

CHE 1031

General Chemistry I

This course is intended for engineering students and consists of the fundamentals of general and physical chemistry. Laboratory work is designed to amplify the lectures, provide an introduction to laboratory techniques, and introduce some methods of analysis currently used in industry; 3 hours of lecture, 3 hours of laboratory per week.

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'We must trust to nothing but facts: these are presented to us by nature and cannot deceive. We ought, in every instance, to submit our reasoning to the test of experiment, and never to search for truth but by the natural road of experiment and observation.'

- Antoine Lavoisier

CHE1031, General Chemistry I, is a rigorous 1-semester general chemistry course providing an introduction to the major topics covered in most inorganic chemistry courses. The course is intended to prepare engineering and technology students for the Fundamentals of Engineering exam and preparing diversified agriculture students for organic chemistry, CHE 2060.

This course requires students to complete a few problems following each lecture and additional homework problems for each chapter or topic covered. Labs are conducted each week and brief lab reports are required. Take-home quizzes are given roughly every other week and four hourly exams are given over the course of the semester. The lowest homework and quiz grades are dropped. The final exam is comprehensive and allows students to replace earlier exam grades with higher from corresponding sections of the final exam.

This fall we have added recitation hours to CHE1031 to increase student success.

I'm using an OER (Open Educational Resource) text that is available for free as a pdf:

OpenStax '[Chemistry 2e](#)'.

How this course site works:

The course is divided into 11 modules and their materials can be accessed using the CHE103 pull-down menu on **this Weebly site**. The pull-down menu brings you to the webpage for each module and that page is organized in left- and right-hand columns.

Left-hand column: a variety of resources that you may find helpful but don't have to use.

Right-hand column: a group of assignments (marked with*). I won't assign all of them but will choose assignments as we go through the semester.

The drop-down menu will also bring you to CHE1031 pages for labs, a library of chemical safety data sheets (SDS), a mock final exam, a page of keys posted for all assignments after their due dates, and an FE exam review.

I use **Canvas** by linking from it to this Weebly site and by using the Canvas topics list, calendar, email function, forums and the grade-book.

The **Cornell note-taking system** is a powerful method of taking and reviewing lecture notes that aims to help you review notes and prepare for exams. You'll find some useful videos on YouTube. See the last link posted in the right-hand column of this page.

Wonderful and fun chem stuff:

- > 'Beautiful chemistry': amazing micro-scale videos and images from the world of chemistry
- > 'Compound Interest': stories about chemistry in the real world and great summaries
- > 'Elemental haiku': very short poems about the elements
- > Tom Lehrer's classic periodic table song (1959)
- > The new periodic table song (2015)



Text: Flowers et al. (2019) Chemistry 2e, OpenStax
PDF version ISBN: 978-1-947172-61-6

Chem resources for students:

- > [CHE1031 syllabus for F'19](#)
- > [Course structure](#)
- > [CHE1031 lab report format](#)
 - > [CHE1031 lab report grading matrix](#)
 - > [CHE1031 good example lab report](#)
- > [Recommended lab notebook](#)
- > [Downloadable periodic table](#)
- > [Interactive periodic table](#)
- > [FE Exam review lecture](#)
- > [The Cornell note-taking system](#)

navigation bar

CHE 1031

General Chemistry I
This course is intended for engineering students. It covers the fundamentals of chemistry to amplify the lectures, and includes some methods of laboratory work.

pull-down menu

- 1 Introduction
- 2 Atoms, molecules & ions
- 3 Composition substances & formulas
- 4 Stoichiometry chemical reactions
- 5 Electrochemistry
- 6 Electronic structure
- 7 Chemical bonding
- 8 Thermochemistry
- 9 Gas laws
- 10 Kinetics
- 11 Equilibrium
- Labs page
- SDS library
- Mock Final Exam
- CHE1031 Keys
- FE Exam Review

Link to scanbot app

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free online text

text link

syllabus

resources

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resources (optional)

1 | Introduction & essential knowledge

*assignments
(mandatory)
Not all assigned!

CHE1031 begins with **Module 1**, an introduction to the nature of science and chemistry, matter and its physical and chemical properties, units and measurement, and conversion - the heart of this transformative science.

Supporting material is found in **chapter 1 of Flowers et al.**

Lecture for Module 1: [Links to PowerPoint slide sets below]

- 1.1: Chemistry in context
 - 1.2: Phases and classification of matter
 - 1.3: Physical and chemical properties
 - 1.4: Measurements
 - 1.5: Measurements: uncertainty, accuracy and precision
 - 1.6: Mathematical treatment of measurement results - unit conversion
- > Terms to know

Resources for students:

- > Module 1 summary (very short!)
- > Module 1 lecture example problems
- > Module 1 practice problems
 - > KEY to practice problems
- > Lecture 1 without notes (PDF)
- > Lecture 1 with notes (PDF)
- > TI calculator scientific notation tutorial
- > Quick guide: units, metric prefixes, sig figs
- > Chemistry conversion factors
- > Conversion guide and practice set

Links, tutorials and items of interest:

- > VIDEO: 'What do Australians think chemistry is?'
- > VIDEO: 'The disposal of surplus sodium, 1947'
- > VIDEO: Scientific method (Monty Python)
- > VIDEO: 'The scientific method is crap' (TED, Terman Cooke)
- > VIDEO: 'What is plasma?' (redOrbit)
- > VIDEO: 'Microwaving grapes makes plasma' (Veritasium)
- > VIDEO: 'Is glass a liquid?' (Veritasium)
- > VIDEO: 'Chemical change' (Bozeman Science)
- > VIDEO: 'Scientific notation: introduction' (Tyler DeWitt)
- > VIDEO: 'Significant digits' (Bozeman Science)
- > VIDEOS: 'Unit conversion, part 1' and 'Unit conversion, part 2' (Tyler DeWitt)
- > 'University fined after students nearly die in botched caffeine study' (Golgowski, Huffington Post)

*Homework assignments:

- > Read through *1.1: 'Chemistry in context' and answer the questions
- > Read through *1.2: 'The basic properties of physical states' and answer the questions
- > Homework set 1

*Recitation assignments:

- > Start-of-semester survey
- > Learning styles quiz
- > Cornell note-taking test-drive
- > Tutorial: Monty Python - scientific method
- > Tutorial: What is plasma?
- > Tutorial: Chemical change
- > Tutorial: Scientific notation
- > Tutorial: Significant digits
- > Tutorial: Unit conversion
- > The horror of word problems

*Lab assignments:

- > Lab homework 1

resources (optional)

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PowerPoint slide sets

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links to videos
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- > Com...
- > Tutor...
- > Tutorial: What is plasma?
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- > Tutorial: Scientific notation
- > Tutorial: Significant digits
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- > The horror of word problems

recitation
assignments

***Lab assignments:**

- > Lab homework 1

lab assignments