Instructor3 (PI): Dr. Howard Lee McLean Office: Carey Hall 14-2313 email: [hlmsch@rit.edu](mailto:hlmsch@rit.edu)



Office hours: Please see ‘myCourses’ for “Where is Dr McLean” in intro folder for course.

<https://mycourses.rit.edu>

Supplemental instructor(SI): Emily Carter (review her handout) [egc3964@mail.rit.edu](mailto:egc3964@mail.rit.edu)

Class: T and R 5:00 p.m. to 6:15 p.m. in Gosnell Hall, 08-1250 (i.e., two 75 min classes)

Optional recitation (students’ request): T W 6:30 p.m. to about maybe 8ish p.m.

T in GOS **08-1300** W in GOS **08-1154**

Students should be registered for the 1-credit laboratory course, Gen & Analytical Chem Lab II (CHMG-146) which meets for one weekly 3-hour session. The lab is independent of the course and scored / graded separately. See your separate syllabus for CHMG 146 on “MyCourses.”

**Outline of Lecture** notes will be available on the web site for the course (‘MyCourses’). Readings for the lectures are indicated in the schedule given below. It is helpful to peruse the reading assignment before lecture and do the pre-class homework problem, without worrying about understanding everything. After lecture, the material should be reexamined within 48 hours to clarify your questions and the post-class problems solved. Practice…practice.

Class items:

1. MasteringChemistry <http://masteringchemistry.com>

MasteringChemistry course id code: RITCHMG142MCLEANS15

MasteringChemistry access code: You supply via purchase, may use last semester.

Access is usually on an annual basis.

You should be able to buy an unexpired access from a friend.

1. i>Clicker (i-Clicker or i-Clicker 2) NOT BEING USED. Work sheets are submitted.
2. scientific calculator TI – “30” series works well, costs less than $12

TI—83 or similar may be used, but instructor reserves the right to clear all memories.

Instructor prefers to level the playing field for all students. Please be honest.

1. Some type of notebook for holding, organizing, and finding old exams, lecture handouts, recitation worksheets, etc. Should date and title notes. Will ask about when appropriate.
2. TEXT: McMurry and Fay: ***General Chemistry: Atoms First (2nd edition preferred)***

I do consult the text for problems, exercises, MS PowerPoint slides, info and exam questions.

Used copies: < $201 Use “ISBN xxxxxxxxxxxx” to do a search in the URL. Bunches from fall…

New copies: <$288 when packaged with and MasteringChemistry / CHMG146 lab manual

The text sold in the bookstore is a custom RIT edition so it less expensive than the regular edition. They are identical. If you are getting the text from another source, **HOWEVER,** you also need access to the online homework (i.e., MasteringChemistry with a valid access code). Most homework problems match text problems! MasteringChemistry homework IS PART OF

YOUR GRADE (19%). The access code comes packaged with the RIT edition. If you buy the text elsewhere know that it costs $56+ to easily purchase the access code separately online. You can buy homework access code + electronic text from the publisher directly ([www.masteringchemistry.com](http://www.masteringchemistry.com)).

COURSE Details

Objective: Present college chemistry as a science based on empirical evidence that is placed into the context of conceptual, visual and mathematical models. Students will learn the concepts, symbolism and fundamental tools of chemistry necessary to carry on a discussion of the chemical sciences. Emphasis will be placed on the relationship between how instantaneous and how spontaneous a change in chemical bonds through chemical reactions and physical processes. The chemical sciences are one of the central sciences (like physics).

Throughout the course you will gain some important ideas. Some of these include:

* Application of previous course concepts and principles (CHMG 141) such as the unifying principle,
* Dimensional analysis & unit conversion (common science thread)
* A review of chemical nomenclature (atoms, ions, molecules = AIM)
* Balancing more complex chemical equations (utilizing mnemonic AMCE)
* Structure of macroscopic matter based on nature of microscopic bonds
* Chemical logic – Quantitative Analysis (another challenge, Mr. Sherlock)
* Energy transfers via chemical and physical process (absorption/release)
* Phase equilibrium also involves dynamic processes between >2 phases
* Contrast between equilibrium the macroscopic zero rate of reaction and dynamic microscopic level which are constantly inter-converting
* Applications involving non- and spontaneous electrochemical processes
* Collaborating and cooperating with a peer on class activities

Key tools and toolbox skills:

