

San José State University
Department of Chemistry
Foundations of Macromolecular Chemistry, Chem 170A, Spring, 2020

Instructor:	Prof. Madalyn Radlauer
Office Location:	DH 517
Telephone:	(408) 924-5482
Email:	madalyn.radlauer@sjsu.edu
Office Hours:	Tues 3:00 – 4:00 pm Wed 3:00 – 4:00 pm
Class Days/Time:	Wed 4:30 – 6:10 pm (until March 11 th)
Classroom:	DH 351
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/>). 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 touch on the mechanical, thermal, and catalytic applications of these systems focusing on common commercial uses and cutting-edge research.

Course Goals and Learning Objectives

The goal of this course is to introduce macro-, supra-, and nanomolecular chemistry, specifically regarding preparation, characterization, and physical properties of these often inhomogeneous materials.

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.

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
Participation in in-class discussions	150
Group Projects	400
Term Paper	250
Total	800

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 practical. Other course structures will have equivalent workload expectations as described in the syllabus.

Participation

In-Class Discussion

Participation during in-class discussions about the course material and assigned reading will account for 150 points (19%) of your grade.

Group Projects

There will be 4 short group projects each worth 100 points (400 points total, 50%) 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

You will be responsible for a term paper due by the start of the final class period that will be worth 250 points (31%) of your grade. This paper will cover one aspect of macromolecules, supramolecular assemblies, or nanomaterials of your choice. The topic must be turned in for approval by week 4 of class. The term paper must rely on peer-reviewed literature and include at least 10 references.

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

Missed Classes

Contact me *in advance* if you will miss a class for a legitimate activity. If an exam, group quiz, or group activity is missed without a legitimate excuse, a score of 0 will be entered for that assignment.

Classroom Protocol

Be on time to class; class starts at 4:30 pm sharp. Device use in class should be limited to taking notes. Students must participate during the class period.

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 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).

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/>.

Accommodation to Students' Religious Holidays

[University Policy S14-7](#) states that San José State University shall provide accommodation on any graded class work or activities for students wishing to observe religious holidays when such observances require students to be absent from class. It is the responsibility of the student to inform the instructor, in writing, about such holidays before the add deadline at the start of each semester. If such holidays occur before the add deadline, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. It is the responsibility of the instructor to make every reasonable effort to honor the student request without penalty, and of the student to make up the work missed.

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 must register with the [Accessible Education Center \(AEC\)](#) to establish a record of their disability.

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.

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The tentative course calendar below includes weekly course content.

Tentative Course Schedule

Class/ Week	Date	Topics, Deadlines
1	1/29/20	What are macromolecules, supramolecular assemblies, and nanomaterials and what do they have in common? What do we mean by inhomogeneity and emergent properties?
2	2/5/20	Group Project #1 due Polymers: Enabling modern life Molar mass and dispersity: How we think about (and measure) macromolecular size?
3	2/12/20	Group Project #2 due Thermal and mechanical properties of polymers and how they're measured
4	2/19/20	Term paper topic due Our consumer-based economy/why there is a plastic island in the ocean Plastic recycling and sustainable materials
5	2/26/20	Introduction to supramolecular assemblies: Synthesis, characterization, and applications
6	3/4/20	Group Project #3 due Introduction to nanomaterials: Synthesis, characterization, and applications Nanomaterials as catalysts: Distinguishing from the bulk
7	3/11/20	Given what we have learned, where can we go from here? <i>Class cancelled due to coronavirus</i>
*	3/13/20	Group Project #4 due
*	3/18/20	Term papers due by 5 pm <i>Optional special office hour to conclude course from 4:30-5:20 pm</i>