CHM6850 (sect. 006G) — Special Topics in Physical Chemistry/EPR Spectroscopy — Spring 2013

Instructor	Dr. Alexander Angerhofer
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O.H.	T-5 (11:45am-12:35pm), R-7 (1:55-2:45pm) and by appointment, CLB318A or CLB313.

Class Meeting Times	During January: M-5+6 (11:45am-1:40pm) and W-5 (11:45am-12:35pm) Rest of the term: M-5 (11:45am-12:35pm)	
Class Location	Lectures will be held in CLB313, labs in CLB303 and CLB416 as appropriate.	
Lab Meeting Times	During February-April: lab meeting times depend on lab groups as follows: Group 1: M-6,7,8 (12:50-3:50pm) Group 2: T-6,7,8 (12:50-3:50pm) Group 3: W-6,7,8 (12:50-3:50pm)	
Holidays	01/21 (MLK Day), 13/04-08 (Spring Break), 04/25-26 (Dead Week, no classes).	
Class Text	Instructor's manuscript (can be downloaded from sakai) optional text: John A. Weil, James R. Bolton: Electron Paramagnetic Resonance: Elementary Theory and Practical Applications, Wiley-Interscience; 2nd Edition, New York, 2007, ISBN-13: 978-0471754961.	
Homework	Homework may be assigned as needed. It is optional and won't be graded but may be discussed in class and will help in the student's understanding of the material.	
Points Earnable	10 lab reports at 10 points each for a total of 100 points.[1] 1 final practical exam valued at 100 points. Max. 20 participation points, earned during lecture classes (see further explanation). Total points earnable: 220 for graduate students, 170 for undergraduate students.	
Grading Scheme[2]	Graduate Students: A: ≥ 187 pts. (85%) 187 pts > A− ≥ 180 pts. (82%) 180 pts > B+ ≥ 174 pts. (79%) 174 pts > B ≥ 165 pts. (75%) 165 pts > B− ≥ 158 pts. (72%) 158 pts > C+ ≥ 152 pts. (69%) 152 pts > C ≥ 143 pts. (65%) 143 pts > C− ≥ 136 pts. (62%) 136 pts > D+ ≥ 130 pts. (59%) 130 pts > D ≥ 121 pts. (55%) 121 pts > E.	Undergraduate Students: A: ≥ 145 pts. (85%) 145 pts > A− ≥ 139 pts. (82%) 139 pts > B+ ≥ 134 pts. (79%) 134 pts > B ≥ 128 pts. (75%) 128 pts > B− ≥ 122 pts. (72%) 122 pts > C+ ≥ 117 pts. (69%) 117 pts > C ≥ 111 pts. (65%) 111 pts > C− ≥ 105 pts. (62%) 105 pts > D+ ≥ 100 pts. (59%) 100 pts > D ≥ 94 pts. (55%) 94 pts > E.

1 Undergraduate students are only required to submit 5 out of 10 lab reports. These lab reports will be specifically assigned by the instructor. Labs for which no lab reports are due still have to be taken All other course requirements remain the same.

2 see **https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx** for more info on UF grade policies.

Further Important Information:

1. **Overview and Goals:** CHM 6580 is a one-semester graduate level course on electron paramagnetic resonance spectroscopy designed for 1st or 2nd year graduate students who desire to use EPR in their research work at UF. The course has a theoretical part which will be discussed in the lecture part of the course, held in January 2013 during 3 periods per week, and during 1 period per week in the remaining part of the term. The laboratory part of the course incorporates 10 distinct EPR experiments which are carried out weekly during the remainder of the term. The outcome of this course ideally will be that the student will A) understand the quantum mechanical principles behind magnetic resonance, B) know how to interpret EPR spectra which also includes the ability to simulate them using appropriate software, and to extract the magnetic parameters from these simulations. C) Moreover, the student will know how to design, set up, and carry out EPR experiments without supervision, specifically on the Elexsys E580 in CLB303 and the Elexsys E500 in CLB416. D) The student will know the "insider language" of magnetic resonance and be able to read and understand the relevant literature, and E) be in a position to develop his/her own research projects using EPR spectroscopy.
2. **Exam Policy:** The course only has one final exam which accounts for 45% of the grade. This exam is a practical exam in the lab. The student will have to make appropriate arrangements with the instructor and set aside two hours during exam week during which he/she will come to the lab and demonstrate competence with the EPR experiment. The student will be given an unknown sample. He/she will have to turn on the instrument correctly, tune it with the sample in the resonator, take a spectrum with a reasonably good signal-to-noise ratio, explain the meaning of the spectrum to the instructor, identify the paramagnetic center(s) in the sample based on the spectrum, and turn the instrument off correctly.
3. **Sakai:** You will need to access your elearning account by following the instructions on the web site, http://lss.at.ufl.edu/ where you will have to supply your Gatorlink ID and password in the appropriate boxes in the login area. Please, log in at your earliest convenience and make yourself familiar with the site.
4. **Prerequisites:** There are no formal prerequisites for graduate students to take this course. Undergraduate students will need the instructor's permission to sign up for the course. This will be granted based on a personal evaluation by the instructor. Typically, undergraduate students would want to enroll if their research involves EPR spectroscopy and if they have had some background in quantum mechanics. Background in quantum mechanics can be demonstrated by either a minimum grade of 'C' in CHM4412 or CHM6470, a miminum grade of 'B' in CHM3400, or a minimum grade of 'A' in CHM2047.
5. **Expected Work Load and Study Habits:** The course is a demanding graduate level course. Quantum mechanics is the foundation to understanding magnetic resonance, and this foundation will be laid during the first few weeks in the course. Prior background in quantum mechanics (see above) is necessary to be able to follow the lectures. If need be, the student will have to supplement his/her own understanding from other sources (internet, textbooks, review articles, etc.).
   The lab portion of the course will require a sustained effort in preparing for the labs and working on laboratory reports afterward. Each lab will include some pre-lab work that may be quizzed when you show up for lab. If you do not have a clue about what is going on you will be sent back to study and may have to do a make-up lab instead. Lab reports typically will be between 2 and 4 typed pages long and include a brief introduction to the lab, a clear description of the laboratory activities and the materials and methods used, a section describing the data received using tables and/or graphs as appropriate, a brief discussion of the experimental results, and a short paragraph with conclusions. All lab reports will have to be typed and submitted via the sakai interface as pdf documents. The filename should include the lab number and your name in order to aid in grading

and archiving your work. Undergraduate students will be expected to submit five out of ten lab reports while graduate students are expected to submit all ten lab reports. The five lab reports will typically be spaced out biweekly but may be specifically assigned by the instructor based on a student's research needs.

6. **Collaboration:** Collaboration between students on both the theoretical and the lab components of this class is encouraged. Specifically, you may work out your lab data analysis together with other students in the course. However, the final lab report needs to be your own work and may not be plagiarized. Please refer to the student honor code for further clarification: http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php.
7. **Participation Grade:** The participation points (up to 20) will be earned through active participation in class. 20 total participation points are available and are assigned based on a student asking questions during lectures (and labs) or answering a question the instructor asks during lecture or lab.
8. **Class Attendance:** Class and lab attendance is essential for your success in this class. If you need to miss class or lab for any reason, please get in touch with the instructor as soon as possible. There will be an option for two make-up labs at the end of the semester. For further information on UF's attendance policies which are in effect for this course, see: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx .
9. **Students with Disabilities:** Students requiring special accommodations should register with the Dean of Students Office and present documentation from that office to the instructor.
10. **Counseling Services:** The University of Florida provides counseling services for students, staff, and faculty. See http://www.counseling.ufl.edu/cwc/ or call (352) 392-1575. The Alachua County Crisis Center hot-line is (352) 264-6789.
11. **Cell Phones:** Please put all cell phones or pagers on "**silent mode**" during all class and lab periods. Thank you.
12. **Honor Code:** This class will operate under the policies of the student honor code which can be found at: http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php . The students, instructor, and TAs are honor-bound to comply with the Honors Pledge: **We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.**

If you have further questions, please contact me. Have a great semester!

Sincerely, Alexander Angerhofer