* Apply periodic trends (electronegativity, reactivity, acid/base, solubility)
* Apply thermochemical reference tables (heat energy versus voltages)
* Apply rate laws models using mathematical and graphical strategies
* Apply the Arrhenius rate constant equation to find instantaneous rates
* Write equilibrium expressions for non- and spontaneous processes
* Mathematically solve chemical equilibrium problems (various systems) using quadratic equation, iteration, or perfect square methods
* Relate free energy (after enthalpy and entropy) to equilibrium constants and spontaneous processes
* Interpret phase diagrams for common substances (i.e., H2O and CO2)

**Schedule:**  Class will meet two times a week (2 lectures for 75 minutes) -- see details at end.

**Lecture** outlines (and some supplementary notes) will be available on ‘MyCourses’. Readings for the lectures are indicated in the schedule; a copy of this syllabus will be available on ‘myCourses’. It is generally helpful to skim the reading assignment before lecture, without worrying about understanding everything. After lecture, the material should be reexamined to clarify your questions in a timely manner, usually 24-48 hours. Pedagogical research strongly suggests that the more active the student is the more success the student should realize. Proactive class participation AND collaborative/cooperative team activities are ingredients for success! That is, being passive with few contributions limits learning and success.

**Exam** schedule:

 QUIZZES on selected topics to lessen impact of 75 minute exam periods: TBA.

**Exam 1 24 February, Tuesday Ch 10, 11, 12, 13**

**Exam 2 7 April, Tuesday Ch 14 and 15**

**Exam 3 12 May, Tuesday (last class day) Ch 16 and 17 (nuclear?)**

**Exam 4 (Comprehensive Final) (5/19 ca. 5-7 p.m. 08-1250) List of areas (4-6 PQ)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. concentrations and colligative properties | | |  |  |
| 2. kinetics (rates of reaction and graphical analysis) | | | |  |
| 3. gaseous equilibrium and matrix decision (calc Kc or Kp) | | | | |
| 4. acid-base equilibria | |  |  |  |
| 5. solubility of sparingly insoluble solid | | |  |  |
| 6. electrochemical cell construction | | |  |  |
| 7. thermodynamics and spontaneity | | |  |  |
| 8. stoichiometry (such as Faraday's Law or ppt or conc) | | | |  |
| 9. applications (osmosis/mechanism/Kc and G/poison Ksp/plated mass/corrosion) | | | | |
| 10.Le Chatelier's Principle | |  |  |  |
| 11.buffer application |  |  |  |  |
| 12.Level 5 problem requiring analysis (capstone) | | | |  |

**GRADING and EVALUATION POLICIES**

Exams (75%) There will be three 75 minutes exam opportunities so strategized wisely.

THE LOWEST EXAM GRADE IS DROPPED not counting THE FINAL EXAM. NO make-up exams will be given **unless by PRIOR permission from the lecture instructor (PI)**. If an exam is missed for any reason, it will automatically become 0, the lowest grade.

Use of calculators should be used for exams, but sharing of calculators is typically not allowed. (Do not expect the instructor to supply. Be self-reliant! And use of a cell phone calculator is prohibited on exams.) An expensive calculator is not necessary. Standard functions will be useful for this course: +, -, X, ÷, LOG, EE or EXP or yx or 10x and +/- and can be found on any standard scientific calculator. TI—30 series are usually the norm. Graphing calculator memory has to be cleared by instructor or designate.

Laptop computers and tape recorders may be used in lecture, but may not be used for exams. It is assumed that laptop computers used during lectures will be for note taking. No headsets will be allowed in lecture or during exams. Written or oral communication is not permitted during exams, except when directed to the instructor or proctor.

The maximum time allowed for *lecture* exams is typically 75 minutes; *final exam is 150 minutes in length.* Students may leave an exam before the allotted time has expired. Please be a good citizen: A quiet, non-disturbing exit is expected at all times and please no congregating at the back of the exam room. People who arrive at the exam after the first person has left will not be permitted to begin in order to discourage unethical practice: Final call is made by the lecture instructor (PI). Rest room breaks are occasionally monitored during exams.

Students with cell phones or pagers should have the courtesy to turn them off or put them on a vibrate mode so that others are not disturbed during a lecture (or exam). If it is necessary to return a call, please leave the room quietly. Permission should be requested if leaving becomes necessary during an exam. (Restroom activity = 3:03 commercial time limit.)

All exams are closed-book, closed-note, but all primary course instructors have mutually agreed to permit single page of 8-1/2x11” paper with any algebraic formulas or other information: (a) photocopying is strictly prohibited and items must be hand written, (b) sheet may not be shared, and (c) the sheet must be surrendered with examination. All physical constants or tables of constants and a periodic table will be provided to you for each exam.

Scored Coursework (Homework worth 12% + 3% bonus guaranteed)

Homework will be assigned through **the Mastering Chemistry** content. Once in a while the instructor will provide a work sheet which is submitted by student at next class meeting.

Inside the Mastering Chemistry Website you will find several coursework units that **MUST** be completed for grade points. The results will be shown in GRADEBOOK/‘MyCourses’ three time per semester. The most successful student reviews all the appropriate sections of the textbook before embarking on these coursework exercises. This instructor uses MasteringChemistry tutorial type questions/problems to reinforce lecture/class concepts and principles especially when hints are provided. Each coursework module should is designed for the average student, thus expect to invest at least three - four hours or so to complete.

**You should all receive an access code to the Mastering Chemistry Website** **with your copy of the book**. If you have a used text and need an ~15 alpha numeric access code, please purchase one . If you do not obtain a text, then use [http://www.masteringchemistry.com/site](http://www.masteringchemistry.com/site" \t "_blank)

You must self-register to the course titled "GENERAL & ANALYTICAL 142-03 Spring2015” with **Course ID RITCHMG142MCLEANS15**

Please use your “username id for RIT email.” For example, let’s say your RIT email address is “ptg1978@rit.edu” then please use “ptg1978” which helps instructor find your results and appropriate credit may be rendered in a timely matter.

Collaboration and cooperation with another person is a crucial life-learning skill, so you may work in a team (and typically recommend 3 or 2 in your team). Be leery of online/internet and just copying answers: Sometimes MC Qs appear on examinations, so be familiar with homework , and recommended text worked Qs as well as problems tackled in class!

COURSE ASSESSMENT:

Three Exams: 50% – there are 3 times 75 min – bonus probable

Student has the option to drop one exam score, but not final exam score.

Final (required) Comprehensive Exam 25% -- bonus probable

Homework: 12% (May involve 7-12 required + guaranteed bonus up to 3.00%)

Quizzes 6% (in-class topic idea, take home collaborative quiz, online quiz)

Participation 7% (26/29 class periods – usually use worksheet Qs); bonus possible

THE GRADING SCALE is listed below:

**PERCENTAGE and GRADE**

A- 90.0 to 93.9 A > 94.0

B- 78.0 to 81.9 B 82.0 to 85.9 B+ 86.0 to 89.9

C- 68.0 to 71.9 C 68.0 to 74.9 C+ 75.0 to 77.9

58.00% – 66.99% D

58% or lower F

The above was utilized previously and appears to be satisfactory for the current subdivisions. The rationale is based on allowing one exam score to be ignored and it is based on providing bonuses for MasteringChemistry, class participation, and an announced quiz questions. Proactive students earn bonus. What is your sincere and serious work ethic?

**PLAGIARISM or CHEATING**

Many institutions of higher learning have experienced a rash spectrum of activities related to copyright infringement or plagiarism or cheating. These actions, in any form, will not be tolerated in order to protect the livelihood of the owner. (How would you feel if someone “stole” your work without compensation?) During an exam, all books and papers will be removed the desk or table top, except (a) refreshments or energy source, (b) approved calculator, (c) pen or pencils/eraser, (d) your one crib sheet and (e) items distributed by the instructor. As noted before, calculators may not be shared, oral and manual communications are prohibited unless directed to the instructor, headsets and other audio devices may not be used, and laptops may not be used during exams. The instructor has the right to inspect programmable calculators to make sure information pertaining to the exam is not stored.

I have a reputation for enforcement . Any case of plagiarism or cheating will result in an automatic score of “0” for the exam, or –100 if student argues with instructor or proctor. A signed memo documenting the event will be hand delivered to the student’s department/college. A second occurrence will result in a grade of “F” for the course and possible disciplinary action from RIT. <http://www.rit.edu/studentaffairs/studentconduct/>

If in doubt about plagiarism, please consult: <http://library.rit.edu/instruction/dl/cptutorial>

Honor Code: <http://www.rit.edu/academicaffairs/policiesmanual/sectionA/honorcode.html>

Policy Number: **P3.0** Policy Name: **HONOR CODE**

**If you misbehave in class such as playing music, talking aloud out of turn, calling the professor a “$#%&!” without proper respect, this instructor will tell you to physically leave the classroom**. If you do not leave within 2:02 min, you will receive “final grade of F”. Integrity and strong moral character are valued and expected within and outside of the RIT community. (Goal is to be fostering as well as firm, fair and friendly.)

* Demonstrate civility, respect, decency and sensitivity towards our fellow members of the RIT community, and recognize that all individuals at this university are part of the larger RIT family, and as such are entitled to that support and mutual respect which they deserve.

(Being disruptive during class, the instructor will ask the student to leave the class instantaneously. Credit for that day may or may not be granted.)

* Conduct ourselves with the highest standards of moral and ethical behavior. Such behavior includes taking responsibility for our own personal choices, decisions and academic and professional work.

Affirm through the daily demonstration of these ideals that RIT is a university devoted to the pursuit of knowledge and a free exchange of ideas in an open and respectful climate.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**READING ASSIGNMENTS**

The course schedule lists suggested sections to read from the text. And in lecture specific sections are emphasized. (Reading prior to class is expected to familiarize one to Cs and Ps.) Cs = concepts or ideas and Ps = principles like math models.

It is generally helpful to skim the reading assignment before lecture, without worrying about complete understanding. Then after lecture, the text selection should be reexamined and questions should be clarified.

Be aware that occasionally the lecture instructor (PI) will provide a worksheet, with specific readings and website references, that is due the next lecture period.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**‘MyCourses’ Website is a valuable resource.** <http://mycourses.rit.edu>

RIT has a web site for each course as a resource and course management system.

This site/CHMG 142 course folder will contain a copy of the:

[1] Syllabus – lecture schedule, the course policies – “the contract” – This is the same sheet we are looking through now. Also “Where is Dr McLean” sheet of my schedule is posted.

[2] Gradebook – This is where exam, homework and quizzes grades will be posted (you can only see yours and class statistics) so you can access your tentative grade. You should receive automatic updates and please check to verify (especially i-Clicker activities). Corrections / petitions need to be submitted within 5 days of posting because of logistics limitations.

[3] “Classlist” Messages – “News” items – I will use this to send mass announcements or mass e-mails to the whole class. An announcement goes to your mail.rit.edu page and e-mails

go to your e-mail address as given on the class list. Usually the announcements

are not repeated or posted in class, thus check ‘myCourses’ frequently.

[4] Power Point lecture outlines – they will be posted weekly under Content folder (Saturday). Decision matrices are posted for your use in managing the volume of information. Study guides for exams are posted at least 7 calendars prior to an exam. PowerPoint slides are occasionally used in lecture especially if they contain pertinent information, definitions, etc.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Class participation (7% + potential bonus ??%)**

Each lecture day there will be a number of “exam like questions” that require either collaboration or independent work during the lecture / class session.

Occasionally the worksheet questions appear on examinations word for word. This is a primary caveat for attending class. Usually solutions to class worksheets are posted after the lecture session (and if not, then kindly and tactfully remind the PI).

**Extra Assistance**

If you need extra assistance in understanding a topic, concept, or problem, please seek help in any of the following ways. Note that sometime students asked to have a night optional recitation (M, T, W in room to be announced, typically starting at 6:30 p.m.).

* Ask for previous exams with solution keys; we could file in ‘MyCourses’ if you want.
* Seek help from friends or classmates (but not on exams, of course). Study groups are typically a great idea if managed properly and appropriately.
* Seek help from SI (supplemental instructor) or PI (principal instructor) – before or after class, during office hours posted or try e-mail. {Be aware that I have a cheap smart phone that has limitation thus short answers supplied by email should be expected unless I am bored.} Oh, usually answer emails between 5 a.m. and 10 p.m. and quite often on weekends but I do have a life.
* Ask questions, especially during the optional recitation, but also during lecture. The best examination questions are sometimes asked by your peers in lecture. Do provide hints!
* Use the tutoring services provided by the Department of Chemistry, your college and private tutors.
* <http://www.rit.edu/~w-asc/> Academic services has been a awesome resource for numerous RIT students. I may recommend that you consult them, but SI nor PI can check on you because of FERPA!

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**SPECIAL NEEDS**

If you have any special needs for lecture or testing situations, please consult with me as soon as possible so that appropriate accommodations can be provided. Last minute requests are very difficult to honor, so proper planning prevents poor performance. (5 Ps)

Again, my door is almost always open so feel free to come in and ask questions.

