

DEREE COLLEGE SYLLABUS FOR: CH 3220 ORGANIC CHEMISTRY							
(Fall 2019)	UK LEVEL:5 UK CREDITS:15 US CREDITS:3/0/3						
PREREQUISITES:	CH 1002 Principles of Chemistry CH 2115 General Chemistry						
CATALOG DESCRIPTION:	An introduction to organic chemistry, focusing primarily on the basic principles underlying the structure and reactivity of organic molecules. Hydrocarbons, alcohols and ethers, aldehydes, ketones and carboxylic acids are discussed, with emphasis on biomolecular and pharmaceutical applications, reactions mechanisms, stereochemistry, nomenclature and tools for structure determination, including nuclear magnetic resonance and infrared spectroscopy.						
RATIONALE:	This is an introductory course in organic chemistry that intends to transmit basic knowledge of organic chemistry which is required for the successful completion of other undergraduate courses of general background and/or specialization, such as biochemistry, medicinal chemistry polymer chemistry and pharmacology. Students following careers in these fields are required to have a good background in organic chemistry that will help them understand the molecular mechanisms underlying the chemistry of life as well as synthetic and applied chemistry. The course also introduces elements of pharmacology and of clinical organic chemistry.						
LEARNING OUTCOMES:	As a result of taking this course, the student should be able to: <ol style="list-style-type: none"> 1. Demonstrate an understanding of the chemical environment and the role that organic molecules play in the natural and the synthetic world. 2. Demonstrate understanding of organic structure, reactivity isomerism, functional group chemistry and structure elucidation. 3. Apply methods of scientific enquiry by demonstrating problem solving and critical thinking skills. 4. Describe how course concepts are applied within the biomolecular and pharmaceutical sciences and give examples of how chemical properties and reactivity can influence environmental and economic decisions. 						
METHOD OF TEACHING AND LEARNING:	In congruence with the teaching and learning strategy of the college, the following tools are used: <ul style="list-style-type: none"> ➤ Class lectures, interactive learning (class discussions, group work) video presentations, and practical problems solved in class. ➤ Exercises and primary source documents are assigned as homework, the solutions of which are reviewed in class ➤ Laboratory work (some laboratory reports and chemical sketching as well as drawing may be required). ➤ Office hours: students are encouraged to make full use of the office hours of their instructor, where they can ask questions, see their exam paper, and/or go over lecture/lab material. ➤ Use of a blackboard site, where instructors post lecture notes, assignment instructions, timely announcements, as well as additional resources. 						
ASSESSMENT:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">Summative:</td> </tr> <tr> <td style="width: 70%;">First Assessment In-class midterm examination (2-hour), (Multiple choice/short answers/matching /short essay questions, exercises)</td> <td style="text-align: center;">40%</td> </tr> <tr> <td>Second Assessment:</td> <td style="text-align: center;">50%</td> </tr> </table>	Summative:		First Assessment In-class midterm examination (2-hour), (Multiple choice/short answers/matching /short essay questions, exercises)	40%	Second Assessment:	50%
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INDICATIVE READING:	<p>REQUIRED READING: Organic Chemistry 10th Edition By Francis Carey and Robert Giuliano Copyright: 2017 ISBN13: 9780073511214 RECOMMENDED READING: N/A</p>				
INDICATIVE MATERIAL: (e.g. audiovisual, digital material, etc.)	<p>REQUIRED MATERIAL:</p> <ul style="list-style-type: none"> Scientific Calculator <p>RECOMMENDED MATERIAL:N/A</p> <ul style="list-style-type: none"> Organic Chemistry Model set 				
COMMUNICATION REQUIREMENTS:	N/A				
SOFTWARE REQUIREMENTS:	Microsoft Word, Microsoft PowerPoint, Blackboard CMS				
WWW RESOURCES:	<p>Royal Society of Chemistry: http://www.rsc.org/learn-chemistry American Chemical Society: www.acs.org Online Resources for Teaching and Learning Chemistry: http://www.chemcollective.org/</p>				
INDICATIVE CONTENT:	<p>Revisiting Organic Chemistry</p> <ul style="list-style-type: none"> Formal charge, functional groups. Conformations of molecules. Physical properties (melting, boiling, solubility) in relation to structure. Hydrocarbons Organic reactions <p>Alcohols</p> <ul style="list-style-type: none"> Description, Nomenclature, Physical properties Important reactions: Oxidation, Substitution reactions: SN1 or SN2, Protection of alcohols <p>Aldehydes and Ketones</p> <ul style="list-style-type: none"> Description, Nomenclature, Physical properties Important reactions : Nucleophilic addition reactions at C=O bond, 				

	<p>Oxidation of aldehydes, Reactions at adjacent positions: enolate chemistry, Keto-enol tautomerism (α-racemization), Aldol condensation, retro-aldol</p> <p>Carboxylic Acids</p> <ul style="list-style-type: none"> • Description, Nomenclature, Physical properties • Important reactions : Carboxyl group reactions, Amides (and lactam), esters (and lactone), anhydride formation, Reduction, Decarboxylation Reactions at 2-position, substitution <p>Acid Derivatives (Anhydrides, Amides, Esters)</p> <ul style="list-style-type: none"> • Description, Nomenclature, Physical properties • Important reactions: Nucleophilic substitution, transesterification, Hydrolysis of amides • General principles : Relative reactivity of acid derivatives, Steric effects, Electronic effects <p>Organic Chemistry in Health and the Environment</p> <ul style="list-style-type: none"> • Atom economy • Principles of Green Chemistry • Introduction to pharmacology • Role of functional groups in drug-target interactions • Factors affecting drug-target interactions (dissociation, affinity, agonism/antagonism) <p>Clinical Organic Chemistry</p> <ul style="list-style-type: none"> • Quantitative parameters of drug action • Pharmacological assays • Natural compounds in pharmacology • Lead compound optimization • Clinical Trials <p>Molecular Structure and Absorption Spectra</p> <ul style="list-style-type: none"> • Infrared region • Visible region • Ultraviolet region • NMR spectroscopy