Wilberforce University **Division**
Course Syllabus

Course:	**Organic Chemistry 2 Lab – CHE232L**
Term:	**Spring 2012**
Instructor:	**Name: Dr. D. R. Buffinger** **Email Address: dbuffing@wilberforce.edu** **Phone Number: (937)708-5639**
Catalog Description:	This lab must be taken with CHE 232 and continues the student's instruction in organic synthesis and the use of characterization techniques including infrared spectroscopy and derivatives to determine the identity of unknown compounds.
Prerequisites	Co-requisite: CHE 232
Course Level Learning Outcomes:	After taking this course, students will know or be able to demonstrate the following: • Know the following safety protocols o Basic rules of lab safety, including ▪ Wear safety goggles/gloves/aprons when appropriate; no eating/drinking/etc.; no unauthorized experiments; no working alone o Where the safety devices are and how to use them, including ▪ Eye wash, fire blanket, fire extinguisher, sand bucket, safety shower, fume hoods o Understand the warnings associated with the NFPA Label o How to properly dispose of organic chemical waste • Identify and properly use common pieces of organic lab glassware and equipment • Describe how and be able to perform the following basic organic lab techniques o Recystallization, including ▪ Basic steps of the process ▪ How to choose a solvent o Distillation (simple and fractional), including ▪ How to set up the apparati o Extraction and washing, including ▪ How to separate the layers o Drying an organic liquid/solution, including ▪ Know common drying agents

	▪ How to use and remove them o Thin-layer chromatography, including ▪ At least two uses of TLC ▪ Prepare a TLC plate for analysis o Filtration (gravity and vacuum) o Heating and cooling techniques, including ▪ Sand baths, ice/water baths, and reflux o Performing moisture-sensitive organic reactions • Describe how and be able to perform the following analytical techniques o Acquiring the Infrared Spectrum of an organic material ▪ Preparing a liquid sample for IR analysis ▪ Preparing a solid sample for IR analysis ▪ Analyzing IR spectra to identify functional groups and to identify unknown compounds o Determining the melting point (mp) of a solid, including ▪ Preparing a sample for melting point determination ▪ How impurities affect melting points o Determining the boiling point (bp) of a liquid o Determining retention factor (R_f)of a spot on a TLC plate o Following an organic reaction by TLC • Describe how and be able to perform the following combined techniques o Separation, purification and identification of an unknown organic compound o Single-step organic synthesis o Multistep organic synthesis • Be able to perform the standard lab calculations, including o Limiting reagent o Percent yield
Materials:	*Experiments for the Organic Chemistry Lab*, Signature Labs, Cengage Learning ***Bound Lab Journal*** ***Scientific Calculator***
Grading:	Grading Scale 90 - 100% = 843 – 942 pts = A 80 - 89% = 749 – 842 pts = B 70 - 79% = 655 – 748 pts = C 60 - 79% = 560 – 654 pts = D Below 60% = 0 – 559 pts = F

	Safety Quiz	50 points
	Equipment Quiz	50 points
	ACS Examination	15 points
	Lab Journal	10 points
	Table of Contents Creation	10 points
	Table of Contents (1 point per experiment)	7 points
	Lab Journal Entries (80 points per experiment)	560 points
	Performing the Lab (10 points per experiment)	70 points
	Lab Safety /Cleanliness (10 points per experiment)	70 points
	Final Exam	100 points
		942 points

	A student's proficiency in course work is measured in terms of the following Alphabetical symbols. Minuses and pluses are not accepted. A: Excellent B: Good C: Satisfactory (Grade C or better required in major courses). D: Poor (passing, except in major courses). F: Earned Failure. (Removed only by repeating the course). Upon successfully passing the course, the first grade is "excluded" from grade point average. The second grade is "included in the recalculation of the grade point average. I: Incomplete (student performing satisfactorily, but unable to complete coursework due to valid reason). N: Used in cases where grades are not yet submitted. W: Withdrew before course drop deadline. WP: Student withdraws from University. Withdrew passing after course drop deadline (2 weeks after mid-term). WF: Student withdraws from University. Withdrew failing after course drop deadline (2 weeks after mid-term. WF is treated as an F (punitive grade). CR: Credit/pass NC: No credit/fail Z: Failed course for non-attendance/unofficial withdrawal (treated the same as an F grade). Last date of attendance is reported by faculty.

