

## **CHEM/MATS/CHEN 4223W *Polymer Laboratory*, Spring 2022**

Canvas site: <https://canvas.umn.edu/courses/290165>

Lecture section (all in 331 Smith Hall):

001 – Mondays 08:00 am – 08:50 am

Lab sections (all in Smith Hall 249A):

002 – Tuesdays 8:00 am – 11:50 am

004 – Thursdays 8:00 am – 11:50 am

### **Instructor:**

Professor Marc Hillmyer [hillmyer@umn.edu](mailto:hillmyer@umn.edu), *office hours by appointment*

### **Teaching assistants:**

*All office hours by appointment*

Red Smith-Sweetser [smi01447@umn.edu](mailto:smi01447@umn.edu) (Head TA)

Alicia Huggett [hugge041@umn.edu](mailto:hugge041@umn.edu)

Grace Kresge [kresg005@umn.edu](mailto:kresg005@umn.edu)

Kate Wortman-Otto [wortm014@umn.edu](mailto:wortm014@umn.edu)

Also, Dr. Caitlin Sample [sampl128@umn.edu](mailto:sampl128@umn.edu) will be participating in the class and has experience with this laboratory course. She will have some availability for consultation or help on a voluntary basis and by appointment.

**Prerequisites:** Chem/MatS/ChEn 4221/5221 (Synthetic Polymer Chemistry) *or*  
Chem/MatS/ChEn 4214 (Polymers)

**Required Materials:** (a) Bound laboratory notebook dedicated solely to this lab course (available at UMN bookstore); (b) Safety goggles (bring your own or purchase at Smith 249 General Chemistry stockroom) must be full-coverage splash-proof safety goggles; (c) a lab coat is highly recommended and will be available for you to use for the semester free of charge

### **Recommended resource material:**

ACS Guide to Scholarly Communications <https://pubs.acs.org/doi/book/10.1021/acsguide#>

### **General reference material freely available (also see the library course page):**

Paul Hiemenz and Timothy Lodge, *Polymer Chemistry* (Third Edition; Taylor and Francis Group, 2020). On reserve in Walter Library and available on-line:

<https://ebookcentral.proquest.com/lib/umn/detail.action?docID=6236342>

James Mark, *Polymer Data Handbook* (2<sup>nd</sup> ed.; Oxford University Press, New York, 2009).

Available online at: <http://tinyurl.com/polydatahandbk>

Herman Mark, *Encyclopedia of Polymer Science and Technology* (Wiley-Interscience, Hoboken, NJ, 2003). Contains chapters on general topics in polymer science. Available online at:

<https://onlinelibrary.wiley.com/doi/book/10.1002/0471440264>

George Odian, *Principles of Polymerization* (4<sup>th</sup> ed.; John Wiley & Sons, New York, 2004). On reserve in Walter Library

**Grading:**

50% Lab reports; 30% Assignments; 10% In-lab performance; 10% Lecture attendance

**Lecture Attendance:**

Attendance in the lecture and the laboratory are required. In the lecture you will learn things that are important to complete pre-lab assignments and/or are important for the upcoming laboratory experience. In addition, required information about preparation for each lab, class expectations and conduct, and specifics about write ups and lab reports will be relayed. 2 points for attending, 1 point if you are late, 0 points for missed lecture.

**Lab Performance and Attendance:**

You will be evaluated on your level of preparation, showing up on time, lab etiquette, lab safety, and keeping a well-organized lab notebook. Every day you are in lab, you will earn up to 3 points based on your timeliness and performance. You are expected to show up to the lab on time. If you arrive late (defined as after 8:05 am), you will receive no more than 2 points for that lab period. You will receive: 3 points for on time and good performance; 2 points for late and good performance OR for on time and poor performance; 1 point for late and poor performance OR for on time and really poor performance; 0 points for missing lab OR late and really poor performance.

**Assignments:**

You will have quite a few short assignments due throughout the semester. Late assignments will not be graded and will be assigned a grade of zero. We encourage you to work together and help each other with assignments; however, you must turn in your own work. In some cases, the assignments will be done jointly between you and your lab partner.

**Lab Reports:**

Much of your grade in this class will be determined through written lab reports. Details on these lab reports will be given throughout the semester. We encourage you to consult with writing tutors at the Center for Writing (<http://writing.umn.edu/sws/>) to improve your written work before turning it in. Plagiarism will not be tolerated in any form on lab reports. All versions of your lab reports will be screened electronically for plagiarism by Turnitin software, which will detect (even small) similarities between your lab report and your classmates' reports along with all published websites and manuscripts.

