

EASTERN MEDITERRANEAN UNIVERSITY
DEPARTMENT OF CHEMISTRY

COURSE CODE	<i>CHEM101</i>	COURSE LEVEL	<i>Freshman</i>
COURSE TITLE	General Chemistry	COURSE TYPE	University Core – Physical / Natural Sciences
CREDIT VALUE	(4,1) 4	ECTS VALUE	6
PREREQUISITES	None	COREQUISITES	None
DURATION OF COURSE	One semester	Semester and year	SPRING 2022 – 23

Attention: All information and rules provided in this syllabus is subject to change in accordance with the new decisions of academic boards of EMU.

	Group(s)	Name	e-mail	Office	Telephone
Instructors (See the LMS page for the most updated list)	01	Osman YILMAZ (Coordinator)	osman.yilmaz@emu.edu.tr	AS 227	2925
	02 & 03	Akeem Oladipo	akeem.oladipo@emu.edu.tr	AS232	2406
	04 & 05	Duygu Uzun	duygu.uzun@emu.edu.tr	AS 224	1013
Tutorial Instructors	See the LMS page				
Responsible Lab Assistants	Group(s)				
	See the LMS page				

COURSE WEB PAGE	Follow the link for General Chemistry (CHEM101) on: https://lms.emu.edu.tr Also check the “Files/Class materials” folder of your Chem101 MS Teams’s “General” channel. - You will be able to access to the course web page by single sign in through your Office365 mail account. - Following information/tools will be provided to the students all-over the semester through Chem101 web page or MS Teams: 1. Important dates, exam schedules and announcements 2. Downloadable files of: - An updated copy of this course outline in pdf format - Lecture handouts of each chapter (Lecture notes) - Answer keys of exams, - Homework questions and answers - Sample exam papers (past exam papers) (most with answers) - Printable Periodic table of elements - And many more... 3. Links to Connect® system and other pages with useful chemistry learning tools (movies, wikies etc)
	Announcements All important news and announcements are published on the course web pages (Teams and/or LMS). Usually a copy of the news and announcements are also sent to your Office365 EMU e-mail address. It is your responsibility to make sure that you activate all these pages and check them regularly.

TEXTBOOK & On-line Learning Platform	General Chemistry, The Essential Concepts (7th International Edition, 2014) by R. Chang & K.A. Goldsby, McGraw Hill together with CONNECT®+chemistry online enhanced study support utility. See the links in Chem101 LMS (learning management system) page for the links to buy the textbook and its online learning platform Connect. Students who buy the digital version of the book will be eligible to use the following on-line resources via the Connect+ internet system of the publisher: downloading the electronic copy of chapters, use self-test utilities, see the animations/videos and other useful material. Thus, each student buying the book will be provided with a unique registration-code. Students who do not have this code will not be able to use this system. A registration code can be used by only one student. Never give this code to others. A detailed explanation of the Connect + system is available on the web page of the course.
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CATALOGUE DESCRIPTION

Atoms, molecules and ions; Mass relations in chemistry, stoichiometry; Gasses, the ideal gas law, partial pressures, mole fractions, kinetic theory of gases; Electronic structure and the periodic table; Thermochemistry, calorimetry, enthalpy, the first law of thermodynamics; Liquids and Solids; Solutions; Acids and Bases; Organic Chemistry.

AIMS & OBJECTIVES

(Relationship of Course to Program Outcomes)

This course is designed as a one-semester course for freshman engineering students. It offers the opportunity to the student to develop:

- an adequate background in fundamentals of descriptive, applied and theoretical chemistry.
- systematic problem solving skills through numerous conceptual and numerical problems requiring critical and analytical thinking skills in addition to a good grasp of chemical concepts.
- scientific literacy and awareness to become an informed citizen
- basic laboratory skills.

LEARNING OUTCOMES

- Recognise the constituents and properties of matter in general, and of atoms, molecules and ions in particular
 - Understand the role of energy in chemistry
 - Understand chemical bonds and intermolecular interactions
 - Identify and name the substances
 - Understand periodicity and periodic table
 - Describe chemical mixtures
 - Interpret system of units used in physical sciences
 - Use symbols and units correctly; and formulate appropriate mathematical and chemical equations for solving problems
 - Apply the theoretical concepts and methods of chemistry covered in this course to solve problems
 - Use dimensional analysis method for solving numerical problems
 - Use efficiently and effectively a variety of printed and electronic text, material (including the textbook) relevant to the course
 - Handle chemicals properly, performing experiments as a team safely, and writing lab reports
 - Understand the concentration or the amount of active matter
 - Use good scientific English for written and oral communication
- By successful completion of the general chemistry laboratory sessions of the course the students will:
1. improve basic laboratory skills, including
 - use of electronic balances, volumetric glassware and some basic lab equipments
 - preparation of solutions,
 - chemical measurements using some electronic and conventional devices,
 - keeping records and data analysis,
 - and report writing.
 2. Get acquainted with a lab working environment
 3. Comprehend the importance of lab safety
 4. Link/express the theoretical knowledge of chemistry with experimental methods

