

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:	5.00
8	Theoretical (hour/week):	4.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	-
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. MUSTAFA TAVASLI
15	Course Lecturers:	Prof. Dr. Mustafa TAVASLI Doç. Dr. Nevin ARIKAN ÖLMEZ
16	Contact information of the Course Coordinator:	coskun@uludag.edu.tr +90 224 29 41 725 Uludağ Üniversitesi, Fen-Edebiyat Fakültesi, Kimya Bölümü, 16059 Görükle / BURSA, TÜRKİYE
17	Website:	
18	Objective of the Course:	The aim of the course is to make sure students understand the basic organic terms, properties of organic compounds, structure and 3-D nature of molecules, the relationship among organic functional groups.
19	Contribution of the Course to Professional Development:	
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 (σ, σ^*, π, π^*) ? sp^3, sp^2 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 ? Aldehyde and Ketons ? Carboxylic Acids, Acid chlorides, Acid			
Activites		Number	Duration (hour)	Total Work Load (hour)
Theoretical	? Electromagnetic Spectrum ? Hook rule	14	4.00	56.00
Practicals/Labs		0	0.00	0.00
Self study	? Bonding/ ? Finger print and Functional group regions	14	2.00	28.00
Homeworks		0	0.00	0.00
Projects	? The Frequencies of Characteristic	0	0.00	0.00
Field Studies		0	0.00	0.00
Midterm	exams	1	24.00	24.00
Others		3	4.00	12.00
Final Exams	• Definition of Acidity and Basicity ? Bronsted-Lowry Definition	1	30.00	30.00
Total Work Load				150.00
Total work load/ 30 hr	• Acid-Base Reactions ? The Strenghtes of Acidity and Basicity (K_a, K_b)			5.00
ECTS Credit of the Course				5.00
	? Equilibrium constant and its Relationship 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 polycyclo alkanes ? Nomenclature ? cis-/trans Isomery ? Ring stretching ? Conformational Analysis: Chair / Boat ? Cyclohexane, monosubstituted cyclohexane and di-substituted cyclohexane 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 Mechanism ? Initiators, Growing and Termination • Examples: ? Radicalic chlorination of methane ? Radicalic Addition of Hydrogen bromide to Alkanes ? Radicalic Polymerization 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:	[1] G. Solomons ve C. Fryhle (Çev. Ed. G. Okay ve Y. Yıldırım), Organik Kimya, Literatür Yayınları, 2002. [2] J. McMurry, Organic Chemistry, Brooks/Cole Publishing Comp., 1992. [3] P. Y. Bruice, Organic Chemistry, Prentice Hall, 2001. [4] R. J. Fessenden ve J. S. Fessenden (Çev. Ed. T. Uyar), Organik Kimya, Güneş Kitabevi, 1992.
23	Assesment	
TERM LEARNING ACTIVITIES		NUMBE R
Midterm Exam		1
Quiz		3
Home work-project		0
Final Exam		1
Total		5
Contribution of Term (Year) Learning Activities to Success Grade		50.00
Contribution of Final Exam to Success Grade		50.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		
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	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	5	4	5	0	0	0	0	0	0	0	0	0	0	0
ÖK3	5	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	5	5	5	0	0	0	0	0	0	0	0	0	0	0
ÖK5	5	5	0	5	5	0	0	0	0	0	0	0	0	0	0	0
ÖK6	0	0	0	0	0	0	0	0	0	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			