Wharton County Junior College

Administrative Master Syllabus

Course Information

Course Title	General Chemistry I
Course Prefix, Num. and Title	CHEM 1411
Division	Math & Physical Sciences
Department	Chemistry
Course Type	Academic WCJC Core Course
Course Catalog Description	Fundamental principles of chemistry for majors in the sciences, health sciences, and engineering; topics include measurements, fundamental properties of matter, states of matter, chemical reactions, chemical stoichiometry, periodicity of elemental properties, atomic structure, chemical bonding, molecular structure, solutions, properties of gases, and an introduction to thermodynamics and descriptive chemistry. Basic laboratory experiments supporting theoretical principles presented in lecture; includes introduction of the scientific method, experimental design, data collection and analysis, and preparation of laboratory reports.
Pre-Requisites	TSI satisfied in Reading and Math; MATH 1314 College Algebra or equivalent academic preparation; High school chemistry is strongly recommended.
Co-Requisites	None

Semester Credit Hours

Total Semester Credit Hours (SCH): Lecture Hours: Lab/Other Hours	4:3:3
Equated Pay Hours	4.8
Lab/Other Hours Breakdown: Lab Hours	3
Lab/Other Hours Breakdown: Clinical Hours	0
Lab/Other Hours Breakdown: Practicum Hours	0
Other Hours Breakdown	0

Approval Signatures

Title	Signature	Date
Prepared by:	Tracey Simmons-Willis Digitally signed by Tracey Simmons-Willis DN: cn=Tracey Simmons-Willis, o=Wharton County Junior College, ou, email=willist@wcjc.edu, c=US Date: 2020.09.29 12:43:06 -05'00'	
Department Head:	Tracey Simmons-Willis Digitally signed by Tracey Simmons-Willis DN: cn=Tracey Simmons-Willis, o=Wharton County Junior College, ou, email=willist@wcjc.edu, c=US Date: 2020.09.29 12:42:48 -05'00'	9/29/2020
Division Chair:	Jennifer Mauch Digitally signed by Jennifer Mauch DN: cn=Jennifer Mauch, o, ou=Wharton County Junior College, email=mauchj@wcjc.edu, c=US Date: 2020.09.18 15:23:15 -05'00'	9-18-2020
Dean/VPI:	Leigh Ann Collins Digitally signed by Leigh Ann Collins Date: 2020.09.29 13:56:16 -05'00'	
Approved by CIR:		

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Additional Course Information

Topical Outline: Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, and clinical or other non-lecture instruction).

Lecture Outline:
1. The Foundations of Chemistry
2. The Structure of Atoms
3. Chemical Formulas
4. Chemical Bonding
5. Molecular Structure and Covalent Bonding Theories
6. Chemical Periodicity
7. Composition Stoichiometry
8. Chemical Equations and Reaction Stoichiometry
9. Types of Chemical Reactions
10. Reactions in Aqueous Solutions I: Acids, Bases, and Salts
11. Reactions in Aqueous Solutions II: Calculations
12. Gases and the Kinetic-Molecular Theory

Laboratory Outline:
Syllabus and Introduction
Lab Orientation / Keeping a Notebook
1. Avogadro Goes to Court
2. Identifying a Substance
3. Introduction to Atomic Structure
4. Classifying Compounds
5. Molecular Geometry
6. Compositional Stoichiometry
7. Reaction Stoichiometry
8. Classifying Reactions
9. Acid-Base Titration
10. Reaction of Metals
11. Thermochemistry
12. Exploring the Properties of Gases
13. Molar Mass of a Gas

Course Learning Outcomes:

Learning Outcomes – Upon successful completion of this course, students will:

Lecture:
1. Define the fundamental properties of matter.
2. Classify matter, compounds, and chemical reactions.
3. Determine the basic nuclear and electronic structure of atoms.
4. Identify trends in chemical and physical properties of the elements using the Periodic Table.
5. Describe the bonding in and the shape of simple molecules and ions.
6. Solve stoichiometric problems.
7. Write chemical formulas.
8. Write and balance chemical equations.
9. Use the rules of nomenclature to name chemical compounds.
10. Define the types and characteristics of chemical reactions.

11. Use the gas laws and basics of the Kinetic Molecular Theory to solve gas problems.
12. Determine the role of energy in physical changes and chemical reactions.
13. Convert units of measure and demonstrate dimensional analysis skills.

