Rowan College at Burlington County
Division of Science, Technology, Engineering & Mathematics
CHE 243-501 Organic Chemistry II Laboratory

COURSE OUTLINE

Term: Spring 2021 (1/22/21 - 5/16/21)
Location: Science Building, Room 212
Mount Laurel, NJ
Time: Wednesday 5:00 – 7:50 pm

Instructor: Angela S. Foy
Email: afoy@rcbc.edu
Office Hours: By appointment
Credits: 1

**I will respond to all student emails within 48 hours*

Course Description: This is the second semester of a two-semester Organic Chemistry laboratory course, providing laboratory experiences that apply to the topics and concepts covered in the Organic Chemistry II lecture. The primary objective of the course is the hands-on synthesis, purification and characterization of organic compounds.

Prerequisites: CHE 240/241 **Co requisite:** CHE 242

Required Material: CHEM 243 Syllabus & Instructional Supplement (available on Blackboard)

Mandatory Student Supplies:

1. Lab Coat (available in bookstore)

2. Three (3) College Ruled Composition Notebooks (any color)
   *Use your notebooks from CHE 241 (preferable).

- Additional Resources can be found at: **http://www.chemistry-solutions.com/**
- Course materials are posted on Blackboard: **https://rcbc.blackboard.com/**

Course Learning Objectives:

Upon completion of the course, students will be able to:

- Work safely and effectively in the organic laboratory.
- Synthesize, purify and characterize organic compounds.
- Maintain research/publication-grade experimental records.
- Compose and deliver an oral presentation on a chemistry research topic.

Core Course Content:

- A typical sequence in oxidation reactions
- Friedel-Crafts synthesis
- EAS reactions
- Esterification reactions
- Grignard reactions
- Intellectual property in the pharmaceutical industry

General Education Outcomes:

Written and Oral Communication

- Students will communicate meaningfully with a chosen audience while demonstrating critical thought.

Scientific Knowledge and Reasoning

- Students will demonstrate critical thinking skills in the analysis of scientific data.

Evaluation: 100% of the total grade will be based on:

Laboratory Notebook/Reports	90.0%
Laboratory Technique	10.0%

The experiments conducted in this course will be worth 100 points each (prelab and post-lab combined). The laboratory technique grade includes proper use of laboratory equipment, preparedness & participation, appropriate laboratory behavior and adherence to safety regulations.

Grading:

A = 90-100
B+ = 85-89
B = 80-84
C+ = 75-79
C = 70-74
D = 60-69
F = <60

Grading Rubrics for Experiments:

Experiment 9: Preparation of Cyclohexanone					
Pre-Lab			**Post-Lab**		
Attendance			Attendance		
	Pts.	**Score**		**Pts.**	**Score**
Purpose	2		Exp. Procedure	5	
Gen. Procedure	2		Exp. Calculations	5	
CHP Appendix	3		Data Table	10	
Physical Constants Table	4		Flow Sheet (experimental)	7	
Reaction Equation	2		IR Spec/Chromatography	5	
Preliminary Calculations	5		Analysis	18	
Labeled Diagram (Reaction equipment)	2		Abstract	15	
Flow Sheet (preliminary)	2				
Exp. Procedure	3				
Technique (prepared, time mgmt., NB protocol, safety)	5		Technique	5	
Total	30		**Total**	70	

Experiment 10: Friedel-Crafts Synthesis					
Pre-Lab			**Post-Lab**		
Attendance			Attendance		
	Pts.	**Score**		**Pts.**	**Score**
Purpose	2		Exp. Procedure	5	
Gen. Procedure	2		Exp. Calculations	5	
CHP Appendix	3		Data Table	10	
Physical Constants Table	5		Flow Sheet (experimental)	7	
Reaction Equation	2		IR Spec/Chromatography	5	
Preliminary Calculations	5		Analysis	18	
Flow Sheet (preliminary)	2		Abstract	15	
Exp. Procedure	4				
Technique (prepared, time mgmt., NB protocol, safety)	5		Technique	5	
Total	30		**Total**	70	

