NOVA SOUTHEASTERN UNIVERSITY
Halmos College of Natural Sciences and Oceanography

*CHEM 2410 - Organic Chemistry II/Lab*

# I. Course Information

**Course:** CHEM 2410 - Organic Chemistry II/Lab
**Semester Credit Hours:** 4.0
**Course CRN and Section:** 20158 - DA5, 20159 - DA6
**Semester and Year:** Fall 2017
**Course Start and End Dates:** 08/21/2017 - 12/10/2017
**Building and Room:** Carl DeSantis Building - 3045

# II. Instructor Information

**Professor:** Dr. Beatrix Aukszi
**Email:** ba285@nova.edu
**Phone:** P124
**Office Hours:** M, W 10:00am-12:00pm
All other times are by appointments only.

# III. Class Schedule and Location

| CRN | Day | Date | Time | Location | Building/Room |
|---|---|---|---|---|---|
| 20158 | T | 08/22/2017 - 10/03/2017 | 9:15 AM - 12:00 PM | Ft Lauderdale/Davie Campus | Parker Building-107 |
| 20158 | TR | 08/22/2017 - 10/05/2017 | 7:45 AM - 9:00 AM | Ft Lauderdale/Davie Campus | Carl DeSantis Building-3045 |
| 20158 | R | 10/12/2017 - 10/12/2017 | 8:00 AM - 10:00 AM | Ft Lauderdale/Davie Campus | Carl DeSantis Building-3045 |
| 20158 | T | 10/17/2017 - 11/28/2017 | 9:15 AM - 12:00 PM | Ft Lauderdale/Davie Campus | Parker Building-107 |
| 20158 | TR | 10/17/2017 - 11/30/2017 | 7:45 AM - 9:00 AM | Ft Lauderdale/Davie Campus | Carl DeSantis Building-3045 |
| 20158 | F | 12/08/2017 - 12/08/2017 | 8:00 AM - 10:00 AM | Ft Lauderdale/Davie Campus | Carl DeSantis Building-1053/1054 |
| 20159 | TR | 08/22/2017 - 10/05/2017 | 7:45 AM - 9:00 AM | Ft Lauderdale/Davie Campus | Carl DeSantis Building-3045 |

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|---|---|---|---|---|---|
| 20159 | R | 08/24/2017 - 10/05/2017 | 9:15 AM - 12:00 PM | Ft Lauderdale/Davie Campus | Parker Building-107 |
| 20159 | R | 10/12/2017 - 10/12/2017 | 8:00 AM - 10:00 AM | Ft Lauderdale/Davie Campus | Carl DeSantis Building-3045 |
| 20159 | TR | 10/17/2017 - 11/30/2017 | 7:45 AM - 9:00 AM | Ft Lauderdale/Davie Campus | Carl DeSantis Building-3045 |
| 20159 | R | 10/19/2017 - 11/30/2017 | 9:15 AM - 12:00 PM | Ft Lauderdale/Davie Campus | Parker Building-107 |
| 20159 | F | 12/08/2017 - 12/08/2017 | 8:00 AM - 10:00 AM | Ft Lauderdale/Davie Campus | Carl DeSantis Building-1053/1054 |

# IV. Course Description

This course and the related lab is the second part of a two-semester sequence that studies the chemistry of heteroatom-containing carbon compounds, including their structure, nomenclature, preparation, reactions, analysis, and properties. Reaction mechanisms within a functional group framework are stressed. Stability, nucleophilicity and electrophilicity, and structurereactivity relationships will also be examined. The laboratory session practices basic organic syntheses. Prerequisite: CHEM 2400 OR CHEM 2400H. Frequency: Every Fall and Winter.

