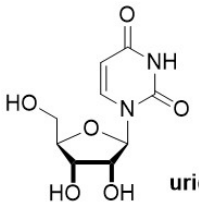
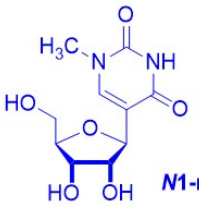
CHEM232-CX-Spring2022

Jump to Today

CHEM 232 Organic Chemistry, Spring 2022



uridine



*N*1-methylpseudouridine

Course Information

Instructors: Prof. B. Mike Bergdahl and Prof. Byron W. Purse
bbergdahl@sdsu.edu (mailto:bbergdahl@sdsu.edu) and bpurse@sdsu.edu (mailto:bpurse@sdsu.edu) (answers normally within 24 h or following weekends)
Office Location: virtual meetings only
Office Hours Times: MW Noon-1pm
Office Hours Location: virtual Zoom sessions **Synchronous Class Meetings: MWF**
Class Times: 10:00–10:50 AM (Recorded and posted on Canvas)
Class Location: AL-201 **Canvas Course website: https://sdsu.instructure.com/courses/94104**

Immediate Access Course:

Chem 232 is an "**Immediate Access Course**": The required course materials for this class are provided in a digital format by the first day of classes and are free through the add/drop date, using *WileyPLUS for Organic Chemistry, by Solomons 12e*. WileyPLUS includes your eBook, and solutions manual. To access, click on the Wiley Course Resources link in the Canvas navigation menu. Your WileyPLUS account will be created automatically with the same email you used to sign into Canvas. Note that the eBook will be on the VitalSource eReader (not RedShelf). Your SDSU student account will then be charged a special reduced price ($65) for use of the materials for the remainder of the semester unless you opt-out of the content by 11:59 PM on the add/drop date. Please visit **www.shopaztecs.com/immediateaccess (Links to an external site.)** **(http://www.shopaztecs.com/immediateaccess)** for additional information about Immediate Access pricing, digital subscription duration, print add-ons, opting out and other frequently asked questions.

Land Acknowledgment

For millennia, the Kumeyaay people have been a part of this land. This land has nourished, healed, protected and embraced them for many generations in a relationship of balance and harmony. As members of the San Diego State University community, we acknowledge this legacy. We promote this balance and harmony. We find inspiration from this land, the land of the Kumeyaay.

Dear Student!

Welcome to Chem 232, first semester organic chemistry.

Due to the continued pandemic the University administration decided to go online from Jan 19 – Feb 4. While writing this document the anticipation is face-to-face starting Monday Feb. 7. We are extremely excited to switch back to the in-person instruction in week three of the semester. Please be aware that the situation can change quickly.

Due to COVID-19 Pandemic there are rules that must be followed: ***You have to wear a face mask at all times when you are inside.*** You have to either have uploaded proof of vaccination (every student was notified through their SDSU email to do this before the semester started) OR you must have been approved for an exemption from the vaccination requirement (e.g. for medical or religious reasons), in which case you have to get tested every week for COVID in order to be eligible to attend.

The COVID-19 guidelines from the administration must be adhered to, to the point! It is of the essence that you stay on top of things in this course, and one maior issue are deadlines. and you will be penalized for late submission of material. The semester moves very fast, so you will need to be on top of your

Midterm Exams

Exam Format: **In person, written exams**.
Saturday, February 12, 10:00 am – 12:00 pm PST.
Saturday, March 12, 10:00 am – 12:00 pm PST.
Saturday, April 9, 10:00 am – 12:00 pm PDT.

Final Exam

Exam Format: **In person, written exams**.
Saturday, May 7, 9:30 am – 11:30 am PDT. **The final exam is cumulative.**

Prerequisites

A grade of "C" (Not "C-") or better from Chem 201 (SDSU) or corresponding chemistry course. If you have already taken and passed Chem 232 lab (232L) from a previous semester, please send proof to Prof. Bergdahl and a schedule number will be provided. If you have taken Chem 201, or similar course at a different university, we need to evaluate whether you have satisfied the prerequisites, please submit proof of what you have taken and what the class and lab entailed.