Experiment 11: Esterification					
Pre-Lab			**Post-Lab**		
Attendance			Attendance		
	Pts.	**Score**		**Pts.**	**Score**
Purpose	2		Exp. Procedure	5	
Gen. Procedure (prepared by student)	5		Exp. Calculations	5	
CHP Appendix	3		Data Table	10	
Physical Constants Table	5		Flow Sheet (experimental)	7	
Reaction Equation	2		IR Spec/Chromatography	5	
Preliminary Calculations	4		Analysis	18	
Exp. Procedure	4		Abstract	15	
Technique (prepared, time mgmt., NB protocol, safety)	5		Technique	5	
Total	30		**Total**	70	

Consumer Product Analysis (Reverse Engineering of a Consumer Product)**:**

Assessment – 100 Points

Selection of Product: 5 Points
Proposal: 20 Points
Laboratory Work: 20 Points (includes 10% technique)
Report: 55 Points

Reverse Engineering Report Rubric

The following guidelines should be followed when preparing your Consumer Product (Reverse Engineering) Report:

Proposal:

Header/Title [To: Instructor Name.. From: Student Name, Title of Proposal] _____2pts
Objective (similar to purpose) _____5pts
Plan of action (may be in paragraph or flow chart format) _____5pts
Table listing compounds and data (similar to physical constants table) _____5pts

- Boiling point, Density, Melting Point, etc. (as applicable for products and standards)
- IR Spectra stretching/bending frequencies for the compound(s) in question
- Refractive Index standard values if applicable

CHP appendix listing data for each compound, with hazards and precautions.

- (format as used in your notebooks) ____3 pts

Final Report:

Intro/Objective_____5pts
Body/Experimental Procedure_____15pts
Results & Discussion_____15pts

- Include GC, IR, HPLC and Refractive Index data
- Show all calculations

Conclusion_____10pts

- Restate significant (conclusive) findings
- Comment on possible ways to further your research and/or propose new ideas for future analysis

Update original data table to include experimental findings_____5pts
Include all experimental chromatograms and standards_____5pts

** Final Report must be a minimum of 2 pages (without chromatograms and standards)*

***Additional details will be discussed in class and posted to Blackboard.*

Intellectual Property Assignment:

Assessment – 100 Points

Claim Form: 75%
Presentation: 25%

Link to IP project overview:
http://www.ciese.org/pathways/rwlo/rwlos/2500/CHEMISTRY%20INTELLECTUAL%20PROPERTY/procedure.html

**Details will be discussed in class and posted to Blackboard.*

Course Policies:

Attendance: Attendance at all laboratory classes is mandatory and will be recorded. If you are unable to attend class, please contact me ahead of time. Grade penalties for absences will be imposed when a student exceeds a 10% absence rate, not to exceed 10% of the final grade. Class participation is considered a separate grading component (see additional rules below).

Students will not be penalized if absent due to religious holidays, legal reasons (e.g., jury duty), required military duty, and personal illness/injury, bereavement due to the loss of a family member or to attend to the medical needs of a family member. ***Proper documentation is required in the above cases.***

Lateness Policy: Students are expected to arrive on time for class. ***Chronic lateness will result in a point deduction equivalent to a missed lab period (10%).*** While I do understand that sometimes circumstances occur which are beyond our control, do not abuse this. Laboratory doors will be closed and locked when class begins, according to school safety regulations.

Assignments are due at the beginning of the lab period. ***Failure to hand in an assignment on time will result in a 10% deduction for that assignment. Assignments more than 2 weeks late will not be accepted.***

Preparedness: It's important that you come prepared for every experiment. Prepared means you've completed the required sections of your journal (physical constants sheet, CHP, preliminary calculations) before you enter the lab. The instructor will check your lab notebook prior to beginning class. ***Incomplete work will result in a 5% deduction from your report grade.*** Students who are unprepared will be prohibited from beginning the lab until they complete the required notebook sections.

