



Course Specifications of: Refrigeration Systems and Equipment MEP 504

Program(s) on which the course is given: Diploma in Power Engineering
(Refrigeration and Air Conditioning Technology)

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: *Refrigeration Systems and Equipment*

Code: *MEP 504*

Credit Hours: 3

Lecture: 3

Tutorial:

Practical:

Total: 3

B- Professional Information

1- Overall aims of course:

This course introduces students to:

- 1- Review and analyze thermodynamically the different refrigeration systems.
- 2- Recognize the operation principles of the refrigeration systems.
- 3- Practice the equipment that used in the different refrigeration system.

2- Intended learning outcomes of course (ILOs)

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

a- Knowledge and understanding

- a.1 Recognize theories and fundamentals in the area of refrigeration systems and equipment technology and categorize sciences related to the professional practice.(2.1.1)
- a.2 Treat the recent problems, in refrigeration and air conditioning field in a critical and evaluative manner. (2.1.3)
- a.3. Explain the effect of refrigeration systems and equipment on the environment and work towards its conservation and maintenance. (2.1.4)

b- Intellectual skills

- b.1 Analyze research papers and topics related to the area of refrigeration and air conditioning.(2.2.3)
- b.2 Take decisions in complex and unpredictable situations for the refrigeration and air conditioning.(2.2.5)
- b.3 Evaluate data sources and make good judgments in the absence of complete data.(2.2.6)

c- Professional and practical skills

- c1. Write professional reports. (2.3.2)
- c3. Test the refrigeration systems and equipment. (2.3.3)

**d- General and transferable skills**

- d.1 Use information technology in order to serve the development of professional practice. (2.4.2)
- d.2 Conduct self-learning and continuous education practices. (2.4.7)

3- Contents

Topic No.	Topic	No. of weeks	Total no. of hours
1	Vapor compression refrigeration system	1	3
2	Absorption refrigeration	1	3
3	Steam jet ejector	1	3
4	Thermo-electric refrigeration	2	6
5	Evaporators	3	9
6	Mid-term exam	2	6
7	Condensers	1	3
8	Compressors	1	3
9	Expansion devices	2	6
10	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.
2.2.3 2.2.5 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.
2.3.2 2.3.3	Experiments demonstrations, practical work, laboratory visits. Design problems tutorial.	Practical skills are assessed through laboratory experimental write-ups, coursework exercises and reports, project reports and presentations.



2.4.2 2.4.7	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
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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 Essential books (Text books)**

- Handbook of HEATING, VENTILATION, and AIR CONDITIONING Ed. Jan F. Kreider
Boca Raton, CRC Press LLC. 2001
- Refrigeration Systems and Applications, [Ibrahim Dincer](#), [Mehmet Kanoglu](#), John Wiely, 2010.

7.2 Recommended books; Periodicals & Websites.

- ASHRAE 2000 HVAC Systems and Equipment Handbook
- ASHRAE 2005 Fundamentals Handbook

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: Refrigeration Systems and Equipment**Code: MEP 504****Lecture: 3 .****Tutorial: ---- Practical: ----****Total: 3****Program on which the course is given: Diploma in 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 content	ILO's A	ILO's B	ILO's C	ILO's D
Vapor compression refrigeration system	a1,a2	a2		
Absorption refrigeration	a2	b1	c1	d1
Steam jet ejector	a1		c1	d2
Thermo-electric refrigeration	a1	b1		
Evaporators	a2	c1		
Condensers	a1	b1	c1	d1
Compressors	a1	b1		d1
Expansion devices	a2		c1	d1



Matrix of course aims and ILO's

Course Title: Refrigeration Systems and Equipment**Code: MEP 504****Lecture: 3 .****Tutorial: ---- Practical: ----****Total: 3****Program on which the course is given: Diploma in 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 A	ILO's B	ILO's C	ILO's D
1-Describe and analyze thermodynamically the different refrigeration systems.	a1,a2	b1		
2- Know the operation principles of the refrigeration systems.			c1	d1
3-Describe the equipment that used in the different refrigeration system.		b1	c1	d1,d2