ADA: <http://www.rit.edu/studentaffairs/studentconduct/rr_ada.php>

See opening statement on each “MyCourse” webpage.

I have personal and proactive experience with assisting others and helping myself over several decades. Please do not be bashful: I personally want you to succeed more tomorrow than you did yesterday! The aim is to have you realize your full potential as soon possible, thus if accommodations are necessary then utilize that opportunity.

See me, preferably not during office hours especially if you are bashful and shy. There are several avenues we can use but let’s discuss the best option for your success!

FERPA: <http://www.rit.edu/fa/grms/compliance/statutes/Family_Educational_Rights.html>

I also follow the spirit and law of the Family Educational Rights and Privacy Act of 1974 (FERPA) (also known as the Buckley Amendment) even if I just happen to know your parents, friends, or other relatives. If you want or need me to consult with your parents on academic endeavors, I will be happy to do so, but I will need your permission in writing and a simple email will not full the requirements. Please consult the above webpage for guidance.

For example, we cannot have a detailed discussion about your grade in the course via email. Some scores can be electronically delivered but you have to initiate the process. (I weekly update the gradebook on ‘myCourses’!)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Lecture | **Date** | **Chapter topics (McMurry and Fay, 2nd edition, General Chemistry, Atoms First)** | | | | | | | | | | |
| 1 | 27-Jan | Syllabus and Course Outline | | | |  | |  | |  |  |
|  |  | CHGM141 | Review solutions, concentrations, solubility guidelines | | | | | | | |  |
|  |  | 10.1 | Polar covalent bonds and dipole moments (conceptual) | | | | | | | |  |
|  |  |  | Relationship to EN or  and electronegativity (EA, IE…) | | | | | | | |  |
|  |  | 10.2 | Intermolecular interactions (attractive forces) | | | | | | |  |  |
|  |  | 11.3 | Concentration (molarity, molality, mole fraction, and links to % and D) | | | | | | | | |
|  |  | handouts | Introduction to Decision Matrices (a business model) | | | | | | | |  |
|  |  |  |  |  |  | |  | |  | |  |
| 2 | 29-Jan | 11.5 | colligative properties based on number of particles in "solvent" | | | | | | | | |
|  |  | 11.6 | vapor pressure lowering and Raoult's Law | | | | | |  | |  |
|  |  | 11.7 | boiling point elevation / freezing pt depression | | | | | | T= k \* i \* m | | |
|  |  | 11.8 | osmosis, osmostic pressure | | | |  = m \* i \* R \* T | | | |  |
|  |  | 11.9 | applications of colligative properties | | | | | |  | |  |
|  |  | 10.8 | Phase diagram for water (relevance to colligative properties) AND maybe carbon dioxide | | | | | | | |  |
|  |  |  |  | | | | | | | |  |
| 3 | 3-Feb | 12.1 | rates of chemical processes and factors that affect rates | | | | | | | |  |
|  |  | 12.2/12.3 | rate laws, reaction order and method of initial rates | | | | | | | |  |
|  |  |  | pattern analysis (units, doubling concentration, graph recognition) | | | | | | | | |
|  |  | 12.8 | zeroth order processes (evaporation of alcohol, dry ice sublimation) | | | | | | | | |
|  |  | 12.4/12.6 | first order processes (radioactive decay) and graphical methods | | | | | | | | |
|  |  |  |  |  |  | |  | |  | |  |
| 4 | 5-Feb | 12.7 | second order processes and graphical methods | | | | | | | |  |
|  |  | 12.9/12.10 | temperature and Arrhenius equation | | | | | |  | |  |
|  |  | 12.14/12.15 | catalyst (compare graphs and compare to temperature affect) | | | | | | | | |
|  |  |  |  |  |  | |  | |  | |  |
| 5 | 10-Feb | 12.11/12.12 | reaction mechanism (two types) and in-class ALEX quiz | | | | | | | |  |
|  |  | 12.13/12.14 | rate laws (especially type related to equilibrium constant) | | | | | | | |  |
|  |  | 13.3 | relate kinetics to equllibrium constant | | | | | |  | |  |
|  |  |  |  |  |  | |  | |  | |  |
| 6 | 12-Feb | 13.1 | equilibrium (vapor pressure, 100% yield) and factors | | | | | | | |  |
|  |  | 13.3/13.4 | Kc and Kp relationships (concentrations and pressures) | | | | | | | |  |
|  |  |  | Kp = Kc \* (R \* T)n | |  | |  | |  | |  |
|  |  | 13.7 | Le Chatelier's Principle (as applied to T, P and conc) | | | | | | | |  |
|  |  |  | Kc > Qc and Kc = Qc and Kc < Qc | | | | | |  | |  |
|  |  |  |  |  |  | |  | |  | |  |
| 7 | 17-Feb | 13.6 | using the equilibrium constant | | | |  | |  | |  |
|  |  | 13.8 | concentrations (molarity) and equlibrium constants | | | | | | | |  |
