



Course Specifications of: Pumps MEP 519

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

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: Pumps

Credit Hours: 3

Tutorial:

Practical:

Code: MEP 519

Lecture: 3

Total: 3

B- Professional Information

1- Overall aims of course:

This course introduces students to:

- 1- Understand the fundamentals of pumps.
- 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- Recognize of Energy management and saving in pump station

2- Intended learning outcomes of course (ILOs)

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

2.1 Knowledge and understanding

- a1. Discuss the fundamentals to solving pumping engineering problems. (2.1.3)
- a2. Explain the effect of professional practice on the environment and work towards its conservation and maintenance. (2.1.4)

2.2 Intellectual skills

- b1. Solve specialized problems in pumps. (2.2.2)
- b2. Analysis and criticize research papers and topics related to pumps. (2.2.3)
- b3. Assess the risks and hazards in pumps. (2.2.4)
- b4. Make professional decisions in the light of available information (2.2.5)

2.3 Professional and practical skills

- c1. Prepare professional reports. (2.3.2)

**2.4 General and transferable skills**

- d1. Use information technology in order to serve the development of professional practice. (2.4.2)
- d2. Identify personal learning needs (2.4.3)
- d3. Use different sources for obtaining information and knowledge.(2.4.4)
- d4. Conduct self-learning and continuous education practices. (2.4.7)

3- Contents

Topic No.	Topic	No. of weeks	Total no. of hours
1	Types of pumps	1	3
2	Pumps connection , series and parallel –	3	9
2	Pump selection - performance curves -losses in pumps	3	9
3	Compatibility between the network of pipes and pump performance - specific speed - cavitation's in pumps - pump blades	3	9
4	The basics of pump maintenance, the basics of pump operation centrifugal pumps, gear pumps, reciprocating pumps, worm pumps, deep pumps, submerged pumps, vacuum pumps, lifting water using compressed air, pump selection, repair the faults (mechanical - electrical) of pumps	2	6
5	Energy management and saving in pump station	2	6
6	Exam	1	3
	Total	15	45

4- Course Matrix

ILO's code number	Teaching/learning methods and strategies	Assessment methods and strategies
2.1.3 2.1.4	Formal lectures, seminars, tutorials, directed reading, project work and independent study.	Individual coursework assignments, quizzes, oral discussions and reports. Mid-year and /or final written examination is given.
2.2.2 2.2.3 2.2.4 2.2.5	Analysis and problem- solving skills are developed through tutorial/problem sheets and small group exercises.	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.
	Experiments demonstrations,	Practical skills are assessed through laboratory

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2.3.2	practical work, laboratory visits.	experimental write-ups, coursework exercises and reports, project reports and presentations.
2.4.2 2.4.3 2.4.4 2.4.7	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, 14
Assessment 2	Quizzes	on weeks	2, 4, 9 and 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 Handbook , Igor J. Karassik, William G. Krutzsch, Warren H. Fraser, McGraw-Hill; 3 edition,
- Piping systems and Pipeline, J. Phillip Ellenberger, McGraw-Hillbook company copyright, 2005
- Hydraulics of Pipeline Systems by B.E. Larock, R.W.Jeppson and G.Z. Watters CRC , ISBN 0-8493-1806-8, TC174.L37

7.2 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



Matrix of course content and ILO's

Course Title: Pumping and Pipe Networks Engineering

Code: MEP 519

Lecture: 3. Tutorial: ----

Practical: ----

Total: 3

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

Major or minor element of program: Compulsory

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
Types of pumps	a1, a2			
Pumps connection , series and parallel -	a1			d4
Pump selection - performance curves - losses in pumps		b1,b4	c1	d1
Compatibility between the network of pipes and pump performance - specific speed - cavitation's in pumps - pump blades		b2,b3	c1	
The basics of pump maintenance, the basics of pump operation centrifugal pumps, gear pumps, reciprocating pumps, worm pumps, deep pumps, submerged pumps, vacuum pumps, lifting water using compressed air, pump selection, repair the faults (mechanical - electrical) of pumps	a1, a2	b4		
Energy management and saving in pump station		b4		d4



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Course content	ILO's A	ILO's B	ILO's C	ILO's D
1- Understand the fundamentals of pumps.	a1, a2			d2
2- Demonstrate principles of operation, performance, testing and selection of pumps.		b1,b4	c1	d1
3- Recognize of all types of losses in pumps and method of calculations.		b2,b3, b4	c1	
4- Recognize of Energy management and saving in pump station		b4		d4