COURSE CONTENT AND LECTURE SCHEDULE

Week	Date	Topics
1	1-4 March	Ch-1 Basic concepts (6 hours)
2	6-10 March	Ch-2 Atoms, molecules and ions
3	13-17 March	Ch-3 Stoichiometry (mass relations) (4 Hours)
4	20-24 March	Ch-3 (Cont'd) (4Hours)
5	27-31 March	Ch-4 Aqueous Solutions (4 Hours)
6	3-7 April	Ch-5 Gases (4 hours)
7	10-14 April	Ch-5 (Cont'd) (4 hours)
8	17-20 April	Ch-6 Energy Relations in Chemical Reactions (4 hours)
9-10	24 April-8 May	MIDTERM PERIOD
11	9-12 May	Ch-6 (Cont'd) (4 Hours)
12	15-18 May	Ch-7 Electronic Structure of Atoms (4 Hours)
13	22-26 May	Ch-7 (Cont'd) (4 Hours)
14	29 May-2 June	Ch-9 Chemical Bonding I: Basic Concepts (4 hours)
15	5-8 June	Ch-12 Intermolecular Forces & Liquid and solid states
16-17	12-26 June	FINAL EXAM PERIOD

ASSESSMENT (Exams)

METHOD OF ASSESSMENT:

Midterms	50%	(2 midterms, 25% each)
Final	35%	
Laboratory	15%	
	Lab reports	10% (4 reports, 2.5 % each)
	Lab quizzes	5% (4 quizzes, 1.25 % each)

SOME IMPORTANT EXAM POLICIES:

- All students should have a **non-programmable** scientific calculator, which can be used in exams.
- Mobile phones and tablets are not allowed in the exams for any purpose.
- The ANSWER KEY of midterm and final exams will be posted in the Chem101 LMS page right after the exam. Answer keys to make-up and resit exams are not posted on the web.
- All assessment marks will be announced via the student portal;
- It is the student's responsibility to follow the detailed exam announcements from MS Teams and LMS as well as the announcements made in the class sessions.

Make-up Exams:

- Students having not attended only the Midterm or Final exams are entitled to enter the Make-up Exam. One CAN NOT sit for the make-up exam to improve his/her already existing regular exam mark.
- There will be a single make-up session with different question sets for midterm and final exams.
- No medical report is needed for the make-up exams.
- There will be no make-up of make-up and resit exams as well as the exams in the lab sessions.

Caution:

- The experience of the course instructors and statistics show that the averages of make-up exams are almost always lower than those of regular exams due to several reasons. Therefore, **we strongly recommend** the students not to miss the exams on their regular dates.

Resit Exams

Those with a letter grade of D- or F can sit in resit exams. Also, those having an academic standing of "Warning" (irrespective of letter grade) can also sit in the resit exam. Online application may be necessary. Resit exam mark replaces the sum of the marks of quiz, midterm and final exams (85% in Chem101). Students with an NG grade are not allowed to take resit exams.

Revision/Inspection of Exam Papers and Objections to Exam Grading:

Students are strongly advised to examine answer keys to the exams that will be posted on LMS right after the exam. According to the by-laws, students can request for revision within 10 days of announcement of marks, after which the instructor may refuse inspection requests. Objections to any grade must first be made to the instructors. If still unsatisfied students may apply to the head of department.

EXAM SCHEDULE:

Exam dates and places will be announced in student portal. Also carefully follow your MS Teams and LMS pages as well as the announcements made in the class sessions for details of the exams.

GRADING CRITERIA

A to F	Letter grades are determined by a "curve system". No fixed letter-grade templates apply.
NG nil grade	Conditions that will lead to NG grade. Each of these conditions is independent. i) Not attending two midterms or one midterm+final exams. ii) Not attending 50% of classes. iii) Missing two or more lab sessions (not submitting two or more lab reports). Students must attend minimum 3 lab sessions (out of 4 experiments) and submit their reports.)