# V. Course Objectives / Learning Outcomes

1) Recognize major functional groups and name organic compounds containing these functional groups.
2) Understand and apply the basic rules of reactivity, nucleophilicity and electrophilicity to organic compounds.
3) Describe simple resonance schemes and their importance to stability and reactivity of organic molecules.
4) Demonstrate mastery of simple organic reaction mechanisms.
5) Recognize functional groups in biochemical compounds and their chemistry.
6) Apply basic organic laboratory techniques to synthesize, purify and broadly characterize simple organic compounds.

# VI. Materials and Resources

**Book Url:** NSU Book Store
**Section Required Texts and Material:** Organic Chemistry 2e; Author: David Klein, Publisher: Wiley; Year: 2015, Edition: 2,
ISBN-13: 9781118454312
Microscale Organic Laboratory: with Multistep and Multiscale Syntheses,
Author: Mayo, Pike, Forbes; Publisher: Wiley, John & Sons, Year: 2015, Edition: 6
ISBN-13: 9781118083406
**Section Recommended Texts and Materials:** Molecular Model Kit, Publisher: Pearson
ISBN-10: 0139554440, ISBN-13: 9780139554445

# VII. Course Schedule and Topic Outline

**Course Schedule:**
Lecture Schedule: Fall 2017
Class and lab schedules are subject to modification, but not without prior notification.

| Date | Day | Topic |
|---|---|---|

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|---|---|---|
| Aug. 22 | T | Chapter 15. MS, IR and UV Spectroscopy and Chapter 16. NMR |
| Aug. 24 | R | Chapter 16 cont'd |
| Aug. 29 | T | Chapter 28: Organometallic Compounds |
| Aug. 31 | R | Chapter 20: Aldehydes and Ketones |
| Sept. 5 | T | Chapter 20 cont'd |
| Sept. 7 | R | Chapter 20 cont'd |
| **Sept. 12** | **T** | **Exam I: Chapter 1-16, 20 and 28** |
| Sept. 14 | R | Chapter 21: Carboxylic acids and Carboxylic derivatives |
| Sept. 19 | T | Review of exam I |
| Sept. 21 | R | Chapter 21 cont'd |
| Sept. 26 | T | Chapter 21 cont'd |
| Sept. 28 | R | Chapter 21 cont'd and Chapter 22: Alpha carbon chemistry: Enols and Enolates |
| Oct. 3 | T | Chapter 22: Reactions at the α carbon of carbonyl compounds |
| Oct. 5 | R | Chapter 22 cont'd |
| *Oct. 10* | *T* | *Chapter 22. cont'd*<br>*Midterm exam week: Check Course Wizard for time and location* |
| *Oct. 12* | *R* | *Midterm exam week: Check Course Wizard for time and location* |
| **Oct. 17** | **T** | **Exam II: Chapter 1-22, 28** |
| Oct. 19 | R | Chapter 18: Aromatic Compounds |
| Oct. 24 | T | Review of Exam II |
| Oct. 26 | R | Chapter 19: Aromatic Substitution Reactions |
| Oct. 31 | T | Chapter 19 cont'd |
| Nov. 2 | R | Chapter 19 cont'd |
| Nov. 7 | T | Chapter 19 cont'd |
| **Nov. 9** | **R** | **Exam III: Chapter 1-19, 20-22, 28** |
| Nov. 14 | T | Review of Exam III |
| Nov. 16 | R | Chapter 23: Amines |
| Nov. 21 | T | Ch. 23 cont'd |
| *Nov. 23* | *R* | Ch. 23 cont'd and Ch 24: Carbohydrates |
| Nov. 28 | T | Ch 24 cont'd |

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| **Nov. 30** | **R** | **Exam IV: Chapter 1-24, 28** |
| **Dec. 8** | **F** | **ACS Final (8:00am-10:00am) *Check* Course Wizard *for information*** |