Activities:	1. There are two (2) quizzes (safety and equipment) given in this course during the second class meeting. **There is no MAKE-UP for these quizzes**. 2. A midyear ACS assessment exam will be given during the second class meeting. **There is no MAKE-UP for this exam.** 3. There are eight experiments planned for the spring semester. Each experiment consists of 10 points for performing the experiment, 10 points for lab safety and cleanliness, 80 points for the lab journal write-up and 1 point for the experiment entry into the table of contents. At the end of the semester, the lowest scored experiment (journal write-up, performance, safety and contents entry) will be dropped. **THERE ARE NO MAKE-UP LABS**.
Policy Statements:	• All cell phones are to be either turned off or on vibrate during class. No cell phone is permitted to be answered during a lecture. However, once lab begins you are free to use your phone as long as it does not interfere with your experiment. If this policy is ignored, I will assess a reduction of two points from the affected experiment for offenders. Cell phones are not allowed in class during exams. They must be off and stored in purses, backpacks, etc. Failure to abide by this rule will cause a penalty of 10 points to be removed from your examination. • During examinations all electronic devices including i-pods, laptops, etc must off and stowed. The only exception is a calculator. Please note that you MAY NOT use your cell phone as a calculator.
University Policies:	Academic Honesty: Plagiarism and cheating are completely unacceptable in an institution of higher education and learning. Such behavior deprives the student involved of the desired education and development of an appropriate value system. It is extremely unfair to other students, and it severely diminishes the value and integrity of a University degree. Plagiarism occurs whenever another's work is submitted as one's own. This includes the use of information from an Internet site or from a published author's ideas and words without proper attribution or documentation. It also includes the coping of term papers, other

	unpublished works, homework, case reports, computer programs and spreadsheets, and any other course assignments which are submitted for course credit as the student's own effort. Each instructor shall state the specific penalties for plagiarism and cheating in the course syllabus. The instructor has final responsibility for assessing the penalty in such cases regarding the course grade. All cases of plagiarism and cheating will be referred to the Vice President for Academic Affairs for possible further action. Additional penalties may be imposed for the egregious cases of plagiarism and cheating.

Drops and Withdrawals

Dropping Courses:

A course may be dropped up through the end of the second week of the semester without any record on the transcript. After this date, a course may be dropped up to two weeks after mid-term grade reports are due, with a W appearing on the transcript. Withdrawals after mid-terms must be approved by the Vice-president of academic Affairs.

In certain General Studies core courses, students' assignments to course sections may be changed by faculty with written notification given to the Registrar. In all other cases, a student wishing to move from one section of a course to another must accomplish this by using a drop-add form to drop the old section and add the new section.

Withdrawal/Grading Policies

The following procedures will apply to all students withdrawing from the University. Grades will be given in regard to the time of withdrawal. Contact the Registrar's Office for forms and assistance.

- **W** (official withdrawal initiated by the student): To be given when a student withdraws between the first day of class/registration and the last day to drop courses, this is two weeks after mid-term exams.

- **AW** (unofficial withdrawal not initiated by the student): The student does not inform anyone that he/she is leaving campus (the student walks out). The university may also administratively withdraw a student for disciplinary reasons, academic legal anytime during the semester.

Special Accommodations:

A student who is ill or who has or develops medical conditions including but not limited to illness, physical or other disability or pregnancy must notify the Director of Health Services immediately.

