

# The University of Missouri at Columbia

## Chemistry 2030 – *Survey of Organic Chemistry* - Fall Semester 2012

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Professor: Dr. Rainer Glaser  
Office: 321 Chemistry Building  
Email: [glaserr@missouri.edu](mailto:glaserr@missouri.edu)  
Dr. Glaser's Home Page: <http://faculty.missouri.edu/~glaserr>  
Lectures: TR 8:00 - 9:15 am, Jesse Wrench Auditorium  
First Meeting: Tuesday, August 21, 2012  
Office Hours: TR 10:00 am – 10:50 am, and by appointment  
Course Web Site: [http://faculty.missouri.edu/~glaserr/RG\\_T\\_FS12.html](http://faculty.missouri.edu/~glaserr/RG_T_FS12.html)

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Organic chemistry is pervasive in every aspect of modern life. Chemistry is the central science and every science major needs to master chemistry. Aside from your professional needs for chemistry knowledge, many consumer choices, economic choices and political choices require the understanding and competent application of chemical concepts. Chemistry knowledge thus informs both the professional life of a science students as well as his/her life as good citizen in a democratic society. It is the goal of this course to teach students the abilities to...

- [1] Learn the (symbolic) language of organic chemistry.
- [2] Develop clear conceptual ideas and quantitative knowledge about the sources, properties, reactions and uses of organic chemical materials.
- [3] Access online journals and databases and extract information from these sources.
- [4] Understand the historical context and the culture of the field of organic chemistry and to judge their own work and the work by others in that context.
- [5] Enable autodidactic behavior - the utopian goal. Still trying...

#### Course Materials

- (1) REQUIRED: *Organic Chemistry: A Short Course, 13/e.* Hart, H.; Hadad, C. M.; Craine, L. E.; Hart, D. J. (2011) Brooks/Cole: Belmont, CA. (Amazon: US\$ 160.31, 05/03/12).
- (2) OPTIONAL: *Study Guide with Solutions Manual for Hart/Craine/Hart/Hadad's Organic Chemistry: A Short Course, 12/e.* Hart, D. J. (2006) Brooks/Cole: Belmont, CA. (Amazon: US\$ 82.81, 05/03/12).
- (3) REQUIRED: *HGS Molecular Structure Model Kit.* (2003) W. H. Freeman and Company, Distributor, ISBN 0-716-74822-3, or similar item. (Amazon: Prices vary greatly depending on seller, 08/07/12; BN.com: US\$ 54.25, 08/09/12).
- (4) REQUIRED: Sapling Learning. Homework site: University of Missouri, Columbia - CHEM 2030 – GLASER (US\$ 29.99). See course web site for more information.

## **Tests & Grading**

There will be graded homework (100 points), four 1h-tests (100 points each) and the 2h-final (200 points) for a total of **700 points** of the course. You will be provided with performance data for tests (i.e., average, standard deviation, minimum & maximum scores) so that you can assess your relative performance. We aim for test averages of about 65±5% but there are fluctuations. Your letter grade will be assigned at the end of the course considering your overall performance (in percent) in relation to the course average and the distribution of student total scores (i.e., the standard deviation of the distribution). The target for the course is an average of B-C.

In concert with the policy of the Department of Chemistry, there will be no make-up exams for individual students. If an exam is missed for a legitimate reason (sickness etc., with acceptable written proof), your overall performance (in percent) will be determined based on the reduced total (i.e., based on 600 points if you missed one test). If you know in advance that you will not be able to take an exam for a certain reason, talk to the instructor before that test. If you miss a test without a legitimate reason, you will receive a score of zero points. Participation in the final is required to complete the course.

**Final Examination.** Time and date of the final examination are determined by Article V of the Academic Regulations which are designed to protect students from irregularities in the administration of final examinations. The following two excerpts from Article V are relevant to this graduate class. (1) No teacher will hold an examination during any time other than the regular meeting time of the class or the time as approved by the Registrar for both final and multi-section examinations. The only exception is that examinations in courses numbered 8000 and above may be conducted at any time agreeable to both the teacher and the students. (2) No examination may be held during Stop Day.

**Instructional Communication Policy.** The University of Missouri is determined to promote effective communication between students and academic personnel involved in instruction. To report communication problems contact the Director of Undergraduate Studies, MU Department of Chemistry.

**Academic Honesty.** Academic integrity is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards breaches of the academic integrity rules as extremely serious matters. Sanctions for such a breach may include academic sanctions from the instructor, including failing the course for any violation, to disciplinary sanctions ranging from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, collaboration, or any other form of cheating, consult the course instructor.

**Students with Disabilities.** If you anticipate barriers related to the format or requirements of this course, if you have emergency medical information to share with me, or if you need to make arrangements in case the building must be evacuated, please let me know as soon as possible. If disability related accommodations are necessary (for example, a note taker, extended time on exams, captioning), please register with the Office of Disability Services (<http://disabilityservices.missouri.edu>), S5 Memorial Union, 882-4696, and then notify me of your eligibility for reasonable accommodations. For other MU resources for students with disabilities, click on "Disability Resources" on the MU homepage.

**Intellectual Pluralism.** The University community welcomes intellectual diversity and respects student rights. Students who have questions or concerns regarding the atmosphere in this class (including respect for diverse opinions) may contact the Departmental Chair or Divisional Director; the Director of the [Office of Students Rights and Responsibilities](http://osrr.missouri.edu/) (<http://osrr.missouri.edu/>); or the [MU Equity Office](http://equity.missouri.edu/) (<http://equity.missouri.edu/>), or by email at [equity@missouri.edu](mailto:equity@missouri.edu). All students will have the opportunity to submit an anonymous evaluation of the instructor(s) at the end of the course.

