Please check only one:

- Course is currently a “General Education” course
- Course is listed in the current catalog, but is NOT a “General Education” course
- New course that is NOT listed in the current catalog and has NOT been legislated through PSU Faculty Senate and/or KBOR

A. Submission date: January 2, 2019

B. Department: Chemistry

C. College: Arts and Sciences
   If two or more Colleges, please indicate which Colleges will be involved in teaching the course:
   Click or tap here to enter text.

D. Name of faculty member on record for the course (may be Coordinating Professor or Chair):
   Kris Mijares
   (As faculty of record, I verify all sections agree to address the Core or Essential Studies Element and corresponding Learning Outcome as indicated below.)

E. Course prefix: CHEM

F. Course number: 106

G. Credit hours: 1

H. Title of course: Introductory Chemistry Lab
   Is this a change in the title of the course? No
   (If "Yes," a Revision to Course form will need to be completed and uploaded to the Preliminary Briefcase and will go through the legislation process.)

I. Will this course require a new course description? No
   (If "Yes," please insert new course description here. A Revision of Course form will need to be completed and uploaded to the Preliminary Briefcase and will go through the legislation process)
   Click or tap here to enter text.

J. Does this course include a co-requisite laboratory course: Yes
   If "Yes", please provide the co-requisite course name and number:
   CHEM 105

K. Will this course be available on-line: No
   If "Yes", please provide a detailed explanation: Click or tap here to enter text.

L. Semester(s) course will be offered (choose all that apply): Fall - Spring - Summer

M. Prerequisite(s): None

N. Co-requisite(s) —other than lab course named above: CHEM 105
O. Select the *Pitt State Pathway Core Element* or *Essential Studies Element* based on the identified Learning Outcome to be covered in the course (choose only *one* set):
(Refer to definitions, hierarchy, and rubrics in the *Pitt State Pathway document*)

- Communication
  - Written Communication
    - Students will communicate effectively.

- Communication
  - Verbal Communication
    - Students will communicate effectively.

- Quantitative/Analytic Methods and Scientific Literacy
  - Quantitative/Analytic Methods
    - Students will analyze data logically.

- Global Understanding and Civic Engagement
  - Human Experience within a Global Context
    - Students will explore global systems conscientiously.

- Global Understanding and Civic Engagement
  - Human Systems within a Global Context
    - Students will explore global systems conscientiously.

- Global Understanding and Civic Engagement
  - Natural World within a Global Context
    - Students will explore global systems conscientiously.

- Personal and Professional Behavior
  - Wellness Strategies
    - Students will model productive behaviors purposefully.

P. Will the course address a *Companion Element*? No
(Refer to definitions, hierarchy, and rubrics in the *Pitt State Pathway document*)

   If “Yes,” please select one: Choose an item.

Q. What is the highest anticipated level of student achievement for the stated learning outcome(s) common across all sections of the course? Note: Sample assessment strategies will be submitted on the representative syllabus. Mastery
(Refer to definitions, hierarchy, and rubrics in the *Pitt State Pathway document*)

R. Please submit course syllabus as an attachment, highlighting the following items: course objectives related to Learning Outcome(s), assessment strategies (e.g. exams, course project, etc.), and assessment tool(s) to be used to measure student achievement.
Legislative Process
Authorization and Notification Signatures
(Electronic signatures accepted)

Department Chairperson

Department Chairperson Signature

Faculty Senate General Education Committee

Approved □ Not Approved □

Faculty Senate General Education Chairperson Signature

Date

Faculty Senate

Approved □ Not Approved □

Faculty Senate Recording Secretary Signature

Date

Note: Each College curriculum representative will notify their respective College and Department(s) of the completion of the approval process.

*Originating Department: Please complete the entire form, acquire the Chairperson's signature, and save as PSP.ABC123.Form. Save the syllabus to be attached as PSP.ABC123.Syll. Email the completed form and attachments to psupathway@pittstate.edu.

Naming convention: PSP.ABC123.Form
PSP = Pitt State Pathway.
ABC123 = Course abbreviation and number
Instructor: Dr. K Mijares Office: HW 112
Email: (best done through Canvas)
Lecture room: Grubbs 109 (T/Th; 9.30-10.45am)
Office Hours: Posted outside my office and on CANVAS or can be made by appointment.

This course is also intended for partial fulfillment of the Pitt State Pathway Curriculum.

Pitt State Pathway Mission Statement: The Pitt State Pathway curriculum serves as the heart of the university education by fostering interdisciplinary competencies that typify the educated person. It is designed to facilitate the development of key proficiencies including communication and information literacy. The Pitt State Pathway curriculum provides a transformational experience that challenges students to think creatively and critically, and to immerse themselves in the productive examination of humans in their global setting. By encouraging the development of skills that promote life-long learning, the Pitt State Pathway fosters a sense of personal responsibility, an appreciation of diversity, and an understanding of interconnectedness in our truly global society.

