

Chemistry 303 Spring, 2010 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: Brittini Qualizza and Samuel Sarsah.

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. Students 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 olde measurement of density fluctuations using laser light scattering.

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 the rotations will focus on technical skills by way of glassblowing, electronics, and numerical integration. Practicum exams will be given at the end of each technical rotation. 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.

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 10, 2010, 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 contact the instructor to discuss problems before they become serious.

Chem 303 Schedule

Ye Olde Monday Section:

M	011810	Martin Luther King Holiday
M	012510	Course Logistics and First Rotation, First Week
M	020110	First Rotation, Second Week
M	020810	Second Rotation, First Week
M	021510	Second Rotation, Second Week
M	022210	Third Rotation, First Week
M	030110	Third Rotation, Second Week
M	030810	Ye Olde Spring Break
M	031510	Fourth Rotation, First Week plus π Day Celebration
M	032210	Fourth Rotation, Second Week
M	032910	Fifth Rotation, First Week
M	040510	Ye Olde Easter Break Holiday
M	041210	Fifth Rotation, Second Week
M	041910	Sixth Rotation, First Week
M	042610	Sixth Rotation, First Week

Ye Olde Wednesday Section:

W	012010	Course Logistics
W	012710	First Rotation, First Week
W	020310	First Rotation, Second Week
W	021010	Second Rotation, First Week
W	021710	Second Rotation, Second Week
W	022410	Third Rotation, First Week
W	030310	Third Rotation, Second Week
W	031010	Ye Olde Spring Break
W	031710	Fourth Rotation, First Week plus π Day Celebration
W	032410	Fourth Rotation, Second Week
W	033110	Fifth Rotation, First Week
W	040710	Fifth Rotation, Second Week
W	041410	Sixth Rotation, First Week
W	042110	Sixth Rotation, Second Week
W	042810	i-dotting and t-crossing

Ye Olde Friday Section:

F	012210	Course Logistics
F	012910	First Rotation, First Week
F	020510	First Rotation, Second Week
F	021210	Second Rotation, First Week
F	021910	Second Rotation, Second Week
F	022610	Third Rotation, First Week
F	030510	Third Rotation, Second Week
F	031210	Ye Olde Spring Break
F	031910	Fourth Rotation, First Week plus π Day Celebration
F	032610	Fourth Rotation, Second Week
F	040210	Easter Break Holiday

F	040910	Fifth Rotation, First Week
F	041610	Fifth Rotation, Second Week
F	042310	Sixth Rotation, First Week
F	043010	Sixth Rotation, Second Week

The final exam for all sections is Monday, May 10, 2009, 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. Light Scattering	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*.
 Team Moore, *ARPC 58*.

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 wirlleth 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.