**LABORATORY SCHEDULE:** Fall 2017 *EXPERIMENT TITLES ARE IN ITALICS*!
Please follow the detailed guidelines posted on BB.
Abbreviations: F.R.: Full report, S.R.: Short report
**PLEASE CHECK TURNITIN FOR DEADLINES OF EACH LAB REPORT.**

| **Week** | EXP # | TITLE |
|---|---|---|
| Aug. 21 | Ch. 1-2 | Lab organization, policies, safety |
| Aug. 28 | Ch. 8 + handout | *Spectroscopy exercises*: **unknown determination in lab S. R. 1** (download lab handout from BB, unknown data will be given in lab) |
| Sept. 4 | - | University holiday. No labs |
| Sept. 11 | Ch. 6 - Exp. 5A | *Reduction of Ketones using a metal hydride reagent: cyclohexanol* **Pre-lab 1 + Technique 1: TLC** |
| Sept. 18 | Ch. 6 - Exp. 5A | Reduction of Ketones cont'd (Part II-Purification and characterization) **S.R.2** **Technique 2: Extraction** |
| Sept. 25 | Ch. 7 –Exp. B1 | Sequence B: The stepwise synthesis of Nylon-6,6 *Oxidation of cyclohexanol: Adipic acid* **S.R.3** **Pre-lab 2 + Technique 2: Reflux setup** |
| Oct. 2 | Ch. 7 –Exp. B2 Ch. 7 –Exp. B3 | *Preparation of an Acid Chloride: Adipoyl Chloride and Preparation of a Polyamide: Nylon-6,6* **F.R. 1** **Pre-lab 3 + Pre-lab 4: Sequence B2+B3** |
| Oct. 9 | - | *Midterm week, no labs* |
| Oct. 16 | Ch. 7-Exp. $A1_a$ | *The benzoin condensation of benzaldehyde*; (Part I- report submitted with Part II) **Pre-lab 5 + Technique 4: Vacuum filtration+recrystallization** |
| Oct. 23 | Ch. 7-Exp. $A2_a$ | *Copper(II) Ion oxidation of benzoin: benzil* (Part II) **S.R. 4** **Pre-lab 6 + Technique 5: Setup of gas delivery tube** |
| Oct. 30 | Ch. 6 - Exp. 20 | **Pre-lab 7:** *Aldol reaction: Dibenzalacetone* **F.R.2** |
| Nov. 6 | Ch. 6 - Exp. 28 | **Pre-lab 8:** Halogenation: *Electrophilic Aromatic substitution to yield 4-bromoacetanilide* (Part I-combined report submitted after Part II) |

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|---|---|---|
| Nov. 13 | Ch. 6 - Exp. 29+ Handout (BB) | **Pre-lab 9 + Technique 6: Mass/density/volume calculations. (5points)** *Nitration of Methyl Benzoate* (Part II-combined report) **S.R. 5** **Write background info based on textbook!** (Lab protocol is on BB) |
| Nov. 20 | - | University holiday. No labs |

# VIII. Assessments

- Class exams will be based on the material previously covered, including material from the previous class.
- **THE LAB GRADE WILL INCORPORATE THE RESULTS OF THE ORIGINALITY REPORTS GENERATED BY THE TURNITIN SYSTEM. HIGH LEVEL OF SIMILARITIES WITH PREVIOUSLY PUBLISHED MATERIAL WILL RESULT IN: 1, REPORTING THE CASE TO THE DEAN'S OFFICE; 2, GRADE PENALTY. SEVERE/REPEAT OFFENSES WILL RESULT IN FAILURE OF THE ENTIRE COURSE.**
- The scale will never be raised, but may be lowered at the discretion of the professor.
- **Partners in the lab can only share the data they jointly produced, which must match between partners. Each student needs to complete their OWN lab report, including structure/mechanism drawing, data analysis and report writing INDEPENDENTLY and INDIVIDUALLY. Producing the lab report in any joint effort or fashion by lab partners will be considered plagiarism and treated as such.**
- **ALL LAB REPORTS MUST BE SUBMITTED TO THE TURNITIN SYSTEM. www.turnitin.com**

To register for Turnitin use the following informatio. PLEASE MAKE SURE THAT YOU REGISTER FOR THE PROPER CLASS SECTION.

