Fall 2017

http://ww2.chemistry.gatech.edu/~collard/SpecID/fall2017.html
https://t-square.gatech.edu/portal (for grades)

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

					Office	*Topic*	*Reading (4e)*
M	21-Aug	**Introduction**	Intro-1	**DC**	Tu-DC	Introduction	
W	23-Aug	*Your intro organic*	Intro-2	**DC**		Elemental analysis, sites of unsaturation	1:1-5*+ intro text*
F	25-Aug	*textbook and*	Intro-3	**DC**		Mass spectrometry	1:6;8.7*+ intro text*
M	28-Aug	*Pavia Chap 1,3*	Intro-4	**DC**	Tu-DC	Infrared spectroscopy	2:intro -7*+ intro text*
W	30-Aug		Intro-5 **HW 1**	**DC**		^{1}H NMR	3:1-9*+ intro text*
F	1-Sep		Intro-6	**DC**		^{1}H NMR	3:10-17*+ intro text*
M	4-Sep		***LABOR DAY***		Tu-DC		
W	6-Sep		Intro-7	**DC**		^{1}H NMR and ^{13}C NMR	3:19;4:14.2A*+ intro text*
F	8-Sep		Intro-8 **HW 2**	**DC**		Problems	***Q3.1-12***
M	11-Sep		**EXAM1**		Tu-DC	Fundamental principles, using basic information to solve structures	
W	13-Sep	**Mass Spectrometry**	MS-1	**DC**		MS techniques	
F	15-Sep	*Pavia Chap 8*	MS-2	**DC**		Fragmentation, Hydrocarbons	
M	18-Sep		MS-3	**DC**	Tu-DC	Alcohols, ethers and amines: α-cleavage	
W	20-Sep		MS-4 **HW 3**	**DC**		C=O compounds	
F	22-Sep		MS-5	**DC**		Halo compounds, reporting MS data	
M	25-Sep		MS-6 **HW 4**	**DC**		Problems	
W	27-Sep		MS-7	**DC**		Problems	
F	29-Sep		**EXAM 2**			MS, plus use of basic principles of IR and NMR to solve structures	
M	2-Oct	**Infrared**	IR-1	**LG**	M-LG	CH, CC bonds	2:8-11
W	4-Oct	**Spectroscopy**	IR-2	**LG**		OH, NH bonds	2:12;14F,15
F	6-Oct	*Pavia Chap 2*	IR-3 **HW 5 (MS)**	**DC**		CO bonds	2:13
M	9-Oct		***FALL RECESS***		Tu-DC		
W	11-Oct		IR-4	**DC**		C=O and CN bonds, reporting IR data	2:14,16-21
F	13-Oct		IR-5 **HW 6**	**DC**		Problems	***Q2.1-11***
M	16-Oct		**EXAM 3**		Tu-DC	IR, plus use of basic principles of IR and NMR to solve structures	
W	18-Oct	**^{1}H and ^{13}C NMR**	NMR-1	**LG**		NMR theory	
F	20-Oct	**Spectroscopy**	NMR-2	**LG**		^{1}H Chemical Shift	6:1-5
M	23-Oct	*Pavia Chap 4,5,6*	NMR-3	**LG**	M-LG	^{1}H Chemical Shift	6:6-10
W	25-Oct		NMR-4	**LG**		^{1}H Multiplicity	5:1-6
F	27-Oct		NMR-5	**LG**		^{1}H Multiplicity, reporting NMR data	5:7-11
M	30-Oct		NMR-6 **HW 7**	**LG**	M-LG	^{13}C Chemical shift, shift calculations	4:1-4,11-16
W	1-Nov		NMR-7	**LG**		Decoupling, NOE, etc	4:5-9; 6.11
F	3-Nov		NMR-8	**LG**		Edited spectra, APT, DEPT	4:10; 10.4-5
M	6-Nov		NMR-9	**LG**	M-LG	Problems	9:intro-21
W	8-Nov		NMR-10 **HW 8**	**LG**		Problems	***Q9.22-43***
F	10-Nov		**EXAM 4**			NMR, and use of MS and IR to solve structures	
M	13-Nov	**2D NMR**	Adv-1	**LG**	M-LG	2D NMR Theory	10:1,6
W	15-Nov	*Pavia Chap 10*	Adv-2	**LG**		COSY	10:7
F	17-Nov		Adv-3	**LG**		NOESY	10.10
M	20-Nov		Adv-4 **HW 9**	**LG**	M-LG	HETCOR, HSQC	10.8-9
W	22-Nov		***THANKSGIVING***				
F	24 Nov		***BREAK***				
M	27-Nov		Adv-5	**LG**	M-LG	HMBC	
W	29-Nov		Adv-6 **HW 10**	**LG**		Problems	***Q10.1-11***
F	1-Dec		**EXAM 5**			Basic and Adv. NMR, MS and IR to solve structures	
M	4-Dec	**More problems**	Problems	**DC**	Tu-DC	Problems	
W	8-Dec (8:00-10:50 a.m.)		**FINAL**			Comprehensive	

INSTRUCTORS

David M. Collard
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Leslie Gelbaum
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Tuesday 1:00-2:00 p.m.
MoS&E 2100J

Monday 3:00 - 4:00 p.m.
MS&E 113

Office hours are only for weeks in which the particular instructor is teaching (see schedule); or by appointment

Throughout the semester, Ashley Johns (ajohns31@gatech.edu) and Bronson Cox (bcox35@gatech.edu) may present solutions to problems in class. They may be consulted regarding these approaches.

LECTURES

Come prepared to ask <u>and answer</u> questions!
MWF, 11:15-12:05
College of Computing (CoC) 17

WORK PROBLEMS

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

REQUIRED TEXTBOOK

"Introduction to Spectroscopy"

This text is currently in its *fifth edition*. You may choose to buy a new copy or a used copy, or a used copy of the fourth edition. The syllabus (above) indicates section numbers in the 4e.
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: Section numbers and problems in older and international editions vary from those in the 4th edition (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	Ten HW assignments (score normalized to 100 points)	100 points
Final	Wed Dec 14 at 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.

<u>Typical</u> 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.

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 ODS-Office of Disability Services at (404)894-2564 or www. http://disabilityservices.gatech.edu

Contact the instructors within the first two weeks if you expect to take exams with ODS. 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.