

San José State University
Department of Chemistry
Foundations of Macromolecular Chemistry, Chem 170A, Spring, 2021

Instructor:	Prof. Madalyn Radlauer
Office Location:	DH 517
Telephone:	(408) 924-5482
Email:	madalyn.radlauer@sjsu.edu (<i>preferred means of contact</i>)
Office Hours:	Wednesdays 2:00 pm – 4:00 pm or by appointment All office hours will be held virtually via Zoom.
Class Days/Time:	Wed 4:30 – 6:10 pm (until March 17 th)
Classroom:	Zoom (this class will be completely online this semester)
Prerequisite:	CHEM 112B (with grades of "C" or better; "C-" not accepted) or with instructor consent

Course Website

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on [Canvas](https://sjsu.instructure.com/) (<https://sjsu.instructure.com/>). In addition, all assignments will be submitted via Canvas. You are responsible for regularly checking with the messaging system in Canvas to learn any updates.

Course Description

Introduction to macromolecular, supramolecular, mesoscale, and nanoscale systems and the principles that govern them including preparation, characterization, and physical properties. Though synthetic polymers, supramolecular aggregates, mesoscale, and nanoscale materials are all vibrant areas of chemistry and materials science in their own right, they are differentiated from small molecule chemistry due to generally inhomogeneous nature of these species. The course will also examine how findings in these areas are reported to different audiences (i.e. science communication to the general public, scientists, and specialists).

Course Goals and Learning Objectives

The first goal of this course is to introduce macro-, supra-, and nanomolecular chemistry (MSN), specifically regarding preparation, characterization, and physical properties of these often inhomogeneous materials. The second goal is to consider and evaluate how research and developments in MSN are communicated.

Program Learning Outcome (PLO)

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

PLO 2: Demonstrate understanding of core concepts and to effectively solve problems in organic chemistry

Course Learning Outcomes (CLO)

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

CLO 1: Define characteristics that differentiate macromolecules, supramolecular assemblies, and nanomaterials from small molecules especially inhomogeneity and emergent properties.

CLO 2: List and explain methods of characterization of macromolecules, supramolecular assemblies, and nanomaterials including some methods that are also utilized for the characterization of small molecules.

CLO 3: Recognize and evaluate various applications for macromolecules, supramolecular assemblies, and nanomaterials in everyday life.

CLO 4: Examine and reflect on different modes of communication about MSN.

Texts/Readings

Textbook (required for course readings)

There is no required textbook for this course.

We will use [The Macrogalleria](http://www.pslc.ws/macrog/maindir.htm) at <http://www.pslc.ws/macrog/maindir.htm> as a reference for polymer chemistry. We will also use primary literature sources.

Library Liaison (Optional)

You should have a student library account with the King Library that allows you access the library electronic databases. If you plan to access the library services from off-campus, you may need to obtain a password and/or proxy to do so. Check the Library website for information. The reference Librarian for Chemistry is Yen Tran and her email is yen.tran@sjsu.edu.

Course Requirements and Assignments

Graded work will include participation, small group projects, and a term paper, which will all contribute to the course learning outcomes.

Assignments	Points
In-class (Zoom) and Canvas discussions	30
Reflections	40
Term Paper	30
Total	100

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 for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practical. This course has been condensed into half a semester so that we will have ample time for in-class discussions. It will be more work for the first 8 weeks of the semester, but then you only have your revised term paper in the remainder of the semester.

Participation

In-Class Discussions

Participation during in-class discussions about the course material and assigned reading will account for 15 points (15%) of your grade.

Canvas Discussions

Participation in Canvas discussions about the course material and assigned reading will account for 15 points (15%) of your grade.

Reflections

There will be 4 short writing assignments each worth 10 points (40 points total, 40%) of your grade. They will cover different topics from the course. They will be completed outside of class, but discussed during class time.

