CHE 150   Chemistry of Natural Products   Spring 2019

Time and Place:  Mondays, TIGP Rm 204; Thursdays and Saturdays, TIGP Rm 207
CRN:  TBD
Instructor:  Dr. Neil Schore
Phone: 530-304-6794  E-mail: neschore@ucdavis.edu
Office Hours:  After lectures and upon request; also note optional discussion sessions
TAs:  Anna Lo, E-mail: annlo@ucdavis.edu
TA Office Hours:  Anna Lo, TBD
Course website:  Please check Canvas for course updates and handouts

Course Description and Objectives:
This course provides an introduction to the chemistry, biosynthesis, and pharmacological activity of natural products. Emphasis will be placed on the key biosynthetic pathways responsible for the production of biologically active secondary metabolites. Upon completion of this course, students should be familiar with the chemistry principles underlying the biological processes for the production of polyketides, phenylpropanoids, terpenoids, steroids, and alkaloids in nature. Students should be able to examine the structure of a natural product and recognize its key biosynthetic pathways and building blocks. Students should also become familiar with literature searching and the use of ChemBioDraw software, presentation of ideas clearly and logically, and proper use of references.

Prerequisite: CHE118C, CHE128C, or Dr. Schore approval
Text Book:  Paul M. Dewick “Medicinal Natural Products: A biosynthetic approach”
            3rd Edition, John Wiley & Sons Ltd, 2009

Additional reading will be distributed in class or posted on Canvas.

Grading:
Midterm (Saturday, May 11, 2019, lecture time)  100 pts
Final (Saturday, May 18, 2019, lecture time)  150 pts
Attendance and participation  50 pts
Take Home Assignments (2 × 50 pts)  100 pts
TOTAL  400 pts

Attendance & Participation:  Full credits are given for those who attend all lectures punctually and participate actively when called on during lecture.

Take Home Assignments:  You may work with your classmates on the assignments, but you must turn in your own work. These are designed to prepare you for the exam, so it is in your best interest to make sure that you can do the problems correctly on your own.

Midterm:  The midterm will be a 50 minute exam on the materials covered in the first half of the course and will consist of problems of a similar format to the first Take Home Assignment. There will be no make-up midterm, no exceptions. Students absent for the midterm for a legitimate reason (supported by documentation) will have the final exam counted for 50% of their total grade.

Final exam:  You must take the final exam in order to pass the class. Students who miss the final exam for a legitimate reason may be given a grade of “incomplete,” provided that the student has a passing grade before the final. Criteria for incomplete are detailed here:
http://catalog.ucdavis.edu/academicinfo/grades.html

Exam regrades:  Exam regrading will be performed only if a detailed written request is provided to Dr. Schore on the day the exam is returned. If a regrade is granted, the entire exam will be regraded and points may be deducted from problems other than the subject of the regrade request. Do not alter your exam in any way if you request a regrade.
**Academic dishonesty:** Please refer to the UC Davis Student Judicial Affairs statement regarding academic conduct: [http://sja.ucdavis.edu/cac.html](http://sja.ucdavis.edu/cac.html) or [http://sja.ucdavis.edu/files/cac.pdf](http://sja.ucdavis.edu/files/cac.pdf). Do not cheat or plagiarize! Penalties may now include assignment of the grade of ‘F’ for a course.

**CHE150 Lecture Topics:**
Introduction
Building blocks and construction mechanisms – From a chemist’s point of view
The acetate pathway – Fatty acids and polyketides
The shikimate pathway – Aromatic amino acids and phenylpropanoids
The mevalonate and methylerithritol phosphate pathways – Terpenoids and steroids
Alkaloids (if time permits)

**Additional Reading:**
4) *Quinine: Malaria and the Quest for a Cure That Changed the World*, F. Rocco (2003)

**Other Sources:**
*Connecting from off campus for electronic journals at UCDavis:*
[https://www.library.ucdavis.edu/ul/services/connect/](https://www.library.ucdavis.edu/ul/services/connect/)
SciFinder Search at ACS site: [https://origin-scifinder.cas.org/scifinder/login](https://origin-scifinder.cas.org/scifinder/login)
Chemical & Engineering News: [http://pubs.acs.org/cen/index.html](http://pubs.acs.org/cen/index.html)

**Tentative Class Schedule (Subject to change)**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Day</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1. May 2, 2pm</td>
<td>(Th)</td>
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<td>Syllabus</td>
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<td><strong>Quiz for Learning Assessment</strong></td>
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<td><strong>Chapter 1. Introduction</strong></td>
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<td>**Chapter 2. Building blocks and construction mechanisms: from a</td>
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<td>chemist’s point of view**</td>
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<td>2. May 4, 9am</td>
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<td>Homework #1-- Problems available at Canvas</td>
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<td><strong>Chapter 3. The acetate pathway: fatty acid and polyketides</strong></td>
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<td>3. May 6, 9am</td>
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<td>Optional discussion session</td>
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<td>4. May 6, 1pm</td>
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<td><strong>Chapter 3 continued</strong></td>
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<td>5. May 9, 2pm</td>
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<td>Homework #1--Due at the beginning of the lecture</td>
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<td>Homework #2-- Problems available at Canvas</td>
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<td>6. May 11, 9am</td>
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<td><strong>Midterm Exam</strong></td>
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<td>**Chapter 4. The shikimate pathway: aromatic amino acids and</td>
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<td>phenylpropanoids**</td>
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<td>7. May 13, 9am</td>
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<td>**Chapter 5. The mevalonate (MVA) and methylerithritol phosphate</td>
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<td>(MEP) pathways**</td>
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<td>8. May 13, 2pm</td>
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<td><strong>Chapter 6. Alkaloids (if time permits)</strong></td>
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<td>9. May 16, 2pm</td>
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<td>Optional discussion session</td>
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<td>8. May 18, 9am</td>
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<td>Homework #2--Due at the beginning of the class</td>
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**Final Exam: Saturday, May 18, 2018, 9 am – 11 am, TIGP Rm 207**