Model No.12
Course Specifications:Chemistry

University: Benha University
Faculty: Faculty of Engineering at Shoubra
Departmentoffering the program: All programs
Department offering the course: Engineering Mathematics and Physics

1- Course Data

Course Code:EMP014 **Course Title:**Physics A
Specialization: All programs **Study Year:**Prep. Year
Teaching Hours: Lecture: 4 Tutorial: 0 Practical: 2 Total: 6

2- Course Aim

For students undertaking this course, the aims are to:

- Understand the essential information as introduction about the fundamentals and basic concepts of Chemistry and their applications, also about basic information related to the applications in the Engineers.
- Understand Theory of Equations and to solve problems on gases, Thermo chemistry and electrochemistry equations.
- Know the properties of solutions and the colligative properties chemical equilibrium.
- Recognize the basic tools necessary to obtain Water treatments and Building materials.
- Describe the concept phase diagrams of the chemical compounds and it is mixture.
- Understand some aspects on chemical industries.

3- Intended Learning Outcomes of Course (ILO's)

a. Knowledge and Understanding Skills: On completing this course, students will be able to:

a.1)Recognize concepts and theories of chemistry and sciences, appropriate to the different engineering specializations. (A.1)

a.2)Recognize methodologies of solving engineering problems, data collection interpretation. (A.5)

b. Intellectual Skills: At the end of this course, the students will be able to:

b.1) Select appropriate chemical and computer-based methods for modeling and analyzing problems. (B.1)

b.2) Select appropriate solutions for engineering problems based on analytical thinking. (B.2)

b.3) Solve engineering problems, often based on limited and possibly contradicting information. (B.7)

c. **Practical and Professional Skills:** On completing this course, the students are expected to be able to:
   c.1) Apply knowledge of chemistry, science, and information technology, design, and business context and engineering practice to solve engineering problems.(C.1)
   c.2) Apply numerical modeling methods to engineering problems. (C.7)

d. **General and Transferable Skills:** At the end of this course, the students will be able to:
   d.1)Collaborate effectively within multidisciplinary team. (D.1)
   d.2) Communicate effectively.(D.3)

4- Course Contents

Week no.	Topics
1	Gaseous state, fuels and heat balance in combustion process
2	Solutions and Colligative properties
3	Dynamic physical and chemical equilibrium and Phase Rule
4	Electrochemistry and corrosion
5	Water and Water treatments
6	Building materials, Pollution and its prevention
7	Fuels and heat balance in combustion process
8	Chemical industries

5- Teaching and Learning Methods

5.1 Lectures
5.2Practical training/laboratory.

6- Teaching and Learning Methodsof Disables

Nothing

7- Student Assessment

a- Student Assessment Methods

1. Assignments to assess knowledge and intellectual skills.
2. Quiz to assess knowledge, intellectual and professional skills.
3. Midterm exam to assess knowledge, intellectual, professional and general skills.
4. Practical exam to assess practical, intellectual, professional and general skills.
5. Final exam to assess knowledge, intellectual, professional and general skills.

b- Assessment Schedule

NO.	Assessment	Week
1	Experimental write up	All
2	Midterm exam	8
3	Practicalexam	14
4	Final exam	15

c- Weighting of Assessments

Assessment	Weight (%)
Midterm Examination	20
Final Term Examination	60
Oral Examination	00
Practical Examination	20
Semester Work	00
Other Types of Assessment	00
Total	**100**

8- List of References

a- Course Notes

1- Lectures material and experimental sheets prepared by instructor

b- Books

1- Chemistry, The Central Science by T. L. Brown, H.E. LeMay, Jr. and Bruce E. Burstein, 10th Edition, Prentice-Hall International, 2006.

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d-Web Sites

- www.GeneralchemistryResearch.com

Course Coordinator: Prof. Dr. Mahmoud El-Komy

Head of Department: Prof. Dr. Said Adballah

Model No.11A
Course Specifications : Chemistry

University: Benha University
Faculty: Faculty of Engineering at Shoubra
Department: Mechanical Engineering Department

Matrix of Knowledge and Skills of the Course						
no.	**Topics**	**Week no.**	**Knowledge and Understanding Skills**	**Intellectual Skills**	**Practical and Professional Skills**	**General and Transferable Skills**
1	Gaseous state, Fuels and heat balance in combustion process - Solutions and Colligative properties	1	a1,a2	b7	c1,c2	d2
2	Gaseous state, Fuels and heat balance in combustion process - Solutions and Colligative properties	2	a1,a2	b7	c1,c2	d2
3	Gaseous state, Fuels and heat balance in combustion process - Solutions and Colligative properties	3	a1,a2	b3	c1,c2	d2
4	Gaseous state, Fuels and heat balance in combustion process - Solutions and Colligative properties	4	a1,a2	b3	c1,c2	d2
5	Dynamic physical and chemical equilibrium and Phase Rule - Electrochemistry and corrosion	5	a1,a2	b2,b3	c1	d2
6	Dynamic physical and chemical equilibrium and Phase Rule - Electrochemistry and corrosion	6	a1,a2	b1,b2		
7	Dynamic physical and chemical equilibrium and Phase Rule - Electrochemistry and corrosion	7	a1,a2	b1,b2		
8	Dynamic physical and chemical equilibrium and Phase Rule - Electrochemistry and corrosion	8	a1,a2	b1,b2		
9	Mid-term exam	9	a1,a2	b2, b3		
10	Water and Water treatments - Building materials, Pollution and its prevention	10	a2	b1	c2	
11	Water and Water treatments - Building materials, Pollution and its prevention	11	a1			d1
12	Water and Water treatments - Building materials, Pollution and its prevention	12	a1	b1	c2	d1

13	Water and Water treatments - Fuels and heat balance in combustion process	13	a1	b1	c2	d1
14	Chemical industries - Fuels and heat balance in combustion process	14	a1	b1		
15	Final exam	15	a1,a2	b2, b3	c1	

Course Coordinator: Prof. Dr. Mahmoud El-Komy

Head of Department: Prof. Dr. Said Adballah

Matrix of Course Aims and ILO's

Course Title:Chemistry

Course Code:EMP014

Teaching Hours: Lecture: 4 Tutorial: 0 Practical: 2 Total: 6

Major or minor element of program: N.A.

Program on which the course is given: B.Sc. Mechanical Power Engineering

Department offering the program: Mechanical Engineering Department

Department offering the course: Engineering Mathematics and Physics Department

Academic year / level: 2014-2015 Preparatory Year / First Semester

Date of specifications approval: 16/3/2010

No.	Topics	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
2.1	Understand the essential information as introduction about the fundamentals and basic concepts of Chemistry and their applications, also about basic information related to the applications in the Engineers.	a1	b2	c1,c2	
2.2	Understand Theory of Equations and to solve problems on gases, Thermo chemistry and electrochemistry equations.	a2	b3	c1,c2	d1
2.3	Know the properties of solutions and the colligative properties chemical equilibrium.	a1	b3	c1,c2	d2
2.4	obtain Water treatments and Building materials.	a1, a2	b3	c1,c2	d2
2.5	Describe the concept phase diagrams of the chemical compounds and it is mixture.	a1, a2	b2, b3	c1	d1
2.6	Understand some aspects on chemical industries.	a2	b1,b2		

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