Term Paper (in place of a final exam)

You will be responsible for a term paper due by the end of the assigned final exam time. All together, the term paper related assignments are worth 30 points (30%) of your grade. The term paper must rely on peer-reviewed literature. Part of your grade will be based on submission and approval of your chosen topic (5 pts) and a draft of the paper due on the last day of class (10 pts, March 17th). You will then get comments from me, which you should consider in editing the final version of your paper (15 pts).

Grading Information

Determination of Grades

The course grade will be assigned according to the following ranges:

<u>Percentage of Total Points</u>	<u>Final Course Grade</u>
96 and above	A+
92 to 95.9	A
88 to 91.9	A-
84 to 87.9	B+
80 to 83.9	B
76 to 79.9	B-
72 to 75.9	C+
68 to 71.9	C
64 to 67.9	C-
60 to 63.9	D+
56 to 59.9	D
52 to 55.9	D-
less than 52	F

Assignment Deadlines

The COVID-19 pandemic and tumultuous happenings causing havoc in our world are still forcing us to work and learn under very strange circumstances. This may make it more difficult for you to maintain a steady course schedule and you may need to miss class or an assignment at some point in the semester. If this is the case, please contact me *ahead* of time and with as much of a heads up as possible and we can discuss the situation. Generally, all assignments are required to be submitted on or before the assigned deadline, but I will do my best to be accommodating for unforeseen circumstances if I receive appropriate communication.

Classroom Protocol

Be on time to class; class starts on Zoom at 4:30 pm. Please find a place where you will be able to use your microphone and webcam. Unless an alternative plan is determined with me before the second class period, I expect everyone to be able to do “face-to-face” discussions so that you can participate during the class period, both as a full class and in breakout rooms. Virtual backgrounds are acceptable as long as they are not distracting and as long as they do not violate the guidelines for a safe and respectful community listed below.

Email policy

I receive a lot of emails, so to be sure that I see your email, all Chem 170A emails should have Chem 170A somewhere in the subject line. I will do my best to respond to class-related emails within 1 business day of receiving them, however, keep in mind that this may not always be possible, especially during high volume times (around exams). You can also message me via Canvas and I will target a similar turnaround time.

University Policies

Per [University Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf) (<http://www.sjsu.edu/senate/docs/S16-9.pdf>), relevant information to all courses, such as academic integrity, accommodations, dropping and adding, consent for recording of class, etc. is available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>".

Safe and Respectful Community

I hope that the classroom 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 classroom is unacceptable. Students exhibiting this behavior will be asked to leave the class. The university has a [brochure on student conduct](http://www.sjsu.edu/studentconduct/docs/ENGLISH%20Brochure.pdf) at <http://www.sjsu.edu/studentconduct/docs/ENGLISH%20Brochure.pdf>.

Examples of such behavior include

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

Foundations of Macromolecular Chemistry, Chem 170A, Spring, 2021

The tentative course calendar below includes weekly course content.

Tentative Course Schedule

Class/ Week	Date	Topics
1	01/27/21	What are macromolecules, supramolecular assemblies, and nanomaterials and what do they have in common? What do we mean by inhomogeneity and emergent properties?
2	02/03/21	Molar mass and dispersity: How we think about (and measure) macromolecular size? Introduction to polymers: Synthesis, characterization, and applications
3	02/10/21	Introduction to supramolecular assemblies: Synthesis, characterization, and applications
4	02/17/21	Introduction to nanomaterials: Synthesis, characterization, and applications
5	02/24/21	Thermal and mechanical properties of polymers and how they're measured
6	03/03/21	Our consumer-based economy/why there is a plastic island in the ocean Plastic recycling and sustainable materials
7	03/10/21	Supramolecular materials: Molecular machines Nanomaterials as catalysts: Distinguishing from the bulk
8	03/17/21	Given what we have learned, where can we go from here?

Class/ Week	Date	Deadlines
2	02/03/21	Reflection #1
3	02/10/21	Reflection #2
4	02/17/21	Term paper topic
6	03/03/21	Reflection #3
7	03/10/21	Reflection #4
8	03/17/21	Term paper draft
*	05/20/21	<i>Assigned Final Exam time (2:45 to 5:00 pm)</i> Term paper and course survey