

Purpose: It is the intention of this Administrative-Master Syllabus to provide a general description of the course, outline the required elements of the course and to lay the foundation for course assessment for the improvement of student learning, as specified by the faculty of Wharton County Junior College, regardless of who teaches the course, the timeframe by which it is instructed, or the instructional method by which the course is delivered. It is not intended to restrict the manner by which an individual faculty member teaches the course but to be an administrative tool to aid in the improvement of instruction.

Course Title – General Chemistry I

Course Prefix and Number – CHEM 1411

Department – Chemistry, Physics & Engineering

Division – Math & Science

Course Type: (check one)

- Academic General Education Course (from ACGM – but not in WCJC Core)
 Academic WCJC Core Course
 WECM course (This course is a Special Topics or Unique Needs Course: Y or N)

Semester Credit Hours # : Lecture hours # : Lab/Other Hours # **4:3:3**

Equated Pay Hours for Course – 4.8

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.

List Lab/ Other Hours
Lab Hours 3
Clinical Hours
Practicum Hours
Other (list)

Prerequisites/Co-requisites – TSI satisfied in Reading and Math. Credit for, or concurrent enrollment in any college level MATH (except MATH 1324, 1325, 1342), and high school chemistry or chemistry 1405 or college GPA of 3.3.

Prepared by Frank Carey

Date 8-2-13

Reviewed by Department Head Kelley Whitley

Date 8-2-13

Accuracy Verified by Division Chair Kevin Dees

Date 8-2-13

Approved by Dean or Vice President of Instruction *gg hunt*

Date 8-2-13



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

Lecture:

TOPICAL OUTLINE	DEDICATED INSTRUCTIONAL TIME
1. Fundamental Concepts	two weeks
2. Chemical formulas and composition stoichiometry	one week
3. Chemical equations / stoichiometry	two weeks
4. Chemical reactions	one
5. Atomic structure and the periodic table	two weeks
6. Chemical bonding and nomenclature	two weeks
7. Acids and bases	one
8. Gases	two weeks
9. Liquids and solids	one week
10. Solutions	one week

Suggested Lab Work: Experiments (See dept. rubrics for grading criteria)

EXPERIMENTS
<u>Lab work: Experiments:</u>
1. Density determination and melting point
2. Measurement
3. Chemical and Physical Changes
4. Determining a Chemical Formula
5. Water of Hydration
6. Specific Heat
7. Vapor Density .
8. Chemical Activity
9. Boyle's Law
10. Charles' Law
11. Graham's Law
12. Solutions
13. Molecular Mass By Solution Methods
14. Acid-Base Titration

II. Course Learning Outcomes

Course Learning Outcome	Method of Assessment
<p><u>Lecture:</u></p> <ol style="list-style-type: none"> 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 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. 	<p>Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams</p> <p>Quizzes, Final Exam, Exit Exams</p>
<p><u>Lab:</u></p> <ol style="list-style-type: none"> 1. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory. 2. Demonstrate safe and proper handling of laboratory equipment and chemicals. 3. Conduct basic laboratory experiments with proper laboratory techniques. 4. Make careful and accurate experimental observations. 5. Relate physical observations and measurements to theoretical principles. 6. Interpret laboratory results and experimental data, and reach logical conclusions. 7. Record experimental work completely 	<p>Labs assessed by:</p> <p>lab notebook entry, formal lab report, lab quiz, homework assignment, and/or exam question</p>

<p>and accurately in laboratory notebooks and communicate experimental results clearly in written reports.</p> <p>8. Design fundamental experiments involving principles of chemistry.</p> <p>9. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.</p>	
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III. Required Text(s), Optional Text(s) and/or Materials to be Supplied by Student.

Whitten, K., Davis, R., Peck, M., & Stanley, G. (2010). Chemistry, 9th Edition. Cengage Learning. ISBN: 9781111085049

Hered, G. (2009). Chemistry Labs Laboratory Experiments for Chemistry 1411 & 1412. Cengage Learning. 9781111005474

IV. Suggested Course Maximum – Wharton and FBTC-Lecture 36 Lab 24 Sugarland- Lecture 36 Lab 32

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

Chemistry Lab required for lab component

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

Evaluative Procedures:

1. Three major tests
2. Several ten-minute tests (announced and unannounced)
3. Problem assignments
4. Question assignments
5. Laboratory reports
6. Final examination
7. Dept. Gateway Exam (Dept. Head will provide a copy to you.)

The following method is used to arrive at the final grade:

All tests, assignments, etc.	50%
Laboratory grade	25%
Final examination	25%

The grade classifications as outlined in the College Catalog are employed:

A	Excellent 90-100
B	Good 80-89
C	Average 70-79
D	Poor 60-69
F	Failure 59- below
W	Withdrawn

VII. Curriculum Checklist

- **Academic General Education Course** (from ACGM – but not in WCJC Core)
No additional documentation needed

- **Academic WCJC Core Course**
Attach the Core Curriculum Review Forms

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

- **WECM Courses**
If needed, revise the Program SCANS Matrix & Competencies Checklist.



Core Curriculum Review Form

Foundational Component Area: **Life & Physical Sciences**

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
The SLO is:	Insert SLO (from Administrative Master Syllabi) below	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:
<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated	Upon successful completion of this course, students will interpret laboratory results and experimental data, and reach logical conclusions.	numerous experiments including (but not limited to) "Identification of an Unknown Substance"	lab notebook entry, formal lab report, lab quiz, homework assignment, and/or exam question
<input type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated			
<input type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated			

Department Head: **Kelley Whitley**
 WCJC Core Curriculum Review Form-Life & Physical Science (April 2013)

Date: **8/7/2013**
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Core Curriculum Review Form

Foundational Component Area: **Life & Physical Sciences**

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
The SLO is:	Insert SLO (from Administrative Master Syllabi) below	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:
<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated	Upon successful completion of this course, students will record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.	numerous experiments including (but not limited to) "Acid-Base Titration"	lab notebook entry, formal lab report, portfolio, poster presentation, and/or oral presentation
<input type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated			
<input type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated			

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Core Curriculum Review Form

Foundational Component Area: **Life & Physical Sciences**

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
The SLO is:	Insert SLO (from Administrative Master Syllabi) below	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:
<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated	Upon successful completion of this course, students will use the gas laws and basics of Kinetic Molecular Theory to solve gas law problems.	numerous experiments including (but not limited to) "Molar Mass of an Unknown Gas"	lab notebook entry, formal lab report, lab quiz, homework assignment, and/or exam question
<input type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated			
<input type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated			

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Core Curriculum Review Form

Foundational Component Area: **Life & Physical Sciences**

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
The SLO is:	Insert SLO (from Administrative Master Syllabi) below	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:
<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated	Upon successful completion of this course, students will conduct basic laboratory experiments with proper laboratory techniques (note that working effectively with lab partners is part of proper technique).	Numerous experiments (including but not limited to) "Magnesium Oxide"	rubric graded self evaluation and/or rubric graded peer evaluation
<input type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated			
<input type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated			

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