

COURSE DESCRIPTION

A continuation from CHEM 281/3.0 intended for students in biological sciences, life sciences, and other plans taking no further courses in organic chemistry. Students in chemistry or biochemistry plans should not enrol in this course. Organic molecules and their reactions; relevance to biological systems. Illustrations using biomolecules such as carbohydrates, amino acids and proteins, lipids, and nucleic acids.

COURSE AUTHOR

Dr. John Carran

TOPICS

- Lecture set 1: Conjugated Unsaturated Systems
- Lecture set 2: Aromatic Compounds
- Lecture set 3: Reactions of Aromatic Compounds
- Lecture set 4: Alcohols from Carbonyl Compounds – Oxidation/Reduction and Organometallic Compounds
- Lecture set 5: Radical Reactions and polymers
- Lecture set 6: Aldehydes and Ketones I – Nucleophilic Additions to the Carbonyl Group
- Lecture set 7: Aldehydes and Ketones II – Enols and enolates

- Lecture set 8: Carboxylic Acids and Their Derivatives: Nucleophilic Addition – Elimination at the Acyl Carbon
- Lecture set 9: Synthesis and Reactions of β -Dicarbonyl Compounds
- Lecture set 10: Amines
- Lecture set 11: Carbohydrates
- Lecture set 12: Lipids
- Lecture set 13: Amino Acids and Proteins

COURSE LEARNING OUTCOMES

Upon successful completion of this course, you will be able to,

1. Write names of molecules from structures and vice versa. Identify and name functional groups
2. Identify reactive sites on reagents (nucleophiles, electrophiles, acids, bases, leaving groups).
3. Identify stereochemistry of molecules in terms of nomenclature and class of compounds.
4. Predict and justify the impact of solvent and electronic effects on reactivity.
5. Predict reaction outcomes in the context of substitution and elimination reactions.
6. Add to the reactions from CHEM281 for functional group interconversions
7. Combine functional group interconversions in more complex molecules
8. Learn ~~select~~ protecting group chemistry and apply to multi-step syntheses
9. Use tools and laboratory techniques commonly required for the synthesis of organic molecules, and critically analyze and communicate scientific results.

UNIVERSITY OPERATING DATES

Please visit the Faculty of Arts and Sciences Sessional Dates website for all academic deadlines.

COURSE TIMELINE

Midterm held 

Wiley Online Assignments due at the end of the week where the topic material is covered in class.

Hard electronic deadlines are shown in the assignment area and cannot be extended for any reason.

All accommodations are included in the hard electronic deadlines.

Final exam is held on campus in the Final exam session for the Winter term.

All times are in Kingston time (Eastern Time).

LAND ACKNOWLEDGEMENT

Queen's University is situated on the territory of the Haudenosaunee and Anishinaabek.

EQUITY, DIVERSITY, AND INCLUSIVITY STATEMENT

Queen's University recognizes that the values of equity and diversity are vital to and in harmony with its educational mission and standards of excellence. It acknowledges that direct, indirect and systemic discrimination exists within our institutional structures, policies and practices and in our community. These take many forms and work to differentially advantage and disadvantage persons across social identities such as race, ethnicity, disability, gender identity, sexual orientation, faith and socioeconomic status, among other examples. In this class I will work to promote an anti-discriminatory, anti-racist and accountable environment where everyone feels welcome. Students in this class are encouraged to participate during class discussions and to support others in their participation. Because the class will represent a diversity of individuals, beliefs, backgrounds, and experiences, every member of this class is asked to show respect for every other member.

NAME/PRONOUN

Knowing and applying students' names and pronouns is a crucial part of developing a productive learning environment that fosters safety, inclusion, and personal dignity. This is an important part of the inclusion work here at Queen's.

If you wish to change how your name appears in onQ and on class lists, please follow these steps. You may also use this process to add your pronouns to the appearance of your name.

1. Log into SOLUS.
2. Click on Personal Information tab.
3. Click on the Names tab
4. Click on the Add New Name tab
5. Choose Preferred from the Name Type drop down menu
6. Enter your preferred name.
7. Click Save.

Please allow 24 to 48 hours for your preferred name to be registered within the system. If you have further questions or concerns please contact ITS at Queen's University.

COURSE TEXTBOOK

The following learning resources for this course are available from the Queen's Campus Bookstore:

- Textbook package
 - Organic Chemistry, Solomons and Fryhle, 13th ed. (Wiley)
 - Study Guide and Solutions Manual
 - Molecular Models
 - WileyPLUS online code to access digital textbook (may be purchased as part of textbook package or separately)
 - **NOTES:** Full access (1 term or 1 year) is required for this course. Do not purchase the trial version.
If you were recently in CHEM281/282 or 285 previously then you do not need to purchase a new code. If you experience

difficulty registering please contact Wiley customer service.

