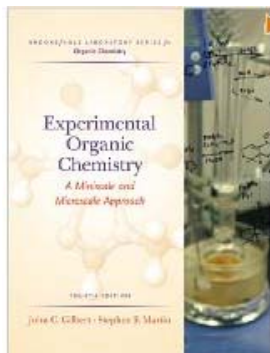


# Course Syllabus

**Instructor:** Professor Cathrine Reck  
**Office:** 021F Chemistry Building  
**Phone:** 855-3972  
**E-mail:** creck@indiana.edu  
**Office Hours:** MW 9:30 – 10:30 am in C046, the Chemistry Resource Center  
**Lecture Times:** TR 10:10 – 11:00 CH 122

Section	Day	When?	Where?	Who?
1819	M	5:00 - 9:00 pm	CH149	Rene Buell (rwbuell)
8609	R	5:00 - 9:00 pm	CH149	Vinnie Cavaliere (vcavaliere)
1818	M	12:15 - 4:15 pm	CH149	Edward Hall (edwhall)
8603	M	5:00 - 9:00 pm	CH147	Craig Hollars (chollars)
1823	W	12:15 - 4:15 pm	CH147	Kevin McDonald (kevmcdon)
1821	T	12:15 - 4:15 pm	CH147	Fese Mokube (femokube)
8605	R	5:00 - 9:00 pm	CH147	Prolay Mondal (pmondal)
8604	F	12:15 - 4:15 pm	CH147	Brendan Monks (bmonks)
10279	F	12:15 - 4:15 pm	CH149	Justin Orlando (jorlando)
30816	M	5:00 - 9:00 pm	CH145	Zachary Poulos (zpoulos)
1822	T	12:15 - 4:15 pm	CH149	Xiaoxiao (Joanne) Qiao
1824	W	12:15 - 4:15 pm	CH149	Lauren Strawsine (lastraws)
1825	R	12:15 - 4:15 pm	CH147	Srinivas Tekkam (stekkam)
1817	M	12:15 - 4:15 pm	CH147	John Tipping (jotippin)
1820	W	5:00 - 9:00 pm	CH147	Abraham Verdoes (averdoes)
6939	W	5:00 - 9:00 pm	CH149	Nathaniel Webber (ntwebber)
1826	R	12:15 - 4:15 pm	CH149	Jing Zhang (jz20)

**Required Text:** *Experimental Organic Chemistry*, John C. Gilbert and Stephen F. Martin, 4<sup>th</sup> ed., Thomson/ Brooks/Cole (2006). **ISBN-13:** 978-0495013341



**Recommended Text:** "Organic Chemistry", Janice Gorzynski Smith, McGraw-Hill, 2nd edition. **ISBN:** 0073327492; alternatively, any organic textbook that has chapters on spectroscopy: IR, NMR and MS.

**Required Materials:**

1. Text by Gilbert and Martin
2. Lab Safety Goggles – NOT safety glasses
3. Duplicate laboratory notebook with numbered pages
4. A Sharpie<sup>®</sup> permanent marker (any color)

**Course Website:** <http://courses.chem.indiana.edu/c343/default.asp>

**Fees:** You paid a non-refundable laboratory fee when you registered for this course. The registration fee covers supplies, *i.e.* chemicals, gloves, perishable and disposable items, *etc.* However, the fee does not cover equipment that is broken/lost/misplaced/cracked, *etc.*, during normal use in the course. The laboratory fee does not include replacement costs for missing equipment at the conclusion of the course. Therefore, you are responsible for **ALL** equipment in your designated laboratory drawer. You will be asked to check in and out of your lab drawer, even if you drop the course prematurely.

**Als:** Your Associate Instructor (A.I.) is responsible for assisting you in the laboratory and helping you with strategizing with solving spectroscopy problems. The A.I. will provide you with practical advice/reminders for an experiment at the beginning of the lab period. However, the A.I. will help you mostly by answering your questions with another question – do not expect straight answers from your AI! A list of AIs will be posted on the course website once the final AI assignments are made shortly before classes start – as well as contact information and office hours for all of the A.I.'s.

