Wharton County Junior College

# Administrative Master Syllabus

## Course Information

| | |
|---|---|
| **Course Title** | Introductory Chemistry I |
| **Course Prefix, Num. and Title** | CHEM 1405 Introductory Chemistry I |
| **Division** | Math & Physical Sciences |
| **Department** | Chemistry |
| **Course Type** | Academic WCJC Core Course |
| **Course Catalog Description** | Survey course introducing chemistry. Topics may include inorganic, organic, biochemistry, food/physiological chemistry, and environmental/consumer chemistry. Designed for non-science and allied health students. Laboratory activities will reinforce lecture topics. |
| **Pre-Requisites** | TSI reading satisfied or concurrent enrollment in INRW 0307 |
| **Co-Requisites** | None |

## Semester Credit Hours

| | |
|---|---|
| **Total Semester Credit Hours (SCH): Lecture Hours: Lab/Other Hours** | 4:3:2 |
| **Equated Pay Hours** | 4.2 |
| **Lab/Other Hours Breakdown: Lab Hours** | 2 |
| **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<br>Digitally signed by Tracey Simmons-Willis<br>DN: cn=Tracey Simmons-Willis, o=Wharton County Junior College, ou, email=willist@wcjc.edu, c=US<br>Date: 2020.09.29 12:41:09 -05'00' | |
| **Department Head:** | Tracey Simmons-Willis<br>Digitally signed by Tracey Simmons-Willis<br>DN: cn=Tracey Simmons-Willis, o=Wharton County Junior College, ou, email=willist@wcjc.edu, c=US<br>Date: 2020.09.29 12:40:52 -05'00' | 9/29/2020 |
| **Division Chair:** | Jennifer Mauch<br>Digitally signed by Jennifer Mauch<br>DN: cn=Jennifer Mauch, o, ou=Wharton County Junior College, email=mauchj@wcjc.edu, c=US<br>Date: 2020.09.18 15:22:04 -05'00' | 9-18-2020 |
| **Dean/VPI:** | Leigh Ann Collins<br>Digitally signed by Leigh Ann Collins<br>Date: 2020.09.29 13:55:58 -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:
Measurement, Significant Figures, Units, Conversions
Matter, Classification and States of Matter, Chemical and Physical Changes and Properties
Atoms and Elements
The Periodic Table, Light, and Electrons in Atoms
Molecules and Compounds
Chemical Bonding
Organic Chemistry
Chemical Composition, Mass, Moles
Quantities in Chemical Reactions (Stoichiometry)
Chemical Reactions
Gases
Liquids, Solids, and Intermolecular Forces
Solutions
Acids and Bases
Energy
Radioactivity and Nuclear Chemistry

Laboratory Outline:
Syllabus, Lab Orientation,

1. Laboratory Measurements – Lab 1, parts A-D
2. Laboratory Measurements – Lab 1, parts E-F (optional part G)
3. Chemical and Physical Properties – Lab 2, parts A and C (optional part B)
4. Ionic and Covalent Bonds – Lab 6, part A
5. Ionic and Covalent Bonds – Lab 6, part B
6. Hydrocarbon Isomerism and Bond Reactivity – Lab 10, part A and Functional Groups
7. The Components of Milk – Lab 18, part F
8. Reaction Stoichiometry – Lab 8
9. Charles' Law – Lab 14
10. All About Solutions – Lab 15, part D
11. pH Indicators – Lab 16, parts A, B, and D (optional part C)

## Course Learning Outcomes:

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

Lecture:

1. Define concepts fundamental to understanding matter, compounds, solutions, and chemical reactions.
2. Describe the relationship between chemistry and daily life.
3. Describe the representation of compounds and reactions by the use of chemical formulas, nomenclature, and chemical equations.
4. Describe the fundamental properties of basic acid – base chemistry.
5. Describe the fundamental properties of basic nuclear and organic chemistry.

6. Demonstrate the ability to synthesize chemical information through chemical calculations.

Laboratory:

7. Demonstrate the safe and appropriate use of basic apparatus and apply experimental methodology.
8. Conduct basic laboratory experiments and record accurate observations in laboratory notebooks.
9. Relate measurements to theoretical principles and draw logical conclusions.
10. Report information in proper technical, clearly written formal laboratory reports

**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:

Textbook: *Introductory Chemistry* by Kevin Revell (MacMillan); ISBN: 9781319133894

Scientific calculator (with log and exponential function)
Online homework software (optional at Instructor's discretion)

Lab Manual: *Exercises for the General, Organic, and Biochemistry Laboratory, Customized for WCJC,* by William G. O'Neal (Morton Publishing); ISBN: 978-1-61731-841-2

## 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 or 4 exams) | 30–55% |
| Other (homework, quizzes, projects, etc.) | 0–25% |
| Laboratory average: (based on Laboratory average below) | 25% |
| Final Exam average: (includes at least 50% comprehensive material) | 20–25% |
| | 100% course total |

| | |
|---|---|
| Laboratory average*: Lab notebooks | 20–75% |
| Other (lab reports, exercises, quizzes, etc.) | 25–80% |
| Lab final | 5-10% |
| | 100% lab total |

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*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 1405

## 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 |
|---|---|---|---|
| Created by Department | Demonstrate the ability to synthesize chemical information through chemical calculations. | Calculation of density | Formal lab report and lab final exam |
| Created by Department | Relate measurements to theoretical principles and draw logical conclusions. | Determination of stoichiometric coefficients | Formal lab report and lab final exam |
| 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 1405

## 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 |
|---|---|---|---|
| Created by Department | Report information in proper technical, clearly written formal laboratory reports | Typed formal lab reports and class presentation or project | Formal lab reports and class presentation and/or project |
| Created by Department | Describe the representation of compounds and reactions by the use of chemical formulas, nomenclature, and chemical equations | Typed formal lab report and class presentation of project or exam or discussion board | Formal lab reports and class presentation and/or project or exam or discussion board |
| 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 1405

## 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 |
|---|---|---|---|
| Created by Department | Demonstrate the ability to synthesize chemical information through chemical calculations | Perform common calculations in lab | Lab reports and lab final |
| Created by Department | Relate measurements to theoretical principles and draw logical conclusions | Formal lab report calculations | Formal 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 1405

## 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 |
|---|---|---|---|
| Created by Department | Report information in proper technical, clearly written formal lab reports | Lab experiments completed in groups of at least two students | Rubric for Discussion section of lab report and students complete peer evaluations |
| 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. |
| 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. |