

Course Title	Organic Chemistry				
Course Code	BMS121				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	1 <sup>st</sup> Year / 2 <sup>nd</sup> Semester				
Teacher's Name	TBA				
ECTS	6	Lectures / week	2 Hours	Laboratories / week	3 Hours
Course Purpose and Objectives	<p>This course is designed to introduce Biomedical Sciences students to the world of Organic Chemistry and provide general background, both at the theoretical and practical level through laboratory exercises. Completion of this course will qualify students for succeeding in all the lessons of the curriculum that require solid background in organic chemistry. More specifically, students will familiarize themselves with the structure and properties (physical and chemical) of members of the main homologous series of Organic Chemistry, as well as simple mechanisms of organic reactions, the structure and function of organic compounds found in living organisms (biomolecules), and the basic spectroscopic techniques used for the identification of organic compounds structure</p>				
Learning Outcomes	<p>Upon successful completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>• Identify the structure of molecules and basic reactions of organic chemistry</li> <li>• Describe the main spectroscopic techniques</li> <li>• Describe the basic principles and rules of stereochemistry</li> <li>• Distinguish the main classes of organic compounds and biomolecules, name them, and describe their properties as well as the mechanisms of their basic reactions</li> <li>• Combine the application of the main spectroscopic techniques to elucidate the structure of simple molecules</li> <li>• Perform antithetical analysis of simple organic molecules</li> <li>• Propose reaction sequences for synthesis of simple organic molecules by drawing the most efficient chemical reaction sequence</li> <li>• Classify organic compounds</li> </ul>				
Prerequisites	CHE113	Co-requisites	None		
Course Content	This course is designed to introduce Biomedical Sciences students to the world of Organic Chemistry and provide general background,				

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**Description:**

**Theory**

- Classification and nomenclature of organic compounds. Structure of carbon, hydrogen, oxygen, sulfur and nitrogen.
- Chemical bonds and structure of the molecule. Stereochemistry and spectroscopy. Inductive effect and resonance. Categories of reagents, reactions and mechanisms.
- Hydrocarbons: alkanes, alkenes, alkynes, cycloalkanes, benzene. Alcohols, ethers, phenols. Simple sulphides. Nitro-compounds, amines, diazonium salts. Esters of organic and inorganic acids. Hydrogen bonds in organic compounds. Stereochemistry: enantiomers, diastereomers, geometric isomers. Carbohydrates. Amino acids and proteins. Aromatic compounds. Nucleic acids and nucleotides. Lipids. Stereochemistry and mechanisms of enzymatic reactions.

**Laboratory Exercises**

- Techniques: Boiling point.
- Simple and fractional distillation. Steam distillation for isolation of eugenol from cloves
- Qualitative analysis of organic matter
- Methods for separation of organic compounds
- Methods for purification of organic compounds
- High performance liquid chromatography, gas chromatography
- Infrared spectroscopy, mass spectroscopy.
- Purification and separation of liquid substances
- Detection and specific functionalization reactions (detection of double bonds, Carbonyls, sugars, amino-acids, alkyl-halides, alcohols)
- Aldehydes - Ketones - carboxylic acids – hydroxy acids - dicarboxylic acids  
Amines – Phenols
- Preparation of acetylsalicylic acid
- Urea-proteins and amino acids
- Carbohydrates
- Benzoic acid and caffeine recrystallizing

	<ul style="list-style-type: none"> <li>• Salicylic acid extraction from aqueous solution</li> <li>• Chromatographic Methods (thin layer chromatography-TLC)</li> <li>• Analysis of analgesic drugs</li> </ul>										
Teaching Methodology	Face- to- face										
Bibliography	<p>McMurry J, Organic Chemistry (2012).</p> <p>McMurry J,. Castellion M.E,. Ballantine D.S, Fundamentals of General, Organic, and Biological Chemistry (5<sup>th</sup> Edition), Prentice Hall, 2006.</p> <p>Organic Chemistry, 10th Edition, by T.W. Solomons and C.B. Fryhle. (Publisher: Wylie)</p>										
Assessment	<table border="1"> <tr> <td>Mid – Term Examination</td> <td>20%</td> </tr> <tr> <td>Final Examination</td> <td>40%</td> </tr> <tr> <td>Laboratory</td> <td>30%</td> </tr> <tr> <td>Class Participation</td> <td>10%</td> </tr> <tr> <td></td> <td>100%</td> </tr> </table>	Mid – Term Examination	20%	Final Examination	40%	Laboratory	30%	Class Participation	10%		100%
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Language	English										