STARK STATE COLLEGE

GENERAL SYLLABUS

Course Information

Course Name: Organic Chemistry I
Course Number: CHM241

Required Materials

Textbook(s): (1) **Organic Chemistry** 10th ed. By John McMurry. Free access here and in BrightSpace: Organic Chemistry: A Tenth Edition - OpenStax
(2) **Organic Chemistry Lab Techniques by Lisa Nichols**. Free access here and in Brightspace: Organic Chemistry Lab Techniques (Nichols) - Chemistry LibreTexts

Required Readings: **Online HW:** Chem21Labs for online HW and timed quizzes

Additional Materials: **Lab Manual**: Christie and Padias, "Organic Chemistry Manual 2016-17", Hayden-McNeil, New York, ISBN: 978-0-7380-8920-1. **Lab notebook:** Scientific laboratory notebook with carbonless duplicate pages from bookstore (preferred). CHM241 notebook may be used **Calculator:** scientific calculator such as the as the "TI-30X IIs." Cell phones will not be permitted during assessments. **Splash-proof Safety Googles and Lab Coat (Mandatory and may be purchased at the bookstore) Molecular model set:** May be purchased new or used (recommended Molymod MMS-008 Organic Chemistry Molecular Model, Student Set (50 atom parts)) or can be borrowed during the course on a first-come, first-served basis. **ChemDraw Software:** License will be provided

Course Outline/Calendar

The date of coverage and order of coverage may be modified based on the faculty member and events beyond the control of faculty members that interfere with class times and teaching.

16 Week Calendar

Week	Chapter/Topic/Lab
1	Syllabus Chapter 1 Structure and Bonding
1	Chapter 1 Structure and Bonding
2	Chapter 2 Polar Covalent Bonds; Acids & Bases
3	Chapter 2 Polar Covalent Bonds; Acids & Bases
3	Chapter 3 Organic Compounds: Alkanes and Their Stereochemistry
4	Chapter 3 Organic Compounds: Alkanes and Their Stereochemistry
4	**Exam I (Chapters 1-3)**
5	Chapter 4 Cycloalkanes and Their Stereochemistry
5	Chapter 5 Stereochemistry at Tetrahedral Centers
6	Chapter 5 Stereochemistry at Tetrahedral Centers
6	Chapter 6 Overview of Organic Reactions
7	Chapter 6 Overview of Organic Reactions
8	**Exam II (Chapters 4-6)**
9	Chapter 7 Alkenes
9	Chapter 7 Alkenes
10	Chapter 8 Alkenes: Reactions and Synthesis
11	Chapter 9 Alkynes: An Introduction to Organic Synthesis
12	**Exam III (Chapters 8-9)**
12	Chapter 10 Organohalides
13	Chapter 11 Reactions of Alkylhalides: Nucleophilic Substitution and Elimination
14	Chapter 12 Structure Determination: Mass Spectrometry and IR Spectroscopy
14	Review Chapters 10-12
15	**Exam 4 (Chapters 10-12)**
15	Review for Final Exam
16	**ACS Exam**
16	**Final Exam (Chapters 1-12)**

LABORATORY SCHEDULE

Week	Experiment Number, Name and Lab Manual Reference (#A/B)	Description
1	0 - Welcome	• Safety Training • Introduction to ChemDraw • Lab equipment and procedures • Molecular models • Notebook primer
2	N/A	Skills Academy Session #2 @ 10:00-12:20 H205 Nomenclature, Lewis Structure, Formal Charge workshop – All lab groups imvited to attend
3	1 – Common Procedures (4A)	• Recrystallization • Filtration • Melting Point Determination
4	2 – TLC and IR spectroscopy (1A and 2A)	• Thin layer chromatography and • Infrared spectroscopy analysis of analgesic drugs
5	3 – Extraction and Purification (3A)	• Extraction and purification of spinach pigments • Column chromatography • Introduction to rotary evaporation
6	4 – Steam Distillation – Isolation of Limonene from Citrus Fruit (6A)	• Extraction of limonene • Simple vs. fractional distillation • Stereochemistry and polarimetry
7	5 – Spectral Analysis Methods	• Spectral analysis methods: IR, NMR, MS
8	5 - Spectral Analysis Working Day	• Spectral analysis workshop • (attendance required) Skills Academy Session #4 @8:30-10:00 H205
9	6 – Extraction and Sublimation (5A)	• Extraction of caffeine from tea • Isolation of caffeine • Analysis by IR and GC-MS
10	7 – Hydrogenation of Methyl Oleate (12A)	• Catalytic reduction of methyl oleate • Isolation and characterization of methyl stearate
11	8 – Synthesis of Esters (8A)	• Reactions of alcohols - esterification • Purification by simple distillation
12	9 – NMR Analysis and Diels Alder Reaction (4B)	• Matching H^1 NMR spectra with structures • Diels Alder cycloaddition of olefins
13	10 – S_N1 and S_N2Reactions (10A)	• Reactions of alkyl halides by S_N1 and S_N2
14	11 – oxidation rxn and GC-MS (2B)	• Green oxidation of alcohols • Synthesis of camphor by oxidation of borneol • Analysis by GC-MS
15	**Lab Practical**	• Lab practical and written components • Chapters 12 and 13 included