CHEM 103: General Chemistry

Middlebury College

Fall 2020

# Course/instructor information

Instructor: Dr. Mary Jane Simpson

Contact: Email anytime [msimpson@middlebury.edu](mailto:msimpson@middlebury.edu)

Zoom drop-in hours are held on Mondays, 7 – 8 pm

Zoom drop-in hours location: 985-569-2968, Password: 456068

In person/Zoom drop-in hours are held in MBH 563 on Fridays, 10 am – 12 pm

Private appointments are held in MBH 329 or on Zoom

# Course description

This course is appropriate for students with little or no prior preparation in chemistry who would like to learn about basic chemical principles while fulfilling the SCI or DED distribution requirement.

# Learning outcomes

* Describe matter using modern atomic theory
* Justify periodic trends using electronic structure
* Examine molecules using advanced theories of bonding
* Analyze chemical reactions using stoichiometry
* Apply thermodynamics to predict heat changes
* Describe states of matter and phase changes at the molecular level

# Course structure

This online course involves a combination of asynchronous individual learning and twice-weekly required synchronous discussion groups. Online learning modules and small group activities learning will introduce students to content. Individual online homework sets provide students an opportunity to practice new skills and identify misunderstandings. Group challenge problem solving sessions will deepen student understanding of the material and provide an opportunity to self-evaluate mastery.

# Course materials

Chemistry: Atoms First textbook

Required, free, Hard copies may also be purchased online.

https://openstax.org/details/books/chemistry-atoms-first

*Sapling Learning* online homework system

Required, $40

Purchase online at SaplingLearning.com

If continuing onto CHEM 104, consider getting a two-semester subscription.

Students on financial aid may be eligible to get a voucher for Sapling Learning from the Middlebury College bookstore.

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| Grading information Exam 1 15%  Exam 2 15%  Final Exam 20%  Sapling Problem Sets 15%  Participation 10%  Lab 25%  *Note: all labs must be completed to pass the course.* | Grading scale A 93.0 – 100%  A- 90.0 – 92.9%  B+ 87.0 – 89.9%  B 83.0 – 86.9%  B- 80.0 – 82.9%  C+ 77.0 – 79.9%  C 73.0 – 76.9%  C- 70.0 – 72.9%  D 60.0 – 69.9%  F 59.9% |

# Relevant policies

## Academic integrity

Each student in this course is expected to abide by the Middlebury College Honor Code. The exams must be your work alone using only the materials authorized. Suspected violations will be reported to the Office of Judicial Affairs.

## Disability access/accommodation

Students with documented disabilities who believe that they may need accommodations in this class are encouraged to contact me as early in the semester as possible to ensure that such accommodations are implemented in a timely fashion. Assistance is available to eligible students through Student Accessibility Services. Please contact Jodi Litchfield at litchfie@middlebury.edu for more information. All discussions will remain confidential.

## Use of technology

All technology is permitted for all students at all times except for during exams, at which point specific guidelines will be provided regarding appropriate use of technology.

# Expectations of students

This course will operate under the principle of growth mindset: we are all here to learn and grow. Our classroom is a safe and constructive learning environment in which mutual trust and respect among everyone is expected.

Students are expected to stay on schedule. Discussion groups will be most beneficial for students who come prepared, having completed their individual work, read through the activity for the day, and written questions that surfaced in the process. Discussion group attendance is a requirement for the course and factors into the participation grade. Attendance will be checked at the end of every class when the instructor checks the day’s activity for completion.

# Relevant campus resources

## Center for Teaching, Learning, and Research (CTLR)

This course requires advanced use of college-level algebra. Many students need to refresh math concepts in order to complete data analysis. The CTLR provides academic support for students in many specific content areas, including math, through both professional tutors and peer tutors. The Center is also the place where students can find assistance in time-management and study skills. These services are free to all students. For more information on how to get the help you need, go to <http://www.middlebury.edu/academics/resources/ctlr/students>.

## Disability Resource Center (DRC)

The DRC provides support for students with disabilities and facilitates the accommodations process by helping students understand the resources and options available and by helping faculty understand how to increase access and full participation in courses. The DRC can also provide referrals for students who would like to undergo diagnostic testing. Students who are on financial aid and have never undergone diagnostic testing can apply to the CTLR for support to cover the cost of off-campus testing. DRC services are free to all students.

# Exam dates

There will be 2 midterms and a final exam, each taking 2 hours. Students may take exams anytime on the date listed.

* Exam 1, covering Modules 1-4, is Friday, October 8.
* Exam 2, covering Modules 5-9, is Friday, November 13.
* Final Exam, covering Modules 1-11, is self-scheduled.

Students should refer to challenge problems for examples of the types of problems to expect on exams, both in terms of difficulty and format.

# Detailed schedule

Every week, students will:

1. Complete an online learning module (LM) on Canvas. This should take approximately 3-5 hours – Begin on Thursdays and complete by Saturday at 11:59 pm. Post questions on Canvas discussion forums.
2. Complete an online homework set (HW) on Sapling Learning. This should take approximately 2 hours – Begin soon after completing the LM and complete by Tuesdays at 11:59 pm. If possible, questions about specific homework problems should be posted on Canvas so everyone can benefit from the discussion.
3. In class on Mondays, work with a group to complete a group activity (GA) covering content in the learning module.
4. In class on Wednesdays, work with a group to complete a challenge problem (CP).

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| **Date** | **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** | **Saturday** |
| 9/8 – 9/12 |  |  |  | GA0 in class |  |  | LM1 due |
| 9/13 – 9/19 |  | GA1 in class | HW1 due | CP1 in class |  |  | LM2 due |
| 9/20 – 9/26 |  | GA2 in class | HW2 due | CP2 in class |  |  | LM3 due |
| 9/27 – 10/3 |  | GA3 in class | HW3 due | CP3 in class |  |  | LM4 due |
| 10/4 – 10/10 |  | GA4 in class | HW4 due | CP4 in class |  |  | LM5 due |
| 10/11 – 10/17 |  | GA5 in class | HW5 due | CP5 in class |  |  | LM6 due |
| 10/18 – 10/24 |  | GA6 in class | HW6 due | CP6 in class |  |  | LM7 due |
| 10/25 – 10/31 |  | GA7 in class | HW7 due | CP7 in class |  |  | LM8 due |
| 11/1 – 11/7 |  | GA8 in class | HW8 due | CP8 in class |  |  | LM9 due |
| 11/8 – 11/14 |  | GA9 in class | HW9 due | CP9 in class |  |  | LM10 due |
| 11/15 – 11/21 |  | GA10 in class | HW10 due | CP10 in class |  |  | LM11 due |
| 11/22 – 11/28 |  |  |  |  |  |  |  |
| 11/29 – 12/5 |  | GA11 in class | HW11 due | CP11 in class |  |  |  |