COURSE SPECIFICATIONS (2010-2011)

Benha University  Faculty of Engineering at Shobra  Mechanical Engineering Department

A- Basic Information

Course Title: Chemistry  Code: MPH 014
Lecture: 4  Tutorial:  Practical: 2  Total: 6
Program on which the course is given: B.Sc. Mechanical Engineering (Power)
Major or minor element of program: Major
Department offering the course: Physics and Sciences Department
Academic year / level: Prep Year / First Semester
Date of specifications approval: 10/5/2006

B- Professional Information

1- Overall aims of course:
Write the aims of the course here ...
By the end of the course the student should be able to:
• Recognize 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.
• Recognize Theory of Equations and to solve problems on gases, Thermo chemistry and electrochemistry equations.
• State the properties of solutions and the colligative properties chemical equilibrium.
• Describe the basic tools necessary to obtain Water treatments and Building materials
• To teach the students how to describe the concept phase diagrams of the chemical compounds and it is mixture.
• Recognize some aspects on chemical industries.

2- Intended learning outcomes of course (ILOs)
By completion of the course, the student should be able to:

a- Knowledge and Understanding
a.1) Concepts and theories of mathematics and sciences, appropriate to the discipline.
a.5) Methodologies of solving engineering problems, data collection interpretation.
a.11) Professional ethics and impacts of engineering solutions on society and environment.

b- Intellectual Skills
b.1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems.
b.2) Select appropriate solutions for engineering problems based on analytical thinking.
b.4) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
b.7) Solve engineering problems, often on the basis of limited and possibly contradicting information.
b.9) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.

c- Professional and Practical Skills

  c.1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice to solve engineering problems.
  c.5) Use computational facilities and techniques, measuring instruments, workshops and laboratories equipment to design experiments, collect, analyze, and interpret results.
  c.7) Apply numerical modeling methods to engineering problems.

d- General and Transferable Skills

  d.1) Collaborate effectively within multidisciplinary team.
  d.2) Work in stressful environment and within constraints.

3- Contents

<table>
<thead>
<tr>
<th>Topic No.</th>
<th>Topic</th>
<th>Weeks</th>
<th>ILO’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Gaseous state</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>• Fuels and heat balance in combustion process</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>• Solutions and Colligative properties</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>• Dynamic physical and chemical equilibrium</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>• Phase Rule</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>• Electrochemistry and corrosion</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>• Water and Water treatments - Building materials</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>14 weeks</strong></td>
<td><strong>84 hours</strong></td>
</tr>
</tbody>
</table>

4- Teaching and Learning Methods

  Lectures
  Practical training / laboratory
  Seminar / workshop
  Class activity
  Case study
  Assignments / homework

5- Student Assessment Methods

  Assignments to assess knowledge and intellectual skills.
  Quiz to assess knowledge, intellectual and professional skills.
  Mid-term exam to assess knowledge, intellectual, professional and general skills.
  Oral exam to assess knowledge and intellectual skills.
  Final exam to assess knowledge, intellectual, professional and general skills.

Assessment Schedule
Benha University       Faculty of Engineering at Shobra       Mechanical Engineering Department

Assessment 1 on weeks 2, 5, 9, 11
Assessment 2 Quizzes on weeks 4, 6, 10, 12
Assessment 3 Mid-term exam on week 8
Assessment 4 Oral Exam on week 14
Assessment 5 Final exam on week 15

Weighting of Assessments
05% Home assignments
05% Quizzes
10% Mid-term examination
20% Oral examination
60% Final-term examination
100% Total

6- List of References
Course notes
Course notes prepared by instructor.

Essential books
Course Notes
• Lecture material training sheets and experimental sheets
  Essential Books (Text Books)
• Chemistry, The Central Science by T. L. Brown, H.E. LeMay, Jr. and Bruce E. Bursten,

Recommended books

7- Facilities required for teaching and learning
Lecture room equipped with overhead projector
Presentation board, computer and data show
Laboratory

Course coordinator: Prof. Dr. Prof. Dr. M. Abo El-Ela Rdwan, Prof.Dr Mahmoud El Koumy
Course instructor: Dr. Dr. shahera shohieb and Dr Manal Talaat

Head of Department: Prof. Dr. Ali Al Sabaagh         Date: December 5, 2011