**Executive Order #38, Academic Inquiry, Course Discussion and Privacy. Faculty not allowing recording:** University of Missouri System Executive Order No. 38 lays out principles regarding the sanctity of classroom discussions at the university. The policy is described fully in Section 200.015 of the Collected Rules and Regulations. In this class, students may not make audio or video recordings of course activity, except students permitted to record as an accommodation under Section 240.040 of the Collected Rules. All other students who record and/or distribute audio or video recordings of class activity are subject to discipline in accordance with provisions of Section 200.020 of the Collected Rules and Regulations of the University of Missouri pertaining to student conduct matters. Those students who are permitted to record are not permitted to redistribute audio or video recordings of statements or comments from the course to individuals who are not students in the course without the express permission of the faculty member and of any students who are recorded. Students found to have violated this policy are subject to discipline in accordance with provisions of Section 200.020 of the Collected Rules and Regulations of the University of Missouri pertaining to student conduct matters.

HEAD CASE | FEBRUARY 5, 2011

## Sunset of the Solo Scientist

By JONAH LEHRER



In recent weeks, President Barack Obama has focused on the importance of innovation for "winning the future." It's our new ideas, he says, that will solve our energy problems, increase exports and create high-paying jobs. "This is our generation's Sputnik moment," he said in the State of the Union speech. "We need to out-innovate the world."

[View Full Image](#)

Masterfile

A brilliant researcher, barely out of his teens and working alone? Scratch that: Today's ideal scientist is close to 40 and working on a team.

The question, of course, is where these new ideas will come from. For centuries, the Western model of innovation has been simple: We've relied on young geniuses. From Da Vinci to Einstein, from Newton to Darwin, our most revolutionary breakthroughs have typically emerged from individuals, working by themselves.

But that model appears to be as old-fashioned as the manual typewriter. In recent years, it's become increasingly clear that our best ideas no longer come from solitary researchers. (Here's a quick test: Name a current scientist as influential as Einstein or an inventor as famous as Edison.) If America is going to

"out-innovate" the world, it's not because we have more youthful geniuses, toiling away alone in a lab. The age of the great scientific thinker is over.

### Complexities of Human Learning

Human learning is complex rather than simple. Learners are apt to learn more than one thing at a time. Sometimes this process is conscious, as when one simultaneously or rapidly assimilates many specific items of a whole. More often, the process is entirely or partly unconscious, as when the student learns some "content" consciously but at the same time absorbs unwittingly a great deal more from interrelationships, tones of voice, and so on.

Educators are therefore becoming increasingly concerned with these concomitant learnings. They are aware that the long-term significance of the arithmetical skill that the student consciously learns may be nugatory compared with the importance of what he learns about himself as a learner, about his capacities and limits, about his relationship with his teacher, about power and authority, about his relationships with his fellow students, about equality, collaboration, competition, and friendship. As educators become more knowledgeable about the importance of learning climates, they are impelled to abandon simplified techniques of teaching in favour of a more complex approach that views learning in the context of a matrix of relationships and forces that act upon the student, the teacher, the school, and the community.

*Excerpt from the Encyclopedia Britannica*

## Activities

### I. Commitment

CHEM2030 is a demanding course and a commitment must be made. Merriam Webster's Dictionary defines **commitment** (noun, 1621) as “**a**: an agreement or pledge to do something in the future; *especially*: an engagement to assume a financial obligation at a future date **b**: something pledged **c**: the state or an instance of being obligated or emotionally impelled (a *commitment* to a cause).”

For every hour of lecture, you are expected to spend two hours studying. This means that you are expected to spend 6 hours every week studying for this course in addition to the 3 contact hours. So, this course requires 9 hours of your time every week and this needs to be clear to you from the start. And before tests you might want to put in a few extra hours on top of that. While this course is demanding, it also is fair in that there will be clear expectations as to what you need to do. Just coming to lecture and putting in a few hours before a test is a strategy that does not work in chemistry. A permanent effort is needed and a planned commitment of time to spend on studying chemistry.

### II. Lectures

Try to read the material in the book before it is covered in class. We want to “talk about chemistry” in class. After the lecture, read the material again and test yourself, possibly in small groups. If uncertainties remain, review the material again, talk to one of the teaching assistants, or come to see me during office hours.

### III. Homework

Homework will be assigned weekly and consists in online organic chemistry question sets. The sets usually will be accessible at noon on Mondays and they will be due a week later. The average percentage of your ten best scores counts toward the course grade (max. 100/700).

### IV. Collaborative Group Activities

Chemistry is very much like a language. You need to learn the structures and the names of compounds and their properties. This is much like learning the spelling and the meaning of new words in a foreign language. Then you need to learn the rules governing the reactions of these molecules. There is a grammar to chemistry just like there is grammar in language. Nobody would expect a language student to be able to speak the language after “attending lectures” and “studying the book.” A language is learned by “speaking in the language” and the same is true for chemistry. You need to put yourself in situations in which you “talk chemistry.”

It is encouraged that you study in small groups with CHEM 2030 peers. Talking chemistry with your peers, working together, obtaining feedback obtained from your peers, all of these mechanisms will provide opportunities for more active learning, will create the framework for support and constructive criticism, and will teach you valuable lessons on group dynamics.

There are some obvious ways to find your peers. Some of you might know each other from courses previously taken together, from living in the same dorm, engaging in the same sports, you might know each other from Greek Life, and so forth. Consider practical aspects (where does (s)he live, what times is (s)he available, ...), personal matters (do you think you can get along with this student ...), and academic issues (peer's ability and motivation) when you select study partners.