

CHEM 4621
Advanced Integrated Lab-Structure

Instructor: Dr. Ismail O. Kady, 431 Brown Hall, Phone: 439-6910, email: kadyi@etsu.edu

Office Hours: Wednesday & Thursday: 2-3pm

Lab Time & Room: Wednesdays 5:00-8:50pm; 418 Brown Hall

Text Book The Systematic Identification of Organic Compounds, by Shriner, et al. 8th ed, Wiley. Available at the ETSU Bookstore.

Other Sources [D2L](#) and hand-outs

Brief Course Objectives

- To apply chemical and spectral techniques to separate & identify unknown samples of organic compounds.
- To learn how to collect and analyze experimental data.
- To learn how to report the results in a technical language and format.

Assignments It is essential that you carefully plan for each experiment before attending lab. Read all assigned background material in the text and prepare appropriate notes in lab notebook.

Notebook You are required to have a **bound** laboratory notebook that is to be used for pre-lab preparation (e.g. notes regarding the experimental procedure, list all reagents and equipment needed for the planned experiment). Also use the note book for recording your raw data and observations during the laboratory period. Your notebook is also the primary source from which individual short reports and formal reports are prepared. You must choose a notebook that has **sewn-in** pages (NOT a spiral notebook or loose-leaf paper), and you should reserve this notebook only for this course. A standard composition notebook is ideal for this purpose. Please refer to "Keeping a Good Notebook" statement mentioned later in this syllabus.

Grading	Exam	20%
	Short Reports	30%
	Formal Report	10%
	Homework Assignments	20%
	Laboratory Notebook	10%
	Lab Techniques/Safety	10%


Lab exam will be based upon the textbook, homework assignments, and all lab activities. **Short Reports** are based upon individual laboratory activities and are due at the end of lab period when experiment is completed. Short report forms are

available on the D2L course web page under "Course Documents", and must be printed out prior to each experiment. One **Formal Report** (on the mixture unknown experiment) is due one week after completing the experiment. Formal report must be typed; the required format of the report is posted on D2L. **Laboratory Notebook evaluation** (unannounced) will be conducted several times throughout the semester, so keep your notebook up to date and ready for evaluation at anytime while in the lab. **Lab Techniques** grade is based upon your general laboratory performance including attendance, promptness, preparedness, organization, safety practices, etc.

Grading Scale	A	93- 100%	B-	77 - 80%	D+	61 - 64%
	A-	89 - 92%	C+	73 - 76%	D	57- 60%
	B+	85 - 88%	C	69 - 72%	F	<57%
	B	81 - 84%	C-	65 - 68%		

Attendance You are expected to make every effort to attend laboratory. Make-up labs may be authorized only for very special reasons (i.e., serious illness, death in family, etc.), and it is the responsibility of the student to document the reason of absence. Make-up of missed lab must be completed within one week. A total of three or more absences, for any reason, will result in a failing grade for the course.

Academic Integrity Policy Please review the Chemistry Department's Academic Integrity Policy posted on D2L under the content section.

Lab Safety All students registered for the lab must complete safety training (by watching the ACS safety video and passing the safety quiz). If you have not done this (on line) in the last year; go to <https://healthsafety.etsu.edu/index/login> and login using your complete e-mail address (i.e. doej@etsu.edu) and your ETSU network password. The site will welcome you, and then you will need to click on the "Training Modules" link on the left side of the page. A list will appear telling you which modules you are registered for. Click on the "Take" option next to Chemistry Safety. Please watch the video and then read all the safety information in the module. When complete, click on the  [Take Training Quiz](#) link at the bottom of the module and take the quiz. **You must complete the safety training by January 19, 2012 or you will be purged from the course. You must also complete and pass the quiz before being allowed in the lab.** If you are purged, you will not be able to add the courses back until you have completed the safety training. Further, you will not be allowed in the laboratory until you have added back the course. The last date to add back the courses is January 25, 2012 at 4:30 p.m..

Additional Safety Notes

Despite the fact that a chemistry lab has potentially hazardous materials, the careful and correct use of chemicals usually circumvents these hazards. Therefore, certain safety precautions will be taken in this lab throughout the semester. Familiarize yourself with the following Department of Chemistry safety rules, as you will be expected to **strictly** adhere to them. If you are found in violation of any one of these safety rules, the instructor may summarily dismiss you from the

laboratory and all work that day will receive a grade of zero. No excuses will be accepted or tolerated.

1. Safety is the responsibility of each person working in the lab.
2. Wear approved chemical splash goggles at all times while you are in the lab. "Approved" means goggles cannot have ventilation holes.
3. Minimize exposure to hazardous chemicals. Do not eat, drink, smoke, chew tobacco, or use snuff in the lab. Never taste chemicals, and do not smell unless specifically directed to do so.
4. You are required to wear clothing that covers you from your neck to below your knees and you are required to wear closed-toed shoes that cover the top of the foot to the ankles. We recommend an old t-shirt and blue jeans. Shoes that do not provide top of the foot protection such as sandals, flip-flops and crocs are forbidden. You are welcome to store proper lab clothes in your lab drawer for your convenience.
5. There might be times when your instructor will require you to wear additional personal protective equipment (PPE) such as a lab apron or gloves when performing particular experimental procedures.
6. Read the label of each chemical container before you use it. Make sure it is the correct chemical and the correct concentration, and that you have read and understood the hazards of each chemical. Dispense chemicals in a hood if so directed. Always dispose of waste chemicals in the proper container. Broken glassware, thermometers, or syringe needles NEVER go in the trash cans!
7. Do not engage in horseplay or unauthorized experiments. Use each piece of equipment only for its intended purpose, and make sure that it is intact before beginning.
8. Do not use electronic devices while in the laboratory. Calculators are ok, but not computers or cell phones.
9. Clean up spills and broken glass. Your instructor will advise you on the best method. Broken mercury thermometers are especially hazardous; notify your instructor immediately if one breaks. Minimize risk of accidents by keeping your work area clean and uncluttered.
10. Flush skin and eyes with water in the event of contact with chemicals. Flush skin exposed to hot objects with cool water. Notify your instructor immediately.
11. Wash your hands before leaving the lab.

