CHE 132-31(R30-R34): General Chemistry II, (Online Synchronous)

Instructor: Dr. Waldemar M. Nieweglowski

Office Hours: Monday, Wednesday 12:30 – 14:00
Email: waldemar.nieweglowski@stonybrook.edu (Please add CHE132 in the subject line)

Teaching Assistants (for office hours please refer to Brightspace):
TBA

COURSE DESCRIPTION
A continuation of either CHE 129 or 131, introducing the fundamental principles of chemistry, including substantial illustrative material drawn from the chemistry of inorganic, organic, and biochemical systems. The principal topics covered are stoichiometry, the states of matter, chemical equilibrium and introductory thermodynamics, electrochemistry, chemical kinetics, electron structure and chemical bonding, and chemical periodicity. The sequence emphasizes basic concepts, problem solving, and factual material. It provides the necessary foundation for students who wish to pursue further coursework in chemistry. Three lecture hours and one 80-minute workshop per week. May not be taken for credit in addition to CHE 152. This course has been designated as a High Demand/Controlled Access (HD/CA) course. Students registering for HD/CA courses for the first time will have priority to do so. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information. (4 credits)

Prerequisite: C or higher in CHE 129 or CHE 131

Pre- or Corequisite: MAT 125 for those who took CHE 129 or 130; MAT 126 or higher for all others

COURSE OBJECTIVES: Expand students’ knowledge in the field of chemistry, foster critical and analytical thinking, quantitative reasoning, problem solving, teamwork, oral and written communication, and metacognition.

LEARNING OBJECTIVES
- Be able to predict the sign of $\Delta S$ for a chemical or physical change
- Explain the second law of thermodynamics, the relationship between enthalpy, entropy and free energy, and the relationship of the second law to chemical equilibrium
- Describe and use the relationship between $\Delta G$ and $K$.
- Explain the factors which determine the rate of a chemical reaction and use experimental data to determine the rate law of a reaction
- Use the initial rates method to determine a rate law and understand its limitations
- Understand the difference between the information provided by kinetics and thermodynamics
- Explain collision theory of chemical reaction
- Relate kinetics to reaction coordinates and mechanisms including elementary steps, transition states, intermediates and rate determining steps
- Explain and predict the effect of various factors (temperature, presence of catalyst, nature and concentration of the reactants, surface area of the reactants) on the reaction rate.
- Explain the fundamental concepts of chemical equilibrium as they pertain to a variety of chemical systems such as gas phase, reactions, acid/base reactions, solubility/precipitation and electrochemical reactions
Each student is responsible for knowing all procedures and course expectations detailed in this document, in other handouts or announced during lectures or workshops or in Blackboard. Failure to attend a lecture or workshop is not an excuse for not knowing what was presented or announced. If you miss a lecture or workshop it is your responsibility to find out what transpired from a fellow student, or from your instructor.
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An Honor Code statement will be provided for each exam. By taking and completing the exam, you acknowledge the terms in the Honor Code statement. Violations may result in a report to Academic Judiciary and a course grade of F. A review of all relevant materials will be conducted prior to each exam. Success on these exams will require that you understand important concepts, as well as their use in solving problems relevant to the course material. If you understand assigned problems in this way, and test your understanding on problems that are not assigned, you are more likely to do well in this course.

**GRADING:** Course grades will be based on the following percentages (all grades will be available on Brightspace):

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>120</td>
</tr>
<tr>
<td>Exam 1</td>
<td>100</td>
</tr>
<tr>
<td>Exam 2</td>
<td>100</td>
</tr>
<tr>
<td>Exam 3</td>
<td>100</td>
</tr>
<tr>
<td>Final Exam</td>
<td>200</td>
</tr>
<tr>
<td>Attendance</td>
<td>10</td>
</tr>
<tr>
<td>Quizzes</td>
<td>110</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>740</strong></td>
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</tbody>
</table>

**Final percent grades** will be rounded (to the tenth’s place). Final letter grades will be based on the following cutoffs:

- **A:** $\geq 90.0\%$
- **A-:** $89.9\% – 85.0\%$
- **B+:** $84.9\% – 80.0\%$
- **B:** $79.9\% – 75.0\%$
- **B-:** $74.9\% – 70.0\%$
- **C+:** $69.9\% – 65.0\%$
- **C:** $64.9\% – 60.0\%$
- **D+:** $59.9\% – 55.0\%$
- **D:** $54.9\% – 50.0\%$
- **F:** $\leq 49.9\%$

*Your final grade is the grade you have earned. I will not negotiate final grades, nor will I be able to provide additional extra-credit assignments to “bump” your grade.*

**CLASS PROTOCOLS:**

- All lectures and workshops will be conducted using Zoom.
- Microphones: During lecture, please keep your microphones muted unless you want to ask a question. During workshops, microphones should be active to engage in team discussion.
- Webcams: During lectures, you may keep your webcams off unless you ask a question. During workshops, webcams should be active.
- Questions regarding class topics are always welcome. Questions that are not directly related to class topics should be directed to the instructor immediately before or after class, and instructors will do their best to be available at these times. If the instructor is not available immediately before or after class, questions can be taken during office hours or sent to instructor email.