Essential Study to be covered in this course: Natural World within a Global Context
Biological, physical, and chemical systems form the context for life. Students need to understand how these systems work, how these change naturally, and how these can change as a result of human activities. The implications of these changes are essential for long-term decision-making. In this course we will:

- Analyze physical and chemical systems;
- Evaluate the implications of changes that result from interactions between natural and human systems.

Companion Element to be covered in this course: Scientific Inquiry
The scientific method is the systematic approach to understanding the world around us. Through experimentation and hypothesis testing, students will apply analytical skills and appropriate methods of scientific inquiry (i.e. qualitative and quantitative) to solve a variety of research questions.

In this course we will:

Compose appropriate research questions and hypothesis, drawing from experts, reliable sources, or previously collected data.
Collect, synthesize, and analyze data from multiple sources;
Draw logical conclusions, assessing for gaps and weaknesses, and addressing potential consequences and implications
Communicate results using appropriate delivery methods or formats.

Course description:
This course will cover Basic Chemistry and its relationship to everyday experiences. The material covered this semester will include classification and structure of matter, basic
principles of chemical reactions and their environmental and social impact, organic chemistry, and selected topics in biochemistry. This course is designed for non-science majors, and applied health majors. Occasionally during lectures, you will be asked to work in small groups to solve given problem sets, for this reason it is important to have a good attendance and to be prepared for lectures.

Course Objectives:

Natural World within the Global Context: Level of Student Learning = Milestone I
Explains physical and chemical processes and human activities that alter them.

Scientific Inquiry: Level of Student Learning = Milestone I
Student will apply the scientific methods to a problem.

You should attain some degree of mastery in the following areas:
1. Explain the scientific method.
2. Describe the scope of the physical/biological sciences.
3. Interpret scientific data to demonstrate basic problem solving.
4. Explain everyday phenomena in terms of basic physical/chemical science concepts.
5. Explain and critique science as presented in the media

Methods of Assessment:
Students, on homework, exams, and Quizzes, will describe and explain, items, principles, and processes related to the student outcomes. (Milestone I)

Pitt State Pathway Pillars to Be Covered in This Course

Required Textbook and other materials:
- Calculator (Non-programmable scientific with a LOG and “EE or E” button)

Pre-requisite/Co-requisite:
Chem 106 (Introductory Chemistry Laboratory) is a pre-requisite or co-requisite to this course. If you drop CHEM 105 at anytime during the semester, you are also required to drop the CHEM 106 lab. If you drop CHEM 106 you will also be required to drop CHEM 105.

Course Learning Objectives:

Scientific Inquiry: Level of Student Learning: Milestone I

Definition of Milestone I under Scientific Inquiry: Students will apply the scientific methods to a problem

After successful completion of the course, students will be able to:

- Explain scientific phenomena
- Understand scientific articles
- Understand molecular structure
- Explain differences between elements, compounds, and mixtures.
- Understand physical phenomena
- Understand chemical reactivity
- Explain chemical reactions
Attendance Policy:
There are several group activities during the semester; a student attendance in class is required. An official note (a doctor’s or nurses note, accident report, official programs for events or a letter from the club advisor on university letterhead stating the date and a student name) is required to excuse an absence due to any of the following:
(i) University sponsored activity (athletic team obligations, choir or theatre practice, etc.)
(ii) or medical or family emergency. It is a student responsibility to submit written documentation to support the absence. Absences without appropriate documentation will be considered unexcused. Attendance will be taken during lectures, it is a student responsibility to sign the roster. If the roster does not show a student signature, it will be counted as an unexcused absence. Signing the roster for another student will be considered Academic Dishonesty and may result in an “XF” and/or removal from the course.

There will be a number of in-class group activities throughout the semester, participation and attendance is expected and common courtesy to a student group members. The groups will be assigned by the instructor and is subject to change throughout the semester. These activities are designed to be done as a group and points can only be earned if a student is in class (regardless of an excused or unexcused absence).

Methods of Assessment:
Homework, Quizzes, In-Class Activities and Exams
Homework is due at the beginning of the lecture according to the syllabus, and should be formatted as shown in Canvas (Modules folder). Late Homework will not be accepted so that the key/solution can be posted as soon as possible. It is recommended that a student scan or photo-copy a student homework.

Topics:
Chapter 1-The Air We Breathe
Chapter 2-Protecting the Ozone Layer
Chapter 3-The Energy of Global Warming
Chapter 4-Energy, Chemistry, and Society
Chapter 5-The Water We Drink
Chapter 6-Neutralizing the Threat of Acid Rain
Chapter 8-Energy from Electron Transfer
Chapter 9-The World of Polymers and Plastics
Chapter 10-Manipulating Molecules and Designing Drugs
Chapter 11-Nutrition: Food for Thought
Chapter 12-Genetic Engineering and the Molecules of Life

GRADES:
• Grades will be based on 4 exams, 4 quizzes
  7 sets of homework problems, 10 Group Activities and a comprehensive final exam.
• The distribution of grades are as follows:
  4 Exams 50 pts each
  4 Quizzes 20 pts each
  10 Group Activity Worksheets 5 pts each
  Picture+First post on blog/discussion 5 pts
  7 Homework Sets 20 pts each
  Final Exam 100 pts
  Maximum Total at end of semester 535 pts
Final letter grades, before the attendance policy is taken into consideration, will be based on the following grading scale:

A > 90 %
B > 80 %
C > 65 %
D > 55 %
F < 55 %

**ACADEMIC HONESTY:**

Help from other students or other third party is not allowed during quizzes and exams and will be viewed as academic dishonesty. Use of other materials, information or persons, cell-phones during a quiz or exam will be viewed as academic dishonesty (i.e. collaborative efforts to answer quiz or exam questions are not acceptable). Calculators (TI-89 or equivalent or computers) with alphabet capabilities may be restricted for quizzes and exams. Everyone should have scientific calculator capable of basic math, trig and log operations (this does not necessarily mean a TI-89 or equivalent).

All calculator memories are to be cleared at the beginning of all quizzes and exams. Academic dishonesty on any exam or quiz will result in an automatic zero for the quiz or exam and maybe removal from the course (even if it involves only one question). Further offences will result in an overall “F” grade and immediate removal from the course. Please consult the policy on Student Academic Dishonesty in the University Catalog (2007-2009).
Instructor: Dr K Mijares
Email: best done through Canvas (Chem 106) email.
Office: Heckert-Wells 105-B
Office Hours: Posted at the end of this syllabus, outside my office and on Canvas or can be made by appointment.

This course is also intended for partial fulfillment of the Pitt State Pathway Curriculum.

Pitt State Pathway Mission Statement:

The Pitt State Pathway curriculum serves as the heart of the university education by fostering interdisciplinary competencies that typify the educated person. It is designed to facilitate the development of key proficiencies including communication and information literacy. The Pitt State Pathway curriculum provides a transformational experience that challenges students to think creatively and critically, and to immerse themselves in the productive examination of humans in their global setting. By encouraging the development of skills that promote life-long learning, the Pitt State Pathway fosters a sense of personal responsibility, an appreciation of diversity, and an understanding of interconnectedness in our truly global society.

Essential Study to be covered in this course: Natural World within a Global Context

Biological, physical, and chemical systems form the context for life. Students need to understand how these systems work, how these change naturally, and how these can change as a result of human activities. The implications of these changes are essential for long-term decision-making. In this course we will: Analyze physical and chemical systems; Evaluate the implications of changes that result from interactions between natural and human systems.

Companion Element to be covered in this course: Scientific Inquiry

The scientific method is the systematic approach to understanding the world around us. Through experimentation and hypothesis testing, students will apply analytical skills and appropriate methods of scientific inquiry (i.e. qualitative and quantitative) to solve a variety of research questions. In this course we will: Compose appropriate research questions and hypothesis, drawing from experts, reliable sources, or previously collected data. Collect, synthesize, and analyze data from multiple sources; Draw logical conclusions, assessing for gaps and weaknesses, and addressing potential consequences and implications Communicate results using appropriate delivery methods or formats.

The Learning Outcome for Natural World in a Global Context is:

Students will explore global systems conscientiously.

The Learning Outcome for Scientific Inquiry is:

Students will analyze data logically.
<table>
<thead>
<tr>
<th>SECTION</th>
<th>INSTRUCTOR</th>
<th>TIME</th>
<th>ROOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>106-01</td>
<td>Dr Mijares</td>
<td>Tuesday 2:00-3:50pm</td>
<td>HW 119</td>
</tr>
<tr>
<td>106-02</td>
<td>Dr Mijares</td>
<td>Tuesday 4:00-5:50pm</td>
<td>HW 119</td>
</tr>
<tr>
<td>106-03</td>
<td>Dr Mijares</td>
<td>Wednesday 9:00-10:50pm</td>
<td>HW 119</td>
</tr>
<tr>
<td>106-04</td>
<td>Dr Mijares</td>
<td>Wednesday 11:00-12:50pm</td>
<td>HW 119</td>
</tr>
</tbody>
</table>

**Required Lab Manual and other materials:**

- *Introduction to Chemistry Lab Manual (Available in the PSU Bookstore)*

**Course description:**

This course covers Basic chemistry and its relationship to everyday experiences. This course is designed to reinforce and highlight concepts that are covered in the lecture (Chem 105) as well as the role of chemistry to everyday life. The course is for non-science majors and applied health majors. Throughout the semester you will be asked to work in small groups to solve a given problem, for this reason it is important to have a good attendance and to be prepared for laboratories. The experiments are designed to stimulate and reinforce communication in a scientific context. Groups may be assigned by the instructor and is subject periodic change throughout the semester. If you are unable to make it to lab, please give advance notice to your instructor and lab partner. This syllabus is subject to change depending on our progress during the semester.