- Class name: Fall 2017-Org 2-20158-DA5-Tues
- Class ID:15778703
- Password: **O2-DA5-T-F17**

- Class name: Fall 2017-Org 2-20159-DA6-Thur
- Class ID:15778754
- Password: **O2-DA6-R-F17**

**Please check Turnitin for lab report deadlines. Due dates will not be announced in class.**

# IX. Grading Criteria

| Grading Scale: | |
|---|---|
| **A** | **1000-900** |
| **A-** | **899-880** |
| **B+** | **879-850** |
| **B** | **849-800** |
| **B-** | **799-780** |
| **C+** | **779-750** |
| **C** | **749-640** |

**Final Grade:**
**Grading Scale:**
**NO, YOU CANNOT CRAM IN THIS COURSE! You've been warned!**

| | | |
|---|---|---|
| Exams (4 @ 11% ea.) | 44% | 440 points |
| WileyPlus | 5% | 50 points |
| Lab (80+90+35+45points) | 25% | 250 points |
| Final Exam | 26% | 260 points |
| **Total** | **100%** | **1000 points** |

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|---|---|
| Lab grade will include: | |

# X. Course Policies

**General Policy:**

1. CONTACT THE PROFESSOR IF YOU ARE HAVING TROUBLE AS SOON AS POSSIBLE!
2. Attend class. Obtain notes from Blackboard, read before and BE PREPARED FOR

| | |
|---|---|
| **C-** | **639-620** |
| **D** | **619-600** |
| **F** | **599-** |

CLASS DISCUSSION.

3. **Cell phones must be turned off during class, and lab, especially during exams. Cell phones kept turned on during an exam indicate intended use for academic misconduct, and will be dealt as such**.

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|---|---|
| 2 full reports: 2*40 points | 80points |
| 5 short reports: 5*18 points | 90points |
| 9 Pre-lab: 9*5 points | 45points |
| 6 techniques: 5*6 +1*5 points | 35points |

4. Come prepared to perform each lab. Unsafe behavior in the laboratory or attending unprepared will result in **immediate dismissal**, earning zero credit for that experiment. Submit well-written lab reports. **Late reports will not be accepted. Reports not submitted on Turnitin.com will not be graded, and will count as a zero grade.**
5. **No lab or exam grades will be dropped**. **There will be no makeup exams provided unless a written, substantial and acceptable proof is presented either BEFORE THE EXAM COMMENCES, OR WITHIN A 24 HOUR PERIOD PAST THE EXAM.**
6. **Important:** the final examination is a standardized test published by the ACS (American Chemical Society). **You cannot write on the test. If you do so, your final exam will not be graded!!**

# XI. University Policies

Students should visit http://www.nova.edu/academic-affairs/nsu-syllabus-policy.html to access additional required college-wide policies. It is your responsibility to access and carefully read these policies to ensure you are fully informed. As a student in this class, you are obligated to follow these college-wide policies in addition to the policies established by your instructor.
The following policies are described on this website:

- Academic misconduct
- Last day to withdraw
- Email policy
- Student course evaluations
- Student responsibility to register
- Student responsibility for course prerequisites

## Academic Resources

Nova Southeastern University offers a variety of resources that may aid in student success. Among these resources are:

**Accommodations for students with documented disabilities:**For more information about ADA policy, services, and procedures, students may call the Office of Student Disability Services at 954-262-7189 or visit http://www.nova.edu/disabilityservices.

**Tutoring and testing center:**
Students are encouraged to use the free, individualized tutoring services offered by the Tutoring and Testing Center (TTC). TTC provides a supportive atmosphere in which tutors and students work collaboratively on improving students' writing, math and/or science skills. http://www.nova.edu/tutoring-testing/index.html