Texas A&M University- Corpus Christi
Department of Physical and Life Sciences

Course: Molecular Spectroscopy CHEM 4490
Lecture MTWRF 12:00—3:45 PM
Prerequisites: CHEM 3411

INSTRUCTOR: Dr. Mark A Olson
Office: CS 210
Phone: 825-3293

Office Hours: By appointment only during Maymester
E-mail: mark.olson@tamucc.edu

Course Description: The course is taught at an advanced undergraduate level/first-year graduate level with the curriculum focusing on the spectroscopic methods of molecular structure determination. The course aims to present foundational theoretical concepts of different molecular spectroscopy techniques including nuclear magnetic resonance, infrared, ultraviolet-visible, and mass spectroscopies and how these techniques are used to interpret spectra of unknown analytes. This includes basic modes of absorption and emission, qualitative and quantitative uses and potential problems and limitations. The course has been designed for students who have completed organic chemistry II lecture and laboratory.

Objectives: The objectives of this course are to learn how to interpret the molecular spectroscopic spectra such as UV-visible, mass spectrometer, infrared, and NMR to deduce structures of organic compounds. These methods will be introduced one by one through the course. Then you will deduce organic structures using multiple spectra. A premium will be placed on developing the ability to write clear, persuasive, well-organized structure proofs. Although this course does not have a laboratory components, students will get a chance to tour our current instrumentation facilities and become familiar with the newest spectroscopic techniques. In addition, scientific papers related to spectroscopy techniques covered in class will be discussed during class time.


MAYMESTER LECTURE AND EXAM (Tentative)

<table>
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<tr>
<th>TOPICS</th>
<th>Week</th>
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<tbody>
<tr>
<td>Molecular Formula</td>
<td>1</td>
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<tr>
<td>Infrared Spectroscopy</td>
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<td>Infrared Spectroscopy</td>
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<tr>
<td>Review and Exam</td>
<td>1</td>
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<tr>
<td>Nuclear Magnetic Spectroscopy-Part I</td>
<td>1</td>
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<tr>
<td>Nuclear Magnetic Spectroscopy-Part II</td>
<td>1</td>
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<tr>
<td>Nuclear Magnetic Spectroscopy-2D NMR</td>
<td>1</td>
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<tr>
<td>Advanced NMR techniques</td>
<td>2</td>
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<tr>
<td>Review and Exam</td>
<td>2</td>
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Make-up Exams: **There are no make-up exams for this class. Students with a university approved scheduled absence (athletics, military duty, etc.) MUST contact the instructor well in advance of the scheduled absence! Exams may be taken early in those specific cases. Students who do not arrange to take exams ahead of time will not be eligible for this special consideration. A written excuse from the university department involved or the Office of the Dean of Students is required.**

**Class Website:** Most announcements, forms, handouts, lecture notes, learning materials etc. are either posted, or will be posted on blackboard. You will be able to login using your WebCT ID and Password.

**Use of Electronic Devices during Exam:** Any use of an electronic device (PDA, Cell Phone, MP3 player, CD player, computer …) during an exam is strictly prohibited. Any use of such a device will be considered an attempt to cheat on the exam and will result in a 0 on the exam although more severe actions may be considered. Calculators may be allowed on exams when needed, but only for mathematical operations. The use of programmable calculators to store or retrieve information during an exam will be considered an attempt to cheat on the exam. Also, if a calculator is discovered to have saved programs or information that could be used as an unfair advantage on the exam, this will be considered an attempt to cheat on the exam.

**Students with Disabilities:** The Students With Disabilities Center is located in the Student Services Center (round building: 825-5816). Should you need special consideration for exams and/or class activities (special microphones, additional time for exams, enlarged exams, etc.), please contact this center. The university will provide assistance as needed, but you must contact the center to make arrangements. The instructor cannot make modifications without the center’s involvement. Should you have mobility problems, please notify the instructor and TA so that they may seek assistance for you in the case of fire drills or emergencies.

**Class Standards:** The student is expected to be on time and attend every class. If absent, it is the responsibility of the student to obtain missed information from a classmate. Missed information includes not only lecture notes, but also any possible information regarding syllabus changes. The student is expected to arrive on time prepared to take notes, i.e., with pen, paper, and colored markers/pencils.

**Before you enter the lecture hall turn OFF your cellular phone! Beepers must also be turned off or put on silent mode. Electronic interruptions absolutely will NOT be tolerated!**
**Class Conduct:** All students are expected to follow proper classroom behavior and treat the other students and the instructor with respect. If a student’s actions or behavior is deemed disruptive to the class by the instructor, the students will be asked to leave the class for that day.

**Academic Integrity and Honesty:** All students are expected to conform to college-level standards of ethics, academic integrity, and academic honesty. By enrolling in this course, you agree to be bound by the Regulations and Procedures published in the TAMU-CC STUDENT HANDBOOK. Group interactions, investigations, and studying are encouraged; however, duplicative work will be treated as cheating and will receive a grade of zero. Anything that is viewed as cheating on an exam will be given the most severe penalty possible, most likely an "F" for the course, but may include more severe punishments.

**Lecture Grades**
Students who are taking this class to learn modern spectroscopy technique may choose to attend class and work on projects on their own instead of taking the final exam. These students final exam grade will be based on their project’s final report.

**TESTS:** 3 @ 100 pts each 300 pts
These tests are cumulative with emphasis on material covered since the last test.
Make up policy: No make-up tests will be given. If you have an excused absence for one of the long tests AND with approval of the instructor, your final exam grade will be substituted for the missed test.

**TOTAL POINTS** 300 pts

**Grading Scale and Final Grade for Lab:**

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<tr>
<th>Percent</th>
<th>Grade</th>
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<tbody>
<tr>
<td>100-90</td>
<td>A</td>
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<tr>
<td>89-80</td>
<td>B</td>
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<tr>
<td>79-70</td>
<td>C</td>
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<tr>
<td>69-60</td>
<td>D</td>
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<tr>
<td>Below 60</td>
<td>F</td>
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**ACADEMIC ADVISING:** The College of Science and Technology requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. The College's Academic Advising Center is located in Faculty Center room 178. Please choose the advisor who corresponds to your major (or potential major). Contact your advisor directly, or call Tracey Ramirez at (361) 825-6094, to schedule an appointment. Walk-in times may be available at especially busy
times of the year (such as the start of a semester). Please call the Advising Center to check availability and ensure a minimal wait.

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Biology MS
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(undergraduate & graduate)
Undecided S&T Students

Grade Appeal Process. As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

In choosing to take this course, you are agreeing to abide by the course rules, regulations, and standards. This includes agreeing to be respectful to your instructor and fellow students. Conduct that is disruptive or disrespectful will not be tolerated and is grounds for dismissal from the class. Should you have concerns or questions, you are to discuss them with the instructor as soon as possible. However, you are bound by these rules, regulations, and standards from the first day of class through the duration of the course.