Laboratory Make-ups: If you miss a lab period, it's essential that you contact me immediately to arrange a make-up. ***Failure to make up a lab will result in a zero (0) for that portion of the experiment. If you miss a lab and make it up in another section, you will still receive a 10% grade deduction for the experiment. If you fail to make up a lab, and as a result require instructor data to complete the experiment, you will receive a 15% grade penalty for the experiment.***

Proper Attire: Open-toed shoes and bare back/midriff clothing is prohibited in the laboratory. These requirements are outlined in the laboratory safety contract and are mandatory. Because we will be working with hazardous chemicals, a ¾ length lab coat is required for this course. Splash goggles must be worn at all times during every experiment. No 'glasses' style goggles are allowed.

Food and Drink: There is absolutely no food or drink allowed in the lab. This includes chewing gum. Any food items must be left in the cubbies by the door and consumed in the hallway if necessary.

Group Work and Participation: You will be working together in groups/pairs during this class; however, each individual is expected to fully participate, or points will be deducted from his/her laboratory technique grade. All work should be in the student's own words, not verbatim from the text, a website or other students work. ***If notebooks or assignments are identical, they will receive a***

grade of zero (0). This is considered a violation of the academic integrity code and further disciplinary action may be taken.
Cell Phones: All phones/electronics must be silenced or turned off during class. Any cell phone use – including texting – is restricted to the hallway. The instructor reserves the right to dismiss a student from the lab for inappropriate cell phone use.

Laboratory Clean-up: Every student is responsible for the proper cleaning of his/her work area and glassware. The instructor will give directions regarding the appropriate disposal of waste products. Proper clean-up of shared work zones (such as the sinks and perimeter of laboratory) will be the responsibility of all students, collectively. ***The instructor reserves the right to deduct technique points for items not cleaned & put away.***

Laboratory Equipment: All laboratory equipment is expensive and delicate. The proper use and care of our equipment and supplies is essential, so please treat everything in the laboratory with care and follow all care instructions. Acidic, basic & corrosive compounds will ruin the instruments!!

Additional Policies and Regulations:

In order for students to know their rights and responsibilities, all students are expected to review and adhere to all regulations and policies as listed in the College Catalog and Handbook. These documents can be accessed at rcbc.edu/publications. Important policies and regulations include, but are not limited, to the following:

- College Attendance Policy
- Grading Standards
- Withdraw (W) and Incomplete Grades (I & X)
- Withdrawal date for this semester **(03/25/21)**
- Student Code of Conduct
- Academic Dishonesty/Plagiarism and Civility
- Use of Communication and Information Technology

Office of Student Support and Disability Services
RCBC welcomes students with disabilities into the college's educational programs. Access to accommodations and support services for students with learning and other disabilities is facilitated by staff in the Office of Student Support (OSS). To receive accommodations, a student must contact the OSS, self-identify as having a disability, provide appropriate documentation, and participate in an intake appointment. If the documentation supports the request for reasonable accommodations, the OSS will provide the student with an Accommodation Plan to give to instructors. For additional information, please contact the Office of Student Support at 609-894-9311, ext. 1208, disabilityservices@bcc.edu, or rcbc.edu/studentsupport.

Educational Technology Statement

Rowan College at Burlington County (RCBC) advocates the use of technology to enhance instruction. Students should assume that classroom and online technology will be used throughout their coursework at RCBC, as it will most certainly be used in their future education and careers. The College provides on-campus facilities for the convenience of the RCBC community. Various college departments, including the Office of Information Technology and the Office of Distance Education, provide technology training and assistance to faculty and students.

Student Success Services

RCBC offers a variety of free services for its students including those listed below. Descriptions of these services, as well as many others, can be found in the College Catalog and Handbook and on the RCBC website at rcbc.edu/publications .

- Academic Advisement (rcbc.edu/advising)
- Career Services (rcbc.edu/careers)
- Educational Opportunity Fund (EOF) (https://www.rcbc.edu/eof)
- Financial Aid (rcbc.edu/financialaid)
- International Students Office (rcbc.edu/international)
- Library/Integrated Learning Resource Center (ILRC) (rcbc.edu/library)
- Office of Veteran Services (rcbc.edu/vets)
- Student Support Counseling (https://www.rcbc.edu/studentsupport)
- Tutoring Center (https://www.rcbc.edu/tutoring)
- Test Center (https://www.rcbc.edu/testcenter)
- Transfer Services (rcbc.edu/transfer)