**Course Objectives:**

1. Expose students to a variety of problems that organic chemists encounter in a real life laboratory setting.
2. Provide practical hands-on experience in fundamental organic chemistry laboratory techniques.
3. Encourage teamwork through the collection of class data and partner-based experiments.
4. Further augment and reinforce your understanding of the chemical principles covered in your organic lectures (*i.e.* C341 or R340 and C342). The emphasis in this course is not upon regurgitation; instead, the emphasis is upon thinking about a problem and providing an educated explanation supported by data and theory. You will be asked to develop a proper scientific approach to the execution and interpretation of laboratory data.

**Basic Instructor Expectations:**

1. **IT IS EXPECTED THAT STUDENTS READ AND KNOW THIS SYLLABUS!**
2. **IT IS EXPECTED THAT STUDENTS READ THE LABORATORY EXPERIMENT AND ATTEND THE PRELAB LECTURE WITH QUESTIONS IN MIND.** See the lecture schedule at the end of this syllabus.
3. **IT IS EXPECTED THAT STUDENTS COME TO LAB PREPARED TO DO THE EXPERIMENT AND TO WORK EFFICIENTLY AND SAFELY IN THE LAB.** We expect students to come to the lab with an understanding of the procedure they are about to perform, including how the steps of the procedure serve the purpose of the experiment.

**Key to Success:**

The key to being successful in this class is learning to be prepared and to work efficiently in lab. This entails your being prepared and organized when entering your lab period. You must read and understand the material prior to entering the lab; this is crucial to your performing the lab correctly. By writing a good pre-lab write-up, it will allow you to become well prepared for the operations to be performed and data to be collected. Utilization of blank tables, graphs, summaries, *etc.*, will prove to be helpful toward your efficient use of lab time. You should be prepared to complete the lab with little, if any, reference to the lab manual.

**Failure to prepare adequately for the lab will result in your wasting time, preventing the completion of the assignment in the allotted time frame; obviously this may have a detrimental effect on your grade.**

**CLASS REQUIREMENTS:**

**Lectures**

There are two lectures a week. The Tuesday lecture is devoted to lecture material called spectroscopy. The Thursday lecture is devoted to discussing the upcoming lab that will be performed the following week. Quiz and exam material will come from what we discuss in lecture, so your attendance is expected. Lecture notes will be posted online for you

to use (<http://courses.chem.indiana.edu/c343/default.asp>), but we will be adding to that material greatly in class, so it behooves you to come to every lecture.

### Lab Grades:

Each lab is worth **50 points** broken down into the following components:

	Prelab assignment	15
	Lab report	35

### Prelaboratory Assignments:

For every lab, you will be asked to answer a series of questions that will help prepare you to perform that week's experiment. You are expected to submit that prelab before you enter lab; no late prelabs will be accepted. Hand written prelab questions at the beginning of lab or CALM submitted prelabs must be submitted **by Wednesday of the week you are doing that lab**. **Prelab due dates are found online on CALM when you log in.**

~~Prelab assignments will be handed in at the beginning of each lab period. You are expected to perform the prelab assignment BEFORE entering the lab; therefore, no late assignments will be accepted. No work may be started until your AI has approved the pre-lab. Some laboratory reports are due at the end of the laboratory period, so be sure you know what type of lab you are doing that week.~~

The format of the reports is indicated for the individual experiments and will be discussed in class. **THE USE OF OLD LAB REPORTS PREPARED BY OTHERS IS EXPRESSLY PROHIBITED AND CONSTITUTES PLAIGIARISM. THIS WILL RESULT IN A NON-DROPPABLE GRADE OF ZERO (0) FOR THE LABORATORY IN QUESTION AS A MINIMUM PUNISHMENT.** We will use Turnitin.com in order to avoid this problem.

### Quizzes:

Periodically, quizzes will be administered (30 points each) in lecture on Thursdays. The best three quiz grades will add to be a potential 90 points.

### Additional Assignments

You will be asked to do worksheets pertaining to spectroscopy for a total of 120 points.

### Grading:

- You will be graded on a straight scale (90/80/70, etc.) based on the assignments below. However, the scale is subject to change at the instructor's discretion to the students' benefit.

*Your grade will be determined from the following points:*

4 In-class Quizzes (30 points each, drop the lowest)	90
12 Lab Reports (50 points each, drop the lowest)	550
4 Spectroscopy worksheets (30 points each)	120
2 Exams (150 pt each)	300
<b>Total:</b>	<b>1060 points</b>

- All late assignments are assessed a 10% reduction in points for every 24 hour period that the assignment is late. For example, if the assignment is worth 50 points and it is turned-in within 24 hours *after* the *time* it was due then 5 points will automatically be deducted. Five points will be deducted for every 24 hour period that the assignment is late.
- The laboratory experiment grades (*i.e.* lab reports & worksheets) will be normalized at the end of the semester to standardize differences in the AI's grading styles. All lab sections will be normalized to ca. 80-82% based on the students' performances. **An AI with a 90% average and another with a 60% average will not be allowed to benefit or penalize their students, respectively.**

**Missed Assignments:**

There are no make-up exams, labs, or quizzes. Your lowest grade on an "experiment" will be dropped when calculating the final grade for the course. If you miss an experiment, then that missed experiment will count as the drop. However, a zero issued for cheating will not be dropped. One quiz will be dropped when calculating the final grade for the course. If you miss a quiz, then that missed quiz will count as the dropped quiz.

**Academic Integrity:**

1. **Cheating will not be tolerated.** Any student caught cheating is subject to the sanctions within the Code of Academic Ethics. Penalties for cheating include a grade of zero for an assignment or an irremovable grade of F for the course. All instances of cheating will be documented and reported to the Office of Student Ethics.
2. **Plagiarism will not be tolerated.** Plagiarism is the direct use of someone's words, ideas, or images; as well as paraphrasing another's work or organizational structure without properly giving credit to the source. All written (or electronic) work for this course that bears your name is assumed to be of your own original creation. Therefore, sources used in the construction of your work must be properly cited.
3. Citations for written work can be formatted using the American Chemical Society (ACS), APA, or MLA styles. Proper formatting for ACS citations can be found in Experiment 13 of the lab manual. The following websites contain many examples of how to properly cite sources using either the APA or MLA styles.

[http://www.indiana.edu/~wts/pamphlets/apa\\_style.shtml](http://www.indiana.edu/~wts/pamphlets/apa_style.shtml)

[http://www.indiana.edu/~wts/pamphlets/mla\\_style.shtml](http://www.indiana.edu/~wts/pamphlets/mla_style.shtml)

**Turnitin.com:**

Indiana University has a license for use of Turnitin.com. Turnitin.com is used nationwide to ensure the academic integrity of the assignments you submit as part of the course structure. This service is used to protect the honest efforts of conscientious students so that students who are not so honest do not earn that same grade. Most written assignments (e.g. lab reports) must be submitted electronically to Turnitin.com. You are required to enroll with Turnitin.com as part of this course, and these instructions for registration will be posted on the course website and the class ID and password for individual sections will be handed on in lab during the first lab meeting when you check in to lab.

A Turnitin.com tutorial is available at: [http://turnitin.com/static/training\\_support/student\\_training.html](http://turnitin.com/static/training_support/student_training.html). The lab that you submit to Turnitin.com and the hard copy you submit must match up. Failure for these two documents to be in sync will be considered an act of academic integrity.

***A hard copy of all assignments submitted to Turnitin.com must be given to the AI for grading purposes. Both the electronic version and a hard copy are due on the due date to avoid late penalties.***

Students and faculty are responsible for maintaining the academic integrity of the University. You are advised to read the *Code of Student Rights, Responsibilities and Conduct*. This a publication put out by the Student Ethics Office located at 705 E. 7<sup>th</sup> Street. Essentially, it is the instructor's decision, based on evidence and student interviews, whether misconduct has occurred. The sanctions made against a student committing academic misconduct may range anywhere from deduction of points to awarding a failing grade for the entire class. In this class, a non-droppable zero will be given for plagiarism, cheating on, or fabricating data for a lab, or cheating on a quiz or exam. Any "repeat performance" of such behavior will result in the maximum penalty being enforced. All cases of academic misconduct will be immediately reported to the Dean of Students as well as the dean or director of the student's school.

Specific violations would be the intentional use of any unauthorized study aids, equipment, or another's work during an examination (i.e., cheating) or allowing/aiding another individual to cheat. Copying another student's lab write-up is considered a form of cheating and will be dealt with according to the Code of Academic Ethics described in the Schedule of Classes.

**Incompletes** can only be “given only when the work of the course is substantially completed (*i.e.*, more than half completed) and when the student’s work is of passing quality (*i.e.*, above a C-), as in the case of illness or similar distress during the final part of the course. This is in accordance with University policy as stated in the Bulletin. **Withdrawal** from the course with an automatic grade of W is possible up until **Wednesday, October 28, 2009**. After this date, a dean’s withdrawal must be sought through your college and cannot be sought from the professor.

Laboratory Schedule, C343			Fall 2009
Week	Date	Lecture Topics & Experiments	Suggested Readings
1	Tue, Sep 1	<b>Lecture:</b> Introduction (syllabus, lab reports & lab safety) Free Radical Halogenation Lab Report (due week 3)	Syllabus thoroughly & chapter 1 (G&M) <b>Lab report Guidelines online</b>
	Thu, Sep 3	Lecture: 4.4: Simple Distillation & Fractional Distillation of a Mixture	Chapter 2.1-2.5, 2.9, 2.13-15, 2.22(G&M); Chapter 4.1-4.4 (G&M)
<b>LABS</b>	Aug 31 – Sep 4	Lab: Safety Introduction (lab check-in)	Chapter 1.8-1.11 (G&M)
2	Tue, Sep 8	Lecture: Infrared Spectroscopy	Chapter 13 (Smith); chapter 8.2 (G&M)
	Thu, Sep 10	Lecture: 6.2 & 6.3: TLC & Column Chromatography	Chapter 6.1-6.3 (G&M)
<b>LABS</b>	Sep 7–11	4.4: Simple Distillation & Fractional Distillation of a Mixture	
3	Tue, Sep 15	Lecture: Infrared Spectroscopy	Chapter 13 (Smith); chapter 8.2 (G&M)
	Thu, Sep 17	<b>Lecture:</b> 5.3 Acid & Base Extractions	Chapter 2.18, 2.21, 2.29; Chapter 3 (G&M); Chapter 5.1-5.3 (G&M)
<b>LABS</b>	Sep 14–18	6.2 & 6.3: TLC & Column Chromatography	<b>FRH lab report due in lab this week</b>
4	Tue, Sep 22	<b>Lecture:</b> Introduction to NMR Spectroscopy & Symmetry Elements	Chapter 8.2 (G&M)
	Thu, Sep 24	<b>Lecture:</b> 17.4: Reduction of 9-Fluorenone	Chapter 17.4 (G&M)
<b>LABS</b>	Sep 21–25	5.3 Acid & Base Extractions	
5	Tue, Sep 29	<b>Lecture:</b> $^{13}\text{C}$ Spectroscopy & DEPT	Chapter 8, pp. 257-260, 283 – 293; chapter 14 (Smith)
	Thu, Oct 1	<b>Lecture:</b> 16.2A: Oxidation of Alcohols	Chapter 16.1-16.2A (G&M)
<b>LABS</b>	Sep 29 – Oct 2	17.4: Reduction of 9-Fluorenone/ Purification and Analysis of Acid and Base Species from previous week if necessary	
6	Tue, Oct 6	<b>Lecture:</b> $^{13}\text{C}$ Spectroscopy & DEPT	Chapter 8, pp. 257-260, 283 – 293; chapter 14 (Smith)
	Thu, Oct 8	<b>Lecture:</b> Base-promoted Elimination of RX (KOH vs. $\text{KO}^t\text{Bu}$ )	Chapter 6.3, 6.4, 10.1-10.2 (G&M)
<b>LABS</b>	Oct 5 – 9	16.2A: Oxidation of Alcohols	
7	Tue, Oct 13	<b>Lecture:</b> $^1\text{H}$ Spectroscopy	Chapter 8.3 (G&M) p.257-283
	Thu, Oct 15	<b>Lecture:</b> $^1\text{H}$ Spectroscopy	Chapter 8.3 (G&M) p.257-283
<b>LABS</b>	Oct 12 – 16	Base-promoted Elimination of RX (KOH vs. $\text{KO}^t\text{Bu}$ )	
8	Tue, Oct 20	<b>Review for exam</b>	
	Tue, Oct 20	<b>Exam I:</b> 7:00 – 9:00 PM	
	Thu, Oct 22	<b>Lecture:</b> 10.7 Hydration of Norbornene	Chapter 2.20, 10.7 (G&M)

<b>LABS</b>	Oct 21 – 23	No labs during exam week	
<b>9</b>	Tue, Oct 27	<b>Lecture:</b> $^1\text{H}$ Spectroscopy	Chapter 8.3 (G&M) p.257-283
	Thu, Oct 29	<b>Lecture:</b> 12.3B: Diels-Alder Reaction	Chapter 16 (Smith); chapter 12.1, 12.2, 12.3B (G&M)
<b>LABS</b>	Oct 26 – 30	10.7 Hydration of Norbornene	
<b>10</b>	Tue, Nov 3	<b>Lecture:</b> $^1\text{H}$ Spectroscopy	Chapter 8.3 (G&M) p.257-283
	Thu, Nov 5	<b>Lecture:</b> 20.2: Fisher Esterification	Chapter 20.1-20.2 (G&M)
<b>LABS</b>	Nov 2 – 6	12.3B: Diels-Alder Reaction	
<b>11</b>	Tue, Nov 10	<b>Lecture:</b> $^1\text{H}$ Spectroscopy	Chapter 8.3 (G&M) p.257-283
	Thu, Nov 12	<b>Lecture:</b> 19.4A: Preparation of Triphenylmethanol	Chapter 2.25-2.28; 19.1-19.2, 19.4A (G&M)
<b>LABS</b>	Nov 9 – 13	20.2: Fisher Esterification	
<b>12</b>	Tue, Nov 17	<b>Lecture:</b> Mass Spectrometry	Chapter 8.5 (G&M)
	Thu, Nov 19	<b>Lecture:</b> 15.4: Nitration of Bromobenzene	Chapter 15.1, 15.4 (G&M)
<b>LABS</b>	Nov 16 – 20	19.4A: Preparation of Triphenylmethanol	
<b>13</b>	Tue, Nov 24	<b>Lecture:</b> Mass Spectrometry	Chapter 8.5 (G&M)
	Thu, Apr 26	<b>Thanksgiving Week</b>	
<b>LABS</b>	Nov 23 – 27	No labs this week	
<b>14</b>	Tue, Dec 1	<b>Lecture:</b> Mass Spectrometry	Chapter 8.5 (G&M)
	Thu, Dec 3	<b>Lecture:</b> Mass Spectrometry	Chapter 8.5 (G&M)
<b>LABS</b>	Nov 30 – Dec 4	15.4: Nitration of Bromobenzene	
<b>15</b>	Tue, Dec 8	<b>Lecture:</b> Integrated Spectroscopy Problems	
	Thu, Dec 10	<b>Lecture:</b> Integrated Spectroscopy Problems	
<b>LABS</b>	Dec 7 – 11	Lab: Check-out – <b>YOU MUST SHOW UP TO LAB TO CHECK OUT!!!</b>	
	Thu, Dec 17	<b>Final Exam:</b> 5:00 – 7:00 pm	