**Pre-requisite/Co-requisite:**

Chem 106 is a prerequisite/co-requisite to Chem 105 (Introductory Chemistry). If you drop CHEM 105 during the semester, you are also required to drop the CHEM 106 lab and vice versa.

**Natural World within the Global Context:** Level of Student Learning = Milestone I

Analyze physical and chemical processes and how human activities alter them.

**Scientific Inquiry:** Level of Student Learning = Milestone I

Students will apply the scientific method to a problem. Students will compare tools of analysis and communicate results. Upon completion of the course, you should be able to:

- Utilize the language and communication commonly used in context of this field.
- Recognize and use Atomic Composition, Measurements, Matter and Chemical Composition.
- Recognize and draw Lewis dot structures and determine their 3D (electron and molecular geometry using VSEPR Theory. Including different types of interatomic and molecular bonding present in a molecule.
- Demonstrate an understanding and concepts involved with the naming of ionic, covalent compounds, chemical formulas and write the chemical formulas/structures from a given chemical name.
- Demonstrate the ability to recognize common quantitative concepts (moles, molar mass, molecular weights, Avogadro’s number) associated with calculating amounts of elements and compounds.
• Demonstrate the ability to recognize molecular formulas of compounds and be able to translate them into molar mass from names and structures for ionic, covalent and simple organic compounds.
• Demonstrate an understanding and determine balanced chemical equations and utilize these for stoichiometry. To be used for balancing chemical equations and conduct mass to mole and mole to mass conversions using these balanced chemical equations.
• Demonstrate an understanding and determine the energy associated with a chemical reaction (atom up approach).
• Demonstrate an understanding and recognize the concepts involved in basic electrochemistry (i.e. REDOX reactions, voltaic cells, galvanic cells and electrochemical half-cells)
• Determine and identify the relationships between acids and bases with strong and weak electrolytes. As well as the ability classify a chemical as an electrolytic solution, solutes from non-electrolytic solutions and measure the pH scale used to distinguish between strong and weak acids and bases.
• Demonstrate the relevance of temperature relative to molecular potential and kinetic energy to chemical reactions.

Safety in the Lab:
It is very important that you observe safety in the lab, you are not only responsible for your own personal safety around the equipment and chemicals but also for the safety of your colleagues and lab instructor/assistants. Part of this preparation and safety in the labs include reading through the designated experiment in the lab manual as well as preparing a short pre-lab summary (paragraph) over the designated experiment (see Announcement in Canvas for further details). The instructor may send you home if you are unprepared/unsafe for lab.

With this in mind, you will be required to always wear goggles in the lab while glassware and chemicals are in use (even while washing dishes or cleaning your work area). If students are repeatedly found not wearing goggles or refusal to wear goggles in lab can result in an automatic zero for the lab experiment and dismissal from that experiment.
Appropriate clothing in lab includes protective goggles (as designated by the Chemistry Department), long pants (the equivalent of jeans to cover legs; capris are not acceptable), sleeved T-Shirt/ Shirt only (no sleeveless t-shirts/shirts), footwear must cover the entire feet (no slippers or flip-flops or Birkenstocks® or Crocs®). Students wearing inappropriate clothing or without appropriate goggles will be asked to leave and may return to the lab period when they are wearing appropriate clothing and goggles. Repeated disregard for safety can result in a zero and dismissal from the lab and/or from the course.
Part of being in a laboratory environment is being aware of your surroundings, please be safe and courteous to your fellow students in the lab.

Helping you succeed in Introductory Chemistry Lab:
• Lab worksheets: Each student must submit a completed lab worksheet at the end of each lab period. Failure to do so will result in zero points for that lab.

ACADEMIC HONESTY:
Academic dishonesty on any lab or quiz will result in an “F” for the quiz and lab may result in an overall “F” grade and you may be dropped from the course. Quizzes and exams are individual work and not group work. The instructor may send the student home
if you are unprepared/unsafe for lab. Repeated disregard for safety in the lab may result in the student being dropped from this course.

**GRADES and ASSESSMENT:**
- All lab worksheets are to be handed in at the end of the lab period for grading unless otherwise instructed.
- The lowest scoring lab report will be dropped at the end of the semester.
- There are no Extra Credits or Final Exam in this class.

**Grades:**

\[ A > 90 \% \quad B > 80 \% \quad C > 70 \% \quad D > 60 \% \quad F < 60\% \]