

CHEMISTRY 8564  
Smith 111  
TTh 11:15 – 12:30

Prof. Renee R. Frontiera  
Office: Smith 233  
r rf@umn.edu

# LASER SPECTROSCOPY

1<sup>ST</sup> HALF OF SPRING SEMESTER 2018, 2 CREDITS

## COURSE OVERVIEW:

CHEM 8564 is a graduate level course which emphasizes the fundamentals of light-matter interactions and their manifestation in spectroscopic observables. This course will cover electric properties of matter, time-correlation functions, symmetry and spectroscopy, and density matrix theory and double-sided Feynman diagrams. Throughout the course, the use of lasers in measuring these quantities will be highlighted.

## TEXTBOOK:

Jeanne L. McHale, "Molecular Spectroscopy", 2<sup>nd</sup> edition.

<https://www.amazon.com/Molecular-Spectroscopy-Second-Jeanne-McHale/dp/1466586583>

Also of use (and free) are notes provided by Professor Andrei Tokmakoff:

<https://tdqms.uchicago.edu/>

**OFFICE HOURS:** To accommodate lots of diverse schedules, it's easiest to have office hours by appointment. Send me an email to set up a time if you'd like to meet. I'm happy to talk about anything relating to the course, or things outside of the course, like graduate school or the University of Minnesota.

**TEACHING ASSISTANT:** Kajari Bera, berax011@umn.edu

## GRADING:

In-class quizzes (4)	60%
Homework	40%

You'll be graded on four, 25 minute in-class quizzes which will begin promptly at the beginning of the class. We will also have four homework assignments throughout the half-semester which will count for 40% of your grade. Homework assignments will be spot checked and given a grade of 0, 5, or 10. The grade will reflect the degree of completion, number of correct solutions with emphasis on the approach taken rather than the final value, AND the clarity, legibility, and organization of presentation. There will be no final exam.

The policy on missed quizzes is as follows: A student can be excused from a quiz for a true emergency, serious illness, or University sponsored activity. The student should contact the instructor as soon as circumstances allow and appropriate documentation must be provided. If the circumstances are deemed as appropriate for missing a quiz, the unweighted average score

of all other quizzes will be used in place of the missed quiz. If circumstances lead to a student missing more than one quiz, the student should immediately schedule a meeting with the instructor to discuss any available options.

## **POLICIES**

Please see:

[http://policy.umn.edu/Policies/Education/Education/SYLLABUSREQUIREMENTS\\_APPA.html](http://policy.umn.edu/Policies/Education/Education/SYLLABUSREQUIREMENTS_APPA.html)

for information on UMn policies including student conduct, disability accommodations, sexual harassment, and others. Students registered with disability services should contact Dr. Frontiera as soon as possible to discuss accommodations outlined in their letter.

## **SCHOLASTIC DISHONESTY** ([policy.umn.edu/education/syllabusrequirements-appa](http://policy.umn.edu/education/syllabusrequirements-appa))

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:

[http://regents.umn.edu/sites/default/files/policies/Student\\_Conduct\\_Code.pdf](http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf)) If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see: <http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html>.

## **MISSED QUIZZES**

In the case of a true emergency, serious illness, or University-related trip that prevents a student from taking a midterm exam, an excused absence may be granted in strict accordance with University policy (see link below). To obtain an excused absence, students must contact the instructor in advance OR as soon as circumstances allow to discuss the nature of the emergency. Documentation will be required. The unweighted average score of all the student's other exams will replace the zero from the excused midterm exam. Only one missed midterm exam will be replaced in this fashion. If circumstances prevent a student from taking more than one midterm exam, the student must contact the instructor as soon as possible to schedule a meeting to discuss options available.