

Chemistry 303 Spring, 2011 Course Guidelines

Instructor: Daniel Graham, Flanner Hall Room 401 (office, 773 508-3169); Loyola Chemistry Office: 773 508-3100; FAX: 773 508-3086; Email: dgraha1@luc.edu.

Course Assistants: Brittnei Qualizza, Samuel Sarsah, and Benjamin Hill.

Lab Times: M, F 0830 – 1230; W, 1445 – 1835.

Places: Flanner 315 and 301.

DJG Office Hours: M, W, F 1230 - 1330, or by arrangement.

This course will introduce apparatus, techniques, and analysis used in experimental physical chemistry. We will pursue the following activities via a rotation format:

- (1) Ye olde crash course in laboratory glassblowing.
- (2) Ye olde information trapping/entropy reduction measurements.
- (3) Ye olde crash course in laboratory electronics.
- (4) Ye olde evaporation kinetics, activity coefficients, and noise signature measurements.
- (5) Ye olde crash course in numerical integration via analogue and digital methods
- (6) Ye crash course in CW lasers and investigation of density fluctuations.

In addition, there will be a library assignment for the first week, a celebration of π -day during the middle of the semester, and a final exam at the end of the semester.

Course Structure:

The core of Chem 303 will consist of six rotations, each lasting two weeks. Three rotations will focus on technical skills by way of glassblowing, electronics, and numerical integration. Practicum exams will be given at the end of these rotations. Three rotations will be experimental in nature, although technical matters will also be involved. Hand-outs, library materials, and on-site instructions will be part of each exercise. Research-style lab reports will be written for each team following each experimental rotation. Every team lab report is due no later than two weeks after the rotation is completed. Please respect the due dates out of consideration for all parties.

Ideally students will work in three-member teams. These will be established during the first class meeting and remain for the duration of the semester.

Grading:

Grades will be determined on the basis of five areas and weight factors:

Library Assignment: 5%

π -Day Assignment: 5%

Glassblowing, electronics, and numerical integration lab practicums: 35%

Research Style Lab Reports: 35%

Final Exam: 20% (**All Sections: Monday, May 9, 2011, 0900 – 1100**).

The following scale will be used:

90% - 100% A ; 80% - 89% B; 70% - 79% C; 60% - 69% D; < 60% F

Points assigned in Chem 303 will be due to a combination of team and individual work. The grading policy aims to encourage both forms of achievement during challenging rotations. Experimental pchem is neither easy nor a quick study, but the process is rewarding if good-faith effort is made. Students are urged to consult with the instructor to discuss problems before they become serious.

Chem 303 Schedule

Ye Olde Monday Section:

M	011711	Martin Luther King Holiday
M	012411	Course Logistics and First Rotation, First Week
M	013111	First Rotation, Second Week
M	020711	Second Rotation, First Week
M	021411	Second Rotation, Second Week
M	022111	Third Rotation, First Week
M	022811	Third Rotation, Second Week
M	030711	Ye Olde Spring Break
M	031411	Fourth Rotation, First Week plus π Day Celebration
M	032111	Fourth Rotation, Second Week
M	032811	Fifth Rotation, First Week
M	040411	Fifth Rotation, Second Week
M	041111	Sixth Rotation, First Week
M	041811	Sixth Rotation, First Week
M	042511	Ye Olde Easter Break Holiday

Ye Olde Wednesday Section:

W	011911	Course Logistics
W	012611	First Rotation, First Week
W	020211	First Rotation, Second Week
W	020911	Second Rotation, First Week
W	021611	Second Rotation, Second Week
W	022311	Third Rotation, First Week
W	030211	Third Rotation, Second Week
W	030911	Ye Olde Spring Break
W	031611	Fourth Rotation, First Week plus π Day Celebration
W	032311	Fourth Rotation, Second Week
W	033011	Fifth Rotation, First Week
W	040611	Fifth Rotation, Second Week
W	041311	Sixth Rotation, First Week
W	042011	Sixth Rotation, Second Week
W	042711	i-dotting and t-crossing

