Fall 2015

http://ww2.chemistry.gatech.edu/~collard/SpecID/fall2015.html
https://t-square.gatech.edu/portal (for grades)

CHEM 6371 – Spectroscopic Identification of Organic Compounds
CHEM 4341 – Applied Spectroscopy

						Topic	*Reading (4e)*
M	17-Aug	**Introduction**	Intro-1		**LG**	Introduction	
W	19-Aug	*Your undergraduate*	Intro-2		**LG**	Elemental analysis, sites of unsaturation	1:1-1.5
F	21-Aug	*textbook and*	Intro-3		**LG**	Mass spectrometry	1:6 + *ug text*, 8.7
M	24-Aug	*Pavia Chap 1,3*	Intro-4	**HW 1**	**DC**	Infrared spectroscopy	2: intro -7+ *ug text*
W	26-Aug		Intro-5		**DC**	^{1}H NMR	3:1-3.9
F	28-Aug		Intro-6		**DC**	^{1}H NMR	3:10-17
M	31-Aug		Intro-7		**DC**	1H NMR and 13C NMR	3:19 + 4:14.2A
W	2-Sep		Intro-8	**HW 2**	**DC**	Problems	3:q1-12
F	4-Sep		EXAM1			Fundamental principles, using basic information to solve s	
M	7-Sep		***LABOR DAY***				
W	9-Sep	**Infrared**	IR-1		**DC**	CH, CC bonds	2:8-11
F	11-Sep	**Spectroscopy**	IR-2		**DC**	OH, NH bonds	2:12,14F,15
M	14-Sep	*Pavia Chap 2*	IR-3		**DC**	CO bonds	2:13
W	16-Sep		IR-4		**DC**	C=O and CN bonds, reporting IR data	2:14,16,**17-21**
F	18-Sep		IR-5	**HW 3**	**DC**	Problems	*2:q1-11*
M	21-Sep		**EXAM 2**			IR, plus use of basic principles of IR and NMR to solve structures	
W	23-Sep	**Mass Spectrometry**	MS-1		**DC**	MS techniques	8:intro-6
F	25-Sep	*Pavia Chap 8*	MS-2		**DC**	Fragmentation, Hydrocarbons	8:8A-C,I-M
M	28-Sep		MS-3		**DC**	Alcohols, ethers and amines: α-cleavage	8:8N-O,T
W	30-Sep		MS-4	**HW 4**	**DC**	C=O compounds	8:8P-**U**
F	2-Oct		MS-5		**DC**	Hal-containing compounds, reporting MS data	8:8V
M	5-Oct		MS-6	**HW 5**	**DC**	Problems	*8:q1-15*
W	7-Oct		**EXAM 3**			MS, plus use of basic principles of IR and NMR to solve structures	
F	9-Oct	--	*no lecture*				
M	12-Oct	--	***MID-SEMESTER BREAK***				
W	14-Oct	**^{1}H and ^{13}C NMR**	NMR-1		**LG**	Nuclear magnetic resonance theory	
F	16-Oct	**Spectroscopy**	NMR-2		**DC**	^{1}H Chemical Shift	6:1-5
M	19-Oct	*Pavia Chap 4,5,6*	NMR-3		**DC**	^{1}H Chemical Shift	6:6-10
W	21-Oct		NMR-4		**DC**	^{1}H Multiplicity	5:1-6
F	23-Oct		NMR-5		**LG**	^{1}H Multiplicity, reporting NMR data	5:7-11
M	26-Oct		NMR-6	**HW 6**	**LG**	^{13}C Chemical shift, shift calculations	4:1-4,11-16
W	28-Oct		NMR-7		**LG**	Decoupling, noe, etc	4:5-9 and 6.11
F	30-Nov		NMR-8		**LG**	Edited spectra, APT, DEPT	4:10 and 10.4-5
M	2-Nov		NMR-9		**LG**	Problems	9:intro-q21
W	4-Nov		NMR-10	**HW 7**	**LG**	Problems	*9:q22-43*
F	6-Nov		**EXAM 4**			NMR, plus use of MS and IR to solve structures	
M	9-Nov	**2D, Advanced and**	Adv-1		**LG**	2D NMR Theory	10:1,6
W	11-Nov	**NMR**	Adv-2		**LG**	COSY	10:7
F	13-Nov	*Pavia Chap 10*	Adv-3		**LG**	NOESY	10.10
M	16-Nov		Adv-4	**HW 8**	**LG**	HETCOR, HSQC	10.8-9
W	18-Nov		Adv-5		**LG**	HMBC	
F	20-Nov		Adv-6	**HW 9**	**LG**	Problems	*10:12,q1-11*
M	23-Nov		**EXAM 5**			Basic and Adv NMR, and use of MS and IR to solve structures	
W	25-Nov	--	*no lecture*				
F	27 Nov	--	***THANKSGIVING BREAK***				
M	30-Nov	**More problems**	Problems		**LG**		
W	2-Dec		Problems		**LG**		
F	4-Dec		Problems		**LG**		
W	9-Dec (8:00 am – 10:50 am)		**FINAL**			Comprehensive	

INSTRUCTORS

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LECTURES

Come prepared to ask and answer questions!
MWF, 11:05-11:55
Molecular Science & Engineering Building (MSE) 1201A

OFFICE HOURS

Collard – first half of course
Friday noon-1 p.m.

Gelbaum – second half of course
Tuesday 1:00 - 2:00 p.m.

or by appointment!

WORK PROBLEMS

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

REQUIRED TEXTBOOK

Introduction to Spectroscopy, *4e or 5e*, Donald L. Pavia, Gary M. Lampman, George S. Kriz, and James A. Vyvyan; *Brooks Cole;* ISBN-10 / ASIN: 0495114782; ISBN-13 / EAN: 9780495114789.
Note: Section numbers and problems vary for different editions (U.S.)

GRADES

Graded Assignments

	Topic	
Exam 1	Fundamental principles and using basic information to solve structures	100 points†
Exam 2	IR, *plus use basic principles of MS and NMR to solve structures*	100 points†
Exam 3	MS, *plus use of basic principles of IR and NMR to solve structures*	100 points†
Exam 4	NMR, *plus use of MS and IR to solve structures*	100 points†
Exam 5	Basic and Advanced NMR techn., *plus use of MS and IR to solve structures*	100 points†
Homework	Nine HW assignments (score normalized to 100 points)	100 points
Final	8:00 am-10:50 am: Comprehensive	200 points

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. *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, along with a periodic table, 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 (typically before the next 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 provide a framework for learning and 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 a "spectroscopy wizard" 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.*

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

For Graded Homework Assignments: You may work with others in developing approaches to solve problems, but submitted work must be in your own handwriting.

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.

LASTLY
Work as many problems as possible, from the notes, from the book, from other sources; work hard; enjoy.