|  |  | 13.9 | pressures and equiibrium constants | | | | | |  | |  |
|  |  |  |  |  |  | |  | |  | |  |
| 8 | 19-Feb | ALEX | group activities involving major specific problems **(Quiz)** | | | | | | | |  |
|  |  |  |  |  |  | |  | |  | |  |
| **9** | **24-Feb** | **Exam01** | **(CHMG141 Ch10.2/8, Ch11.6-8, Ch12, Ch13; 8 classes)** | | | | | | | |  |
|  |  |  |  |  |  | |  | |  | |  |
| 10 | 26-Feb | 14.1/14.3 | acid-base concepts (Arrhenius, Bronsted-Lowry, Lewis) | | | | | | | |  |
|  |  |  | conjugate pairs | |  | |  | |  | |  |
|  |  |  | factors that affect acid or base strengths (some theory) | | | | | | | |  |
|  |  | 14.15 | Lewis acid and Lewis bases | | | |  | |  | |  |
|  |  |  |  |  |  | |  | |  | |  |
| 11 | 3-Mar | 14.4/14.6 | pH modeling, -log [HO-] = pOH and pH + pOH = 14.01 at 298 K | | | | | | | | |
|  |  |  |  |  |  | |  | |  | |  |
| 12 | 5-Mar | 14.7 -- 14.8 | Ka values and calculations: strong acid vs. weak acid | | | | | | | |  |
|  |  | 14.10 | percent ionization | |  | |  | |  | |  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13 | 10-Mar | 14.12 | Kb values and calculations: strong base vs. weak base | | | | | | |  | |
|  |  | 14.10 | percent ionization | | | |  |  | |  |  | |
| 14 | 12-Mar | 14.11 to 14.14 | (Challenge problems): salt of a weak acid is basic! | | | | | | |  | |
|  |  |  | hydrolysis processes: Ka from Kw/Kb for conjugates | | | | | | |  | |
|  |  | 15.2 | common ion problems | | | |  |  | |  |  | |
|  |  |  |  | | |  |  |  | |  |  | |
| 15 | 17-Mar | 15.3/15.5 | Buffer solutions, capacity, and relation to pH titration curve | | | | | | | | |
|  |  |  |  | | |  |  |  | |  |  | |
| 16 | 19-Mar | 15.5 thru 15.9 | (Quiz) monoprotic and polyprotic titration curves | | | | |  | |  | |
| SPRING BREAK | | 21 Mar thru 29 Mar -- sanity check and RRR | | | | | |  | |  |  | |
| 17 | 31-Mar | 15.10 thru 15.13 | solubility of sparingly soluble solids (Ksp calculations) | | | | | | |  | |
|  |  |  | pattern analysis and mathematical modeling | | | | |  | |  | |
| 18 | 2-Apr | 15.14 + 15.15 | solubility guidelines and Mr. Sherlock Holmes (schemes) | | | | | | |  | |
|  |  |  |  | | |  |  |  | |  |  | |
|  |  |  |  | | | | |  | |  | |
| **19** | **7-Apr** | **Exam02** | **Ch 14 and 15 + essential previous C&Ps (9 classes)** | | | | |  | |  | |
|  |  |  |  | | | | |  | |  | |
| 20 | 9-Apr | 8.12 + 8.13 | Review of Labs 11 and Lab 12 (CHMG 145) – thermodynamic views! | | | | |  | | Exam03 | |
|  |  | 16.1 + 16.2 | enthalpy, entropy, free energy, equilibrium arrow (Kc) | | | | | | |  | |
|  |  | 8.8+ 8.9 | review of Hess' Law | | | |  |  | |  |  | |
|  |  |  |  | | |  |  |  | |  |  | |
| 21 | 14-Apr | 16.3 thru 16.5 | entropy modeling (effect of temperature, phase change) | | | | | | |  | |
|  |  |  |  | | |  |  |  | |  |  | |
| 22 | 16-Apr | 16.6 thru 16.11 | free energy and relationship to equilibrium (G0 = \_ R \* T \* ln Kc) | | | | | | | | |
|  |  |  | standard conditions | | | | G0 = H0 \_ T \* S0 |  | |  | |
|  |  |  | nonstandard condition | | | | G = G0 + R \* T \* ln (Qc) | | |  | |
| 23 | 21-Apr | **7.6 thru 7.9** | reduction/oxidation review: The Activity Series (oxidation) | | | | | | | | |
|  |  |  | balancing redox equations (acidic versus basic solutions) (Quiz on balancing equations) | | | | | | | | |
| 24 | 23-Apr | 17.1 + 17.2 | spontaneous, voltaic, galvanic electrochemical cells | | | | | | |  | |
|  |  |  | standard reduction potentials at 298 K (activity, reduction) | | | | | | | | |
|  |  | 17.4 | conventional strategies and difference 0 | | | | |  | |  | |
| 25 | 28-Apr | 17.3 | equilibrium conditions | | | |  = 0 \_ (R \* T / n) ln (Kc) | | |  | |
|  |  |  | nonstandard conditions | | | |  = 0 \_ (R \* T / n) ln (Qc) | | |  | |
|  |  |  | free energy concepts | | | | G0 = \_ n \* F \* 0 |  | |  | |
| 26 | 30-Apr | 17.5 + 17.6 | predicting spontaneity by calculating voltages | | | | | | |  | |
|  |  |  | redox reactions, activity cell, precipitation cells | | | | | | |  | |
| 27 | 5-May | 17.12 thru 17.4 | electrolysis and Faraday's Law related to electroplating (Quiz) | | | | | | |  | |
|  |  |  | Q = i \* e \* t | and | relation to redox converted moles and "F" | | | |
| 28 | 7-May | 17.9 thru 17.11 | corrosion, fuel cells, batteries (applications) | | | | |  | |  | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **29** | **12-May** | **Exam03** | **Ch 16 and 17 (9 classes)** |  |  |  |
|  |  |  | \*\*\*Intel ISEF will be held May 11-15, 2015 in Pittsburg, PA | | | |

Here is my teaching schedule, etc. as of 22 January 2015.

Be aware that the more updated one appears on ‘MyCourses’.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| iger_walking_rit_color.jpg | Department of Chemistry School of Chemistry and Materials Science Rochester Institute of Technology | | | | |
|  | Dr. Howard Lee McLean | | |  | updated |
|  | Office | 14 -- 2313 | Carey Hall | | 30-Jan-15 |
|  | Office | phone | 5-2303 | 585-475-2303 |  |
|  | email | [hlmsch@rit.edu](mailto:hlmsch@rit.edu) | |  |  |
|  | Monday | Tuesday | Wednesday | Thursday | Friday |
| 0700 | swimming and walking workout (M thru F) | | | | |
| 0800 | usually back by 0830 | | CHMG 123 lab | usually back by 0830 | |
| 0900 | Declared office hours | | should be in | Declared office hours | |
| 1000 | Declared office hours | | 08-2163 | Declared office hours | |
| 1100 | 08-2159 mtg |  |  | Declared office hours | |
| 1200 | Research |  | CHMI 565 lab | Seminar in |  |
| 1300 (1 p.m.) | mobile |  | should be in | 08-3305 | Chemeeting |
| 1400 (2 p.m.) | try 08-2231 |  | 08-2231 | Either 08-2231 | CHMG 123 lab |
| 1500 (3 p.m.) |  |  |  | or office | should be in |
| 1600 (4 p.m.) |  |  |  | research | 08-2163 |
| 1700 (5 p.m.) | CHMI 351 Lec GOS 8-1250 | CHMG 142 Lec GOS 8-1250 | CHMI 351 Lec GOS 8-1250 | CHMG 142 Lec GOS 8-1250 |  |
| 1800 |  |
| 1900 |  | Tues 6:30 to 8:00 | Wed 6:30 to 8:00 | Recitation  (optional on T, W) |  |
|  |  | 08-1300 | 08-1154 |  |  |
|  | Make a quality appointment at other times or just drop by | | | | |
|  | CHEM 493 Chemistry Research typically M, Th maybe T | | | |  |