

Fall

CHEM 6371 – Spectroscopic Identification of Organic Compounds

M	22-Aug	Introduction	Intro-1	DC/LG	- Introduction
W	24-Aug	<i>Your undergraduate</i>	Intro-2	DC	- Elemental analysis, sites of unsaturation
F	26-Aug	<i>textbook and</i>	Intro-3	DC	- Mass spectrometry
M	29-Aug	<i>Pavia Chap 1</i>	Intro-4	DC	- Infrared spectroscopy
W	31-Sep		Intro-5	LG	- ¹ H NMR
F	2-Sep		Intro-6	LG	- ¹ H NMR
M	5 Sep		- LABOR DAY		
W	7-Sep		Intro-7	DC	- ¹ H NMR and ¹³ C NMR
F	9-Sep		Intro-8	DC	- Problems
M	12-Sep		Intro-9	DC	- Problems
W	14-Sep		EXAM 1		Fundamental principles and using basic information to solve structures
F	16-Sep	Infrared Spectroscopy	IR-1	LG	- CH, CC bonds
M	19-Sep	<i>Pavia Chap 2</i>	IR-2	LG	- OH, NH bonds
W	21-Sep		IR-3	DC	- CO bonds
F	23-Sep		IR-4	DC	- C=O and CN bonds, reporting IR data
M	26-Sep		IR-5	DC	- Problems
W	28-Sep		EXAM 2		IR, plus use of basic principles of IR and NMR to solve structures
F	30-Sep	Mass Spectrometry	MS-1	DC	- MS techniques
M	3-Oct	<i>Pavia Chap 8</i>	MS-2	DC	- Fragmentation, Hydrocarbons
W	5-Oct		MS-3	DC	- Alcohols, ethers and amines
F	7-Oct		MS-4	LG	- C=O compounds
M	10-Oct		MS-5	LG	- Hal-containing compounds, reporting MS data
W	12-Oct		MS-6	DC	- Problems
F	14-Oct (d)	-	EXAM 3		MS, plus use of basic principles of IR and NMR to solve structures
M	17-Oct		- MID-SEMESTER BREAK		
W	19-Oct	Fundamentals of ¹H and	NMR-1	LG	- Nuclear magnetic resonance theory
F	21-Oct	¹³C NMR Spectroscopy	NMR-2	DC	- ¹ H Number of Peaks, integral
M	24-Oct	<i>Pavia Chap 3,4,5,6</i>	NMR-3	DC	- ¹ H Chemical Shift
W	26-Oct		NMR-4	DC	- ¹ H Multiplicity
F	28-Oct		NMR-5	LG	- More on Multiplicity, reporting NMR data
M	31-Oct		NMR-6	LG	- ¹ H Advanced experiments, decoupling, noe, etc
W	2-Nov		NMR-7	LG	- Problems
F	4-Nov		NMR-8	DC	- Problems
M	7-Nov		EXAM 4		NMR, plus use of MS and IR to solve structures
W	9-Nov	2D, Advanced and	Adv-1	LG	- ¹³ C Number of peaks, symmetry
F	11-Nov	Multinuclear NMR	Adv-2	LG	- Chemical shift, shift calculations
M	14-Nov	<i>Pavia Chap 10</i>	Adv-3	LG	- Edited spectra, APT, DEPT
W	16-Nov		Adv-4	LG	- 2D NMR Theory, COSY
F	18-Nov		Adv-5	LG	- More COSY, NOESY
M	21-Nov		Adv-6	LG	- HETCOR, HSQC
W	23-Nov		Adv-7	LG	- HMBC
F	25-Nov		THANKSGIVING BREAK		
M	28-Nov		Adv-8	LG	- Structure determination
W	30-Nov		Adv-9	LG	- Structure determination
F	2-Dec		EXAM 5		Basic and Advanced NMR techn., & use of MS and IR to solve structures
M	5-Dec	More problems	Problems	DC/LG	
W	7-Dec		Problems	DC/LG	
F	9-Dec		Problems	DC/LG	
M	12 Dec (8:00pm – 10:50pm)		FINAL		Comprehensive

(d) Fri 14 Oct - Last day to withdraw from classes with a "W"

LECTURES

Come prepared to ask and answer questions!

MWF, 11:05-11:55

Molecular Science & Engineering Building (MSE) 1224

OFFICE HOURS

WORK PROBLEMS

Work as many problems as possible, from the notes, from the book, from other sources.

REQUIRED TEXTBOOK

Introduction to Spectroscopy, 4e, Donald L. Pavia, Gary M. Lampman, George S. Kriz, and James A. Vyvyan; *Brooks Cole*; ISBN-10 / ASIN: 0495114782; ISBN-13 / EAN: 9780495114789.

Note: Problems in older and international editions vary from those in the 4th edition.