Course Schedule	1. This course meets from 1:00 to 3:50 T 2. The new University Class Make-up Policy states that any missed class for whatever reason must be made up. For this course, any missed classes will be rescheduled for an agreed upon evening. 3. My Office Hours are as follows: MWF 1:00 – 1:50 MW 3:00 – 4:00 T 4:00 – 6:00
Course Policies :	1. Attendance will be taken each day at the very beginning of the lab. If you are not present within the first 20 minutes, I will mark you absent. You may miss one day without any penalty. Please note that this one absence includes excused absences. If you are going to be absent, please email me. 2. There are two (2) quizzes (safety and equipment) given in this course during the second class meeting. **There is no MAKE-UP for these quizzes**. 3. A Mid point ACS assessment exam will be given during the second class meeting. **There is no MAKE-UP for this exam.** 4. There are six stations in the organic lab. Depending on the number of students enrolled, students will work individually or if more than six students, then in pairs. However, **each student** will individually keep a lab journal. Although the data and results section (s) will be the same, the theory and error analysis sections must be different. I do compare lab journals while grading. Please do not plagiarize each other. 5. Lab Journals are required in this course. You must bring your lab journal with you for the second class meeting. If you fail to bring it you will lose 1 point per day for lateness up to a maximum of 10 points. Your journal may not be removed from the lab during the semester so all entries must be made during the lab period. 6. There are eight experiments planned for the spring semester. Each experiment consists of 10 points for performing the experiment, 10 points for lab safety and cleanliness, 80 points for the lab journal write-up and 1 point for the experiment entry into the table of contents. At the end of the semester, the lowest scored experiment (journal write-up, performance, safety and contents entry) will be dropped. **THERE ARE NO MAKE-UP LABS**. 7. To ensure that you have adequate time to complete the experiment, you must begin the experiment no later than 1:30. If you have not begun the experiment by then, points

will be reduced from the lab conduct category. Please do not write your theory section at the beginning of the lab. Wait until the end or during down times in the experiment.

8. Lab begins at 1:00. If you have not arrived by 1:30, points will be deducted from the lab conduct category at a rate of 5 points per 15 minutes for tardiness. If you are more than an hour late, you will be considered absent from the class for that day.

9. If you miss a lab, you may not copy the data from your lab partner and submit it as your own. You will receive a zero for this lab journal entry. If you miss a day of a two day lab experiment, you will lose the half the points for the lab journal entry (at least for the Procedure and Data; Results; and Error Analysis sections).

10. The lab journal will be graded after the first experiment, and at two or three other random times within the semester.

11. At the end of the semester, an oral assessment final exam will be given in class.

12. To succeed in this class, I recommend a minimum of two (2) study hours per week. During this time you should read the lab manual to prepare for the experiment and start to write a theory section.

13. Cheating is totally unethical and will not be tolerated in this class. First offense is an F for that assignment or exam. The second offense will net you an F for the course. Please note that plagiarism is cheating. Do not copy each others theory or error analysis, or I will be forced to give a zero for that assignment. This zero, if given, will not be dropped.

ADA Policy: In accordance with the Americans with Disabilities Act (ADA), please inform the instructor of any special learning needs you may have at the beginning of the semester so that reasonable accommodations may be provided. Please present documentation of the same to the instructor.

Weekly Schedules:

DATE	ACTIVITY
Jan 10	Introduction to Lab
Jan 17	Safety and Equipment Quiz & ACS Exam
Jan 24	EXP 1 - Identifying an Unknown Compound by IR Spectroscopy (pgs: 173 – 188) Unknown Procedure only (pg 183)

Jan 31	EXP 2 - Acetaminophen: The Acetylation of p-Aminophenol (pgs: 189–200) Microscale Procedure (pgs: 195 – 197)
Feb 7	EXP 3 - Nitrating of Acetanilide or Methyl Benzoate (pgs: 201 – 212) Microscale Procedure (pgs: 206 – 208)
Feb 14	EXP 4 - Triphenylcarbinol - Grignard Synthesis (pgs: 213 – 218) Microscale Procedure (pgs: 188 – 190)
Feb 21	**EXAM 2 for Lecture**
Feb 28	EXP 4 - Grignard Synthesis, cont. EXP 5A – Multistep Synthesis (pgs: 219 – 244) Beginning of first synthesis (pg: 223)
Mar 6	**NO LAB – SPRING BREAK**
Mar 13	**EXAM 3 for Lecture**
Mar 20	EXP 5A – Multistep Synthesis – completion of first synthesis (pgs: 233 - 234)
Mar 27	**EXAM 4 for Lecture**
Apr 3	EXP 5B – Multistep Synthesis – Second Synthesis (pgs: 236 – 239)
Apr 10	EXP 5C – Multistep Synthesis – Third Synthesis (pgs: 240 – 241)
Apr 17	Fireflies and Photochemistry Essay (pgs: 245 – 248) EXP 6 - Luminol Synthesis and Chemiluminescence (pages 249 – 259) Procedure (pgs: 254 – 256)
Apr 24	**EXAM 5 for Lecture**
	LAB FINAL EXAM

Advising & Tutorial Support: