CHEMISTRY 261L (01, 02)

(CHE 261L)

ORGANIC CHEMISTRY II / LABORATORY

"Welcome Back to What You Love Experimenting: CHEMISTRY!!!"

Summer 2006 / Session B / July 3 – August 4

1:00 PM - 5:00 PM (01) Tuesday & Thursday
5:30 PM - 9:20 PM (02) Tuesday & Thursday

Jennings Hall 325 (JE 325)

Olivier J.-C. Nicaise, Ph.D., Professor of Potions and Elixirs
Jan Pikul, M.S., Laboratory Instructor

Office: 327 Jennings Hall Laboratories: 329 & 325 Jennings Hall

Phone: (203) 392-6271 Home: (203) 230-8466 E-mail: nicaiseo1@southernct.edu

COURSE OBJECTIVE AND DESCRIPTION

YOU CANNOT SERIOUSLY CONSIDER **LEARNING** ABOUT SCIENCE WITHOUT **PRACTICING** IT. Well, if there is A SCIENCE that especially requires practicing it in order to seriously consider learning about it, this is CHEMISTRY for sure! Also, if there is A SCIENCE that is AN EXPERIMENTAL SCIENCE, this is CHEMISTRY for sure!

Well, still need to be convinced about the necessity of a 100% experimentally-oriented laboratory course such as CHEMISTRY 261L?????!

The main objective of CHEMISTRY 261L is to 1) "consolidate", and 2) expand your knowledge of Organic Chemistry acquired in the "Organic Chemistry II" lectures *via* the **PRACTICE** of Organic Chemistry; especially the **PRACTICE of Synthetic Organic Chemistry**.

The primary focus of CHEMISTRY 261L is mostly on the **use** of the basic experimental techniques learned during the previous session, and that are important to the **synthetic organic chemist** toward the **preparation**, the **isolation**, the **purification**, and the **analysis** of the products of a wide variety of organic reactions. We will concentrate our efforts on the synthetic and mechanistic aspects of a wide variety of organic reactions, with the goal of illustrating and bringing together as many of the concepts from the "Organic Chemistry II" lectures as possible.

Spectroscopy, a means to gather information about the structure of molecules by making physical measurements on compounds, will be systematically used.

It is absolutely required that EVERY student registered in CHE 261 has a working understanding of Organic Spectroscopy (*e.g.*, ^{1}H & ^{13}C NMR, IR, MS, and UV-Vis).

OTHER REMARKS OF GENERAL INTEREST

Arrive at lab ready to do chemistry!!! Preparation for the laboratory includes reading the laboratory procedure (handout) and supporting material (if any), and preparing your notebook in advance.

Pre-lab discussions will be kept to "a minimum". Post-lab –actually, mid-lab– discussions will be *occasionally* conducted to ensure that the key points of the exercises (the experiments!) have been understood, to generalize the concepts beyond the specific examples used, and will *always* conclude with the post-laboratory question sheets.

Laboratory is scheduled for a ca. four (4) hour period. Realize that the time needed to complete the laboratory will depend on the actual experiment and your preparedness.

ATTENDANCE POLICY

PROMPT ATTENDANCE FOR LABORATORY SESSIONS IS REQUIRED. Students arriving late to laboratory sessions will not be able to participate in the pre-lab discussion, and thus, and will not be allowed to complete the exercise.

If you **must** miss a lab, you **must** be excused **by me, OJ-CN**. A legitimate excuse for missing a lab "can be" illness. Other situations may also be considered legitimate (by me, OJ-CN, and me only), but they better be rock-solid legitimate situations! If you **must** miss a lab, contact me **as soon as possible after the lab** (***within 24 hours***) or, if possible –actually, highly recommended!–, **let me know before the lab**. If you miss a lab and do not contact me ***within 24 hours***, you will receive zero points for both the post-laboratory question sheet and the laboratory report. Under **NO** circumstances will

you be allowed to miss more than one (1) lab. Hey, it's Summer Organic, there is NO time for missing lab work!

