Clackamas Community College

Online Course/Outline Submission System

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Section #1 General Course Information

Department: Sciences

Submitter

First Name: Eden
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Course Prefix and Number: CH - 105

 # 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: Introductory Chemistry

Course Description:

A laboratory course discussing heat; molecular and ionic interactions in solids, liquids, gases and solutions; chemical reactions including acid-base, electron transfer and equilibrium.

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: Pass CH-104

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?

✓ Summer

✓ Winter
✓ Spring

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. apply scientific and technical inquiry, individually and collaboratively, to critically evaluate existing or create alternative explanations and solve problems; (SC2)
2. use electronic resources and common laboratory equipment in the pursuit of scientific inquiry; (SC1) (SC2)
3. describe the scientific method and the procedures used in generating hypotheses and solving scientific questions in the context of chemistry; (SC1) (SC2) (SC3)
4. analyze problems and apply appropriate problem-solving methods, including the correct use of experimental data, units and significant figures; (SC1) (SC2)
5. describe ad explain basic scientific principles and concepts important to an understanding of major topics in introductory chemistry; (SC1)
6. define, explain and apply fundamental concepts of chemistry in examinations and laboratory exercises; (SC1) (SC2)
7. critically examine the fundamentals of chemistry as applied to 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

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

SP: Speech/Oral Communication Outcomes

1. Engage in ethical communication processes that accomplish goals.
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.
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:

✓ General Examination

✓ Writing Assignments

:

Major Topic Outline:

1. Gases.
a. Kinetic molecular theory.
b. Avogadro's Law, Boyle's Law, and Charles' Law.
c. Ideal gas law.
d. Dalton's Law of Partial Pressures.
e. Given experimental data, perform calculations using the ideal gas law, the combined gas law, and Dalton's Law, as appropriate.

2. Heat (chemical and physical changes).
a. Bonding and molecular motion in the solid, liquid, and gas phases.
b. Relationships between energy, heat, and temperature.
c. Describe the relationship between heat and temperature.

3. Bonding and phases.
a. Energy changes involved in making and breaking chemical bonds.
b. Heat capacity (or specific heat).
c. For a material changing temperature, do calculations relating the heat lost or gained, change in temperature, mass of the material, and heat capacity (or specific heat) of the material.
d. Heat of fusion, heat of vaporization, heat of condensation, and heat of crystallization.

4. Solutions, precipitation and other aqueous reactions.
a. Solutions (unsaturated, saturated, and supersaturated), pure liquids, colloidal dispersions and suspensions.
b. Solubility.
c. Electrolytes.
d. Solvation reactions and precipitation reactions.
e. Heat of solution.
f. Colligative properties of solutions.
g. Osmosis.
h. Concentrations of solutions in weight percent, volume percent, weight/volume percent, and molarity.
i. Colorimetry and Beer's Law.
j. Solubility product expressions (Ksp).

5. Acids and bases.
a. Properties of acids and bases.
b. Arrhenius, Brønsted-Lowry, and Lewis concepts.
c. Conjugate pair relationships.
d. PH, Kw.
e. Equivalents and normality.
f. Titrations.
g. Acid-base neutralization reactions.
h. Acid strength and base strength in terms of reversible reactions and equilibrium.
i. Ka and Kb.
j. Hydrolysis.

8. Reaction rates and equilibrium.
a. Le Chatelier's Principle.
b. Buffers.
c. Collision theory.
d. Bonding and energy changes that take place during chemical reactions.
e. Reaction diagrams.
f. Heats of reaction (H).
g. Reaction rates.
h. Equilibrium constant expressions for a variety of chemical reactions.

9. Oxidation-reduction reactions.
a. Electrolysis.
b. Electrolytic cells.
c. Voltaic cells.
d. Important biological processes that consist of oxidation-reduction reactions.

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)

✓ PSU (Portland State University)

✓ OSU (Oregon State University) ✓ UO (University of Oregon)

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

CH LDT Introductory Chemistry (OSU)
CH 105, CH 108 (PSU)
CH 120T (UO)

How does it transfer? (Check all that apply)

✓ general education or distribution requirement
✓ general elective
:

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

✓ Other. Please explain.

OSU Course Equivalencies List (online)
Transferology website (PSU, UO)

First term to be offered:

Next available term after approval
:
