

			Anil Damarancha, ardamarancha@alaska.edu
73262	Thursday	2:45 - 5:45	Ginna Quesada, quesada.ginna@gmail.com
73763	Thursday	6:00 - 9:00	Anil Damarancha, ardamarancha@alaska.edu
73766	Friday	2:15 - 5:15	Ginna Quesada, quesada.ginna@gmail.com

### **Instructor**

Thomas Green, Professor of Chemistry

Reichardt 174, Phone: 474-1559 [Email: tkgreen@alaska.edu](mailto:tkgreen@alaska.edu)

Office Hours: Tues 1-3, Wed 1-2

### **Teaching Assistant Office Hours**

TBA

### **Course Materials Required:**

1. Lab notebook for recording experimental data, results and conclusions. The lab notebook will be supplied by the department. Student Lab Notebook, 2012 Book Factory, Lab-050-7GSS, 50 pages.
2. Textbook: Making the Connections<sup>3</sup>; A How-to-Guide for Organic Chemistry Lab Techniques, 3<sup>rd</sup> edition, Anne B. Padias, 2015, Hayden McNeil.

**Course Description:** A laboratory designed to illustrate modern techniques of isolation, purification, analysis and structure determination of covalent, principally organic, compounds. Lab portion will include an introduction to synthetic techniques and spectroscopy. Special fees apply.

**Course Goals.** Learn the following practical aspects of organic synthesis.

1. Common safety procedures.
2. Reaction methods
3. Isolation Procedures
4. Pur

### **Student Learning Outcomes**

1. Know the hazards associated with common chemicals, especially those encountered in the experiments.
2. Know how to safely assemble reaction systems using glassware commonly employed in the organic laboratory. These methods include reflux, heating and cooling of reactions, and addition of reagents.
3. Know how to isolate and purify organic products using methods such as extraction, filtration, crystallization, distillation, solvent removal, and thin layer chromatography.
4. Learn the importance of stoichiometry to a chemical reaction. Learn how to assess the efficiency of a chemical reaction (percent yield and atom economy).
5. Learn the practical aspects of spectroscopic analyses of organic compounds.
6. Learn how to build and optimize simple molecules using WebMO/Gaussian and how to measure properties of those molecules.

### **Instructional Methods**

1. The instructor or teaching assistant will provide a brief introduction on the practical aspects of organic chemistry, using a combination of Power Point slides and Chalkboard. The Lab Schedule will be available on Blackboard and at the e(a)-15(c)-5(k)-9(b6 nBT )-5(k-19(e)-5( )-19(a)-5( )-o)-2C o,

## 8. Conclusions

- Is the product pure from the mp range and the NMR/IR spectra? Compare to literature where possible.
- If impure, can any impurities be identified?
- Is the yield consistent with expectations for this experiment? If not, why was the yield low?

**Laboratory Safety:** Laboratory safety is a major concern of all chemical laboratories but is especially important in organic labs due to the presence of flammable solvents, potentially hazardous fumes, highly reactive reagents, etc. The first lecture will deal explicitly with these hazards and the appropriate safety measures you must follow. Subsequent lectures, besides covering the theory and pitfalls of the coming weeks' experiments and perhaps helping you interpret the previous week's experiment, will also cover specific hazards that you may encounter. Please attend these lectures and be prepared for the lab by doing any assigned readings and completing the Pre-lab exercises before coming to lab. If you are not prepared for lab you may be asked to leave.

## Grading

Category	Points
Lab Reports	35 pts x 9 = 315 pts
Lab Notebook	50 pts
Spectroscopy HW	35 pts x 3 = 105 pts
<b>Total Points</b>	<b>470 pts*</b>

\*The points that you earn will be normalized to 250 pts and incorporated into your overall grade for the course. For example, if you earn 400 pts, then you will receive  $400/470 \times 250 = 213$  pts. See the lecture syllabus for more detail.

## Notes and Policies:

- Students are expected to perform experiments following commonly accepted safety protocols.
- Safety glasses must be **worn at all times during lab**.
- Class attendance is expected and role will be taken.
- Make-up labs will be allowed with a legitimate excuse. Excuses must be approved by the instructor.
- All labs must be completed to receive a passing grade.
- You will often be asked to work with another student in pairs. You are expected to contribute equally with your partner in carrying out the experiment. Each student is required to complete and submit a lab report.
- Late reports are penalized 10% per day up to 1 week and then not accepted.**

**Lab Schedule** – see Blackboard for specific Experimental Procedures and Report Forms.

Experiment	Week of	Concepts/Techniques
Exp 1: WebMO/Solvents	August 27	

## Exp 5: Limonene from Orange Peel