Ye Olde Friday Section:

F	012111	Course Logistics
F	012811	First Rotation, First Week
F	020411	First Rotation, Second Week
F	021111	Second Rotation, First Week
F	021811	Second Rotation, Second Week
F	022511	Third Rotation, First Week
F	030411	Third Rotation, Second Week
F	031111	Ye Olde Spring Break
F	031811	Fourth Rotation, First Week plus π Day Celebration
F	032511	Fourth Rotation, Second Week
F	040111	Fifth Rotation, First Week

F	040811	Fifth Rotation, Second Week
F	041511	Sixth Rotation, First Week
F	042211	Easter Break Holiday
F	042911	Sixth Rotation, Second Week

The final exam for all sections is Monday, May 9, 2011, 0900 – 1100. Please bring a ruler, calculator, periodic table, and a single sheet of notes. The exam will address two-three Qs about each lab rotation.

Ye Olde Rotation Schedule: Initial Assignments

1. Glassblowing	Benson	Eyring	Mayer
2. Information Trapping	Pitzer	Herschbach	Hirota
3. Electronics	Herzberg	Klemperer	Johnston
4. Evaporation Kinetics	Hirschfelder	Weissman	Stockmayer
5. Numerical Integration	Ramsay	Fenn	Hildebrand
6. CW Lasers	Hochstrasser	Pauling	Moore

Ye Olde Monday Teams:

Team Benson, *ARPC 39*.
 Team Pitzer, *ARPC 38*.
 Team Herzberg, *ARPC 36*.
 Team Hirschfelder, *ARPC 34*.
 Team Ramsay, *ARPC 45*.
 Team Hochstrasser, *ARPC 57*.

Ye Olde Wednesday Teams:

Team Eyring, *ARPC 28*.
 Team Herschbach, *ARPC 51*.
 Team Klemperer, *ARPC 46*.
 Team Weissman, *ARPC 41*.
 Team Fenn, *ARPC 47*.
 Team Pauling, *ARPC 16*.

Ye Olde Friday Teams:

Team Mayer, *ARPC 33*.
 Team Hirota, *ARPC 42*.
 Team Johnston, *ARPC 43*.
 Team Stockmayer, *ARPC 35*.
 Team Hildebrand, *ARPC 14*.

First Assignment Due in One Week:

Each Chem 303 team is named after a top flight physical chemist. Each chemist has written a short memoir appearing in the *Annual Reviews of Physical Chemistry*.

The first assignment is for every Chem 303 individual to (1) read the memoir associated with one's team name, (2) type a one page, double-space paper describing the most interesting pchem idea/experiment, in your own opinion plus words, in the memoir. Please aim for clarity of thought and conviction in writing. Chem 303 teams should coordinate reading logistics of their particular ARPC volume.

The Ten Commandments of Physical Chemistry (adapted from SU handout)

- I. Thou Shalt have an Open Mind.
- II Thou shalt never take anything for granted; thou shalt check up early and often and make repeatedly sure of absolutely everything.
- III. Thou shalt have a pretty good time and thy work shall be interesting.
- IV. Thou shalt respect the intelligence of all parties.
- V. Thou shalt not gather in small and divisive groups, nor do violence upon one another.
- VI. Thou shalt fear no pchem problem. Yet shall ye fear and despise sloth, dullness, tastelessness, and gutlessness, for these will surely bring down the wrath of Mother Nature.
- VII. Thou shalt hacketh awayeth at pchem problems with dignity and helpeth thy associates to doeth likewise.
- VIII. Thou shalt bendeth over backwards to recordeth data, observations, and questions that cometh to mindeth.
- IX. Thou shalt admiteth thy mistakes, for they shall be forgiven.
- X. Thou shalt rolleth and bounceth over the inevitable potholes. When everything aroundeth thee wirleth and creameth and seemeth to falleth aparteth, thou shalt adjusteth and sayeth to thyself calmly, "This too shall pass".

The Pchem Motto: No lies, no hate, no fear.