SAFETY CONSIDERATIONS

There is only one kind of laboratory –one that is safe, clean, well organized, and in an environment conducive to learning; and discovery! This is the kind of laboratory which must be run in this course. **Students not dressed properly or prepared properly will NOT be permitted into the laboratory.**

- **Protective eye covering in the form of APPROVED safety goggles or safety glasses must be worn in the laboratory at ALL times.** The use of contact lenses is highly not advisable. Sun glasses are not acceptable.
- **Proper attire is mandatory**, as is strict attention to all safety guidelines at all times. Yes, it might be Summer Organic! Still, **sandals and shorts are NOT permitted into the laboratory**. In other words, closed toe shoes or boots, socks and long pants are required. Shirts must cover the midsection (speaking of that, just like in the Organic Chemistry Laboratory, don't wear a midriff-bearing tank top to the Vatican, you won't be allowed inside!). Finally, aprons or lab coats are recommended.
- **Eating, drinking, or smoking are never permitted in the laboratory.**

REQUIRED SUPPLIES

- You will receive handouts detailing the experimental procedure you will follow for each lab.
- Approved safety goggles or safety glasses.
- **BOUND** laboratory notebook (use the one from last session).

"STRONGLY RECOMMENDED SUPPLIES"

- "A minimum of interest" in experimental chemistry, as before.
- Some manual dexterity, as before.
- And some good common sense, as before.

OPTIONAL SUPPLIES

- Lab coat OR apron.

OFFICE HOURS

- "OPEN DOOR" policy at all time.

(That is, if the door is open, feel free to 'knock'. If the door is closed, I am VERY probably in the Laboratories (JE 329 or JE 325); so, come & see me!).

- AT FIXED HOURS: **Mondays, 12:30 - 2:00 pm**
  Wednesdays, 12:30 - 2:00 pm
- Office hours may also be held by appointment.

CHEMISTRY 261L FORMAT

The **laboratory contribution (CHE 261L)** to the final grade in CHEMISTRY 261 is ***ca. 21% of the Total Points***. Thus, the laboratory makes a greater contribution to the final course grade than does any single examination. The laboratory can offset a low examination grade in CHE 261. The laboratory work is dependent mostly on individual efforts and dedication of the students to writing good reports at their own convenience. Thus, the laboratory grade is dependent on effort as well as mastery of specific techniques. The **laboratory grade** is a cumulative average based on the **laboratory notebook** *(20 Points)*, the **laboratory reports** *(120 Points)*, and the **post-laboratory question sheets** *(35 Points)*, as indicated below.

With this being said, SCSU Chemistry Department policy requires that students taking courses which include lecture AND laboratory **MUST PASS THE LABORATORY** in that course in order to **PASS THE COURSE**, regardless of the average grade received in lecture. A **passing grade** for the **LABORATORY** in that course requires that you achieve **AT LEAST 60% of the lab points** in that course, *i.e.*, **a minimum of 105 Points** (0.60 x 175pts) in the present case (CHE 261L); a piece of cake, believe me!

- **Laboratory Notebooks.** *20 Points (11% of Lab Points)*

Laboratory notebooks **will not be** systematically collected -and graded- at the end of each laboratory session. However, you will be required to maintain a *"research quality"* laboratory notebook. I will keep an eye on the "maintenance" of laboratory notebooks during the course of the laboratory sessions, but I may also collect laboratory notebooks once during the course of the Summer / Session B, and write some comments in them –if necessary!

Laboratory notebooks will be definitely collected on the **last week of laboratory** (week of **July 31, 2006**), and can be turned in, **AT THE VERY LATEST**, on the last day of lecture, *i.e.*, **August 3, 2006**. You may receive up to a total of *20 Points*. They will be returned to you at the end of the Final Exam, *i.e.*, August 4, 2006, 12 NOON; otherwise, please stop by my office (JE 327), and pick them up.

The "minimum required information" –that would come to anybody's mind– to **"CLEARLY & CLEANLY"** include in your laboratory notebook is:

→ A Table of Contents.

→ Title of the experiment.
→ Date.
→ Reference to the experimental procedure.
(cite "handout" [affix the handout into your notebook], or any other distributed information)
→ Chemical reaction to be performed (write it when any),
or A brief statement of objective if no reaction is involved.
→ A table of Reagents and Solvents (when any) with **actual** amounts (g, mg, L, mL) and **calculated** numbers of moles (mol) or millimoles (mmol), including their physical properties (when indicated in handout).
→ Record of any pertinent observations.
→ Record of all collected, required data.

• **Laboratory Reports.** *120 Points (69% of Lab Points)*

The **laboratory reports** will serve as the place to **1)** state the goal(s) of the experiment, **2)** indicate the source of the procedure that you used, **3)** turn-in your experimental results, **4)** discuss your results and some collected –or given– analytical data, and **5)** draw some conclusions. **These laboratory reports should ONLY contain the information that is requested on the laboratory report sheet that will be handed for each experiment.** However, they should be **clearly written and presented** (*i.e.*, word processed). **NEATNESS COUNTS!!!**

There should be six (6) laboratory reports for a total of eight (8) laboratory experiments (wet labs).