Recommended Materials (not obligatory)

- *Organic Laboratory Techniques*, Fessenden, Fessenden and Feist, 3rd ed. (Brooks/Cole)
- *Organic Chemistry I as a Second Language: Translating the Basic Concepts*, David R. Klein.
 - *Organic Chemistry I As a Second Language: First Semester Topics, 3rd Edition; ISBN: 978-1-118-20377-4, 400 pages, August 2011, ©2012*
 - *Organic Chemistry I As a Second Language: First Semester Topics, 3rd Edition; ISBN: 978-1-118-01040-2, 400 pages, June 2011, ©2012*
 - Wiley E-Text or paperback

EDUCATIONAL TECHNOLOGIES

WileyPlus Course Resources

Getting started with WileyPlus: First Day of Class (D2L Integration) - Registration Videos - Student Video Tutorials - [wileyplus.com \(gallery.video\)](http://wileyplus.com/gallery/video)

PRIVACY STATEMENT FOR THIRD-PARTY SOFTWARE

This course makes use of WileyPlus online assignments for some activities. Be aware that by your independent access of the WileyPlus online content, beyond what is required for the course (for example, purchasing the company's products), is subject to Wiley's terms of use and privacy policy. You are encouraged to review these documents, using the link(s) below, before using the site.

https://www.wileyplus.com/WileyCDA/privacy_policy.html

All other required and recommended materials will be available through onQ.

CALCULATOR POLICY

As noted in Academic Regulation 9.2, "Calculators acceptable for use during quizzes, tests and examinations are intended to support the basic calculating functions required by most Arts and Science courses. For this purpose, the use of the Casio 991 series calculator is permitted and is the only approved calculator for Arts and Science students."

COPYRIGHT OF COURSE MATERIAL

Course materials created by the course instructor, including all slides, presentations, handouts, tests, exams, and other similar course materials, are the intellectual property of the instructor. It is a departure from academic integrity to distribute, publicly post, sell or otherwise disseminate an instructor's course materials or to provide an instructor's course materials to anyone else for distribution, posting, sale or other means of dissemination, without the instructor's express consent. A student who engages in such conduct may be subject to penalty for a departure from academic integrity and may also face adverse legal consequences for infringement of intellectual property rights.

EXPECTATION FOR INTERACTION

Throughout this course, there will be opportunities for you to interact with your instructor, your teaching team (e.g., Teaching Assistants), and your classmates. You will interact with and have opportunities to learn from your peers during learning activities that include office hours, help desks and discussion boards. Access before and after class is also available (time permitting). Please limit course topic questions to office hours, discussion posts or face to face meetings (not e-mail).

You are expected to behave with integrity at all times, in face-to-face interactions and when engaging with each other online. See the netiquette and discussion guidelines below which I expect each of us to adhere to when interacting with one another whether in person or online.

NETIQUETTE

In any course you often communicate with your peers and teaching team through electronic communication. You are expected to use the utmost respect in your dealings with your colleagues or when participating in activities, discussions, and online communication.

Here is a list of netiquette guidelines. Please read them carefully and use them to guide your communication in this course and beyond.

1. Make a personal commitment to learn about, understand, and support your peers.
2. Assume the best of others and expect the best of them.
3. Acknowledge the impact of oppression on the lives of other people and make sure your writing is respectful and inclusive.
4. Recognize and value the experiences, abilities, and knowledge each person brings.
5. Pay close attention to what your peers write before you respond. Think through and re-read your writings before you post or send them to others.
6. It's ok to disagree with ideas, but do not make personal attacks.
7. Be open to being challenged or confronted on your ideas and to challenging others with the intent of facilitating growth. Do not demean or embarrass others.
8. Encourage others to develop and share their ideas.

SUGGESTED TIME COMMITMENT

Learning Hours: 141 (36 Lecture, 33 Laboratory, 12 Online Activity, 60 Private Study)

COURSE ANNOUNCEMENTS

Throughout the course, I will post announcements to the class, including reminders of upcoming due dates, responses to frequent questions, corrections to broken links, etc. I encourage you to routinely check the Announcements section of the course homepage in onQ. To ensure that you receive these announcements promptly, I also recommend that you enable email notifications to your Queen's email address. Any course announcements made through ONQ will be assumed to have been understood and read by the student.

QUESTIONS ABOUT THE COURSE AND CONTACTING THE TEACHING TEAM

The teaching team contact information is located in the **Teaching Team** widget on the homepage of the course.