Each student is responsible for knowing all procedures and course expectations detailed in this document, in other handouts or announced during lectures or workshops or in Blackboard. Failure to attend a lecture or workshop is not an excuse for not knowing what was presented or announced. If you miss a lecture or workshop it is your responsibility to find out what transpired from a fellow student, or from your instructor.
Stony Brook University expects students to: maintain standards of personal integrity that are in harmony with the educational goals of the institution; to observe national, state, and local laws and University regulations; and to respect the rights, privileges, and property of other people. Any behavior that interrupts the ability of instructors to teach, the safety of the learning environment, and/or students' ability to learn will be reported to University Community Standards. Students who display such behavior may be asked to consult with one of the course instructors or asked to leave a class session, whereupon University Police will be notified. Information on campus policy regarding student disruptions can be found at http://www.stonybrook.edu/sb/behavior.shtml

COURSE RESOURCES:

Brightspace: should be checked regularly for announcements, reading and homework assignments, lecture notes, help room schedules, sample exams from previous semesters, and other important matters. Support for Brightspace is available through the information at brightspace.stonybrook.edu.

Getting Help:

- Help with concepts or assignments is available during office hours or by appointment.
- Issues with the Workshops should be addressed to your Workshop Instructor. Issues that cannot be resolved by your instructor should be taken to Dr. Nieweglowski during her office hours as posted on Brightspace under Announcements.
- Questions about course content, organization, grades, exams, or personal problems should be addressed to Dr. Nieweglowski, immediately after lectures or during office hours.
- Office hours for all instructors are posted under Announcements in Brightspace.
- Additional academic help may be available through the Residential Tutoring Centers (studentaffairs.stonybrook.edu/res_programs/rtc/) or the Academic Success & Tutoring Center (stonybrook.edu/commcms/academic_success/).

REQUIRED SYLLABUS STATEMENTS

The University Senate has authorized that the following required statements appear in all teaching syllabi on the Stony Brook Campus. This information is also located on the Provost’s website.

Student Accessibility Support Center (SASC) Statement:
If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website: https://ehs.stonybrook.edu/programs/fire-safety/emergency-evacuation-evacuation-guide-disabilities and search Fire Safety and Evacuation and Disabilities.

Academic Integrity Statement:
Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected
instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Professions, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

In this course you are strongly encouraged to work with others to master the material in the class activities, workshops, and homework. However, in working with others to arrive at your response to a question, you must understand and be able to explain the rationale behind your response and not just report someone else’s answer. It is intellectually dishonest to report someone else’s work and understanding as your own. Therefore, violations of the following will result in a course grade of F and a report to the Academic Judiciary.

- You must submit responses to in-class questions and problems only with your own clicker subscription.
- You must record and submit your own answers to homework questions based on your understanding not on how someone else told you to respond.
- You must work independently when asked to do so.
- You must take the in-class exams and the final exam independently with no assistance from any other person, without the aid of any unauthorized materials, and without access to any electronic communication devices.
- Violations may result in a report to Academic Judiciary and a course grade of F.

Critical Incident Management Statement:
Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students’ ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.
Each student is responsible for knowing all procedures and course expectations detailed in this document, in other handouts or announced during lectures or workshops or in Blackboard. Failure to attend a lecture or workshop is not an excuse for not knowing what was presented or announced. If you miss a lecture or workshop it is your responsibility to find out what transpired from a fellow student, or from your instructor.

Table 1: Tentative lecture and exams schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topics</th>
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<tbody>
<tr>
<td>12.4-12.7</td>
<td>Intermolecular Forces</td>
</tr>
<tr>
<td>14.1-14.7</td>
<td>Solutions</td>
</tr>
<tr>
<td>15.1-15.7</td>
<td>Chemical Kinetics</td>
</tr>
<tr>
<td></td>
<td><strong>Exam I (Ch 12, 14, 15)</strong> 19-Jul</td>
</tr>
<tr>
<td>16.2-16.9</td>
<td>Chemical Equilibrium</td>
</tr>
<tr>
<td>17.1-17.9</td>
<td>Acid and Bases</td>
</tr>
<tr>
<td>18.1-18.6</td>
<td>Aqueous Ionic Equilibrium</td>
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<tr>
<td></td>
<td><strong>Exam II (Ch 16, 17, 18)</strong> 2-Aug</td>
</tr>
<tr>
<td>19.1-19.10</td>
<td>Free Energy and Thermodynamics</td>
</tr>
<tr>
<td>20.1-20.6</td>
<td>Electrochemistry</td>
</tr>
<tr>
<td></td>
<td><strong>Exam III (Ch 19, 20)</strong> 12-Aug</td>
</tr>
<tr>
<td>26.1-26.6</td>
<td>Transition Metals and Coordination Compounds</td>
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<tr>
<td></td>
<td><strong>Exam IV Final (cumulative)</strong> 16-Aug</td>
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