Each laboratory report will be worth *20 Points*.

Proper scientific language and English usage and content are mandatory in all reports. Do not repeat word for word the theory or any other information given in the handouts or supporting material. This is **PLAGIARISM**, and anyways I know what is said in these materials!

Proper reports must be based on the **actual** data obtained in the experiment. No report however well written will be accepted, if the appropriate data is not used. Scrupulous honesty in reporting results is crucial in any scientific investigation no matter how apparently insignificant the study may be. Part of the training in chemistry is the reporting of all results honestly.

ATTENTION!!!: Laboratory reports are due BEFORE or BY THE DEADLINE which is indicated on the laboratory report sheet that will be handed for each experiment. Late or missed laboratory reports will receive a grade of zero except

in the case of substantiated illness (a physician's note is required). Hey, it's Summer Organic, there is NO time for late work! And I mean it!

• **Post-Laboratory Question Sheets.** *35 Points (20% of Lab Points)*

The **post-laboratory question sheets** will serve as the place to –hopefully!– show your –hopefully!– true-enough understanding of the experiment of the day.

There should be seven (7) post-laboratory question sheets for a total of eight (8) laboratory experiments (wet labs).

Each post-laboratory question sheet will be worth *5 Points*.

• **Important Remarks about Laboratory Reports and Post-laboratory Question Sheets.**

You should know the **names** and **structures** of most of the compounds you worked with (unless told otherwise), know all the **reactions** carried out along with their **mechanism**, know the **reagents** needed, and –of course!– know how to use the analytical tools that we will have learned during the previous session (NMR, IR, MS, GC, and TLC). You are also expected to know WHY various procedures were followed, WHY certain side products were or were not formed. This listing is not meant to be all inclusive, but is given to provide a basis for your studying, ...and your understanding of what "takes place" in JE 325!

ACADEMIC IMPROPRIETY

This polished euphemism needs to be brought up. 'Cheating' (and I hate to use this term, especially at this august institution) of any kind will not be tolerated, because it degrades the principle of meritocracy. Specific application to this course will largely cover the **writing of laboratory reports**. Identically written lab reports are unacceptable, and if you are caught **plagiarizing**, it will be reflected in the grade.

LABORATORY SCHEDULE

Day of . . .	**Experiment**
July 6th	**HELLO AGAIN! GENERAL COMMENTS, SAFETY, & CHECK-IN**
	#1 – Anti-Markovnikov SYN Addition - Hydroboration/Oxidation

	Lab Report Due No Later Than: **July 11th**
July 11th	**#2** – Diels-Alder Reaction: 4-Cyclohexene-*cis*-1,2-dicarboxylic Acid Anhydride Lab Report Due No Later Than: **July 18th**
July 13th	**#3** – Oxidation of an Alcohol by a Chromate-Impregnated Resin: 9-Fluorenone Lab Report Due No Later Than: **July 20th**
July 18th & 20th	**#4** – An Oxidation-Reduction Scheme: Part I: Bleach Oxidation of L-(–)-Borneol to Camphor **#5** – An Oxidation-Reduction Scheme: Part II: $NaBH_4$ Reduction of Camphor to Isoborneol Overall Lab Report Due No Later Than: **July 25th**
July 25th	**#6** – Grignard Addition to a Ketone *and* an Ester: Triphenylmethanol Lab Report Due No Later Than: **August 1st**
July 27th	**#7** – Aldol Condensation: Dibenzalacetone Lab Report Due No Later Than: **August 3rd**
August 1st	**#8** – Synthesis of a Chemiluminescent Substance: Luminol NO Lab Report!
August 3rd	**CHECK-OUT; GOODBYE! HAVE A GREAT REST OF THE SUMMER!**

AND LAST, BUT NOT LEAST

CELLULAR PHONES

All cellular phones and pagers and beepers and other devices of this type are STRICTLY FORBIDDEN in the teaching laboratory (JE 325), ...unless TURNED OFF and KEPT AWAY.

Under NO circumstances are telephones to be answered or used to make a call in the laboratory.

Students who ignore this policy will be asked to leave the laboratory PROMPTLY, and will receive a grade of ZERO for ALL evaluations to be carried out during that time.

If you are on call for work related emergencies or personal reasons, switch all devices to a mode that will not disturb the laboratory (*i.e.*, vibrate mode), and inform the instructor prior to class.

There will be a ZERO tolerance in this course with regard to the use of telecommunication devices, and the rules stated above will be STRICTLY ENFORCED.