For general questions about the course, please post to the relevant forum.

Throughout this course, you may come upon some general questions about the course and assignments. If you think that your question may benefit other students, you are invited to post your question in the Course Questions discussion forum. Feel free to help answer your peers' questions on this forum. The teaching team will monitor this discussion forum and answer questions. Most questions are answered within 24 hours. Any other questions that you would prefer to share privately, please contact me or your TA at one of the emails listed at the top of this syllabus. The teaching team contact information is located on the homepage of the course

QUEEN'S EMAIL

The university communicates with students via Queen's email. Please check your email regularly to ensure you do not miss important information related to your course.

VIRTUAL MEETINGS

The use of cameras is optional but encouraged during Zoom office hours. Office hours for this course will not be recorded unless a student requests them to be.

COURSE FEEDBACK

At various points during the course, I may ask you to take part in a variety of feedback activities, such as surveys and questionnaires. This feedback enables my teaching team and me to make any adjustments necessary to improve your learning environment. Additional feedback may be requested throughout the course. All surveys are anonymous and are directly related to activities, assessments, and other course material.

ALIGNMENT OF ASSESSMENTS WITH LEARNING OUTCOMES

Course Assessment	CLO 1-9
WileyPLUS Online Mastery Assignments	X
Labs	X
Midterm Test	X
Final Exam	X

WEIGHTING OF ASSESSMENTS

Assessment	Weighting
WileyPLUS Online Mastery Assignments (throughout course)	20%
Labs (throughout course)	20%
Midterm Test (covers material from weeks 1-6, ██████████ see course calendar, news posts)	20%
Proctored Final Exam held during the Winter term final exam period.	40%
Total	100%

STUDENTS TAKING THIS COURSE ARE REQUIRED TO PASS BOTH THE LABS AND THE LECTURE/MAIN COURSE COMPONENTS OF THIS COURSE.

DESCRIPTION OF LEARNING ACTIVITIES AND ASSESSMENTS

WileyPlus Online Mastery Assignments (20%)

WileyPLUS online materials are designed to help you expand your knowledge in the concepts discussed and act as a supplementary virtual tutor. The assignments provide an opportunity for you to apply your knowledge to a mastery level before moving onto another topic. Practice questions are also available to help you to check your understanding of the material and increase your skill at completing organic calculations.

The WileyPlus assignments are numbered 1-13 and mirror the Course Module numbers. Please attempt the assignments in order and make sure they are all completed before the suggested due date (see announcements for included accommodations for all students).

Each assignment clearly shows its hard electronic due date and time but you should aim for the suggested due dates in the timeline for each assignment; this will keep you on schedule. You will have three attempts at each question in the assignment before it is marked wrong, and each successive try will be worth 80% of the total mark for that question. Check the timeline for the due dates of these assignments.

Wiley Assignments 1-6 are a required component of the course for preparation for the midterm. Hence the non-extendable hard electronic due date(s) for these assignments show in the assignment area as before the midterm date so that students can use the assignments and answers for study purposes, please see the assignment area for the hard electronic due dates for these (and all) assignments.

Please note that answers to assignments are set to be viewable after the hard electronic due date (and any included accommodations) for study and discussion purposes. For this reason, assignments cannot be extended beyond this date under any circumstances. Because of this limitation accommodations have been included on all relevant hard electronic due dates. Do not miss due dates and do not leave assignments until the last day in case of server or wi-fi outages.

Labs (20%)

The laboratory will consist of 10 in-person laboratory experiments. The first lab check-in sessions will begin [REDACTED] depending on your section. Please purchase the **2024 CHEM 282 Laboratory Manual** and **carbon-copy lab notebook** in Chemistry Stores (Room 109, Chernoff Hall) before your first lab session, if possible. You will work with a lab partner to conduct experiments and write a combined lab report each week, submitted to your TA. The lab manual has further details, and a Schedule of Lab Experiments is posted on the CHEM 282 onQ site, along with an Announcement concerning laboratory information.

Grading Scheme

- Laboratory (10 in-person experiments) 20%

Department of Chemistry Policy on Missed Labs

Laboratory work is an integral part of this course. All labs must be completed to pass the course. It is the responsibility of the student to notify the Lab Coordinator when a lab cannot be completed at the scheduled time. In exceptional circumstances, the following considerations will be given if a scheduled lab cannot be completed at the assigned time. Whenever possible, provisions will be made for a make-up lab preferably shortly before or after the missed experiment. The lab may be completed during the following academic year and a course mark of IN will be assigned until the missing work is completed. In rare circumstances, other accommodations may be made. For further information please consult the Lab Coordinator.