Your lab reports will take the format of research manuscripts to be submitted to a scientific journal such as *Macromolecules*. At the beginning of the course, you will be revising your reports, with our help, to develop your scientific writing style. By the end of the course, you will be writing these reports on your own. You will need access to a word processing program (e.g., Microsoft Word), a graphing program (e.g., Microsoft Excel, Origin, MATLAB) and a chemical structure drawing program (ChemBioDraw, available to UMN students for free—instructions will be provided).

Late lab reports will not be accepted, so it is incumbent upon you to turn in whatever you have on time. Submission of revised lab reports are possible and will be determined/announced depending on specific circumstances.

**Lab Groups:**

You will choose a lab partner to work with this semester, though we reserve the right to switch you if necessary. Make sure that you know how to contact your lab mate (e.g., phone, email, etc.). For this course, you will be expected to work in a team atmosphere with your labmate on the experiments. Also, for the experiments, it will be important for you and your partner(s) to share data, calculations, analyses, etc. in order to set up the experiment correctly and to analyze data in an accurate manner.

**Notebook:**

A dedicated lab notebook is required for this lab course. You are expected to maintain a neat, organized notebook with your data, observations and comments. You will also need to add your analysis and conclusions from assignments to your lab notebook after assignments are due. You will need to keep your own data; please do not rely on your partner to take down the data for an experiment. Your notebooks will be checked periodically as part of your in-lab performance evaluation. You may be required to turn in your lab notebook periodically to the TAs.

**Safety:**

As in all laboratory settings, practice the “safety first” method. You will be required to wear full-coverage splash-proof safety goggles in the lab at all times. (It’s not just a good idea; it’s Minnesota State law.) Gloves will also be required at all times while performing experiments. Lab coats are highly recommended.

Of course, because of COVID-19 we have made some changes to help ensure a safe laboratory experience. The main change that we have made is reducing the section size from 24 to 10. This will allow for much easier distancing from one another in the lab. In addition, along with other normal personal protection equipment, everyone must wear a face covering in accordance with UMN policy. Disposable face masks and gloves will be provided for each laboratory.

Here is the best place for all UMN resources associate with operating a safe campus:

<https://safe-campus.umn.edu/return-campus/university-planning-response>

**Reference Texts:** Although the instructor will lecture on various topics related to the experiments you do in this laboratory course, it will often be your responsibility to find appropriate reference materials. This means polymer textbooks, handbooks, encyclopedias, and original literature (e.g., journal articles). *SciFinder Online* (<http://scifinder.cas.org/>), the search tool for the American Chemical Society’s Chemical Abstracts Service, is an excellent tool for searching for journal articles on a particular topic. To use SciFinder Online, you will need to register (<http://tinyurl.com/scifinderumn>) with your umn.edu e-mail address. You can also usually access journal articles directly from a SciFinder search by clicking “Get Full Text”.

## UMN Policy Statements

### Student Conduct Code

The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.

As a student at the University you are expected to adhere to Board of Regents Policy: *Student Conduct Code*. To review the Student Conduct Code, please see: [https://regents.umn.edu/sites/regents.umn.edu/files/2019-09/policy\\_student\\_conduct\\_code.pdf](https://regents.umn.edu/sites/regents.umn.edu/files/2019-09/policy_student_conduct_code.pdf)

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach and/or a student's ability to learn." The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities.

### Use of Personal Electronic Devices in the Classroom

Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each instructor to determine if and how personal electronic devices are allowed to be used in the classroom. For complete information, please reference: <https://policy.umn.edu/education/studentresp>.

### Scholastic Dishonesty

You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. (Student Conduct Code: [https://regents.umn.edu/sites/regents.umn.edu/files/2019-09/policy\\_student\\_conduct\\_code.pdf](https://regents.umn.edu/sites/regents.umn.edu/files/2019-09/policy_student_conduct_code.pdf)) If it is determined that a student has cheated, the student may be given an "F" or an "N" for the course and may face additional sanctions from the University. For additional information, please see: <https://policy.umn.edu/education/instructorresp>.

The Office for Community Standards has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: <https://communitystandards.umn.edu/avoid-violations/avoiding-scholastic-dishonesty>. If you have additional questions, please clarify with your instructor for the course. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class, e.g., whether

collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.

### **Makeup Work for Legitimate Absences**

Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances do not include voting in local, state, or national elections. For complete information, please see: <https://policy.umn.edu/education/makeupwork>.

### **Appropriate Student Use of Class Notes and Course Materials**

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see: <https://policy.umn.edu/education/studentresp>.

### **University Grading Scales**

The University has two distinct grading scales: A-F and S-N.

