C106 Fundamental Chemistry
Summer 2018 Syllabus & Policies

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Instructor's schedule (Summer 2018)

Time	Monday	Tuesday	Wednesday	Thursday
9:00 to 10:15 AM	**C106 Lecture (A112)**	**C106 Lecture (A112)**	**C106 Lecture (A112)**	**C106 Lecture (A112)**
10:30 to 11:45 AM	Discussion	**C106 Laboratory (B140)**	Discussion	**C106 Laboratory (B140)**
11:45 AM to 1:15 PM	***Office Hours***		***Office Hours***	

NOTE: Feel free to schedule specific meeting times with me if you have a conflict with my **office hours.**

Course Description

Chemistry 106 is the second-half of a two-semester sequence in **general chemistry** that satisfies prerequisites for enrollment into C248 and C325. The topics listed below, I believe, involve concepts that more abstract & complex than those from C105. On the other hand, they are more interesting for those students that are curious about the more subtle issues regarding the particle nature of matter. In any case, I believe that you will need to devote just as much, if not more, time on working problems and thinking about details of each of the 5-units listed below.

- **Unit 1 Kinetic Molecular Theory** & the properties of gases, liquids, & solutions.
- **Unit 2 Kinetics** the rates of chemical reactions.
- **Unit 3 General Equilibrium** the final state of reversible processes in closed systems.
- **Unit 4 Equilibrium Applications** in acid-base chemistry & solubility.
- **Unit 5 Thermodynamics & Free Energy** limitations to the amount of work energy a system can transfer to (perform on) its surroundings (with applications in electrochemistry & batteries).

Course prerequisites to be enrolled in C106, it is expected that you have recently completed and are able to apply concepts from:

- **C105** (or equivalent transfer credits)
- **M100** (note that C106 has a higher math requirement than C105)

Required materials

- Textbook: Chemistry, the central science (12th edition) by Brown, LeMay, Bursten, Murphy & Woodward).
- A scientific calculator that you can use to easily enter and inter-convert numbers between decimal and exponential notation forms as well
- Note, you may not use a cell phone as a calculator during C106 exams.
- Packet of C106 laboratory experiments (Available for purchase at the bookstore).
- Recommended: a three-ring binder to hold and organize your laboratory experiments.

Homework guidelines and Attendance Policy

- While I assign homework, I never collect or grade it! You need to consider your work and effort on these assignments as ungraded practice for your exams.
- In this regard, it is imperative for you to complete as many of the suggested textbook & discussion problems as possible as these exercises are designed to challenge your understanding and ability to apply key concepts from lecture . . . and then take the time to make an appointment with me to go over details that you are struggling with.
- I cannot over-emphasize the importance of NOT FALLING behind on the workload in this class!
- While I do not take attendance, my experience suggests that **active participation** in each & every lecture, laboratory & discussion session is key to success in general chemistry. In this sense, attendance to all class meetings is mandatory.
- If you miss a class meeting, it is your responsibility to obtain all material and information that you missed.
- Course information is often distributed electronically, so check your email on a regular basis.

Exam schedule, make up policy and letter grading scale

Exam	Date & Time		Points
Exam 1	Week 2	Monday, June 11, 9 AM.	200
Exam 2	Week 4	Monday, June 25, 9 AM.	200
Exam 3	Week 6	Monday, July 11, 9 AM.	200
Exam 4	Week 8	Friday, July 20, 9 AM.	200

Make-up exams? Except for excused absences (written notification 24 hours prior to the exam) NO MAKE-UP EXAMS will be administered.

In addition to 800 points on four lecture exams, 12 laboratory exercises (15 points each) will be collected & graded for 180 total laboratory points (which is 18% of the 980 total points).

Letter grades are assigned based upon the grading scale posted below.

Percentage of total points earned	Letter grade	Percentage of total points earned	Letter grade
Above 91 %	A	77 -79 %	C+
89 - 91 %	A−	68 - 77 %	C
87 - 89 %	B+	60 - 68 %	D
81 - 87 %	B	Below 60%	F
79 - 81 %	B−		

- I reserve the right **to lower** (**but will never increase)** the posted grading scale.

Accommodations for disabilities: Students should contact the Office of Disability Services within the first two weeks of the semester in order to request and arrange necessary accommodations for exams and laboratory assignments.

Academic Responsibility All cases of academic dishonesty will be dealt with in accordance to the UWSP rules on academic misconduct as stated in Chapter 14 of the Rules and Regulations Governing the Faculty, Staff, and Students of UWSP (Community Rights and Responsibilities). This document may be assessed at the UWSP web site at *http://www.uwsp.edu/centers/rights/rights.pdf*.