Laboratory Coordinator: Dr. Jason Z. Vlahakis (vlahakis@queensu.ca)

Midterm Test (20%)

This short auto-graded test of 1h duration will be administered through ONQ and may consist of a combination of multiple choice/fill in the blanks/multiple selection type questions covering module material from weeks 1-6 of the course. The exam will take place at the end of week 8 of the course on [REDACTED] and will be set for 1h duration. **Please see the course timeline for exact dates.** Anyone who cannot sit at the common midterm exam time will be accommodated by reweighting of the final exam but you must contact your instructor about this.

Final Exam (40%)

This will be held on campus during the normal exam period and will be administered by Queen's Exams Office.

LATE ASSIGNMENT SUBMISSION POLICY

All assignments have a built-in automatic accommodation for all students to use at their discretion. All WileyPlus assignments have two due dates, the first is an expected due date that follows the delivery of the course. An assignment associated with a course module/lecture topic is expected due at the end of the week that topic is covered in class. The second is a hard electronic deadline beyond which no extensions are allowed or possible. Any assignment answers submitted after the hard electronic deadline will not be accepted. **Hard deadlines have been set with generous due dates and answers are set to be available after those due dates for students to use for study purposes. There are thus no extensions possible for online assignments beyond the hard electronic deadline all accommodations have been included in these hard electronic due dates.** Students should keep to the topic delivery for expected due dates for assignments and not leave submission until the last days before the hard electronic deadline in case of network/server or WiFi issues.

Timing of Final Examinations

Once the exam schedule has been finalized the exam date will be posted on your SOLUS account. The exam dates for each Term are listed on the Faculty of Arts and Science webpage under "Important Dates." Student exam schedules for the Fall Term are posted via SOLUS immediately prior to the Thanksgiving holiday; for the Winter Term they are posted on the Friday before Reading Week, and for the Summer Term they are individually noted on the Arts and Science Online syllabi. **Students should delay finalizing any travel plans until after the examination schedule has been posted. Exams will not be moved or deferred to accommodate employment, travel/holiday plans or flight reservations. For more information regarding what is considered extenuating circumstances and qualifications for Academic Consideration, please visit <https://www.queensu.ca/artsci/undergrad-students/student-services/academic-consideration-for-students> or email asc.consideration@queensu.ca.**

GRADING SCHEME AND METHOD

All components of this course will receive numerical percentage marks. The final grade you receive for the course will be derived by converting your numerical course average to a letter grade according to Queen's Official Grade Conversion Scale:

Queen's Official Grade Conversion Scale

Grade	Numerical Course Average (Range)
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69

C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52
F	49 and below

ACADEMIC SUPPORT

All undergraduate students face new learning and writing challenges as they progress through university: essays and reports become more complex; effectively incorporating research into writing becomes more important; the types of assignments become more diverse; managing your time and developing the skills you need to read and think critically gets more challenging. I encourage students to contact **Student Academic Success Services (SASS)**. SASS offers many different ways to receive support:

- Free online or in-person appointments to get personalized support on writing and academic skills from expert staff and trained peers.
- Workshops and drop-in programs. SASS' Events Calendar lists events coming soon.
- Online resources that provide strategies for academic skills and writing development at university.
- If English is not your first language, SASS has specific resources for English as Additional Language students, including weekly programs and EAL academic skills appointments. You can meet on an ongoing basis with an EAL consultant to work on your academic writing, speaking, listening, and reading skills.

ACCOMMODATIONS FOR DISABILITIES

Queen's University is committed to working with students with disabilities to remove barriers to their academic goals. Queen's Student Accessibility Services (QSAS), students with disabilities, instructors, and faculty staff work together to provide and implement academic accommodations designed to allow students with disabilities equitable access to all course material (including in-class as well as exams). If you are a student currently experiencing barriers to your academics due to disability related reasons, and you would like to understand whether academic accommodations could support the removal of those barriers, please visit the QSAS website to learn more about academic accommodations.

VENTUS is an online portal that connects students, instructors, Queen's Student Accessibility Services, the Exam's Office and other support services in the process to request, assess, and implement academic accommodations.

To learn more go to the Visual Guide to Ventus for Students.

Please note. Accommodations that need to be applied to exams must be in Ventus 10 days before the exam otherwise time extensions etc cannot be guaranteed.

