

**METU NCC**  
**CHM107 "General Chemistry" COURSE DESCRIPTION**  
**Fall 2014-2015**

**Course Unit Title:** General Chemistry

**Course Unit Code:** CHM 107

**Type of Course Unit:** Compulsory

**Level of Course Unit:** 1st Year BSc

**Number Credits Allocated:** (3-2)4, 6 ECTS

**Prerequisite:** None

**Theoretical (hour/week):** 3

**Practice (hour/week):** 2

**Laboratory (hour/week):** 4

**Catalogue Description:** Introduction to atomic and electronic structure, chemical bonding, molecular structure and bonding theories, properties of liquids, solids and solutions, chemical equilibrium, thermodynamics and electrochemistry.

**Instructor(s):** Assist. Prof. Dr. Mustafa Erkut Özser (Sec. 1,3) & Assist. Prof. Dr. Umut Oğuz (Sec. 2,4)

**Instructor Assistant(s):** Dr. Süleyman Aşır, office SZ-42

**Class Hours/Location:** Section 1 Tues. 09:40-11:30/SZ-08 & Fri. 09:40-10:30/SZ-08. Section 2; Mon. 10:40-12:30/SZ-08 & Thurs. 9:40-10:30/SZ-08. ; Section 3; Tues. 15:40-16:30/SZ-08 & Thurs. 09:40-11:30/TAZ-09. ; Section 4; Tues. 14:40-15:30/SZ-08 & Fri. 09:40-11:30/TAZ-11.

**Recitation Hours/Location:** All Groups; Thurs. 12:40-13:30/T-116

**Office Hours/Location/Contact:** Assist. Prof. Dr. Umut Oğuz (Sec. 2, 4): Mon. 09:40-10:40, Tues. 13:40-14:40, Thurs. 10:40-11:40 / Academic S-building, SZ-32. Tel. 2942, email: [uoguz@metu.edu.tr](mailto:uoguz@metu.edu.tr), web: [www.metu.edu.tr/~uoguz](http://www.metu.edu.tr/~uoguz)  
Assist. Prof. Dr. Mustafa Erkut Özser (Sec. 1,3): Tues. 13:40-14:30, Wed. 11:40-12:30, Fri. 11:40-12:30 / Academic S-building, SZ-45. Tel. 2955, email: [ozser@metu.edu.tr](mailto:ozser@metu.edu.tr) Web: [www.metu.edu.tr/~ozser](http://www.metu.edu.tr/~ozser)

**Textbook / Material / Recommended Readings:**

Required: "Chemistry for Engineering Students", Brown and Holme, 2<sup>th</sup> Edition, Brooks/Cole, 2011.  
Help Book(s): Any College level General Chemistry book would be helpful.

**Course Objectives:**

This course explores the fundamental laws, theories, mathematical concepts and applications of chemistry. Designed primarily for engineering majors.

**Learning Outcomes (LO):**

LO1 Identify the common elements by name and symbol.

LO2 Describe the nuclear and electronic structure of an atom of any element in the periodic table and predict the properties of the element on the basis of these structures.

LO3 Describe the electronic structures of common molecules and ions, and predict the properties of these species on the basis of their structures.

LO4 Write and balance equations for chemical reactions, and describe verbally the processes which occur in these reactions.

LO5 Have an understanding in chemical bonding, behavior of gases, chemical thermodynamics, chemical kinetics, equilibrium, and electrochemistry

LO6 Answer questions relating to the chemical laws, theories, and concepts described in the assigned chapters and in the lectures; and apply these laws, theories, and concepts by solving representative problems.

