Chem 270, Advanced Chemistry, Section 1
Special Topic: Atmospheric Chemistry
Spring 2023
San José State University
Department of Chemistry

Course and Contact Information

Instructor:	Annalise Van Wyngarden, Ph.D., Associate Professor of Chemistry
Office Location:	Duncan Hall 2
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Office Hours:	TBD after student poll
Class Days/Time & Classroom:	Mondays & Wednesdays 3-4:15pm Sweeney Hall 444
Prerequisites:	Satisfactory background in upper division chemistry and instructor consent.
Credit:	3 units

BOOKS/SUPPLIES/WORKSHOPS

Required

1) *Atmospheric Chemistry* – Daniel J. Jacob – free electronic versions:
    a. The author has graciously agreed to allow us to use the draft version of chapters of the 2nd edition of his book for free! The website for pdf chapters will be posted to Canvas and the password will be announced in class. The author would appreciate feedback, so we will have a Google doc for corrections/comments. Please respect the author's intellectual property: **Electronic files (or printed copies) are NOT to be shared with others.**
    b. Not all chapters of the 2nd edition are available, yet. The 1st edition will be used for remaining topics. Free electronic copies of the chapters can be found here. (If desired, hardcopies may be purchased online.)
2) Journal Articles and the IPCC Report on Climate Change – links will be provided on Canvas

CANVAS (COURSE WEBSITE)

Course materials such as this syllabus, assignments, instructions, links to assigned readings, etc. will be provided on Canvas. You are responsible for the material on the course website, so you must either check it daily or set up your profile to notify you when there are changes/announcements. Login with your student ID & SJSUOne password.

Instructions: http://www.sjsu.edu/ecampus/docs/Canvas%20Student%20Log%20In%20Document.pdf
Login: https://www.sjsu.edu/ecampus/

(If you are having trouble logging in, the most common problem is trying to bookmark the next page after the above website, which will not work. Instead go back to the above login website which may be bookmarked. If this does not solve your problem, then go to https://www.sjsu.edu/ecampus/how-we-can-help/contact-us.php for

technical support.)

COURSE FORMAT: In person

CATALOG COURSE DESCRIPTION

Lectures, discussions and reading assignments in special fields of chemistry. Topics vary. Course may be repeatable for maximum of 10 units.

ATTENDANCE/WORKLOAD

Regular attendance to lecture is required. Attendance will not be taken in lecture, but you are responsible for all announcements and material presented during class. Lecture material will not necessarily reiterate text material. It is a serious mistake either to depend on a classmate's notes or exclusively on the textbook. It is essential to keep up with class readings and homework to succeed in this class. The instructor is not responsible for covering material you missed due to absences.

"*Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.*" More details about student workload can be found in University Policy S16-9 at http://www.sjsu.edu/senate/docs/S16-9.pdf.

NOTE that University Policy S16-9 at http://www.sjsu.edu/senate/docs/S16-9.pdf states that "*Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading*."

GRADING

Homework

Graded homework problems/activities will be assigned (posted to Canvas) with problems relevant to the lectures that are particularly important, interesting or challenging. You are encouraged to work with others on homework assignments, but individual students should be able to explain their work verbally to the instructor! Expect to spend at least several hours weekly on homework problems.

Homework Problem Presentations

All or part of some class periods will be used to consider several problems from the assigned homework. These sessions will occur roughly every two weeks and a schedule will be posted to Canvas. Students will be assigned to groups and each group will be assigned 1-4 homework problems per session. Each student will be responsible for presenting and explaining the solution to one of the group's assigned problems to the entire class. Depending on class size, students may not end up presenting at every session. Groups will be given some time at the beginning of class to consult with their group about the problems, but should come to class prepared since the group will be graded on their presentations. Each student will receive a grade for these presentations that will be 75% based on the problems that they personally present and 25% based on the average of the grades obtained by the presentations of the entire group. This encourages the whole group to work together to do their best on each problem, but also gives credit to each student for presentation of their specific problems.

Oral Presentations

There will be two formal oral presentations by each student during the regular semester. The first presentation will cover a topic that involves chemistry from the IPCC Report on Climate Change. The

second presentation will elaborate on the methods and results of a single journal article published within the last 5 years. The article should be one that is also referenced in the term paper and approved by the instructor. More details will be provided on Canvas and discussed in lecture. Each presentation will be critiqued/graded by one or more classmates in addition to the instructor.