ACADEMIC CONSIDERATIONS FOR STUDENTS IN EXTENUATING CIRCUMSTANCES

Academic consideration is a process for the university community to provide a compassionate response to assist students experiencing unforeseen, short-term extenuating circumstances that may impact or impede a student's ability to complete their academics. This may include but is not limited to,

- short-term physical or mental health issues (e.g., stomach flu, pneumonia, COVID diagnosis, vaccination, etc.),
- responses to traumatic events (e.g., death of a loved one, divorce, sexual assault, social injustice, etc.),
- requirements by law or public health authorities (e.g., court date, isolation due to COVID exposure, etc.).

Queen's University is committed to providing academic consideration to students experiencing extenuating circumstances. For more information, please see the Senate Policy on Academic Consideration for Students in Extenuating Circumstances.

Each Faculty has developed a protocol to provide a consistent and equitable approach in dealing with requests for academic consideration for students facing extenuating circumstances. For more information, undergraduate students in the Faculty of Arts and Sciences should consult the Faculty's webpage on Academic Consideration in Extenuating Circumstances and submit a request via the Academic Consideration Request Portal. Students in other Faculties and Schools who are enrolled in this course should refer to the protocol for their home Faculty.

Students are encouraged to submit requests as soon as the need becomes apparent and to contact their instructor and/or course coordinator as soon as possible once Academic Consideration has been granted. Any delay in contact may limit the options available for Academic Consideration.

For more information on the Academic Consideration process, what is and is not an extenuating circumstance, and to submit an Academic Consideration request, please see the Faculty of Arts and Science Academic Consideration website. ASO courses include links to information on **Academic Accommodation** on your **Course Homepage** in onQ.

Please see the Teaching Team page for all contact information regarding Academic Accommodations and Considerations.

ACADEMIC INTEGRITY

Queen's University is dedicated to creating a scholarly community free to explore a range of ideas, to build and advance knowledge, and to share the ideas and knowledge that emerge from a range of intellectual pursuits. Queen's students, faculty, administrators and staff therefore all have responsibilities for supporting and upholding the fundamental values of academic integrity. Academic integrity is constituted by the five core fundamental values of honesty, trust, fairness, respect and responsibility and by the quality of courage. These values and qualities are central to the building, nurturing and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University.

The following statements from "The Fundamental Values of Academic Integrity" (2nd edition), developed by the International Center for Academic Integrity (ICAI), contextualize these values and qualities:

1. **Honesty:** Academic communities of integrity advance the quest for truth and knowledge through intellectual and personal honesty in learning, teaching, research, and service.
2. **Trust:** Academic communities of integrity both foster and rely upon climates of mutual trust. Climates of trust encourage and support the free exchange of ideas which in turn allows scholarly inquiry to reach its fullest potential.
3. **Fairness:** Academic communities of integrity establish clear and transparent expectations, standards, and practices to support fairness in the interactions of students, faculty, and administrators.
4. **Respect:** Academic communities of integrity value the interactive, cooperative, participatory nature of learning. They honor, value, and consider diverse opinions and ideas.

5. **Responsibility:** Academic communities of integrity rest upon foundations of personal accountability coupled with the willingness of individuals and groups to lead by example, uphold mutually agreed-upon standards, and take action when they encounter wrongdoing.
6. **Courage:** To develop and sustain communities of integrity, it takes more than simply believing in the fundamental values. Translating the values from talking points into action -- standing up for them in the face of pressure and adversity — requires determination, commitment, and courage.

Students are responsible for familiarizing themselves with and adhering to the Senate regulations concerning academic integrity, along with Faculty or School specific information. Departures from academic integrity include, but are not limited to, plagiarism, use of unauthorized materials, facilitation, forgery and falsification. Actions which contravene the regulation on academic integrity carry sanctions that can range from a warning, to loss of grades on an assignment, to failure of a course, to requirement to withdraw from the university.

TECHNOLOGY REQUIREMENTS

Please note that mobile devices are not recommended for the course as they cause several known issues in onQ.

Computer Specifications

- Windows 8.1 or newer
- OSX 10.13 (High Sierra) or newer
- Dual Core 2 GHz processor
- 4 GB RAM
- Soundcard
- USB headset
- Webcam

Supported Browsers

- Chrome (preferred - latest version)
- Firefox (latest version)
- ***Safari is not recommended as it causes several known issues in onQ***
- ***Edge is not recommended as it causes several known issues in onQ***

Internet Connection

- Wired high speed access: Cable or better
- ***Wifi is not recommended***
- A minimum download speed of 10 Mbps and up to 20 Mbps for multimedia is recommended
- Click here for an Internet speed test

Java

- ♦ Latest version

Media Player

- ♦ HTML5 compatible

Adobe Reader

- ♦ Latest Version