#### Tentative Weekly Lecture Schedule:

Week of	Lecture Material	Covered Sections
September 22,	Orientation and Chapter 1. Introduction to Chemistry	1.1-1.6
September 9,	Chapter 2. Atoms and Molecules	2.1-2.8
October 6,	Chapter 3. Molecules, Moles and Chemical Equations	3.1-3.6
October 6-7	Religious Holiday (Kurban Bayram) (Monday-Tuesday, 2 days)	
October 13,	Chapter 4. Stoichiometry	4.1-4.6
October 20,	Chapter 5. Gases	5.1-5.7
October 27,	Chapter 6. The Periodic Table and Atomic Structure	6.1-6.8
October 29,	NATIONAL HOLIDAY (National Day / Cumhuriyet Bayramı) (Wednesday)	
November 03,	Chapter 6. The Periodic Table and Atomic Structure, <i>continued</i>	
November 10,	Chapter 7. Chemical Bonding and Molecular Structure	7.1-7.9
November 17,	Chapter 7. Chemical Bonding and Molecular Structure, <i>continued</i>	
November 24,	Chapter 8. Molecules and Materials	8.1-8.5, 8.7
December 1,	Chapter 9. Energy and Chemistry	9.1-9.8
December 8,	Chapter 10. Entropy and the Second Law of Thermodynamics	10.1-10.8
December 15,	Chapter 11. Chemical Kinetics	11.1-11.5, 11.7-11.8
December 22,	Chapter 12. Chemical Equilibrium	12.1-12.5
December 29,	Chapter 13. Electrochemistry	13.1-13.8
January 1	New Year's Holiday (Thursday)	
January 05-17	Final Exams	
January 28-30	Re-sit Exams	

#### Relationship to CHM 107 Lab :

Passing the lab work is prerequisite for this course. If you fail the lab, you automatically fail the course. Incomplete lab. work will result in a "NA" grade. Some of you may not need to repeat the laboratory work. Make sure that you check your status with your instructor. Lab scheduling and coverage will be provided by your lab instructor.

#### General Policies:

Attendance: You are expected to attend **at least 60%** of class unless you have an official excuse.

**Failing to meet this criteria will result in a "NA" grade.**

Makeup: Make-up exams will not normally be given, unless you have a university approved written excuse in a timely manner.

Re-sit Exam: Students with "NA" grade are NOT allowed to take re-sit exam.

#### Exams and Grading:

There will be two midterm exams and one final exam at the dates which will be announced later. In addition to those there will be also 8 online quizzes at preannounced dates .

Letter grades will be calculated based on the following scheme:

Online Quizzes: 10% (6 best out of 8 will count.)

Midterms: 40% (20% each)

Final: 40%

Laboratory average: 10% (You should get at least 60% from your lab work. Anything less will result in a letter grade of "NA")

**Assignments:**

Chapter 1 - Introduction to Chemistry (From Brown&Holme, page 27-29): 1.9, 1.11, 1.13, 1.16, 1.17, 1.20, 1.33, 1.41, 1.42, 1.43, 1.45, 1.46, 1.57, 1.60, 1.64, 1.67, 1.85.

Chapter 2 - Atoms and Molecules (From Brown&Holme, page 60-63): 2.10, 2.11, 2.13, 2.18, 2.20, 2.24, 2.26, 2.38, 2.40, 2.45, 2.50, 2.57, 2.64, 2.71, 2.73, 2.75, 2.76, 2.85.

Chapter 3 - Molecules, Moles and Chemical Equations (From Brown&Holme, page 93-98): 3.6, 3.12, 3.14, 3.16, 3.26, 3.28, 3.34, 3.38, 3.42, 3.46, 3.52, 3.60, 3.66, 3.86, 3.112

Chapter 4 – Stoichiometry (From Brown&Holme, page 119-124): 4.4, 4.8, 4.12, 4.16, 4.22, 4.28, 4.34, 4.40, 4.44, 4.48, 4.50, 4.54

Chapter 5 – Gases (From Brown&Holme, page 153-157): 5.28, 5.30, 5.32, 5.42, 5.44, 5.52, 5.54, 5.58, 5.60, 5.70, 5.72, 5.74, 5.78, 5.79

Chapter 6 - The Periodic Table and Atomic Structure (From Brown&Holme, page 195-199): 6.7, 6.8, 6.10, 6.15, 6.16-6.24, 6.26, 6.31, 6.38-6.44, 6.54, 6.55, 6.67-6.76

Chapter 7 - Chemical Bonding and Molecular Structure (From Brown&Holme, page 236-239): 7.7, 7.11, 7.15, 7.22, 7.24, 7.29, 7.31, 7.33, 7.35, 7.41, 7.43, 7.44, 7.46, 7.51, 7.60, 7.69, 7.71, 7.73, 7.75, 7.78, 7.79, 7.83, 7.89, 7.91

