

**CHM 4308, Section 136C, Introduction to Enzyme Mechanisms**  
**CHM 6301, Section 1356, Enzyme Mechanisms**

**Spring 2018**

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<b>Professor</b>	Jon D. Stewart Office: 102 Leigh Hall Phone: 352.846.0743 E-mail: jds2@chem.ufl.edu
<b>Lectures</b>	Monday, Wednesday and Friday, 7 <sup>th</sup> period (1:55 – 2:45 p.m.), 207 Leigh Hall
<b>Office hours</b>	Monday, 2 <sup>nd</sup> period, 8:30 – 9:20 a.m., 102 Leigh Hall Tuesday, 2 <sup>nd</sup> period, 8:30 – 9:20 a.m., 102 Leigh Hall Wednesday, 8 <sup>th</sup> period, 3:00 – 3:50 p.m., 102 Leigh Hall
<b>Course Objectives</b>	<p>Overview of concepts of biological catalysis, including transition state theory, descriptions and examples of mechanisms of biochemical catalysis and a survey of co-factors. Students who have successfully completed this course will be able to:</p> <ul style="list-style-type: none"><li>• Deduce enzyme mechanisms based on experimental data</li><li>• Propose mechanisms for novel enzymes</li><li>• Propose useful experiments for elucidating enzyme mechanisms</li></ul>
<b>Prerequisites (CHM 4308)</b>	BCH 4024 or CHM 3218; Corequisite: CHM 3400 or CHM 4411.
<b>Grading</b>	<p>Three examinations (100 points each) will be scheduled during the semester (<b>during the evenings of February 7, March 14 and April 11</b>). The final examination (100 points) will be comprehensive, although it will somewhat emphasize material presented after the third in-class examination (<b>7:30 – 9:30 a.m. on Monday, April 30</b>). No make-up exams will be offered. After each exam, approximate letter grade distributions will be posted separately for so that you will have a feel for your performance relative to others in the class as the semester progresses. The lowest grade from exams 1 - 3 will be dropped before calculating your final grade (you may not drop the final exam score). Your final letter grade will be calculated in two ways:</p> <p>1) Points method. After dropping the exam score (from tests 1, 2 or 3) with the lowest number of points, the remaining two scores will be added together with the final exam score and compared to the distribution of total points for the class in order to assign a final letter grade. The class-wide mean of grades assigned by this method will be at the B- / C+ border.</p> <p>2) Letter grade method. After dropping the lowest exam letter grade (from tests 1, 2 or 3), the remaining two letter grades will be averaged with that from the final exam by assigning points in the following manner: A = 4.00, A - = 3.67, B + = 3.33, B = 3.00, B - = 2.67, C + = 2.33, C = 2.00, C - = 1.67, D + = 1.33, D = 1.00, D - = 0.67, E = 0.00.</p>

The three best values will be averaged, then the following scheme will be used to convert this to the final course grade:

3.85 - 4.00 = A  
3.51 - 3.84 = A -  
3.18 - 3.50 = B +  
2.85 - 3.17 = B  
2.51 - 2.84 = B -  
2.18 - 2.50 = C +  
1.85 - 2.17 = C  
1.51 - 1.84 = C -  
1.17 - 1.50 = D +  
0.84 - 1.16 = D  
0.51 - 0.83 = D -  
<0.51 = E

For example, if your three best exam letter grades are A, A and A-, your average would be  $(4.00 + 4.00 + 3.67) / 3 = 3.89$ , which is an A.

*Whichever method (#1 or #2) gives you a higher grade will be used to calculate the letter grade reported to the Registrar.*

Current UF grading policies can be found at  
<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

**Class Attendance**

While attendance is voluntary, the lectures are an essential component of the experience for this class. Readings from the textbook serve as a starting point and the classroom lectures will explain and expand upon this material.

**Make-Up Work**

Since students are allowed to drop an exam score, no make-up exams will be scheduled.

**Course Evaluation**

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

**Recommended Textbook**

*The Organic Chemistry of Enzyme-Catalyzed Reactions*, Revised Edition, Silverman, R.B., Academic Press, 2002.

**Lecture Schedule**

A tentative schedule of lectures is available at the course e-Learning site (<http://lss.at.ufl.edu>).

**Academic Honesty**

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the University of Florida,

the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

Additional information can be found on-line

(<http://gradcatalog.ufl.edu/content.php?catoid=8&navoid=1493#student-honor-code>)

**Students with Disabilities**

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

**Additional Information**

Your well-being is important to the University of Florida. The *U Matter, We Care* initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the *U Matter, We Care* Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The *U Matter, We Care* Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

## Tentative Lecture Schedule

January 8	Introduction, proteases
January 10	Proteases, esterases and lipases
January 12	Glutamine-dependent enzymes
<i>January 15</i>	<i>Martin Luther King, Jr. Day, No class</i>
January 17	Phosphoryl transfer
January 19	Phosphoryl transfer
<i>January 22</i>	<i>No class</i>
January 24	Nicotinamide-dependent enzymes
January 26	Nicotinamide-dependent enzymes
January 29	Nicotinamide-dependent enzymes
January 31	Flavin-dependent enzymes
February 2	Flavin-dependent enzymes
February 5	Quinone-dependent enzymes
February 7	Quinone-dependent enzymes
February 9	Other redox enzymes
February 12	Flavin-dependent hydroxylations
February 14	Flavin-dependent hydroxylations
February 16	Pterin-dependent hydroxylations
February 19	Heme-dependent hydroxylations
February 21	S <sub>N</sub> 1 substitutions
February 23	S <sub>N</sub> 1 / S <sub>N</sub> 2 substitutions
February 26	S <sub>N</sub> 2' substitutions
February 28	Carbon dioxide-dependent carboxylations
March 2	Bicarbonate-dependent carboxylations
<i>March 5</i>	<i>Spring Break, No class</i>
<i>March 7</i>	<i>Spring Break, No class</i>
<i>March 9</i>	<i>Spring Break, No class</i>

March 12	$\beta$ -Keto acid decarboxylations
March 14	$\beta$ -Hydroxy acid decarboxylations
March 16	$\alpha$ -Keto acid decarboxylations
March 19	Amino acid decarboxylations
March 21	Racemases
March 23	<i>Cis</i> / <i>trans</i> -isomerases
March 26	<i>Anti</i> -eliminations and additions
March 28	<i>Syn</i> -eliminations and additions
March 30	<i>Syn</i> -eliminations and additions
April 2	Aldolases
April 4	Aldolases and Claisen reactions
April 6	Claisen reactions
April 9	Folate-dependent enzymes
April 11	Folate-dependent enzymes
April 13	<i>S</i> -adenosylmethionine-dependent enzymes
April 16	Pericyclic reactions
April 18	Acylion rearrangements
April 20	Rearrangements involving radicals
April 23	To be announced
April 25	To be announced