Students unwilling to abide by any of these rules will be immediately dismissed.

**Department of
Chemistry
Pregnancy Policy**

Pregnancy introduces a special set of variables to the consideration of hazards in laboratory. While the exposure levels to chemicals commonly encountered in a university laboratory setting pose no or low risk to an adult, they can pose a significantly higher level of hazard to the unborn fetus. Many of these hazards are not well studied, and it is not known what exposure level is safe for an unborn child. It is therefore prudent for pregnant women to limit the unnecessary exposure of a fetus to any chemicals. This is especially true if the chemicals are mutagenic (causes damage to chromosomes) or teratogenic (causes birth defects and/or fetal death).

If you have recently become pregnant or you are anticipating becoming pregnant, you should take this laboratory class at a later time when you are not pregnant to protect your unborn child.

**Keeping a Good
Lab Notebook**

If you were working in a research laboratory, your lab notebook could be the most important scientific document that you write. In legal cases, it is treated as a legal record of your experiments, and is sometimes used to prove when and how you conducted the experiments. Although we doubt that your organic lab notebook will ever appear as evidence in a court of law, we want you to keep a good notebook that is an accurate, permanent record of what you have done in the lab. You have some leeway in how you prepare the notebook, but the following hints should be considered:

- The notebook must be bound. Loose-leaf or spiral notebooks are unacceptable.
- All pages must be numbered in sequence.
- A ballpoint pen with non-erasable ink is preferred.
- All errors must be crossed out with a single line, no scribbles or white-out!
- A clear Table of Contents should appear on the first few pages
- No pages must be missing; do not remove any pages. Pages can be crossed out with an (X) if the entire page is incorrect. Avoid leaving any pages blank. Use front and back of each page.
- All experiments must have titles and dates they are performed. Upon completion of each experiment, sign and date the last page of the experiment.

**Student Mental
Health Mental
Health**

Students often have questions about mental health resources, whether for themselves or a friend or family member. There are many resources available on the ETSU Campus, including: ETSU Counseling Center (423) 439-4841; ETSU Behavioral Health & Wellness Clinic (423) 439-7777; ETSU Community Counseling Clinic: (423) 439-4187.

If you or a friend is in immediate crisis, call 911. Available 24 hours per day is the National Suicide Prevention Lifeline: 1-800-273-TALK (8255).

**Laboratory Schedule - CHEM 4621
(Spring 2012)**

<u>Period</u>	<u>Date</u>	<u>Lab Activity</u>	<u>Background Reading</u>	<u>Homework</u>
1	1/18	Check in; Informational session and review of safety rules and lab policy; Review syllabus and lab schedule	Syllabus & Chapter 1	Safety Training & Online Safety Quiz
2	1/25	Lecture: Examination & Identification of Unknowns (Ch 2 & 3)	Chapter 2 Chapter 3	p64: Problems 10 & 11
3	2/1	Lecture: Separation of Mixtures (Ch 4) & Solubility Classification (Ch 5)	Chapter 4 Chapter 5	p99: Q 7 & 8 p134: Q 4, 6
4	2/8	Lecture: NMR Spectroscopy (CH 6)	Chapter 6	P171: Q 2, 3 P187: Q 5, 6
5	2/15	Lecture: IR Spectroscopy (Ch 7) & Mass Spectroscopy (Ch 8)	Chapter 7 Chapter 8	P225: Q 1, 2, 3 P244: Q 3, 4
6	2/22	Experiment (Unknown #1)	Chapter 9 Chapter 10	P460-61: Q 1, 3, 4 P462: Q 1, 2
7	2/29	Experiment (Unknown #1)	Chapter 9 Chapter 10	P475: Q 1, 3 P489: Q 1, 2, 4
8	3/14	Experiment (Unknown #2)	Chapter 9 Chapter 10	P490-91: Q 2, 3, 5 P492: Q 2, 6, 10
9	3/21	Experiment (Unknown #2)	Chapter 9 Chapter 10	P493: Q I, II, III P495-96: Q 1, 3, 4
10	3/28	Experiment (Unknown #3 Mixture)	Chapter 9 Chapter 10	P497: Q 2, 3, 4 P499: Q 2, 4
11	4/4	Experiment (Unknown #3 Mixture)	Chapter 9 Chapter 10	P500-501: Q 1, 2, 5 P502: Q 2, 3
12	4/11	Experiment (Unknown #3 Mixture)	Chapter 9 Chapter 10	P503: Q 5, 7 P504: Q 2, 4, 6
13	4/18	Experiment (Unknown #3 Mixture) Formal Report due date	Chapter 9 Chapter 10	No Assignments
14	4/25	Exam	Chapters 1-11	