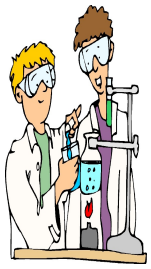
Chemistry 125/126

Welcome

What? Why? How?



Nancy Konigsberg Kerner
nkerner@umich.edu

Chemistry 125 vs 126?

CHEM.125/126
- Co-requisites with identical work and grades.
- One credit each for a total of two credits.
- Credit for TWO inorganic lab courses.

WAIT LISTS AND OVERRIDES
- Report to 1500 chem. (administrative office)
- Contact Debra Buck; debbuck@umich.edu

Course Information

- An independent introductory gen chem course with its own lecture, lab, and discussion
- Labs and discussion on a given topic occur after pre-lab lecture.
- Instructors for lab and discussion are GSIs.

Course Format

- Pre-lab lecture (1 hour) in 1800 chemistry
- Discussion (1 or 0 hour) in lab room
- Laboratory (2 or 3 hours) in lab room

- Labs = 3 hours if discussion is NOT held; labs = two hours when discussion is held
- Discussions occur AFTER the lab experiment is done

Required Materials

Collaborative Investigations in Chemistry,
Nancy Konigsberg Kerner and James Penner-Hahn,
Hayden McNeil Publishing, Inc., Fall 2010 edition

Supplies
Lab Marking pens

Web Sites

Ctools
- Course Information
- Resources: Lectures, Schedule, Exams, Review notes
- iTunes: Lecture Podcasts, Review Podcasts, Video Resources
- Lab data: Link to course website with evolving lab data

http://www.umich.edu/~chem125

Lab Safety

- Contact Lenses may NOT be worn in lab.
- Goggles and aprons must be worn in lab.

Lab Safety

- No open shoes -- sandals, thongs, etc
- Clothing should adequately cover your body – i.e. no shorts etc.
- Follow safety rules (pp.18-19, manual) at all times

Special Needs

Special Safety Problems?

- Richard Giszczak; 1608 chem.
- richg@umich.edu

Special Needs or Concerns?

- Nancy Kerner; 3541 chem.
- nkerner@umich.edu
- Office hours:
  Tuesdays, 3-4 pm, Thursdays, 1-2 pm

Chemistry 125/126 Grading

TOTAL course points	500 points
Lab and discussion (6)	300 points*
Exams (2)	150 pts
GSI/peer points	50 points

* See Course Information for lab and discussion point details

- Points reward individual and team **efforts**.

Team % points	54 %
Individual % points	46 %

Chemistry 125/126 Grading

- Grades based on explicit point criteria to establish mastery; there is NO grading on a curve

Fall 2010 guaranteed course letter grades:	
At least an A-	450 points
At least a B-	400 points
At least a C-	350 points
At least a D-	300 points

- Point grade cutoffs guaranteed.
  - Points needed for a particular letter grade will not be increased *but may be lowered* if some aspect of grading is not equitable to prior terms.

Lab Performance and Points

- Labs must be performed to earn points
- Miss two labs? Contact the course coordinator for permission to stay in the course.
- Makeup may be arranged informally with home GSI to be performed in his/her other section
- Formal makeup directives are in the back of your lab manual
- Participation in discussion is required to earn discussion points

Lab Makeups

- When arranging a time/day for a makeup check the schedule of labs:

	Mon	Tues	Wed	Thurs	Fri
8-11				√	√
11-2	√	√	√		√
2-5		√	√	√	

- The lab week runs from Wednesday thru Tuesday
- You will perform an individual (rather than team) makeup if your makeup occurs outside the lab week

Earning Maximum Points

Team Reports

- The form in the manual is merely an outline.
- For maximum points respond to all questions in the experiment
- **Refer to lab data to support conclusions**
- Study the "Team Report Tips" in the manual
- Study the experiment grading rubricks

Discussion

- Study the Discussion Grading Rubricks

Exams

- There is no final exam!
- There are two hourly exams (75 pts each):
  - Tuesday, November 9, 6:15 - 7:45 pm
  - Monday, December 13, 6:15 - 7:45 pm
- There are alternate exams on the same days for students with legal conflicts or students needing extended time

Session One (September 8 - 14)

- Introductions
- Team Assignment Survey Form, manual, page 4

Break

- Team assignments
- Check-In
- Team Task Exercise, pages 5- 7
- Team Task Schedule, page 8
- Periodic Table Scavenger Hunt, pages 12-15
- Safety and Scavenger Hunt, pages 18 – 20

Pre-lab Prep and Schedule

(Manual, pages 239 - 240)

Experiment Topics	Pre-lab lecture	Pre-lab Reading Pages	Lab Points
Check-in Safety Hunt Team Task Periodic Table Hunt	9/7 (300 sections) 9/7 (200 sections) 9/9 (100 sections)	1-21 230-243	

Pre-lab Prep and Schedule

Experiment Topics	Pre-lab Lecture	Pre-lab Reading Pages	Lab Points
Experiment 1: Precipitation and Water Purity	9/14 (300 sections) 9/14 (200 sections) 9/16 (100 sections)	22-53 190-191 208-211	35

The Pre-lab report (page 38) for experiment 1:

- requires work on the Internet
- is due at the start of experiment 1.

Chem.125/126 Topics and Learning

"*To develop learning competence* ***students must understand facts and ideas in the context of a conceptual framework"***
— Bransford, Brown, & Cocking, Eds.
How People Learn: Brain, Mind, Experience, and School.

- The **chem.125/126 framework** is the Periodic Table.

Chem.125/126 Topics and Learning

"*To develop learning competence* ***students must understand facts and ideas in the context of a conceptual framework"***

- The chem.125/126 theme song,
  "Structure and Property Relationships"

Chem. 125/126 Goals and Methods

Student goals and background?
- Do you intend to be a chemist?