C106 Schedule of Laboratory Exercises (Summer 2018)

Date	Experiment title (15 points per exercise)
Tuesday, May 29	**Check-in & review exercises**
Thursday, May 31	**1. Faraday's Law**
Tuesday, June 5	2. Separation of Amino Acids by Paper Chromatography
Thursday, June 7	3. Heat of Solution Measurement & Lattice Energy of KI & $CaCl_2$
Tuesday, June 12	**4. The MW of a Compound by Freezing Point Depression Measurements**
Thursday, June 14	**5. The Iodine Clock Reaction - - the effect [KIO_3] on reaction rate.**
Tuesday, June 19	6. Kinetics of Crystal Violet Decomposition
Thursday, June 21	7. LeChatelier's Principle of Shifting equilibrium
Tuesday, June 26	**8. The separation of Fe^{+3} and Cu^{+2} ions from a mixture**
Thursday, June 28	**9. Measuring the Ksp of lead iodide**
Tuesday, July 3	**No Laboratory Exercise**
Thursday, July 5	10. The pH Titration of Weak Monoprotic vs. Weak Diprotic acids
Tuesday, July 10	**11. pH Buffers**
Thursday, July 12	**12. Thermodynamics of Potassium Nitrate solubility**
Tuesday, July 17	Check-out
Thursday July 19	**No Laboratory Exercise**

Lab attendance & grading: Laboratory is a mandatory component that accounts for about 20% of your letter grade any you cannot earn a passing grade with two unexcused laboratory absences. On the other hand, your grade will not be affected by just one excused laboratory absence but your grade may be affected by more than one excused absence. Excused absences are defined as an acceptable, written notification to your instructor prior to the date of the absence. If you get sick and need to miss a laboratory meeting, you need to obtain a note from your medical provider. Unlike the fall and spring semesters, make up labs cannot be arranged during the summer session!

- **Pre-laboratory exercises (when applicable)** must be submitted to your instructor at the start of the laboratory meeting.
- **Data and results** laboratory report forms must be submitted to your instructor each week before you leave the lab. Point deductions will be made for significantly large mistakes in your results as well as incorrect recording of data (i.e. significant figures and units) and calculation errors.

Overview of general laboratory guidelines

Come Prepared *Be Safe* *Clean up after yourself* *Relax & have fun!*

A. Read instructions beforehand so that you are prepared to start immediately.

B. **BE SAFE**
- **Goggles must be worn over your eyes at all times.**
- Pay attention & use common sense when handling reagents and glassware!
- Be aware of those around you, your instructor, as well as fire and safety-related equipment.
- Follow directions and ASK questions regarding the use of reagents and equipment.

C. Clean up after yourself and follow directions for proper chemical disposal.

D. We anticipate that you will make mistakes - - this is a vital part of the learning process - - so RELAX and don't worry too much about reasonable errors.

C106 Tentative Lecture Topics for (Summer 2018)

Week	Monday	Tuesday	Wednesday	Thursday
(1)	**No Class!!**	***Introduction & Review***	Kinetic Molecular Theory & gas laws **(10. 1-8)**	***Wrap-up Gas Laws***
(2)	Intramolecular forces (IMF's) & liquid properties **(11.1-6)**	More properties of liquids	Wrap-up liquids & Solution properties **(13. 1-5)**	**Solution properties**
(3)	**Exam 1: Gases & Liquids (Chapters 10 & 11)**	Solution properties	Wrap-up solutions & Kinetics **(14.1-7)**	Kinetics
(4)	Kinetics	Kinetics	Wrap-up Kinetics & General Equilibrium (15.1-7)	General equilibrium
(5)	**Exam 2: Solutions & Kinetics (Chapters 13 & 14)**	General Equilibrium	Acid/base chemistry **(16.1-10)**	Acid/base chemistry
(6)	Acid/base Chemistry	pH Titrations & Buffers **(17.1-4)**	**No Class!!**	pH titrations & Buffers
(7)	**Exam 3: Equilibrium (Chapters 15-16)**	Solubility equilibria **(17.5)**	Thermodynamics **(19.1-7)**	Thermodynamics
(8)	Wrap-up Thermo & Electrochemistry (20.1-5)	Electrochemistry	Electrochemistry	**Summary . . . Questions & Answers**
(8) Friday July 20	**Exam 4: Titrations / Buffers, Thermo. & electrochemistry (chapters 17, 19 & 20)**			