Term Paper

Term papers will review a specific atmospheric chemistry topic or technique, as selected by the student and approved by the instructor. Topics that differ from the material covered by the instructor are highly encouraged, but not required. Details for writing the term paper will be discussed in class. Writing expectations and grading criteria will be issued will be provided. See the course schedule for deadlines in preparation of the term paper.

Final Oral Presentation

The culminating experience will be a presentation on the same topic as the term paper during the assigned final exam time. See course schedule and note the date/time since it is not a regular class day/time. More details will be provided on Canvas.

Grading Information

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- Achievement of learning objectives will be evaluated according to the table below. Detailed grade breakdowns and grading rubrics will be posted on Canvas.

	Points	**Percentage of Grade**
Homework assignments	100	18%
Homework problem presentations	100	18%
Peer Reviews (for Presentations and Term Paper)	75	14%
Oral Presentations (2)	100	18%
Term Paper	100	18%
Final Oral Presentation	75	14%
Total	**550**	**100%**

- Late Work: Unless excused for documented unavoidable circumstances, 5% of the total grade for each assignment will be deducted for every 24 hours of late submission.
- The following scale indicates minima for each letter grade. I reserve the right to adjust the scale downward if conditions warrant, but will not raise the minimum required for any particular grade. The final course grade will be determined by rounding your final score to two significant figures.

Grade	**Percentage**
A plus	97 to 100%
A	94 to 96%
A minus	90 to 93%
B plus	87 to 89%
B	84 to 86%
B minus	80 to 83%
C plus	77 to 79%
C	74 to 76%

C minus	70 to 73%
D plus	67 to 69%
D	64 to 66%
D minus	60 to 63%
F	Below 60%

Academic Integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at http://www.sjsu.edu/senate/docs/S07-2.pdf requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sjsu.edu/studentconduct/.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism will result in a failing grade and possible sanctions by the University. An online tutorial on Plagiarism may be found at http://library.sjsu.edu/video/plagiarism-graduate-level. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Integrity Policy S07-2 requires approval of instructors.

Safe and Respectful Community

We hope that the classroom and laboratory will serve as an environment that will promote learning and the development of new ideas, as well as be a safe and respectful community. Behavior that interferes with the normal academic function in a virtual classroom or lab is unacceptable. Students exhibiting this behavior will be asked to leave the class. Examples of such behavior include

a) Persistent interruptions or using disrespectful adjectives in response to the comments of others.
b) The use of obscene or profane language.
c) Yelling at classmates and/or faculty.
d) Persistent and disruptive late arrival to or early departure from class without permission.
e) Physical threats, harassing/bullying behavior, or personal insults (even when stated in a joking manner).
f) Use of personal electronic devices such as pagers, cell phones, PDAs in class, unless it is part of the instructional activity.

Emergencies/Evacuations

If you hear a continuously sounding alarm, or are told to evacuate the building by an Emergency Coordinator, walk quickly to the nearest exit. Take your personal belongings as you may not be allowed to return. Follow the instructions of the Emergency Coordinators. Be quiet so you can hear instructions. Once outside, move away from the building. Do not return to the building unless the police or the Emergency Coordinator announces that this is permissible. If an alarm should occur during an exam or quiz, please attempt to give your instructor the paper.

College of Science COVID-19 Safety Policy

Office Hours

My office is located in the basement level of Duncan Hall (Room 2) but I may decide to hold office hours in our classroom if available or other location TBA. Please be efficient and organized when you come to ask questions during office hours. I might have to limit the amount of time I spend with you if there are several students waiting. If my office hours do not match your schedule, then contact me to set up an appointment. Office hours are subject to change with adequate notice.

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UNIVERSITY POLICIES

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/ Make sure to review these university policies and resources.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations register with the Accessible Education Center (AEC) to establish a record of their disability. AEC will contact the instructor with further details, if needed.

Note from Dr. Van Wyngarden: This ensures protection of privacy and allows for appropriate accommodations to be provided in cases where they are necessary. Assignments missed due to disabilities or other special concerns will not be accepted and exam accommodations will not be provided except as requested by the AEC.

Workload

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Recording Classes and Public Sharing of Instructor Material

This course or portions of this course (i.e., lectures, discussions) may be recorded for instructional or educational purposes. The recordings will only be shared with students enrolled in the class through Canvas. The recordings will be deleted at the end of the semester. If, however, you would prefer to remain anonymous during these recordings, then please speak with the instructor about possible accommodations.