- Students do NOT intend to be chemists!

CHEMISTRY 125/126 Methods

Methods fueled by concern about what non-chemist students can do with the skills they learn later on in life and student learning research.

- Develop life long skills
  Data analysis, team work, presentation skills…)
- Understand core concepts
  Emphasize process rather than content or memorization

Boyer Commission Report: Carnegie Foundation for the Advancement of Teaching (1998 & 2004)

"Many undergraduates graduate without knowing how to think logically, write clearly, or speak coherently"

Alter classroom methods:

Traditional → Inquiry
Individual → Teamwork
Teacher-centered → Student-centered
→ Incorporate technology

Why Inquiry-based learning ?

- Students construct their own understanding of concepts, rather than simply being told information
- Students develop stronger critical thinking skills
- The approach exposes students to the process of science

Chem.125/126: Guided Inquiry Labs

E → **I** → **A**

Exploration
Collect data to solve a problem

Concept Invention
Interpret data formulate results

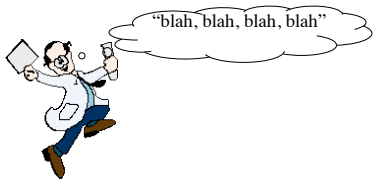
Application
Apply concept in a new setting

Discussion

Why Student-Centered Course?

- Teacher (rather than the student) becomes highly skilled in a teacher-centered class -

Teacher (rather than the student) writes, speaks, consults, organizes, and solves problems.



Why Teamwork?

- Students differ in thinking and processing skills.

- **Social interactions** reveal differences and result in learning by restructuring of students knowledge.

Chem.125/126: Why Teamwork?

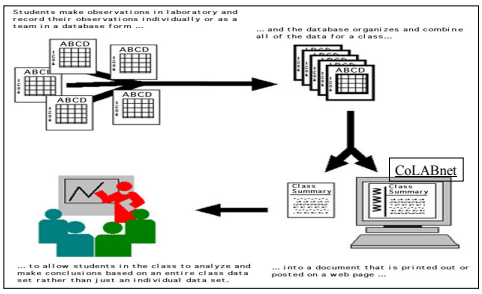
- Learning is a social activity
- Social interactions can help students build their knowledge base, monitor their progress, and clarify their understanding (and misunderstanding)

Lab Methods

- Collaborative Team research.
- Teams collect data for different (rather than identical) samples and/or conditions.*
- Technology assisted data collection and analysis.

* See page 232 of the lab manual for team experiment and discussion question assignments.

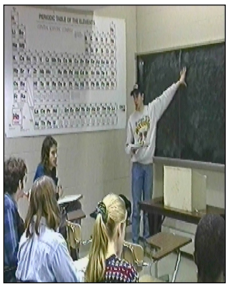
CoLABnet



- Data is available in lab and on the course website: http://www.umich.edu/~chem125.

Discussion Methods

- Teams' solve assigned problems in lab.*
- Teams' orally present results in discussion.
- Questions address critical thinking skills of invention and application



* See p.232 of lab manual for team assigned discussion questions.

Student Success in chem.125/126

The inquiry format and team work does NOT
- insure an A in the course
- insure student learning and understanding.

YOU (the student) need to make tactical decisions!

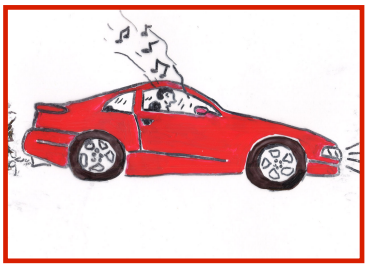
Student Success in Chem.125/126

- Choice of tactics must be appropriate.

Student Success in Chem.125/126

- Is NOT dependent on prior knowledge
- Is dependent on your individual efforts!
  - Come prepared to lecture, lab, and discussion
- Invest effort in your team work and social interactions
  - think out loud with teammates
  - instruct one another as to how solutions are derived
  - collaborate; don't split up work!
- Use available support and resources
  - use Ctools resources, office hours…
  - Study exams now!

Where Would We Be Without Chemistry?



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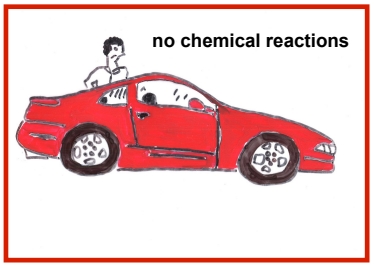

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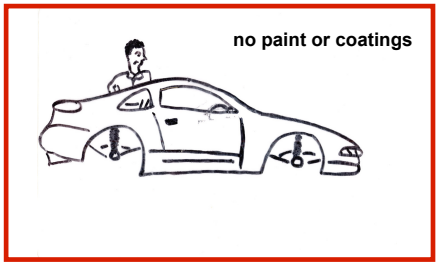

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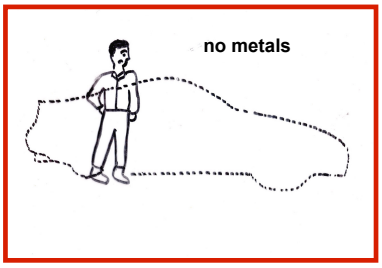

Where Would We Be Without Chemistry?

Where Would We Be Without Chemistry?

150 kg male

H_2O	50.1 kg
C	12.6 kg
N	1.8 kg
Ca	1.7 kg
P	.68 kg
K	.25 kg
Na, Mg, Fe, etc	.32 kg

Where Would We Be Without Chemistry?

No you

Email nkerner@umich.edu
Attend office hours