CH4412
Spring Semester 2010

Instructor: Dr. Dallas K. Bates    Office: 19-708A
email: dbates@mtu.edu
Office Hours: My schedule allows me to accommodate most
students’ schedules. If you want to discuss
class issues, just stop by my office or email for a
meeting time.

Text(s): Organic Structure Analysis [2nd Edition]
Phillip Crews, Jaime Rodriguez and Marcel Jaspars
Hardback, 656 pages published Oct 2009

Software: Introduction to Spectroscopy-Mass Spec, IR,
$^1$H and $^{13}$C NMR (10 licenses), MestRe-C
(freeware), nmrsm (NMR spectrum simulator)
(freeware), ChemDraw
Aldrich/ACD NMR database

CH4412 is designed to make you proficient at interpretation of organic spectral data
and, as such, is very problem-solving oriented. Little emphasis is placed on instrument
theory, operation or design. This course is not a course to provide training for hands-
on operation of chemistry instrumentation. The ‘laboratory” time is used primarily for
group and individual problem-solving exercises. If you wish to learn to use any
departmental equipment, please contact me to arrange training independent of class.

I assign reading in the textbook; I expect students to read the textbook and to be able
to apply assigned material in problem solving.

TOPICS
Lecture material, homework problems and in-class group problem assignments will
cover the following topics (in this order):

Introduction-Using Spectral and Analytical in Structural Analysis
$^1$H NMR
$^{13}$C NMR
Mass Spectroscopy
Infrared Spectroscopy
2D NMR techniques
GRADING

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes (8)</td>
<td>60%</td>
</tr>
<tr>
<td>Poster presentation/class participation*</td>
<td>10%</td>
</tr>
<tr>
<td>Final (comprehensive)</td>
<td>30%</td>
</tr>
</tbody>
</table>

*Class participation is required.*

Typically, quizzes are given during the “Lab” session, but may be unannounced and given at any time.

Email me prior to missing a class stating the reason for your absence. Graded material is assigned “0” for unexcused absences.

The Blue Book of Useful Spectroscopic Information

A hand-written (no exceptions) “Blue Book of Useful Spectroscopic Information” may be used on quizzes and the final exam. You may include any information in the blue book. This blue book is the ONLY source that may be used on tests and quizzes. All information in the blue book must be hand-written by the individual using it. You can add new material to your bluebook at anytime.

Posters

Poster presentations will be in class during the last lab session of the term. The poster project involves solving an assigned problem, preparing a poster showing how the spectroscopic data from the problem supports the structure you propose as the answer, and orally discussing the poster with other students and attending faculty during the presentations. I will discuss in class the poster format and answer any questions you have later in the term. Some examples of student spectroscopy posters are posted outside my office.

CH4412 information will be posted on the course webpage (Go to the MTU Chemistry homepage, click on “Students” in the menu on the left side of the page, then click “courses” and select CH4412. This is a resource you should check periodically throughout the semester.)
Assignments

<table>
<thead>
<tr>
<th>Week</th>
<th>reading</th>
<th>Problems*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chap 1 (19 pages)</td>
<td>1.5 - 1.7, 1.10</td>
</tr>
<tr>
<td>2</td>
<td>TBA</td>
<td>TBA</td>
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* I will ask for volunteers to present solutions to problems on the blackboard

Curiosity – A scientist’s best friend