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## *Course Specifications of: Engineering Software MEP 509*

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

**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:** Engineering Software

**Credit Hours:**3

**Tutorial:**

**Practical:**

**Code:** MEP 509

**Lecture:** 3

**Total:**3

### **B- Professional Information**

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

This course introduces students to:

- 1- Support students to upgrade their knowledge in the field of computer programming.
- 2- Utilize the available engineering software in the field of refrigeration and air conditioning.
- 3- Apply the principles and practice of different software for refrigeration and air conditioning.
- 4- Recognize the physical principles and the most important techniques in engineering software.
- 5- 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:

##### **a- Knowledge and understanding**

- a.1 Recognize theories and specialized knowledge in the area of engineering software categorize sciences related to the refrigeration and air conditioning field.( 2.1.1)
- a.2 List principles of professional practice in the area of Numerical technique. (2.1.2)
- a.3 Analysis and design engineering software.( 2.1.5)

##### **b- Intellectual skills**

- b.1 Analyze the problems in the area of engineering software and categorize them according to their priority.( 2.2.1)
- b.2 Solve design, installation and operation problems in refrigeration and air conditioning. (2.2.2)
- b.3 Critically read research papers and topics related to engineering software.( 2.2.3)

##### **c- Professional and practical skills**

- c.1 Apply professional skills in the area of engineering software (2.3.1)
- c.2 Prepare professional reports. (2.3.2)
- c.3 Comply with codes, standards, quality assurance methodology, environmental issues in the design programs in the field of RAC . (2.3.3)

**d- General and transferable skills**

- d.1 Communicate effectively using different means. (2.4.1)  
 d.2 Use information technology in order to serve the development of professional practice.( 2.4.2)  
 d.3 Use different sources for obtaining information and knowledge.( 2.4.4)  
 d.4 Conduct self learning and continuous education practices.( 2.4.7)

**3- Contents**

Topic No.	Topic	No. of weeks	Total no. of hours
1	Introduction to computer programming , Software design and development methods	1	3
2	Analysis, design and implementation of large software systems.	2	6
3	Design methods fragmented and assembled to larger programs - Programming team management – Software testing and evaluation	3	9
4	Maintenance and documentation of software – Applications to design compilers methodology and methods of compilers, linguistic analysis and methods of expressing top-down and bottom to top	2	6
5	Methods of generating optimal code, design of a simple compiler. Steam properties software - heat transfer software - pipe networks software	2	6
6	Programs for systems of linear equations and non-linear equation Graphical presentation software	2	6
7	Project – a project using computers in the field of the diploma	2	6
8	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.
2.2.1 2.2.2 2.2.3	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 2.3.3	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 2.4.4 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

**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)**

- \* Course notes Prepared by the instructor
- \* Numerical Methods for Scientists and Engineers by R. W. Hamming (Mar 1, 1987)

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

- \* Numerical Methods by J. Douglas(Douglas Faires) Faires and Richard L. Burden (Jun 18, 2002)
- \* Numerical Methods for Engineers, Sixth Edition by Steven Chapra and Raymond Canale (Apr 20, 2009)

**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:** Engineering Software **Code:** MEP 509 .  
**Lecture:** 3 . **Tutorial:** **Practical:** ---- **Total:** 3  
**Program on which the course is given:** Diploma in 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 computer programming , Software design and development methods	a1	b1		d1
Analysis, design and implementation of large software systems.	a1	b1		d3
Design methods fragmented and assembled to larger programs - Programming team management – Software testing and evaluation	a2	b2		
Maintenance and documentation of software – Applications to design compilers methodology and methods of compilers, linguistic analysis and methods of expressing top-down and bottom to top	a2			d2,d4
Methods of generating optimal code, design of a simple compiler. Steam properties software - heat transfer software - pipe networks software	a3	b2,b3		
Programs for systems of linear equations and non-linear equation Graphical presentation software		b1,b3	c1	d3
Project – a project using computers in the field of the diploma	a1	b1		d4



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**Matrix of course aims and ILO's**

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Course aims	ILO's A	ILO's B	ILO's C	ILO's D
1- Support students to upgrade their knowledge in the field of computer programming.	a1	a2	b2	
2- Utilize the available engineering software in the field of refrigeration and air conditioning.	a3	b2	c2	
3- Apply the principles and practice of different software for refrigeration and air conditioning.	a2	b3	c2	
4- Recognize the physical principles and the most important techniques in engineering software.	b2		c2	
5- Research skills are developed through a small subject oriented research project.	a2		c1	D1,d3