Course Information

Updated information is available on the course Canvas site through SDSU. Students can enroll or being added from the waitlist only if space is available the first week of class. All lectures will be recorded posted the same day. Lecture recordings will be used via zoom or the MediaSite (Canvas) once we are back to in person modality instruction.

Course Catalog Description

Prerequisite(s): CHEM 201 (https://catalog.sdsu.edu/content.php?filter%5B27%5D=CHEM&filter%5B29%5D=232&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=5& with a grade of C (2.0) or better and credit or concurrent registration in CHEM 232L (https://catalog.sdsu.edu/content.php?filter%5B27%5D=CHEM&filter%5B29%5D=232&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=5&
.
Properties and synthesis of organic compounds including reaction mechanisms.
Note: Not open to students with credit in Chemistry 231.

Scope and Purpose

This course is the first in a two-semester study of the fundamentals of organic chemistry. The course will focus on how to use molecular structure to predict and understand the properties and chemical reactivity of organic molecules, with examples drawn from industrial process chemistry, medicinal chemistry, and biological chemistry.

Students should meet the following **general learning outcomes** as a minimum requirement in order to pass the course. A detailed list of learning outcomes will be developed and provided chapter-by-chapter, throughout the semester.

1. Understand physical properties of organic compounds and fundamental chemical reactions in organic chemistry.
2. Determine bonding, hybridization, Lewis structures, three-dimensional structure, conformation, and stereochemistry of organic molecules.
3. Show chemical mechanisms for fundamental organic reactions using the curved arrow formalism (“arrow pushing”).
4. Determine and differentiate various types of simple organic reactions, for example S_N1, S_N2, E1 and E2 pathways, radical chain reactions, and additions to double bonds.
5. Understand the relationships between different functional groups and organic chemical reactions.
6. Identify examples of organic chemistry in common “daily life” situations or biochemical processes.
7. Be able to apply and use the outcomes above in more advanced courses such as upper division organic chemistry (CHEM 432), biochemistry, and more advanced organic chemistry courses.

Course Outline, Assigned Reading and Highly Recommended Study Problems from Solomons 12e.

Review: Course material from Chem 201/200 (esp. fundamentals of chemical reactions, acidity/basicity, pka, hybridization, bonding, & resonance
Chapter 1: The Basics, Bonding and Molecular Structure. Read pp. 1-54. Probl: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,

13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25,

Chapter 3: Acids and Bases. Read pp. 104-143. Probl: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38

Chapter 4: Nomenclature and Conformations of Alkanes and Cycloalkanes. Read pp. 144-192. Probl: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 23, 24, 25, 26, 27, 28, 29, 33, 36, 37, 38, 39, 41, 43, 44, 45, 46

Chapter 5: Stereochemistry. Read pp. 193-239. Probl: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 44, 45, 46, 47, 48

Chapter 6: Nucleophilic Reactions. Read pp. 240-281. Probl: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 43, 45, 46, 47

Chapter 7: Alkenes and Alkynes I. Read pp. 282-336. Probl: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44

Chapter 8: Alkenes and Alkynes II. Read pp. 337-390. Probl: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 53, 54, 59, 61

Chapter 9: Nuclear Magnetic Resonance and Mass Spectrometry. Read pp. 391-419 Probl: 1, 2, 3, 4, 5, 6, 7, 8, 9, 14, 20, 22, 23, 24, 26, 35, (you don't have to know mass spec, so the formula is C_6H_8O), 9.41 ($C_{10}H_{12}O$), 9.42 ($C_{15}H_{24}$), 9.43 ($C_{10}H_{12}O_3$)

Chapter 10: Radical Reactions. Read pp. 448-488. Probl: 1, 2, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, 30, 31, 32, 33

Chapter 11: Alcohols and Ethers. Read pp. 489-533. Probl: 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 52

Adding/Dropping Procedures

February 1 is the last day to add/drop classes. To add a class during the schedule adjustment period, students can request a schedule number from the instructor. Please email the instructor for other circumstances.

