SYLLABUS
CHEM 2544 - ORGANIC CHEMISTRY II LABORATORY
Spring 2019
January 16 - May 3, 2019

LABORATORY TIME:

Section 1:	03:00 PM - 04:50 PM,	M,	SSB 228
Section 2:	09:00 AM - 10:50 AM,	T,	SSB 228
Section 3:	09:00 AM - 10:50 AM,	T,	SSB 232
Section 4:	12:00 PM - 01:50 PM,	T,	SSB 228
Section 5:	03:00 PM - 04:50 PM,	T,	SSB 226
Section 6:	03:00 PM - 04:50 PM,	T,	SSB 228
Section 7:	03:00 PM - 04:50 PM,	W,	SSB 228
Section 9:	09:00 AM - 10:50 AM,	Th,	SSB 228
Section 10:	09:00 AM - 10:50 AM,	Th,	SSB 232
Section 11:	12:00 PM - 01:50 PM,	Th,	SSB 228
Section 12:	03:00 PM - 04:50 PM,	Th,	SSB 226

INSTRUCTOR:

Dr. Peter Grundt, Office: Chem. 319, Phone: 726-6939
e-mail: pgrundt@d.umn.edu
Office hours: M, W 11:00 to 12:00 am, or by appointment

TEACHING ASSISTANTS:

Alvin Burrows — Sections: 1, 3, 7
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Office hours: M, W 1:30 - 2:30 PM

Kim Ngo — Sections: 2, 5, 9, 12
e-mail: ngo00043@d.umn.edu
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Jack Norman — Sections: 4, 6, 10, 11
e-mail: norma344@d.umn.edu
Office hours: M, F 11:00 -12:00 PM

STUDENT LEARNING OUTCOME:

CHEM2544 (Organic Chemistry II Laboratory) is the second semester Organic Chemistry laboratory course. Upon successful completion of this course students have learnt how to carry out experiments involving reactions of carbonyl compounds, aromatics, amines, carbohydrates and polymers. Students will also receive basic knowledge and hands-on experience of IR and NMR spectroscopy.

LABORATORY MATERIALS:

- Macroscale and Microscale Organic Experiments 5th, 6th or 7th edition by Williamson/Minard/ Masters
- Safety Goggles

- Bound Laboratory Book (Composition type)
- Simple calculator (addition, subtraction, division and multiplication) – you are not allowed to use your phone in lieu of a calculator!

PREREQUISITES:
CHEM 2541 (Organic Chemistry I Lecture) and CHEM 2543 (Organic Chemistry I Laboratory)

SCHEDULE OF EXPERIMENTS – updated 01/31/19:

02/04/19 - 02/07/19	Chapter 11 - IR & Chapter 12--NMR - No labs for Monday sections.
02/11/19 - 02/14/19	Chapter 22.4 - Cyclohexanone from Cyclohexanol by Hypochlorite Oxidation
02/18/19 - 02/21/19	Chapter 26 - Sodium Borohydride Reduction of 2-Methylcyclohexanone
02/25/19 - 03/28/19	Chapter 36 - Aldehydes and Ketones (1,2,3,6,7)
03/04/19 - 03/07/19	Chapter 63.2,3, Carbohydrates
03/18/19 - 03/21/19	Chapter 40.1 -Esterification: Synthesis of n-Butyl Acetate
03/25/19 - 03/28/19	Chapter 67.1 - Polymers
04/01/19 - 04/04/19	Chapter 28.1 - Nitration of Methyl Benzoate
04/08/19 - 04/11/19	Bromination of isatin.
04/15/19 - 04/18/19	Chapter 43 - Amines(1&2)
04/22/19 - 04/25/19	Chapter 44 - Sandmeyer Rxn(1,2,3
04/29/19 - 05/02/19	Chapter 46 - Dyes and Dyeing(1,4) AND check-out
5/6/19	Final - 8:00 - 9:00 am, MonH 80

GRADING:

12 Experiments	240 points (12x20 pts)
12 5-Minute Quizzes	72 points (12 x 6 pts)
Final Exam	60 points
General performance in the laboratory and safety	48 points (12 x 4 pts)
Total:	420 points

- The write-up of every experiment constitutes a major portion of the grade for this course. If you happen to adjust yields, melting points etc. to any other values than you observed, you may receive 0 pts for that particular experiment. Your TA will announce in class details concerning the write-up.

- The purpose of the quizzes is to a) ensure that you arrive on time for each laboratory session and b) verify that you did prepare for the up-coming experiments of each laboratory session. There is no quiz in the first week of this course. The quizzes will be given in the first 5 minutes of the beginning of each laboratory session. If you are late, you may not be able to take the quiz and a score of 0 pts will be included in the total quiz score.

