

**FLORIDA INTERNATIONAL UNIVERSITY**  
**CHM 1046 - GENERAL CHEMISTRY 2 (U02)**  
**FALL 2022**

Instructor: Jeff Joens  
Office: CP 331; phone 348-3121 (voice mail)  
Web page: [www.joenschem.com](http://www.joenschem.com)

Time: M,W,F 11:00am to 12:15pm  
Room: PG5-Room 155  
e-mail: [joensj@fiu.edu](mailto:joensj@fiu.edu)

Office hours: TBA (to be announced)

Course objective: To provide, along with the companion course CHM 1045 and the corresponding laboratory courses, a two semester general introduction to basic concepts in chemistry.

Prerequisite: CHM 1045 and CHM 1045L

Co-requisite: CHM 1046L (the laboratory class is designed to help you engage with the concepts and understand them).

Text: (recommended) Chemistry: Atoms First, 4<sup>th</sup> Edition, Burdge and Overby (or equivalent).  
Chemistry-2e (openstax) <https://openstax.org/details/books/chemistry-2e>

Bring a simple scientific calculator with a logarithm key to each class session and exam. Graphing calculators are **not** allowed for exams. I recommend the Sharp EL 531 calculator or TI-30XA, which are cheap and very good.

Grading:	3 hour exams (100 points each)	300 points
	Final exam (comprehensive)	200 points
	Take home worksheets (6 highest)	<u>30 points</u>
		530 points total

Final grades:	450-530 (85%) A	265-370 (50%) C	0-229 F
	370-450 (70%) B	220-265 (42%) D	(+/- grades are given)

**EXAMS: The date for each hour exam is given on the attached calendar. Hour exams are in class at the same time and place as the lecture.** The date will be confirmed at least one week prior to the day of the exam. The hour exams will be worth 100 points each, for a total of 300 points. The final exam will be comprehensive and will be worth 200 points. The date, time and location of the final exam will be announced later in the semester.

During exams you are only allowed to keep with you pens and/or pencils, erasers, a scientific non-graphing calculator, and a photo ID. You have to leave all other material in the front of the class. You can use the back of the exam for scratch paper or additional room for your work. ***Graphing calculators will be confiscated and grading penalties will be assessed if the you are found with one during the exam. You cannot keep your cell phones or any other electronic devices with you during the exam. If you are found with one it is grounds for academic misconduct.***

**YOU WILL BE REQUIRED TO PROVIDE A PHOTO ID AT EACH EXAM.**

**Notes:** 1) Final grades will be based on the total number of points accumulated from all of the exams, along with the six highest take home worksheets. **NO EXAM GRADE WILL BE DROPPED.**

2) If you are forced to miss an exam you must notify me as far in advance as possible. Excused absences from exams, and the procedure for making up exams, will be at the discretion of the instructor.

3) Homework will be assigned periodically but not collected. Solutions to the homework will be available at my web page: [www.joenschem.com](http://www.joenschem.com). Other useful material, such as the powerpoint presentations, review outlines, sample exams, and so forth, will also be available at my website.

4) There will be several worksheets given in class, worth a maximum of 5 points per worksheet. Worksheets will be due on the date given on the worksheet at the beginning of class. **NO LATE WORKSHEETS WILL BE ACCEPTED.** The six highest worksheets will be used in calculating your final grade for the class.

5) As per University policy, an incomplete for this class will be given only for a valid medical reason, and only after a written agreement that states the reason for the incomplete and with a timetable for the missing work.

**Disability Resource Center** provides assistance for students with a disability. I will make accommodations for students with a disability as needed under the advisement of the Disability Resource Center located in GC-190. (305-348-3532). Their website is: <https://studentaffairs.fiu.edu/get-support/disability-resource-center/>

**Academic misconduct:** Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook. **Cheating is unfair to your honest classmates and absolutely will not be tolerated.** The first such infraction will be dealt with to the fullest extent permissible by the university. Cheating includes (but is not limited to) any form of inter-student collaboration on exams, use of prohibited materials or devices during exams (viz. a graphing calculator, **CELL PHONE**), copying or distribution of quiz or exam answers prior to the test, adding or altering answers after exams have been returned and asking for regrading, and plagiarism. For more information go to: <https://online.fiu.edu/faculty/resources/university-resources/academic-misconduct-policies-and-procedures.php>

**Recording:** Please be advised that classes may be audio and visually recorded and/or subject to course capture for future access by students in this course. Your attendance/ participation in this course constitutes consent to such recordings, which will only be used for educational purposes by students in the course and securely stored in University systems. If there is a concern regarding the recording and use of such recording, please contact FERPA@fiu.edu.

#### Tentative course outline

### Unit 1 - Solutions, thermochemistry

#### Chapter 13: Physical Properties of Solutions

Types of solutions, a molecular view of the solution process, concentration units, factors that affect solubility, colligative properties, calculations using colligative properties

#### Chapter 14: Entropy and Free Energy

Spontaneous processes, entropy, entropy changes in a system, entropy changes in the universe, predicting spontaneity

\*\*\*\*\*EXAM 1 – Friday, September 23<sup>rd</sup> \*\*\*\*\*

### Unit 2 – Equilibrium, acid-base chemistry

#### Chapter 15: Chemical Equilibrium

The concept of equilibrium, the equilibrium constant, equilibrium expressions, chemical equilibrium and free energy, calculating equilibrium concentrations, Le Chatlier's principle: factors that affect equilibrium

#### Chapter 16: Acids, Bases, and Salts

Bronsted acids and bases, molecular structure and acid strength, the acid-base properties of water, the pH and pOH scales, strong acids and bases, weak acids and acid ionization constants, weak bases and base ionization constants, conjugate acid-base pairs, diprotic and polyprotic acids, acid-base properties of salt solutions, oxides, and hydroxides, Lewis acids and bases

\*\*\*\*\*EXAM 2 – Friday, October 21<sup>st</sup> \*\*\*\*\*

### Unit 3 – Titrations, solubility, electrochemistry

#### Chapter 17: Acid-Base Equilibria and Solubility Equilibria

The common ion effect, buffer solutions, acid-base titrations, solubility, factors affecting solubility, separation of ions using differences in solubility

#### Chapter 18: Electrochemistry

Balancing redox reactions, galvanic cells, standard reduction potentials, spontaneity of redox reactions under standard-state conditions, spontaneity of redox reactions under conditions other than standard state, batteries, electrolysis, corrosion

\*\*\*\*\*EXAM 3 – Friday, November 18<sup>th</sup> \*\*\*\*\*

#### Chapter 19: Chemical Kinetics

Reaction rates, collision theory of chemical reactions, measuring reaction progress and expressing reaction rate, dependence of reaction rate on reactant concentration, dependence of reaction rate on time, dependence of reaction rate on temperature, reaction mechanisms, catalysis

\*\*\*\*\*FINAL EXAM – TBA \*\*\*\*\*