Essential Student Information

- Compliance with **CSU / SDSU vaccination and facial covering policies** (https://newscenter.sdsu.edu/student_affairs/srr/covid-policies.aspx?) is required.
- Your **SDSU email address** (https://gsuite.sdsu.edu/) will be used for all course-related communications.
- The **Student Conduct Code** (https://newscenter.sdsu.edu/student_affairs/srr/conduct.aspx) prohibits conduct disruptive to instruction, including academic dishonesty and the unauthorized recording, dissemination, or publication (including on websites or social media) of lectures or other course materials.
- SDSU provides disability-related accommodations via the Student Ability Success Center (sascinfo@sdsu.edu | **edu/sasc** (http://sdsu.edu/sasc)). Please allow 10-14 business days for this process.
- The **Family Educational Rights and Privacy Act** (http://bfa.sdsu.edu/hr/oerc/students/ferpa.aspx) (FERPA) mandates the protection of student information, including contact information, grades, and graded assignments. I will not post grades or leave graded assignments in public places. Students will be notified at the time of an assignment if copies of student work will be retained beyond the end of the semester or used as examples for future students or the wider public.
- As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. I am required to share information regarding sexual violence on SDSU's campus with the **Title IX** (http://titleix.sdsu.edu/) coordinator, Gail Mendez (619-594-6464), who will contact you to let you know about support services at SDSU and possibilities for holding accountable the person who harmed you. If you do not want the Title IX Officer notified, you can speak confidentially SDSU's Sexual Violence Victim Advocate (619-594-0210) or Counseling and Psychological Services (619-594-5220, **psycserv@sdsu.edu** (mailto:psycserv@sdsu.edu)).
- Class rosters are provided to the instructor with the student's legal name. Please let me know if you would prefer an alternate name and/or gender pronoun.
- Need help finding an advisor, tutor, counselor, emergency economic assistance, or other support? Contact the **SDSU Student Success Help Desk** (https://studentsuccess.sdsu.edu/) Monday through Friday, 9:00 AM to 4:30 PM. For technical or computing assistance, contact the **Library Computing Hub** (https://virtual-academic-help.sdsu.edu/technology) .

Course Materials

Custom course materials (lecture slides, etc.) will be posted on Canvas. Do not share them in violation of copyright. See below, in orange text.

Unauthorized recording or dissemination of virtual course instruction or materials by students, especially with the intent to disrupt normal university operations or facilitate academic dishonesty, is a violation of the Student Conduct Code. This includes posting of exam problems, the instructor's lecture

eBook with Study Guide and Solutions Manual to

Accompany Organic Chemistry, 12e., by Solomons, Fryhle, and Snyder, Wiley Publ. 2016; ISBN-13: 978-1119077329. Material is available via "Immediate Access," including the required WileyPlus. The price is $65 for one semester. You'll receive a registration code from the bookstore, or you can purchase access directly from Wiley when you access any WileyPLUS links from this course Canvas site. For an overview video on accessing these resources, **click here** (https://players.brightcove.net/4931690914001/default_default/index.html?videoId=6177746486001) .

Electronic Homework
WileyPLUS is included with the eTextbook listed above and will be used for homework in this course.

Other Learning Materials Included in the outline above there is a list of highly recommended problems from each chapter found in the book. These problems encapsulate the nature of problems you will face on the exams. The key take-home from organic chemistry is the understanding of the topics, thus you should never memorize but rather understand and apply yourself. WORK THE PROBLEMS !!

Old exams and Course Tools On the following website: **http://www.chemistry.sdsu.edu/courses/CHEM232/** (http://www.chemistry.sdsu.edu/courses/CHEM232/) you will find a variety of useful tools (pka chart, study skills, learning glass videos for chapters 1-5) and a library of old exams specifically created for Chem 232. The website is password protected and please try to keep it for your eyes only (username: chem232 password: markovnikov).

Required Equipment Computer webcam (Zoom) and microphone for office hours. If we go completely online these equipment are essential if there is a need to take exams online (but let's hope we are back in person by Feb 7).

Course Structure and Conduct

The course will consist face-to-face and virtual lectures with problem solving, assigned readings, electronic homework, and synchronous exams. Canvas will be used for all course management and communication.

Course Assessment and Grading

If the pandemic forces the movement of any exams to a virtual, Zoom-proctored format, then web cam use will be required for proctoring.

