



**LOYOLA**  
UNIVERSITY CHICAGO

*Preparing people to lead extraordinary lives*

## CHEM 171-001: General Chemistry for Engineering

Fall 2021: Aug 30, 2021 – Dec 11, 2021

**Instructor:** Murat Kahveci, Ph.D.  
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Email: [mkahveci@luc.edu](mailto:mkahveci@luc.edu)  
Office Hours:

Fridays 11 am – 1 pm via Zoom. All other times, by appointment only.  
<https://luc.zoom.us/j/84673064175?pwd=RkpHRHJVVlljS2RUVWMrY2ordGR5dz09>  
Meeting ID: 846 7306 4175  
Passcode: 510577

**Fall 2021 Masking Requirement:** It is Departmental policy that, even in the event the University relaxes its universal requirement for indoor mask-wearing during the Fall 2021 semester, it will remain a principle of this class-section that, out of respect for the health of housemates and others in regular contact with members of our community, in this class we properly wear masks at all times (e.g. over nose and mouth).

**Course Description:** To acquaint students with fundamental concepts of chemistry and their application in engineering science.

**Textbooks:** “Chemistry for Engineering Students”, 4th edit. by Larry Brown and Tom Holme (Cengage Learning, Inc., 2019) ISBN 978-1-337-39890-9 is required. The Student Solutions Manual with Study Guide, ISBN 978-1-337-39906-7 is recommended.

**Lecture Notes:** Lecture notes/handouts for each chapter will be made available electronically. Students are expected to “fill in the blanks” (take notes) with calculations, chemical equations, and structures in the handouts as the lectures proceed. When set of notes is completed for a Chapter, a completed version will be posted in Sakai.

**Other Materials:** You will need an inexpensive calculator having logarithmic (base 10 and base e), exponential, and trigonometric functions. Be sure you are familiar with your calculator and that it is in user-ready condition for quizzes and exams. **Calculators cannot be shared during exams and the covers must be removed while taking the exam. You are not allowed to have a cell phone during the exam.**

**Zoom Guidelines and Expectations:** This class will use Zoom for office hours. Students should follow general guidelines and meet participation expectations for Zoom meetings:

- Use your given or preferred name as your display name.

- Don't use distracting or inappropriate profile photos or virtual backgrounds.
- Minimize distractions, such as televisions and cell phones, when possible.
- Try to put your device at eye level on a solid surface. Holding your device or placing it in your lap can add movement to your video, which can be distracting.
- Don't engage in other activities during sessions (driving, cooking, cleaning, etc.)
- Mute your microphone when you're not speaking to minimize background noise.
- Don't share meeting links, passwords, screenshots, recordings, or other meeting information. with people outside the class.
- If connectivity issues impact your audio/video quality, try turning off your camera.
- Be on time or notify your instructor if you will be late or unable to attend.
- If you think you might have trouble actively participating in meetings, let your instructor know in advance, if possible.
- Contact Loyola's Technology Support Center at (773) 508-4487 or via email at ITS Service Desk [ITSServiceDesk@luc.edu](mailto:ITSServiceDesk@luc.edu), if you need assistance during a video call.

**Class Procedures:** All sections of this class will meet for lecture on Monday, Wednesday, and Friday from 8:10 to 9:00 AM in Flanner Hall 07. Discussion sections will be held from 9:30 AM to 10:20 AM on Wednesday in Flanner Hall 07. A discussion worksheet will be provided at the beginning of each discussion period. The instructor will demonstrate the first problem or a selected problem on the worksheet for the class. Then you will be expected to complete the worksheet problems (you may work together) and hand them in at the end of the session. These will not be graded. Students may work in groups and need not hand in perfect worksheets but must make a good faith effort to complete the assignment to get full credit. Completed discussion sheets will be posted on Sakai prior to the upcoming exam.

**Homework Problems:** Students who expect to do well on the quizzes and exams should be able to the assigned problems at the end of the chapters in the book. Representative problems will be demonstrated in lecture and worked out in the discussion sections. Students who expect to do well must understand the concepts behind the problems. Students who can do the indicated problems at the end of the chapters should have no problem with the tests.

**Exams, Discussion Assignments, and Grading:** The total grade for the course is based on five 1-hour exams given over the course of the semester, discussions, and one final. Your lowest 1-hour exam score will be dropped. If you have to miss an exam due to illness or some other reason, this will be your dropped grade. If you miss another exam, then you must have a valid excuse (doctor's note) to have a make-up exam arranged. Each of the five hour exams is worth 17% of your grade (best four is 68% of total). The final is worth 22% of your total grade. Discussions are 10% of your total grade.

**Grading Scale:** The following scale will be used to determine letter grades.

Percent Range	Letter Grade
100 – 93	A
92 – 89	A–
88 – 85	B+
84 – 81	B
80 – 77	B–
76 – 73	C+
72 – 69	C
68 – 65	C–
64 – 53	D
0 – 52	F

**Exams and Academic Honesty:** Students are expected to present their IDs upon taking exams and quizzes. Academic dishonesty of any sort will not be tolerated. Students caught cheating on an exam or who have someone else take it for them will receive an F grade for the course.

**Laboratory:** General Chemistry laboratory, Chem 173 (section 01) should be taken concurrently with this course.

**Course Repeat Rule:** Effective with the Fall 2017 semester, students are allowed only THREE attempts to pass Chemistry courses with a C- or better grade. The three attempts include withdrawals (W).

