

FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: CHM 2205C

COURSE TITLE: Introductory Organic/BioChemistry

PREREQUISITE(S): CHM 1032C

COREQUISITE(S): None

CREDIT HOURS: 4

CONTACT HOURS/WEEK: 6

CONTACT HOUR BREAKDOWN:

Lecture/Discussion: 3

Laboratory: 3

Other _____:

FACULTY WORKLOAD POINTS: 5.1

STANDARDIZED CLASS SIZE ALLOCATION: 24

CATALOG COURSE DESCRIPTION:

This course is an introduction to organic chemistry of functional groups and a survey of the biochemistry of proteins, carbohydrates, lipids and nucleic acids.

SUGGESTED TEXT(S):

General, Organic, and Biochemistry, Brown and Rogers, 2nd edition, Prindle, Weber and Schmidt.

Laboratory Manual for Chemistry for the Life Sciences, Hendrickson, Healy and Summerlin.

Organic and Biochemistry: Connecting Chemistry To Your Life. Blei and Odian. W. H. Freeman and Company. 2000.

SUGGESTED TEXT (S) CONTINUED

Chemistry For The Health Sciences, 8th edition,
Sackheim & Lehman, Prentice-Hall Publishers, 1998.

IMPLEMENTATION DATE:

November 14, 1987 (outline)

REVIEW OR MODIFICATION DATE:

Winter Term, 1992 (922)

Fall Term, 2002 (20031)

Fall Term, 2006 (20071)

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Alcohols, Phenols, Ether, and Halides	3
A. Nomenclature of Alcohols	
B. Phenols	
C. Ethers	
D. Physical Properties of Alcohols, and Ethers	
E. Alkyl and Aryl Halides	
II. Aldehydes and Ketones	3
A. Naming Aldehydes	
B. Naming Ketones	
C. Characteristics of Aldehydes and Ketones	
D. Some Important Aldehydes and Ketones	
E. Oxidation of Aldehydes	
III. Carboxylic Acids and Esters	2
A. Nomenclature of Carboxylic Acids	
B. Nomenclature and physical Properties of Esters	
C. Hydrolysis of Carboxylic Esters	
IV. Amines and Amides	4
A. Naming the Amines	
B. Physical and Chemical Properties of Amines	
C. Nomenclature of Amides	
D. Alkaloids	
V. Carbohydrates	4
A. Stereoisomerism and Carbohydrate Structure	
B. Classes of Carbohydrates	
C. The Monosaccharides	
D. The Disaccharides	
E. The Polysaccharides	
F. Digestion of Carbohydrates	
VI. Lipids	2
A. Structure of Fats	
B. Complex Lipids	
C. The Compound Lipids	
D. The Derived Lipids - The Steroids	
E. Digestion of Lipids	
VII. Proteins	3
A. Amino Acids	
B. Bonding and Protein Structure	
C. Protein Denaturation	
D. Primary, Secondary and Tertiary Structures	

COURSE TOPICS (CONTINUED)	CONTACT HOURS <u>PER TOPIC</u>
VIII. Enzymes - Biological Catalyst	3
A. Naming and Classification of Enzymes	
B. Enzyme Activity and Factors Affecting Enzyme Activity	
C. Enzyme in Medical Diagnostic Treatment	
IX. Bioenergetics	5
A. The Principle Compounds of the Common Catabolic Pathway	
B. The Citric Acid Cycle	
C. Electron and H ⁺ Transport	
D. Phosphorylation	
E. Energy Yield	
X. Catabolic Pathways	5
A. Glycolysis	
B. The Energy Yield from Glucose	
C. Glycerol Catabolism	
D. Ketone Bodies	
E. Catabolism of Nitrogen in Amino Acid, Carbon in Amino Acid and Heme	
XI. Nucleic Acids and Proteins Synthesis	5
A. Structure of DNA and RNA	
B. Transcription	
C. The Genetic Code	
D. Genes, Exons, and Introns	
E. Mutations, Mutagens and Genetic Diseases	
XII. Body Fluids	6
A. Blood as a Carrier of Oxygen	
B. Blood Buffers	
C. Water and Salt Balance in the Blood and kidneys	

LABORATORY

I.	Preparation of a Standard Solution	3
II.	Osmosis in Potatoes	3
III.	Acids, Bases, Indicators, and Buffers	3
IV.	Molecular Structure	3
V.	Hydrocarbons	3
VI.	Alcohols and Phenols	3
VII.	Aldehydes and Ketones	3
VIII.	Carboxylic Acids, Esters and Amines	3
IX.	Preparation of Aspirin	3
X.	Amines	3
XI.	Isolation of Caffeine from Soft Drinks	3
XII.	Carbohydrates	3
XIII.	Lipids	3
XIV.	Proteins	3

We will choose two from the following: 3

Enzymatic Hydrolysis of Starch

Digestion of Fats and Proteins

Urinalysis

Vitamin C in Beverages and Urine



NOTE: Use either the Tab key or mouse click to move from field to field. The box will expand to accommodate your entry.

