CHEM 490 Honors Thesis  
Spring 2015

Instructor: Dr. Stephen D. Starnes  
Time & Location: To be arranged with the student  
Office & Phone: Science 339  903-886-5389  
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COURSE INFORMATION AND REQUIREMENTS

Course Description: The purpose of this class is to train you to conduct research in a chemistry laboratory and produce an honors thesis. This includes all aspects of the research process: development of a research question and the methods and/or experimental procedures to study that question, how to conduct scientific experiments, data analysis and interpretation, and scientific technical writing. The class is conducted through informal meetings with Professor Starnes. The goal of the class is to successfully propose, conduct, and defend your honors thesis project. Beyond meeting to discuss research, you will be asked to conduct library research, conduct research, maintain a quality laboratory notebook, and write research reports. Data analysis and report writing skills are important aspects for interpreting the laboratory research and producing technically written, scientific reports. Over the duration of the thesis work you will be expected to apply a range of instrumental and data analysis techniques and you will refine report writing skills all of which are needed to interpret laboratory research and produce technical scientific reports. You will become familiar with NMR, UV/Vis, Computational Chemistry experimental techniques and the use of SciFinder, Web of Knowledge and Endnote for searching and collecting scientific literature related to your project and developing a bibliography. You will also be required to develop your critical reading skills of research papers, which will further help you develop your technical writing skills.

All class members must complete Responsible Conduct in Research & Scholarship training and provide a copy of the certificate of completion to Professor Starnes. The training is online and takes about 10 hours to complete. The training can be found at the below website: http://www.tamuc.edu/research/responsibleConduct.aspx

Texts and Other Necessities: No texts required; student and professor will use sources as needed for thesis.

University Catalog Description: No description; a thesis readings course work load and assignments are determined by the student’s topic and advisor’s guidance.

Student Learning Outcomes: Upon completing selected readings, the student will produce and defend an honors thesis proposal. If the student does not complete and defend the thesis during the Spring 2015 semester, the instructor will assign a grade of “I” and the student will defend the proposal in a subsequent semester.

Through the process of developing a thesis proposal and subsequently conducting the work to produce the thesis, the student will gain the necessary skills involved in conducting organic chemistry-related research and computational scientific research. The skills will include organic synthesis techniques, computational chemistry, oral presentations, report writing, critical reading of literature, chemical database searching and review of the literature. During the thesis
The student will develop the skills and material needed for writing a technical research report. The database searching portion of the thesis work will familiarize the student with the software tools of Web of Science, SciFinder, and Endnote. The instrumental analysis portion of the thesis work will cover nuclear magnetic resonance spectroscopy (NMR), infrared spectroscopy (IR), ultra-violet and visible (UV-VIS) spectroscopy, polarimetry, and may include fluorescence spectroscopy and circular dichroism spectroscopy. The computational portion of the thesis work will use the Spartan software package on the computer cluster for exploring a range of chemical properties.

**Technology Requirements:** The student will need access to the University library’s electronic features, as well as to a word processor and printer to prepare the thesis proposal.

**Communication:** Given the nature of a thesis project, the student has direct and near-unfettered access to the professor as the student completes readings and writes the thesis proposal.

**Attendance & Academic Dishonesty:** As the course does not meet in a formal and fixed setting, attendance is irrelevant. Although the student might attempt to use plagiarized material, the professor’s attentiveness will ensure that cheating and academic dishonesty does not occur. Should the student engage in plagiarism, the professor/advisor may request that the student drop the course and select an alternative topic and advisor.

**ADA Statement and Student Behavior**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Office of Student Disability Resources and Services in the Gee Library Room 132, call (903) 886-5835, or email StudentDisabilityServices@tamuc.edu.

All students enrolled in the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See the Student Handbook.)

A&M-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.