**A-F grading scale.** The A-F grading scale allows the following grades and corresponding GPA points:

| <b>Grade</b> | <b>GPA Points</b> | <b>Definitions for undergraduate credit</b>                                   |
|--------------|-------------------|---|
| A            | 4.000             | Represents achievement that significantly exceeds expectations in the course. |
| A-           | 3.667             |   |
| B+           | 3.333             |   |
| B            | 3.000             | Represents achievement that is above the minimum expectations in the course.  |
| B-           | 2.667             |   |
| C+           | 2.333             |   |
| C            | 2.000             | Represents achievement that meets the minimum expectations in the course.     |
| C-           | 1.667             |   |
| D+           | 1.333             |   |

| Grade | GPA Points | Definitions for undergraduate credit   |
|-------|------------|--|
| D     | 1.000 -    | Represents achievement that partially meets the minimum expectations in the course. Credit is earned but it may not fulfill major or program requirements. |
| F     | 0.000      | Represents failure in the course and no credit is earned.  |

**S-N grading scale.** The S-N grading scale allows for the following grades and corresponding GPA points:

| Grade | GPA Points | Definitions for undergraduate credit        |
|-------|------------|---|
| S     | 0.00       | Satisfactory (equivalent to a C- or better) |
| N     | 0.00       | Not Satisfactory                            |

For additional information, please refer to: <https://policy.umn.edu/education/gradingtranscripts>.

### **Sexual harassment, sexual assault, stalking and relationship violence**

The University prohibits sexual misconduct, and encourages anyone experiencing sexual misconduct to access resources for personal support and reporting. If you want to speak confidentially with someone about an experience of sexual misconduct, please contact your campus resources including the Aurora Center, Boynton Mental Health or Student Counseling Services (<https://eoaa.umn.edu/report-misconduct>). If you want to report sexual misconduct, or have questions about the University's policies and procedures related to sexual misconduct, please contact your campus Title IX office or relevant policy contacts.

Instructors are required to share information they learn about possible sexual misconduct with the campus Title IX office that addresses these concerns. This allows a Title IX staff member to reach out to those who have experienced sexual misconduct to provide information about personal support resources and options for investigation. You may talk to instructors about concerns related to sexual misconduct, and they will provide support and keep the information you share private to the extent possible given their University role.

[https://regents.umn.edu/sites/regents.umn.edu/files/2019-09/policy\\_sexual\\_harassment\\_sexual\\_assault\\_stalking\\_and\\_relationship\\_violence.pdf](https://regents.umn.edu/sites/regents.umn.edu/files/2019-09/policy_sexual_harassment_sexual_assault_stalking_and_relationship_violence.pdf)

### **Equity, Diversity, Equal Opportunity, and Affirmative Action**

The University provides equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, membership or activity in a local commission created for the purpose of dealing with discrimination, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: [https://regents.umn.edu/sites/regents.umn.edu/files/2019-09/policy\\_equity\\_diversity\\_equal\\_opportunity\\_and\\_affirmative\\_action.pdf](https://regents.umn.edu/sites/regents.umn.edu/files/2019-09/policy_equity_diversity_equal_opportunity_and_affirmative_action.pdf).

## **Disability Accommodations**

The University views disability as an important aspect of diversity and is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

- If you have, or think you have, a disability in any area such as, mental health, attention, learning, chronic health, sensory, or physical, please contact the DRC office on your campus (UM Twin Cities - 626.1333) to arrange a confidential discussion regarding equitable access and reasonable accommodations.
- Students with short-term disabilities, such as a broken arm, can often work with instructors to **minimize** classroom barriers. In situations where additional assistance is needed, students should contact the DRC as noted above.
- If you are registered with the DRC and have a disability accommodation letter dated for this semester or this year, please contact your instructor early in the semester to review how the accommodations will be applied in the course.
- If you are registered with the DRC and have questions or concerns about your accommodations, please contact your (access consultant/disability specialist).

**Additional information:** Twin Cities - <https://diversity.umn.edu/disability/>, [drc@umn.edu](mailto:drc@umn.edu))

## **Mental Health and Stress Management**

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: <http://www.mentalhealth.umn.edu>.

## **Academic Freedom and Responsibility:**

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.\*

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost.

*\* Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students."*

**Department of Chemistry Diversity and Inclusion Committee:** Collaboration among people of all cultures and backgrounds enhances our experiences and contributes to excellence in teaching, learning, and research. We strive for a climate that celebrates our differences and strengthens our department by embracing and working to increase diversity, equity, and inclusion. For more information about our departmental efforts and upcoming activities: <https://sites.google.com/umn.edu/chemintranet/diversity-inclusion>.