Chapter 8 - Molecules and Materials (From Brown&Holme, page 275-279): 8.1, 8.2, 8.3, 8.5, 8.23, 8.25, 8.26, 8.29, 8.30, 8.31, 8.32, 8.35, 8.39, 8.43, 8.44, 8.47, 8.49, 8.52, 8.53, 8.61, 8.63

Chapter 9 - Energy and Chemistry (From Brown&Holme, page 312-31): 9.6, 9.19, 9.20, 9.29, 9.31, 9.33, 9.35, 9.39, 9.40, 9.41, 9.43, 9.45, 9.53, 9.55, 9.59, 9.61, 9.65, 9.67, 9.71

Chapter 10 - Entropy & 2nd Law of Thermodynamics (From Brown&Holme, page 339-45): 10.7, 10.9, 10.11, 10.12, 10.15, 10.25, 10.27, 10.35, 10.37, 10.39, 10.41, 10.44, 10.45, 10.51, 10.53, 10.57, 10.59, 10.68, 10.69

Chapter 11 - Chemical Kinetics (From Brown&Holme, page 382-88): 11.3, 11.9, 11.13, 11.17, 11.22, 11.23, 11.25, 11.29, 11.33, 11.43, 11.45, 11.59, 11.72, 11.75, 11.81, 11.85, 11.87

Chapter 12 - Chemical Equilibrium (From Brown&Holme, page 429-32): 12.9, 12.13, 12.15, 12.17, 12.19, 12.21, 12.23, 12.37, 12.39, 12.45, 12.48, 12.51, 12.53, 12.55

Chapter 13 – Electrochemistry (From Brown&Holme, page 468-71): 13.5, 13.6, 13.7, 13.8, 13.11, 13.13, 13.15, 13.23, 13.25, 13.29, 13.33, 13.39, 13.43, 13.49, 13.53, 13.59, 13.67, 13.75, 13.79, 13.85, 13.93, 13.95

**University Policies:**

**It is very important that you know and understand the university regulations regarding academic integrity, since you are expected to and should act according to these rules throughout your university life.** Below I quoted the abovementioned academic integrity code:

**Code of Integrity**

*All students are expected to have academic integrity principle in all academic works. That is, a student must submit work only the student's own. Students shall comply with academic integrity codes and shall avoid situations likely to violate this code since academic dishonesty diminishes credit to the academic community.*

**Academic Dishonesty**

*Academic dishonesty is defined as any activity, which tends to undermine the academic integrity of the university. Academic integrity is one of the major factors that determines the image and dignity of the university. So not only academic people are responsible to maintain the duration of academic integrity, all members of the university including students should obey the rules and regulations of the university.*

**Academic Misconducts**

*Behaviour considered as misconduct or violation in academic terms are defined so:*

*a. Cheating*

*Cheating means giving or receiving any unauthorized aid in any academic exercise. It includes but is not limited to the following actions:*

- *Copying from someone else's test or examination paper*
- *Using external assistance like the use of tutors, books, lecture notes and calculator in any in-class or take-home examination although it is prohibited*
- *Possessing, buying, selling, removing, receiving or using a copy or copies of any materials to be used as an instrument of academic evaluation*
- *Using another person as a substitute in an academic evaluation*
- *Working with other persons on a particular project although the instructor has required individual work*
- *Copying a report or homework assignment prepared by someone else or using records or laboratory results obtained by someone else as it is your work*
- *Attempting to influence or change any academic evaluation by unfair means which includes altering exam results or grades or changing anything on exam papers hiddenly while they are shown by the instructor for control and objections*

*b. Plagiarism*

*Plagiarism means using a part or whole of a written material without proper acknowledgement of source. A student should pay attention to the originality of any material he or she uses for such situations:*

- *Whenever he or she quotes another person's actual words,*
- *Paraphrases another person's words,*
- *Uses another person's idea, opinion or theory,*
- *Whenever he or she uses internet sources, borrows facts, statistics or any information which is not common knowledge.*
- *As a whole, theses, essays, term papers, and other academic project requirements must be the original work of the student who is submitting them. And while using other materials, the source should be properly and clearly defined by references. For useful information regarding plagiarism check <http://www.fbe.metu.edu.tr/Intihal/intihal.htm>*