ATTENDANCE POLICY

Lectures:

- The students are expected to attend all the lectures (maximum of 50% absence). Failure to fulfil this criterion will result with an "NG" grade. (See the Grading Criteria).
- Attendance check is done in every class including the lab and tutorial sessions. The instructor may check the attendance in the first or the second hour or in both hours of a two-hour session.
- Each student can follow his/her attendance records from the on-line attendance tracking system in portal.
- Missed classes before the **late registration** date are recorded as "absent".

Lab sessions:

- Attendance to minimum 3 lab sessions out of 4 is a must. Missing 2 or more lab sessions results in failure from Chem101 with an NG grade.

LABORATORY

The details of how lab sessions will be carried out will be provided by your instructors and assistants.

LEARNING / TEACHING METHOD

- Regular lectures in classroom (face-to-face) (4 hours/week + 2 hours when needed)
- **Connect** – Internet based learning system of the textbook
- **Tutorial sessions** (2 hours in every two weeks)
- **Lab sessions** (2 hours in every two weeks)

LAB and TUTORIAL SCHEDULE

See your lab schedule at your LMS page.

RULES for REPEATING STUDENTS:

Students repeating the course for a better grade (to improve CGPA):

- Whatever grade you receive at the end of this semester will replace your previous grade. This may result with a lower grade. In such instances no appeals will be accepted to keep the old mark.

Exemption from the lab:

- Students with passing old lab marks (6/10 (or 9/15) or more) are exempted from the lab work; therefore they don't have to repeat the lab work. Their old lab mark will be transferred as the normalised grade.
- Names of students who have passing old lab grade (names of exempted students) will be posted on the course web page before the beginning of experiments. It is the students' responsibility to check that they are exempted from the LAB. Students who are not in the exemption list and do not attend Lab sessions will fail the whole CHEM101 course and will receive an NG grade.

Textbook & Connect System Registration Code

- Students who already own a textbook with a valid registration code will be allowed to use the same code for Connect® system if purchased in the previous semester. Details will be provided on the web page and in the class.

ACADEMIC HONESTY – PLAGIARISM

Cheating is copying from others or providing information, written or oral, to others. Plagiarism is copying without acknowledgement from other people's work. According to university by laws cheating and plagiarism are serious offences punishable by disciplinary committee ranging from simple failure from the exam or project, to more serious action (letter of official warning, suspension from the university for up to one semester). Disciplinary action is written in student records and may appear in student transcripts.

Periodic Table of Elements

	1 1A																		18 8A
1	1 H 1.008	2 2A											13 3A	14 4A	15 5A	16 6A	17 7A	2 He 4.003	
2	3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18	
3	11 Na 22.99	12 Mg 24.30	3 3B	4 4B	5 5B	6 6B	7 7B	8 8B	9 8B	10 8B	11 1B	12 2B	13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95	
4	19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.88	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.54	30 Zn 65.39	31 Ga 69.72	32 Ge 72.61	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80	
5	37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc 98.91	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.75	52 Te 127.6	53 I 126.90	54 Xe 131.29	
6	55 Cs 132.91	56 Ba 137.33	57 La 138.91	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.22	78 Pt 195.08	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.2	83 Bi 208.98	84 Po 208.98	85 At 209.99	86 Rn 222.02	
7	87 Fr 223.02	88 Ra 226.03	89 Ac 227.03	104 Rf 261.1	105 Db 262.1	106 Sg 263.1	107 Bh 264.1	108 Hs 265.1	109 Mt 266.1	110 Ds 271	111 Rg 272	112 Cn 285	113 Uut 284	114 Fl 289	115 Uup 288	116 Lv 292	117 Uus	118 Uuo 294	
	Lanthanides			58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm 146.92	62 Sm 150.36	63 Eu 151.97	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04	71 Lu 174.97		
	Actinides			90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np 237.05	94 Pu 244.06	95 Am 243.06	96 Cm 247.07	97 Bk 247.07	98 Cf 251.08	99 Es 252.08	100 Fm 257.10	101 Md 258.10	102 No 259.10	103 Lr 260.11		

Useful Constants

R = 0.0821 (L.atm)/(mol.K) or	8.314 J/mol.K	N _A = 6.022 × 10 ²³ items/mol	h = 6.63 × 10 ⁻³⁴ J.s
c = 3.00 × 10 ⁸ m/s	1 atm = 760 mmHg	1 in = 2.54 cm	1 cal = 4.184 J