Laboratory:

14. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.
15. Demonstrate safe and proper handling of laboratory equipment and chemicals.
16. Conduct basic laboratory experiments with proper laboratory techniques.
17. Make careful and accurate experimental observations.
18. Relate physical observations and measurements to theoretical principles.
19. Interpret laboratory results and experimental data, and reach logical conclusions.
20. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.
21. Design fundamental experiments involving principles of chemistry.
22. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.

Methods of Assessment:

Outcomes assessed by:
Class work, homework assignments, quizzes and/or exams, posters/graphs/charts, oral

Lab outcomes assessed by:
Data entries, lab reports, lab quizzes, homework assignments and/or lab final exam questions

Required text(s), optional text(s) and/or materials to be supplied by the student:

- *Interactive General Chemistry Atoms First* Access Card (Macmillan Learning, ISBN: 978-1-3193-21951-9)
- *CHEM 1411 Lab Manual*, Wharton County Junior College; (ISBN: 978-1-5339-2274-8)
- Scientific calculator (with logarithms and exponent functions)

Suggested Course Maximum:

Lecture: 36; Lab: 24

List any specific or physical requirements beyond a typical classroom required to teach the course.

Chemistry laboratory classroom required for the lab component.

Course Requirements/Grading System: Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course.

Lecture average:	Exam average (3-4 exams)	30-55%
	Other (homework, quizzes, projects)	0-25%
Lab average:	(based on lab average below)	25%
Final exam average:	(includes at least 50% comprehensive material)	20-25%
		100% total

Lab Average*:	Lab notebooks	20-75%
	Other (lab reports, exercises, quizzes)	25-80%

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Lab final	5-10%
	100% lab total

*Department policy: A student must earn a 60% laboratory grade or greater in order to pass the course.

The overall course grade is assigned as specified by the college:
A = 90–100
B = 80–89
C = 70–79
D = 60–69
F = below 60

Curriculum Checklist:

☐**Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.

☒**Administrative WCJC Core Course**. Attach the Core Curriculum Review Forms

- ☒Critical Thinking
- ☒Communication
- ☒Empirical & Quantitative Skills
- ☒Teamwork
- ☐Social Responsibility
- ☐Personal Responsibility

☐**WECM Course** -If needed, revise the Program SCANS Matrix and Competencies Checklist

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Core Curriculum Review Form

Foundational Component Area: Core 030: Life & Physical Science

Course Prefix & Suffix: CHEM 1411

Core Objective:

Critical Thinking Skills—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

Student Learning Outcome Supporting Core Objective*:*

For each core objective, there must be at least two different methods of assessment.

SLO Status	Student Learning Outcome (SLO)	Learning Activity	Assessment
State Mandated	Interpret laboratory results and experimental data, and reach logical conclusions.	Lab reports	Lab reports and lab final
State Mandated	Design fundamental experiments involving principles of chemistry.	Lab reports	Lab reports and lab final
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.

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Core Curriculum Review Form

Foundational Component Area: Core 030: Life & Physical Science

Course Prefix & Suffix: CHEM 1411

Core Objective:

Communication Skills—to include effective development, interpretation and expression of ideas through written, oral and visual communication

Student Learning Outcome Supporting Core Objective*:*

For each core objective, there must be at least two different methods of assessment.

SLO Status	Student Learning Outcome (SLO)	Learning Activity	Assessment
State Mandated	Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.	Formal lab reports	Lab reports and lab final
State Mandated	Make careful and accurate experimental observations.	Lab reports	Lab reports and lab final
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.

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Core Curriculum Review Form

Foundational Component Area: Core 030: Life & Physical Science

Course Prefix & Suffix: CHEM 1411

Core Objective:

Empirical and Quantitative Skills—to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

Student Learning Outcome Supporting Core Objective*:*

For each core objective, there must be at least two different methods of assessment.

SLO Status	Student Learning Outcome (SLO)	Learning Activity	Assessment
State Mandated	Solve stoichiometric problems.	Lab report calculations	Lab report and lab final
State Mandated	Convert units of measure and demonstrate dimensional analysis skills.	Lab report calculations	Lab report and lab final
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.

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Core Curriculum Review Form

Foundational Component Area: Core 030: Life & Physical Science

Course Prefix & Suffix: CHEM 1411

Core Objective:

Teamwork—to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

Student Learning Outcome Supporting Core Objective*:*

For each core objective, there must be at least two different methods of assessment.

SLO Status	Student Learning Outcome (SLO)	Learning Activity	Assessment
State Mandated	Design fundamental experiments involving principles of chemistry.	Student groups design experiment	Lab reports discussion section and student peer evaluation
State Mandated	Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.	Group lab report or presentation	Lab report discussion and student peer evaluation
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.