**Tentative Outline of the Course:** An outline of the topics that will be covered in this course appears on the next page. Although I will generally follow the order of presentation found in your textbook, on occasion I will deviate from this order. Please refer to the tentative schedule and posted announcements on Sakai to note these deviations.

MONDAY		WEDNESDAY		FRIDAY	
Aug 30th Introduction	1	Sep 1st Atoms and Molecules <i>Chapter: 1, 2</i>	2	3rd Balancing Chemical Equations <i>Chapter: 2</i>	3
6th Labor Day: No Classes	4	8th Chemical Bonds <i>Chapter: 2</i>	5	10th Limiting reagent, Ions in Solution <i>Chapter: 2</i> Discussion I: Balancing Equations	6
13th Ions in Solution <i>Chapter: 3</i>	7	15th Reactions in Solution <i>Chapter: 3</i>	8	17th <b>Exam 1</b> <i>Chapter: 1, 2, 3</i> Discussion II: Mole-Mass and Volumetric Calculations	9
20th Reaction Stoichiometry <i>Chapter: 4</i>	10	22nd Reaction Stoichiometry <i>Chapter: 4</i>	11	24th Ideal Gas Law <i>Chapter: 5</i> Discussion III: Reaction Stoichiometry	12
27th Kinetic Theory and non-Ideal Gases <i>Chapter: 5</i>	13	29th Gas Law Calculations <i>Chapter: 5</i>	14	Oct 1st <b>Exam II</b> <i>Chapter: 4, 5</i> Discussion IV: Gas Law Calculations	15
4th Electron Configurations of Atoms <i>Chapter: 6</i>	16	6th Electron Configurations of Atoms <i>Chapter: 6</i>	17	8th Periodic Trends in Atomic Properties <i>Chapter: 6</i> Discussion V: Electron Configurations	18

MONDAY	WEDNESDAY	FRIDAY
11th <b>19</b> Mid-Semester Break: No classes	13th <b>20</b> Ionic, Covalent bonds and Lewis Structures <i>Chapter: 7</i>	15th <b>21</b> Hybrid orbitals and Molecular shapes <i>Chapter: 7</i> Discussion VI: Periodic Trends, Bonds
18th <b>22</b> Drawing Lewis Structures <i>Chapter: 7</i>	20th <b>23</b> <b>Exam 3</b> <i>Chapter: 6, 7</i>	22nd <b>24</b> Molecules and Materials <i>Chapter: 8</i> Discussion VII: Lewis Structures
25th <b>25</b> Molecules and Materials <i>Chapter: 8</i>	27th <b>26</b> First Law of Thermodynamics <i>Chapter: 9</i>	29th <b>27</b> Hess's Law <i>Chapter: 9</i> Discussion VIII: Molecules and Materials
Nov 1st <b>28</b> Calorimetry <i>Chapter: 9</i>	3rd <b>29</b> Calorimetry <i>Chapter: 9</i>	5th <b>30</b> <b>Exam 4</b> <i>Chapter: 8, 9</i> Discussion IX: Calorimetry and Hess's Law Calculations
8th <b>31</b> Spontaneous Chemical Reactions and Entropy <i>Chapter: 10</i>	10th <b>32</b> Second Law of Thermodynamics <i>Chapter: 10</i>	12th <b>33</b> Gibbs free energy and Chemical Reactions, Rate Laws <i>Chapter: 10, 11</i> Discussion X: Spontaneous Reactions
15th <b>34</b> Rate Laws of Chemical Reactions <i>Chapter: 11</i>	17th <b>35</b> Temperature, Reaction Rates, 11 and Catalysis <i>Chapter: 11</i>	19th <b>36</b> <b>Exam 5</b> <i>Chapter: 10, 11</i> Discussion XI: $\Delta G$ and Chemical Kinetics
22nd <b>37</b> Chemical Equilibrium, L $\hat{e}$ Chatlier's principle <i>Chapter: 12</i>	24th <b>38</b> Thanksgiving Break: No classes	26th <b>39</b> Thanksgiving Break: No classes
29th <b>40</b> Chemical Equilibrium and Equilibrium Constants; L $\hat{e}$ Chatlier's principle <i>Chapter: 12</i>	Dec 1st <b>41</b> Acid-Base Equilibria <i>Chapter: 12</i>	3rd <b>42</b> Acid-Base and Solubility Equilibria <i>Chapter: 12</i> Discussion XII: Chemical Equilibrium
6th <b>43</b> Redox Reactions and Galvanic Cells <i>Chapter: 13</i>	8th <b>44</b> Nernst Equation <i>Chapter: 13</i>	10th <b>45</b> Corrosion, Batteries, and Electrolysis <i>Chapter: 13</i> Discussion XIII: Electrochemistry

I reserve the right to make changes to this schedule, as necessary.

**Final Exam:** The University sets the schedule for all final exams. The final will be held on:

**12/16/2021, Thursday, 9:00AM - 11:00AM, Flanner Hall 07**

You will have exactly 2 hours to complete the exam. Additional time will not be granted, even if you arrive late. There will be no make-up final exams given under any circumstance, and the exam will not be given early, either.

**Student Accommodations:** If you have any special needs, please let me know in the first week of classes. The university provides services for students with disabilities. Any student who would like to use any of these university services should contact the Student Accessibility Center (SAC), Sullivan Center, (773) 508-3700. Further information is available at <http://www.luc.edu/sac>.