ORGANIC CHEMISTRY I

1	Course Title:	ORGANIC CHEMISTRY I	
2	Course Code:	KIM2011	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	2	
6	Semester:	3	
7	ECTS Credits Allocated:	4.00	
8	Theoretical (hour/week):	4.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	Compulsory course	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. GANİ KOZA	
15	Course Lecturers:	Prof. Dr. MUSTAFA TAVASLI	
16	Contact information of the Course Coordinator:	ganikoza@uludag.edu.tr +90 224 27 55 083 Bursa Uludağ Üniversitesi, Fen-Edebiyat Fakültesi, Kimya Bölümü, 16059 Görükle / BURSA, TÜRKİYE	
17	Website:		
18	Objective of the Course:	To introduce organic chemistry, which is the department of chemistry. To teach the structure, properties and some basic reactions of organic molecules.	
19	Contribution of the Course to Professional Development:	Gains knowledge of the properties and synthesis of organic molecules by learning Organic Chemistry.	
20	Learning Outcomes:		
		1	Learning the basic organic chemistry terms
		2	Realizing the general properties of organic compounds
		3	Learning the risks about organic compounds (personal and environmental) and using the chemicals carefully
		4	Learning the reactions of some main organic functional groups.
		5	Understanding and being able to comment on the reaction mechanisms.
		6	Being able to comment on the problems about organic chemistry and getting skills for solving the problems.
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21	Course Content:		

Course Content:

Week	Theoretical	Practice

1	Carbon Compounds and Chemical Bonds • Chemical Bonds: Ionic and covalent bonds ? Writing Lewis Structure ? Octet Rule and exceptions of the rule ? Formal Charge ? Resonance • Molecular Orbital Theory ? Atomic Orbitals (s, p) ? Molecular Orbitals (?,?*, ?, ?*) ? sp3 , sp2 and sp Hybridization ? Molecular Geometry • Presentations of Molecular Formula ? Closed, ? Structural, ? Condensed, ? Line, ? Three dimensional formulas At the end of the course problem solving	
2	Functional Groups • Polar/apolar covalent bonds • Intermolecular forces • Unctional Groups: ? Alkanes, Alkenes and Alkynes ? Aromatic Compounds ? Alkyl Halides ? Alcohols and Ethers ? Amines ? Aldehide and Ketons ? Carboxylic Acids, Acid chlorides, Acid	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	4.00	56.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	2.00	28.00
Homeworks	4	8.00	32.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	2.00	2.00
Others	0	0.00	0.00
Final Exams	1	2.00	2.00
Total Work Load			120.00
Total work load/ 30 hr			4.00
ECTS Credit of the Course			4.00

	? Electromagnetic spectrum ? Hook rule Bonding) ? Finger print and Functional group regions ? Absorption frequency / wave number ? The Frequencies of Characteristic ? Construction of the spectrum	
4	Acids and Bases ? Bonsted-Lowry Definition ? Lewis Definition ? The Strenghtes of Acidity and Basicity (Ka , pKa) with pKa ? Curve arrows ? The factors effecting the Acidity and Basidity ? Hybridization ? Inductive effect ? Resonance effect ? Diameter ? Positive atoms ? Solvent	

5	Alkanes: Nomenclature and Conformation • Straight and branched Alkanes: ? Nomenclature ? Structural Isomery ? Intermolecular Forces ? Conformational Analysis: Newman Projects / Sawtooth ? Ethane, propane and butane analyses	
6	• Cycloalkanes: ? One cyclo, two cyclo and policyclo alkanes ? Nomenclature ? cis-/trans Isomery ? Ring stretching ? Conformational Analysis: Chair / Boat ? Cyclohexane, monosubstituted cyclohexane and di-substitutedcyclohexane analyses	
7	Stereochemistry • Chiral Molecules: ? Tetrahedral carbon and chirality ? N-containing compounds and chirality ? Substituted cyclohexane and chirality	
8	? Determining the (R/S) Configuration ? Optical Activity ? Specific turning angle	
9	• Enantiomers: ? Racemic Mixture ? Enantiomeric excess (e.e) • Diastereoisomery: ? Diastereomeric excess (d.e.) • Meso Compounds • Fisher Projection Formulas ? Determining the (R/S) Configuration	
10	Reactions of Alkanes • Radical Reactions: ? Homolytic Bond Breaking ? Radical Formation and Stability ? Reaction Mecanism ? Initiators, Growing and Termination • Examples: ? Radicalic chlorination of methane ? Radicalic Addition of Hydrogen bromide to Alkanes ? Radicalic Polimerization of alkanes	
11	Reactions of Alkyl Halides • Nucleophilic Substitution (SN1/SN2) Reactions: ? Nucleophile, Electrophile and Leaving Groups ? Heterolytic bond breaking • SN2 Reaction: ? Reaction Kinetics ? Non-steady state (Walden Inversion) ? Stereochemistry ? Factors effecting the reaction rate ? The effects of Nucleophile, Electrophile, Leaving Group and Solvent	

12	• SN1 Reaction: ? Reaction Kinetics ? Non-steady state (Carbocation Formation) ? Stereochemistry ? Factors effecting the reaction rate ? The effects of Nucleophile, Electrophile, Leaving Group and Solvent	
13	• Elimination Reactions (E1/E2) ? Base, Acid and leaving group • E2 Reaction ? Reaction Kinetics ? Non-steady state (antiperiplanar and E/Z alkene formation) ? Stereochemistry • E1 Reaction ? Reaction Kinetics ? Non-steady state (Carbocation and steady alkene formation) ? Stereochemistry	
14	Alcohols • Classification-Primer, seconder and tertier alcohols • Physical Properties and H-Bond • Nomenclature • Reactions: ? Transformation to alcoxylates with base ? Transformation to alkyl halides with HX ? Transforming to alkyl bromides with PBr3 ? Transformation to alkyl chlorides with POCl3, PCl5 ve SOCl2 ? Transformation to alkyl tosylates,mesylates and thriphlates with TsCl, MsCl ve TfCl ? SN1/SN2 and E1/E2 reactions ? Oxidation reactions	

22	Textbooks, References and/or Other Materials:	Organic Chemistry, Graham Solomons Craig Fryhle Scott Snyder 11e
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		Homework and written exams

24	**ECTS / WORK LOAD TABLE**

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	3	4	5	5	4	4	3	3	4	0	0	0	0	0	0	0
ÖK2	5	4	3	4	4	4	3	5	3	0	0	0	0	0	0	0
ÖK3	5	4	4	3	4	4	3	4	5	0	0	0	0	0	0	0
ÖK4	4	5	3	4	4	2	4	3	3	0	0	0	0	0	0	0
ÖK5	4	4	5	2	3	5	4	3	4	0	0	0	0	0	0	0
ÖK6	5	4	5	4	3	2	4	3	4	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	**1 very low**		**2 low**			**3 Medium**			**4 High**			**5 Very High**				