There will be three **midterm exams** during the semester, each worth 100 points. The schedule is above.

The **final exam** is **cumulative** and is worth 200 points. If your final exam score is better than any of your midterm exam scores, then your final exam score will be scaled to a total of 300 points and your lowest midterm exam score will be dropped. This policy has the effect of allowing your final exam grade to replace one midterm exam grade, but only if it would benefit you.

There will be **no make-up exams**. If you have to miss a midterm exam for any reason, then it will count as the dropped exam and be replaced with your final exam grade, as described in the preceding paragraph.

There will be a **chapter homework** assigned for each chapter using WileyPLUS.

Activity	**Points**
Midterm 1	100
Midterm 2	100
Midterm 3	100
Homework	50
Final Exam	200
TOTAL	**550**

Curving: Curves *may* be applied to individual activities (exams, homework, etc.), but the total grade will not be curved.

Letter Grades will be assigned according to the following table. Scores will not be rounded.

Letter Grade	**Minimum Score / 550**
A	495
A−	467
B+	440
B	412
B−	385
C+	357
C	330
C−	302

D−	220
F	0

Students with Disabilities

If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that accommodations based upon disability cannot be provided until you have presented your instructor with an accommodation letter from Student Disability Services. Your cooperation is appreciated.

Absences

- If you plan to be absent for a religious observance or holiday, notify me by the end of the second week of classes.
- If you are absent more than five days due to illness or injury, you may contact **Student Health Services** (http://shs.sdsu.edu/index.asp) for help in communicating your absence.
- If you miss class because you have been diagnosed with or are required to quarantine due to exposure to COVID-19, contact vpsafrontdesk@sdsu.edu to notify the university.

Academic Honesty

Academic honesty is always vital and special attention is warranted during the COVID-19 pandemic.

The University adheres to a strict policy regarding cheating and plagiarism. These activities will not be tolerated in this class. Become familiar with the policy at <**https://newscenter.sdsu.edu/student_affairs/srr/conduct.aspx** (https://newscenter.sdsu.edu/student_affairs/srr/conduct.aspx)>. Any cheating or plagiarism will result in failing this class and a disciplinary review by Student Affairs. **Cheating, which includes unauthorized team work and the use of unauthorized resources or hired/voluntary help during exams, will not be tolerated.** I want you all to be proud of yourselves for working hard, learning lots, and doing a great job at a tough course, not ashamed of yourselves for having cheated in O Chem. I believe that everyone in this class has the ability and talent to do a great job and I'm committed to help you achieve your best, but there's no substitute for hard and honest work.

The University adheres to a strict **policy prohibiting cheating and plagiarism** (http://go.sdsu.edu/student_affairs/srr/cheating-plagiarism.aspx), including

- Copying, in part or in whole, from another's test or other examination.
- Obtaining copies of a test, an examination, or other course material without the permission of the instructor.
- Collaborating with another or others in coursework without the permission of the instructor.
- Falsifying records, laboratory work, or other course data.
- Submitting work previously presented in another course, if contrary to the policies of the course.
- Altering or interfering with grading procedures.
- Assisting another student in any of the above.
- Using sources verbatim or paraphrasing without giving proper attribution (this can include phrases, sentences, paragraphs and/or pages of work).
- Copying and pasting work from an online or offline source directly and calling it one's own.
- Using information found from an online or offline source without giving the author credit.
- Replacing words or phrases from another source and inserting one's own words or phrases.

Under CSU policy, instructors must report instances of academic misconduct to the Center for Student Rights and Responsibilities for disciplinary review by the University, which may lead to probation, suspension, or expulsion. Instructors may also, at their discretion, penalize student grades on any assignment or assessment discovered to have been produced in an academically dishonest manner.

Labs

The lab coordinator for this class is Kevin Walsworth. Labs will be primarily face-to-face sessions with some virtual work. Labs are designed to provide essential lab skills while maintaining physical distancing and other safety strategies to prevent the spread of COVID-19. The modality of this lab course is subject to change in connection with evolving public health conditions and recommendations.

Extra Help

Help is available in a variety of forms.

