

Clackamas Community College
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Section #1 General Course Information

Department: Sciences

Submitter

First Name: Nick

Last Name: Hamel

Phone: 3353

Email: nickh@clackamas.edu

Course Prefix and Number: CH - 221

Credits: 5

Contact hours

Lecture (# of hours): 44

Lec/lab (# of hours):

Lab (# of hours): 33

Total course hours: 77

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

Course Title: General Chemistry

Course Description:

Transfer lab course for science, engineering, and professional majors. Covers the nature of chemistry, atomic theory, electron configuration, structure, bonding, properties, composition and nomenclature of covalent and ionic substances. Introduces organic chemistry and biochemistry topics.

Type of Course: Lower Division Collegiate

Is this class challengeable?

Yes

Can this course be repeated for credit in a degree?

No

Is general education certification being sought at this time?

Yes

Check which General Education requirement:

✓ Science & Computer Science

Is this course part of an AAS or related certificate of completion?

No

Are there prerequisites to this course?

Yes

Pre-reqs: One year high school chemistry or pass CH-150 or pass CH-104 & CH-105; pass MTH-095 with a C or better or placement in MTH-105 or MTH-111

Have you consulted with the appropriate chair if the pre-req is in another program?

No

Are there corequisites to this course?

No

Are there any requirements or recommendations for students taken this course?

No

Are there similar courses existing in other programs or disciplines at CCC?

No

Will this class use library resources?

Yes

Have you talked with a librarian regarding that impact?

No

Is there any other potential impact on another department?

No

Does this course belong on the Related Instruction list?

No

GRADING METHOD:

A-F or Pass/No Pass

Audit: Yes

When do you plan to offer this course?

- ✓ Fall
- ✓ Winter

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

No

Will this course appear in the college catalog?

Yes

Will this course appear in the schedule?

Yes**Student Learning Outcomes:**

Upon successful completion of this course, students should be able to:

1. correctly describe, explain, apply, illustrate, evaluate and perform qualitative and quantitative calculations based on information given, derived, and/or developed in a laboratory setting involving concepts, models, and theories;
 2. read actively, think critically and write purposely and capably about scientific concepts, theories, and problems based in chemistry;
 3. demonstrate the ability to communicate and comprehend basic scientific principles and concepts important to an understanding of major topics in general chemistry, (SC1)
 4. critically examine fundamentals of chemistry and their role in shaping current scientific knowledge, (SC3)
 5. apply key concepts of general chemistry to solutions for everyday problems and generate further questions, (SC1)
 6. apply scientific and technical inquiry, individually, and collaboratively, to critically evaluate existing or alternative explanations and solve problems; (SC2)
 7. use electronic resources and common laboratory equipment in the pursuit of scientific inquiry, (SC2)
 8. demonstrate an ability to work individually and collaboratively to critically analyze scientific data, explore ideas and present complex scientific issues; (SC2)
 9. apply mathematics and technology to accurately interpret, validate and communicate solutions to solve scientific problems and test hypotheses; (SC1)
 10. critically examine the influence of scientific and technical knowledge on human society and the environment. (SC3)
-

**AAOT/ASOT GENERAL EDUCATION OUTCOMES
COURSE OUTLINE MAPPING CHART**

Mark outcomes addressed by the course:

- Mark "C" if this course completely addresses the outcome. Students who successfully complete this course are likely to have attained this learning outcome.
- Mark "S" if this course substantially addresses the outcome. More than one course is required for the outcome to be completely addressed. Students who successfully complete all of the required courses are likely to have attained this learning outcome.
- Mark "P" if this course partially addresses the outcome. Students will have been exposed to the outcome as part of the class, but the class is not a primary means for attaining the outcome and assessment for general education purposes may not be necessary.

As a result of completing the AAOT/ASOT general education requirements, students will be able to:

WR: Writing Outcomes

- P** 1. Read actively, think critically, and write purposefully and capably for academic and, in some cases, professional audiences.
- P** 2. Locate, evaluate, and ethically utilize information to communicate effectively.
- P** 3. Demonstrate appropriate reasoning in response to complex issues.

SP: Speech/Oral Communication Outcomes

- P** 1. Engage in ethical communication processes that accomplish goals.
- P** 2. Respond to the needs of diverse audiences and contexts.
3. Build and manage relationships.

MA: Mathematics Outcomes:

- P** 1. Use appropriate mathematics to solve problems.
- P** 2. Recognize which mathematical concepts are applicable to a scenario, apply appropriate mathematics and technology in its analysis, and then accurately interpret, validate, and communicate the results.