Section 1	
COURSE PREFIX AND NUMBER: <u>CHM 2205C</u>	SEMESTER CREDIT HOURS: <u>4</u>
COURSE TITLE: <u>Introductory Organic/Biochemistry</u>	

Section 2		
TYPE OF COURSE: (Click on the box to check all that apply)		
<input type="checkbox"/> AA Elective	<input type="checkbox"/> AS Required Professional Course	<input type="checkbox"/> College Prep
<input type="checkbox"/> AS Professional Elective	<input type="checkbox"/> AAS Required Professional Course	<input type="checkbox"/> Technical Certificate
<input type="checkbox"/> Other _____		
<input checked="" type="checkbox"/> General Education: (For General Education courses, you must also complete Section 3 and Section 7)		

Section 3 (If applicable)		
INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES:		
<input type="checkbox"/> Communications	<input type="checkbox"/> Social & Behavioral Sciences	<input type="checkbox"/> Mathematics
<input checked="" type="checkbox"/> Natural Sciences	<input type="checkbox"/> Humanities	

Section 4					
INTELLECTUAL COMPETENCIES:					
<input checked="" type="checkbox"/> Reading	<input checked="" type="checkbox"/> Speaking	<input checked="" type="checkbox"/> Critical Analysis	<input checked="" type="checkbox"/> Quantitative Skills	<input checked="" type="checkbox"/> Scientific Method of Inquiry	
<input checked="" type="checkbox"/> Writing	<input checked="" type="checkbox"/> Listening	<input checked="" type="checkbox"/> Information Literacy	<input checked="" type="checkbox"/> Ethical Judgment	<input checked="" type="checkbox"/> Working Collaboratively	

Section 5		
LEARNING OUTCOMES		METHOD OF ASSESSMENT
<ul style="list-style-type: none">• Explain and apply major concepts in organic and bio/chemistry including classification, nomenclature, characteristic reactions, stereochemistry and structure determination of organic compounds.		Written tests, reports and/or use of equipment to demonstrate student competency in field.
<ul style="list-style-type: none">• Demonstrate knowledge of scientific method.		Formulate problem, make observations, derive and test hypothesis and make conclusions.
<ul style="list-style-type: none">• Communicate scientific ideas through oral or written assignments.		Students use analytical reasoning skills to solve problems on written tests and/or laboratory work.
<ul style="list-style-type: none">• Interpret scientific models such as formulas, graphs, tables and schematics, draw inferences from them and recognize their limitations.		Written reports of lab experiments and/or written tests demonstrate student competency in the application of scientific knowledge.
<ul style="list-style-type: none">• Demonstrate problem solving methods in situations that are encountered outside of the classroom.		Students use demonstrations, group discussions, written tests, laboratory reports, research projects and/or field experiences to illustrate competence in recognizing and evaluating various scientific processes.
<ul style="list-style-type: none">• Demonstrate proper laboratory technique including safety in the use and care of laboratory equipment and materials.		Results from laboratory work and experiments demonstrate student awareness of science and society.

Section 6	
Name of Person Completing This Form: <u>Peter Mullin</u>	Date: <u>7/28/2005</u>

SECTION 7 MUST BE COMPLETED FOR ALL GENERAL EDUCATION COURSES ONLY (exclude AA electives)

<i>Section 7</i>							
KNOWLEDGE	<i>Primary</i>	<i>Secondary</i>	<i>N/A</i>	VALUE	<i>Primary</i>	<i>Secondary</i>	<i>N/A</i>
A. Global and Historical Knowledge & Understanding				Intellectual honesty	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Comprehends a general knowledge of the nature, origins and contributions of major civilizations	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Curiosity and openness to new ideas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Comprehends the workings and interrelations of personal, business and government economies	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Recognition of one's own creative potential	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Comprehends political, social and economic systems and their effects upon society	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Acceptance of and respect for differences among people and cultures	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B. Cultural and Aesthetic Knowledge and Understanding							
• Comprehends the contributions of the arts and humanities to the human experience on a personal, national or global level	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Civic Engagement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Comprehends the historical development of the arts and sciences	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Lifelong Learning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Comprehends religious and cultural systems and their effects upon society	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
C. Human Awareness and Understanding							
• Comprehends the dynamics of human behavior and the process of increasing self-awareness, growth and development	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
• Comprehends the stages of human development and the dynamics of human relationships in diverse cultures	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
• Comprehends the factors that promote physical, mental and social well-being	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
D. Mathematics, Science and Technology							
• Comprehends the basic concepts and investigative processes of the natural sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
• Comprehends the breadth, significance and development of the mathematical sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
• Comprehends the ways science and technology have shaped and continue to reshape human cultures and the environment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Section 8

Name of Person Completing This Form: Peter Mullin Date: 7/28/05