- Online discussions on this Canvas site

You are always welcome to join my office hours for help in a fun and positive group setting, but please make a strong effort to solve problems on your own or work with study groups because doing so will enhance your learning experience.

Tips for Success

Do not fall behind. We will start with reviewing the fundamentals and build on them so that you can develop a deep understanding of how the structure of organic molecules determines their properties. Consequently, material later in the course will be much more difficult if you haven't mastered the material that comes first, and we will never move on to a point where you will not need the earlier material.

In our opinion, the most important skill for success is your ability to self-assess. Don't plan to study for a fixed number of hours. Plan to study for as long as it takes until you are confident that you've mastered the material. Develop a plan to check the completeness of your understanding by problem solving exercises and discussion with your peers. You should be confident of your skills when heading into an exam. Obviously, this is much harder to achieve if you don't start preparing until the day before an exam.

You can't be a proficient scientist without a basis of factual knowledge, meaning that some memorization is an essential part of your education. That said, exams will be designed as much as possible to test your comprehension rather than focusing on rote memorization. For that reason, exam questions will use concepts that you've learned, but won't be identical those questions found on old exams and as practice problems.

Few people find organic chemistry easy to learn. You should expect to study hard to earn a great grade!

To the student and how to succeed in Organic Chemistry (and science in general):

1. *Develop good study habits:*
2. Attend all lectures and labs.
3. Take good lecture notes.
4. Use your lecture notes as a guide to your reading in the textbook. Write your questions down if there is something you don't understand. Ask your instructor if you don't understand a concept.
5. Make flash cards of definitions, concepts, reactions, structures, and nomenclature that are in the textbook that are emphasized by your instructor in lecture. Writing something is equivalent to reading it ten times.
6. Do all the homework problems with the aid of the study guide or answer book. The suggested problems (homework) have about the same difficulty as the problems you will be given on the exams.
7. One of the alternative ways for understanding of organic chemistry is to find a study partner or to form a study group and work on problems independently, and then review the answers in the group.
8. Keep up to date and **don't fall behind**.
9. Seek course advice from science professors and students.
10. If necessary, see your instructor or department for a tutor.
11. Try to see the "big picture"; try to see how the topic of the week fits in with the whole course. If you have a difficulty achieving this, ask your instructor.
12. Practice applying what you have learned in class to the world around you.
13. Try to foster your own scientific curiosity – wonder why things are and how they happen.
14. Put emphasis on understanding concepts rather than memorizing material.
15. If you read the text more than 10 minutes without practicing a problem, something is wrong…..this is not how you should study organic chemistry.
16. *Have a positive attitude*.
17. *Realize that science requires more self discipline than many other majors, but actually offers more rewards*.
18. *Be organized*.
19. *Persevere and be determined to succeed*. Good Luck in Chem 232!!

Ithaca (a philosophical view of the journey of Organic Chemistry)

*by **Constantine P. Cavafy** **(http://www.poetry-chaikhana.com/C/CavafyConsta/index.htm)***
(1863 - 1933)

When you set out on your journey to Ithaca,
pray that the road is long,
full of adventure, full of knowledge.
The Lestrygonians and the Cyclops,
the angry Poseidon -- do not fear them:
You will never find such as these on your path,
if your thoughts remain lofty, if a fine

if you do not carry them within your soul,
if your soul does not set them up before you.

Pray that the road is long.
That the summer mornings are many, when,
with such pleasure, with such joy
you will enter ports seen for the first time;
stop at Phoenician markets,
and purchase fine merchandise,
mother-of-pearl and coral, amber, and ebony,
and sensual perfumes of all kinds,
as many sensual perfumes as you can;
visit many Egyptian cities,
to learn and learn from scholars.

Always keep Ithaca on your mind.
To arrive there is your ultimate goal.
But do not hurry the voyage at all.
It is better to let it last for many years;
and to anchor at the island when you are old,
rich with all you have gained on the way,
not expecting that Ithaca will offer you riches.

Ithaca has given you the beautiful voyage.
Without her you would have never set out on the road.
She has nothing more to give you.

And if you find her poor, Ithaca has not deceived you.
Wise as you have become, with so much experience,
you must already have understood what these Ithacas mean.

Course Summary:

Date	Details	Due