Students are not allowed to record without instructor permission. Students are prohibited from recording class activities (including class lectures, office hours, advising sessions, etc.), distributing class recordings, or posting class recordings. Materials created by the instructor for the course (videos, exam questions, homework solutions, syllabi, lectures and lecture notes, presentations, etc.) are copyrighted by the instructor. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent. This university policy (S12-7) is in place to protect the privacy of students in the course, as well as to maintain academic integrity through reducing the instances of cheating. Students who record, distribute, or post these materials will be referred to the Student Conduct and Ethical Development office. Unauthorized recording may violate university and state law. It is the responsibility of students that require special accommodations or assistive technology due to a disability to notify the instructor via the AEC.

LEARNING OUTCOMES

Program Learning Outcomes (PLO's)

PLO's for the MS or MA degree in Chemistry may be found at the following website: Graduate Program Learning Objectives | Chemistry Department (sjsu.edu)

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

(1) Apply chemistry knowledge, skills and methods – especially in analytical and physical chemistry – to solve problems in atmospheric chemistry; (2) to identify and explain many of the major atmospheric chemistry topics/issues of societal concern (3) understand and critically analyze the experimental results in multiple peer-reviewed journal articles on major topics in atmospheric chemistry; (4) to improve written and oral communication skills through application to topics in atmospheric chemistry.

Course Schedule

The following schedule of lecture topics is ***very tentative*** and subject to change at the instructor's discretion. In fact, I will spend significant time at the beginning of the semester seeking **your** input for designing much of the course content/schedule to fit the particular learning objectives, potential career goals and interests of the students enrolled, so the schedule is expected to change. This will be discussed in detail on the second day of class.

Day	Date	Topics/Due Dates	Reading/Due Dates
1	Wed. 1/25	Brief introduction, Measures of Atmospheric Composition	Jacob 2nd Ed. Ch. 1
2	Mon. 1/30	Introductions, syllabus and course format Choose your own adventure discussion	**Student Info. Sheet Due**
3	Wed. 2/1	Atmospheric Pressure	Jacob 2nd Ed. Ch. 2
4	Mon. 2/6	Simple Models	Jacob 2nd Ed. Ch. 3
5	Wed. 2/8	Simple Models	
6	Mon. 2/13	Atmospheric Transport	Jacob 2nd Ed. Ch. 4
7	Wed. 2/15	Atmospheric Transport IPCC Report – Find the Chemistry Climate Change Chemistry Student Presentation Instructions	
8	Mon. 2/20	Chemical Forcing of Climate Change	Jacob 2nd Ed. Ch. 6, Selections from IPCC Report on Climate Change
9	Wed. 2/22	Chemical Forcing of Climate Change	
10	Mon. 2/27	IPCC Report – Climate Change Chemistry	**Student Presentations**
11	Wed. 3/1	IPCC Report – Climate Change Chemistry	**Student Presentations**
12	Mon. 3/6	Global biogeochemical cycles	Jacob 2nd Ed. Ch. 5
13	Wed. 3/8	Global biogeochemical cycles	
14	Mon. 3/13	Aerosols	Jacob 1st Ed. Ch. 8 Review Articles TBA
15	Wed. 3/15	Aerosols	
16	Mon. 3/20	Chemical Kinetics	Jacob 2nd Ed. Ch. 7
17	Wed. 3/22	Chemical Kinetics	
	Mon. 3/27	*Spring Break – No Class!*	
	Wed. 3/39	*Spring Break – No Class!*	
18	Mon. 4/3	State of the Science Report from ACS Meeting	**Term Paper Topic Due**

Day	Date	Topics/Due Dates	Reading/Due Dates
19	Wed. 4/5	Indoor Air Quality	TBA
20	Mon. 4/10	Indoor Air Quality/Aerosols and COVID Intro.	Journal Articles TBA **Term Paper Outline Due**
21	Wed. 4/12	Mercury	TBA
22	Mon. 4/17	Journal Article Presentations/Discussions	**Student Presentations**
23	Wed. 4/19	Journal Article Presentations/Discussions	**Student Presentations**
24	Mon. 4/24	Journal Article Presentations/Discussions	**Student Presentations**
25	Wed. 4/26	Calculating Greenhouse Warming Potentials	Handout
26	Mon. 5/1	Methane	TBA
27	Wed. 5/3	Term Paper In-Class Peer Reviews	**Term Paper Draft Due for Peer Review**
28	Mon. 5/8	Stratospheric Chemistry	TBA
29	Wed. 5/10	Air Pollution: Ozone	Jacob 1st Ed. Ch. 12
30	Mon. 5/15	Air pollution: Organic Aerosols	**Term Paper Due**
Final	**Thu. 5/18**	**Final Exam Presentations: 12:15 – 2:30pm**	