GENERAL LABORATORY RULES AND REQUIREMENTS

Clothing and shoes:

- Shoes: You are required to wear closed-toe shoes. – Any shoes – for example sandals, crocs with breathing holes, or flip-flops – that reveal the top of foot, or your toes are unacceptable.

- Clothing and socks: Any exposed clothing and your socks have to be made from at least 50% cotton. Blue jeans and a preferentially at least 50% cotton round neck T-shirt with tight fitting long sleeves may provide the best protection. Under no circumstances you are not allowed to wear shorts. Any clothing that reveals the skin of your legs, your stomach and your shoulders is not allowed. You are not allowed to wear any clothing that is made from 100% synthetic material such as polyester or polyamide.

- If your TA considers your clothing including your shoes is inappropriate for this you may be given the opportunity to change however you will not be able to make-up any missed time. The TA's decision to make you change is final.

Gloves and Safety goggles:

- When performing an experiment you are required to wear gloves and safety goggles at all times. You are not allowed to touch door handles with gloves. Gloves need to be removed when working in the seating area of the lab.

Fume hoods

- You are not allowed to perform experiments outside the fume hood. You need to clean the fume hood before you leave.

Cell phones

- At the beginning of the lab you are required to store your cell phone in your bag. – Under no circumstances you are allowed to use your phone in the lab

Appropriate lab conduct

- You are expected to be respectful to me, to your TA, and to other students. Disorderly conduct will not be tolerated. If the TA finds anyone in violation of this they may ask them to leave the lab, and they cannot return until they talk to the professor.

The University of Minnesota Duluth policies related to teaching and learning apply for this course. Further details see can be found at: http://d.umn.edu/academic-affairs/academic-policies/classroom-policies/recommended-syllabi-policy-statements

Academic Integrity: In this course, the minimum penalty for plagiarism is receiving no points on the plagiarized lab and documenting the offense with the Office of Student Conduct. Two documented offenses are grounds for expulsion from the University. In addition, a single offense of severe plagiarism is sufficient grounds for expulsion on its own. http://d.umn.edu/academic-affairs/academic-policies/classroom-policies/student-academic-integrity

Access for Students with Disabilities: It is the policy and practice of the University of Minnesota Duluth to create inclusive learning environments for all students, including students with disabilities. If there are aspects of this course that result in barriers to your inclusion or your ability to meet

course requirements please notify the instructor as soon as possible. You are also encouraged to contact the Office of Disability Resources to discuss and arrange reasonable accommodations. Please call 218-726-6130 or visit the DR website at www.d.umn.edu/access for more information.

UMD is committed to providing a positive, safe, and inclusive place for all who study and work here. A central mission of the university is to educate students through the offering of courses and programs leading to the conferral of degrees. Teaching and learning at the university take place in a variety of educational settings including on-campus lecture halls and classrooms, laboratories, field sites, and online. Instructors and students have mutual responsibility to ensure that the environment in all of these settings supports teaching and learning, is respectful of the rights and freedoms of all members, and promotes a civil and open exchange of ideas. Making hostile, threatening, discriminatory or disparaging remarks toward or about the instructor, other members of the class or groups of people will not be tolerated.

Title of the Experiment Date: (0.5 pt)	
Lab Partner's Name (0.5 pt)	
Chemical Structures and Reaction Mechanisms (2 pts) Draw chemical structures with chemical names, not just the chemical names. If there is no chemical reaction in a certain experiment draw the reaction mechanism.	
Materials: (1 pt) i.e. the glassware, the instruments	
Procedures: (2 pts)	Observations: (4 pts)
* Write down the experimental Procedures in your own words by using the handout as the guideline. * Write point-wise * Using as many pages as you want * You should be able to use this procedure in lab * Draw figures or flow chart if necessary (on left side)	* Write down everything you notice * Starting weights; end weights; boiling point; melting point; color changes; precipitation formation; gas evolution; physical state changes

Calculations and Results: (4 pts) * Presenting your data in tabular format, no paragraphs! * Need to present your starting materials and end products' weights in this session. * Show all the calculations used, i.e. theoretical yield and percent yield or % recovery. * States the melting points and boiling points if are required during the experiment. * Attach the spectra that were taken during the experiment. * Analyzing the spectroscopic information and presenting it in a separate table.
Discussion: (6 pts) • What is the reaction type and how did you achieve the synthesis? Discuss the theories behind the experiment. • What is the driving force of the reaction? Such as how are you able to isolate the final product from the starting materials. • Legibility (1 pt)

Total points: 20

Note:
- You must have page numbers on each page of your lab notebook. Do not rip out pages from the notebook.
- Everything should be written in the lab notebook. Separate reports are not accepted.