, b3		d4
Cavitation, cavitation in pumps, blades and its impact on pump performance.	a1	b1, b2		d3
Pump selection	a2	b1, b2		d2
Control the speed of rotation and its measurement – lift measurement – discharge measuring		b1	c1, c2	d1
Pressure sensors - determination of losses in the pumps Pump testing		b1	c1, c2	d1



Matrix of course aims and ILO's

Course Title: Experiments on Pumps

Code: MEP 524

Lecture: 3.

Tutorial: ----

Practical: ----

Total: 3

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

Course aims	ILO's A	ILO's B	ILO's C	ILO's D
- Understand the fundamentals of Turbo-machine	a1, a2			d1
- Demonstrate principles of operation, performance, testing and selection of pumps.	a2	b1, b2		d2
- Recognize of all types of losses in pumps and method of calculations	a2	b2, b3		d3
- Research skills are developed through search for some pump applications in different industries		b1	c1, c2	d4