GRADES

Graded Assignments

	Date	Topic	
Exam 1	14-Sept	Fundamental principles and using basic information to solve structures	100*
Exam 2	28-Sept	IR, plus use basic principles of MS and NMR to solve structures	100*
Exam 3	14-Oct	MS, plus use of basic principles of IR and NMR to solve structures	100*
Exam 4	7-Nov	NMR, plus use of MS and IR to solve structures	100*
Exam 5	2-Dec	Basic and Advanced NMR techn., & use of MS and IR to solve structures	100*
Homework	Various		100
Final	12-Dec	8:00 am-10:50 am: Comprehensive	200

The lowest score of the five mid-term exams (*) will be dropped. If you miss an exam, that score (0) will be dropped. The course grade will be determined based on your score out of 700 points.

Typical Grade Cut-offs

A: 85%+

B: 70-84.99

C: 60-69.99

D: 50-59.99

RETURNED WORK AND REGRADES

All graded assignments will be returned as soon as possible, usually within a week. Work not picked up in lecture will be available from outside of the instructor's office door.

If you want any work regraded you must make a written request and return the assignment within one week. Work will not be regraded after this deadline.

LECTURE ATTENDANCE

It is strongly recommended that you attend all lectures.

MATERIAL COVERED, KEEPING UP, WORKING PROBLEMS, STUDENT RESPONSIBILITIES

You are responsible for all material presented in lectures and in assigned readings. You are also responsible for announcements made in class or by email. You must check your *gatech.edu* email account on a regular basis.

Note: there are potential problems associated with automatic forwarding of messages from your *gatech* mail to other email addresses; check your *gatech* account even if you have it set up to forward email elsewhere.

By the end of each section you should have completed all reading associated with that section, and worked all of the end-of-chapter problems and any additional problems which have been distributed. These questions should form the basis for discussion with your peers, and serve as a guide for the types of questions to appear on examinations (some of these questions might even appear on the exams!) Do not submit answers to these problems, they will not be graded.

EXAMS: SCHEDULE, MAKE-UPS AND DROPS

You must take the exam at the assigned time. All exams are closed to textbooks, class-notes and electronic devices (unless otherwise stated prior to the exam). *Tables of NMR, IR, MS data will be provided.*

The only valid reasons for missing an exam are illness and official GA Tech business. Make-up exams can only be given if advance notification is given or upon presentation of a doctor's note. All make-up exams must be administered before the exams are returned to the class. Exams not made-up by this time for any reason will receive a score of zero and will be the drop grade for the class (i.e., it will be the lowest score).

WORK PROBLEMS

Work as many problems as possible, from the notes, from the book, from other sources.

WORKING IN GROUPS

Most learning takes place *outside* of the classroom. Although lectures should put things in perspective, working through the textbook, and solving the problems is when you will come to terms with the material. We encourage you to work together on these reading and problem assignments. For most students, it is actually unwise to try to work alone. Although you might study in groups, remember that you are ultimately responsible for your learning. Everybody can benefit from team work. If you are struggling with the material you stand to learn a lot; if you are an "Spectroscopic Whiz" you also stand to learn from the challenge of presenting your understanding to others. You will learn through teaching.

Office hours are available for individual instruction. No *new* information will be introduced during office hours. Come prepared to ask *and answer* problems.

COMPETITION AND GRADING

Formal education often puts students in competition with each other for good grades. We do not believe that competition for grades, and the exclusion of everything else, is the most effective way to foster student development. Although grades will be assigned based on a numerical score, which judges attainment on exams/homework, we hope that the course is structured such that if you show a desire to learn, put *the effort in*, and have the intellectual ability, you can get the grade you want.

CANCELLATION OF CLASSES

If class is cancelled by Georgia Institute of Technology owing to campus closing, the entire schedule for the course will be delayed by one lecture. This will move all exams and the homework due dates back by one lecture.

TIME COMMITMENTS

We all have extensive demands on our time. For each hour of lecture you should aim to put in *at least* another two hours of your own time. You will need to spend more time preparing for exams. Some students will require more, some less.

WORK PROBLEMS

Work as many problems as possible, from the notes, from the book, from other sources.

SOME STUDY TIPS

Work Problems. Understand and Rationalize. Read the text, prepare your own summaries. Study in groups. Keep up to date! Ask Questions!! Work more problems. Oh! Almost forgot ... and work even more problems!

STUDENT CLASS ACCOMMODATIONS

Students with disabilities who require reasonable accommodations to fully participate in course activities or meet course requirements are encouraged to register with ADAPTS-Disability Services Program at (404)894-2564 or www.adapts.gatech.edu

Contact the instructors within the first two weeks if you expect to take exams with ADAPTS. Please send reminders one week before each exam.

GEORGIA TECH ACADEMIC HONOR CODE

Please visit www.honor.gatech.edu

Word: Use of any previous semester course materials is allowed for this course. However, this should only serve as examples, not as guidelines for any tests, quizzes, homework, projects, or any other course work that may be assigned during the semester.

The *processes* by which you can solve the problems will be *exactly* the same as those in the book. Occasionally, an exam question will be taken directly from the text.

For Graded Homework Assignments: You may work with others in developing approaches to solve problems, but submitted work must be in your own handwriting. Provide the names of anyone you worked with in developing approaches to the problems.

For Tests: Cheating from another person's exam and use of unauthorized materials are direct violations of the GT Academic Honor Code, and will be dealt with accordingly.

For any questions involving these policies, please discuss them with the instructors or consult www.honor.gatech.edu.

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