AL: Arts and Letters Outcomes

1. Interpret and engage in the Arts & Letters, making use of the creative process to enrich the quality of life.
- P** 2. Critically analyze values and ethics within range of human experience and expression to engage more fully in local and global issues.

SS: Social Science Outcomes

1. Apply analytical skills to social phenomena in order to understand human behavior.
2. Apply knowledge and experience to foster personal growth and better appreciate the diverse social world in which we live.

SC: Science or Computer Science Outcomes

- S** 1. Gather, comprehend, and communicate scientific and technical information in order to explore ideas, models, and solutions and generate further questions.
- S** 2. Apply scientific and technical modes of inquiry, individually, and collaboratively, to critically examine the influence of scientific and technical knowledge on human society and the environment.

S

3. Assess the strengths and weaknesses of scientific studies and critically examine the influence of scientific and technical knowledge on human society and the environment.

CL: Cultural Literacy Outcome

1. Identify and analyze complex practices, values, and beliefs and the culturally and historically defined meanings of difference.

Outcomes Assessment Strategies:

:

Major Topic Outline:

1. Matter and measurements.
 - a. The scientific method.
 - b. Classification of matter.
 - c. Properties of matter.
 - d. Units of measurement.
 - e. Uncertainty in measurement.
 - f. Dimensional analysis to solve problems.
2. Atoms, ions, and molecules.
 - a. Atomic theory of matter.
 - b. Discoveries of atomic structure.
 - c. The modern view of atomic structure.
 - d. Atomic weights.
 - e. The periodic table.
 - f. Molecules and molecular compounds.
 - g. Ions and ionic compounds.
 - h. Nomenclature of inorganic compounds.
 - i. Simple organic compounds including alkanes and alcohols.
3. Stoichiometry.
 - a. Chemical equations.
 - b. Patterns of chemical reactivity.
 - c. Formula weights, Avogadro's number and the mole.
 - d. Empirical formulas from analyses.
 - e. Quantitative information from balanced equations.
 - f. Limiting reactants.
4. Aqueous reactions.
 - a. General properties of aqueous solutions.
 - b. Precipitation reactions.
 - c. Acid–base reactions.
 - d. Oxidation–reduction reactions.
 - e. Concentrations of solutions.
 - f. Solution stoichiometry and chemical analysis.
5. Thermochemistry.
 - a. The nature of energy.
 - b. The First Law of Thermodynamics.
 - c. Enthalpy.
 - d. Enthalpies of reaction.
 - e. Calorimetry.

- f. Hess's law.
- g. Enthalpies of formation.
- h. Foods and fuels.
- 6. Electronic structure of atoms.
 - a. The wave nature of light.
 - b. Quantized energy and photons.
 - c. Line spectra and the Bohr model.
 - d. The wave behavior of matter.
 - e. Quantum mechanics, atomic orbitals.
 - f. Representations of orbitals.
 - g. Many-electron atoms and alteration of energy levels.
 - h. Electron configurations.
 - i. Electron configurations and the periodic table.
- 7. Periodic properties of the elements.
 - a. Development of the periodic table.
 - b. Effective nuclear charge.
 - c. Sizes of atoms and ions.
 - d. Ionization energy.
 - e. Electron affinities.
 - f. Metals, nonmetals, and metalloids.
 - g. Group trends for the active metals.
 - h. Group trends for selected nonmetals.

Does the content of this class relate to job skills in any of the following areas:

- | | |
|--------------------------------------|-----------|
| 1. Increased energy efficiency | No |
| 2. Produce renewable energy | No |
| 3. Prevent environmental degradation | No |
| 4. Clean up natural environment | No |
| 5. Supports green services | No |

Percent of course: 0%

Section #2 Course Transferability

Concern over students taking many courses that do not have a high transfer value has led to increasing attention to the transferability of LDC courses. The state currently requires us to certify that at least one OUS school will accept a new LDC course in transfer. Faculty should communicate with colleagues at one or more OUS schools to ascertain how the course will transfer by answering these questions.

1. Is there an equivalent lower division course at the University?
2. Will a department accept the course for its major or minor requirements?
3. Will the course be accepted as part of the University's distribution requirements?

If a course transfers as an elective only, it may still be accepted or approved as an LDC course, depending on the nature of the course, though it will likely not be eligible for Gen Ed status.

Which OUS schools will the course transfer to? (Check all that apply)

Identify comparable course(s) at OUS school(s)

How does it transfer? (Check all that apply)

:

Provide evidence of transferability: (minimum one, more preferred)

First term to be offered:

Next available term after approval

:
