INTERAMERICAN UNIVERSITY OF PUERTO RICO
METROPOLITAN CAMPUS
SCIENCE AND TECHNOLOGY FACULTY
NATURAL SCIENCES DEPARTMENT

SYLLABUS

I. GENERAL INFORMATION

Course title	:	General Chemistry I
Code and number	:	CHEM 1111
Crédits	:	4 credits
Academic term	:	
Professor	:	
Office hours	:	
Office telephone	:	
Email	:	

II. DESCRIPTION

Study of matter, its relationship with energy, its properties and its behavior from a macroscopic and microscopic qualitative approach. Formulation of basic concepts of chemistry through laboratory experience. Requires 45 hours of lecture and 45 hours of lab. Prerequisite: GEMA 1200.

III. OBJECTIVES

Macro Vision

1. Demonstrate an understanding of chemical principles governing the matter in terms of the relationship between structure (atomic , molecular and macroscopic level) and physical and chemical properties of substances
2. Develop basic concepts of chemistry, from experimentation, recognize patterns of behavior and evaluate hypotheses.
3. Develop and apply theories about the behavior of matter at the microscopic and macroscopic level.
4. Develop critical thinking and systematic analysis of data to evaluate and resolve situations or new problems using the basic concepts of chemistry.
5. Recognize geometric structures of compounds and common ions.
6. Integrate basic concepts and principles of chemistry to everyday life.

Terminal

1. Define, differentiate and use the properties of matter and its various measurement systems and conversions.

2. To analyze the chemical properties, their classifications, chemical formula, its nomenclature and stoichiometry of composition.

3. Use the concept of chemical equation and solution concentration performing calculations of quantities of substances using a reaction stoichiometry solutions.

4. Distinguish between different types of chemical reactions in solution, predict and calculate products formed in these reaction types.

5. Recognize, describe and evaluate the interaction of electromagnetic radiation with matter and apply quantum mechanics in the distribution of electrons in atoms to determine their chemical properties.

6. Evaluate and relate the characteristics of the elements that give rise to their properties and organization.

7. Identify, measure and calculate various types of energies involved in chemical reactions and dissolution processes.

8. Define, describe and evaluate the properties and variables that govern the behavior of gases and theories that explain it .

9. Apply the concepts discussed in the class experimentally in a research-based environment.

GRADUATE PROFILE COMPETENCES ADDRESSED IN THIS COURSE

- Demostrar valores éticos necesarios para la práctica de la profesión.

IV. THEMATIC CONTENTS

THEMES	CHAPTER (7th Edition)
1. Chemical Tools: Experimentation and Measurement	Ch. 1 (1.1-1.11), Ch. 2 (2.1-2.3)
2. Atoms, Molecules and Ions	Ch. 2 (2.4-2.12)
3. Mass Relationships in Chemical Reactions	Ch. 3 (3.1-3.3, 3.6-3.8)
PARTIAL TEST #1: Friday, Sept. 2nd, 2016	
4. Reactions in Aqueous Solution	Ch. 3 (3.4-3.5), Ch. 4 (4.1-4.7, 4.10-4.12)
5. Periodicity and the Electronic Structure of the Atoms	Cap. 5 (5.1-5.14)
PARTIAL TEST #2: Friday, Sept. 30th, 2016	
6. Ionic Compounds	Cap. 6 (6.1-6.6)
7. Thermochemistry and Thermodynamics	Cap. 9 (9.1-9.13), Cap 17 (17.1-17.2)
PARTIAL TEST #3: Wednesday, Oct. 19th, 2016	
8. Gases: Their Properties and Behavior	Cap. 10 (10.1-10.9)
FINAL EXAM: FINAL EXAM WEEK (Oct. 29-Nov. 3, 2016); THEMES 1-7 (90%); 8 (10%)	

V. ACTIVITIES

A. Laboratory Practices

1. Reglas de seguridad y SDS

2. Incertidumbre en las medidas y análisis numérico
3. ¿Qué es la Materia?
4. ¿Cuánto valen los centavos? (2 semanas)
5. ¿Cuánto es demasiado?
6. ¿Por qué los “hot dogs” se venden en paquetes de diez y los panes en paquetes de ocho?
7. ¿Cambian los iones sus parejas?
8. El color de los materiales
9. ¿Por qué el piso se siente más frío que la alfombra?
10. ¿Cuál es la mejor bolsa de aire?
11. Examen Práctico

B. Teaching Strategies

We recommend using strategies such as:

1. teamwork
2. cooperative learning
3. demonstrations
4. software application in data collection and group discussion
5. movies
6. simulations
7. conceptual maps

VI. EVALUATION

1. The evaluation of the course consists of:

    A. A thoretical part, which consists of three parcial tests (100 pts. each) and a final exam (125 pts.; themes 1-7 ✐ 90%, theme 8 ✐ 10%). These tests correspond to 70% of the final grade.
    B. An experimental part, which corresponds to 30% of the final grade.

Evaluation Criteria	Points	%
Partial test # 1 or Substitute grade	100	17.5
Partial test # 2 or Substitute grade	100	17.5
Partial test # 3 or Substitute grade	100	17.5
FINAL Exam	125	17.5
Laboratory	100	30

2. None of the exams will be eliminated, but the student can opt to substitute the lowest grade in the parcial tests with a Substitute grade (100 accumulated points). These 100 accumulated points consist of 80 points on quizzes through Blackboard, 10 points on homeworks and 10 on attendance. The lowest Quizz grade will be eliminated and the rest will be normalizad with the following formula, $(((\square 1+\square 2\ldots\ldots\ldots+\square 8)/80)*80)$.
3. No replacement tests will be offered. Students that are absent from a partial test, due to excused medical reasons, will use their substitute grade and/or the final test will be counted double.
4. A defficient grade (54.4 % or less in class or lab) means that the student will not pass the course.
5. The following evaluation scale will be applied to the final grade:

100-85 A
84-75 B
74- 65 C
64-55 D
54-0 F

VII. EDUCATIONAL RESOURCES

- McMurray, J. E.; Fay, R. C.; Robinson, J. K. *Chemistry*; 7th Edition, Pearson Education, Inc.:USA, 2015.
  ISBN-13: 978-0-321-94317-0

- *Manual de Laboratorio de Química General I*; Parga, K. A., Ed.; Universidad Interamericana de Puerto Rico, Recinto Metropolitano: San Juan, PR, 2016.

VIII. SUPPLEMENTARY INFO

1. Chang, R. and Goldsby, K., *General Chemistry: The Essential Concepts*, 7th Edition, (2013), McGraw Hill Co.
2. Chang, R. and Goldsby, K., *Chemistry*, 12th Edition, (2015), McGraw Hill Co.
3. Burdge, J. *Chemistry,* Third Edition, (2014), McGraw Hill Co.
4. Darrell D. Ebbing,Steven D. Gammon, *General Chemistry*, 9th edition, (2007), McGraw Hill Co.
5. Ebbing, D. D. & Gammon, S.D. (2011). *General Chemistry Enhanced Edition* (9th Ed.). Belmont, CA: Brooks/Cole Cengage Learning.
6. Tro, N.J., *Principles of Chemistry: A Molecular Approach*, Third Edition (2016), Prentice Hall.
7. Tro, N.J. , *Chemistry: Structure and Properties*, First Edition, (2015), Prentice Hall
8. Petrucci, R.H., Herring G., Madura, J.D., Bissonnette C., *General Chemistry: Principles and Modern Applications*, 10th Edition, (2011), Prentice Hall
9. D. D. Ebbing, *Quimica General*, 5ta Edición, McGraw Hill, Mejico,1997.
10. Boikess, R., *How to Solve General Chemistry Problems*, 8th Edition, 2009, Prentice Hall
11. Explore Chemistry with ChemEd DL http://www.chemeddl.org/
12. Seguridad MSDS http://www.msdsonline.com/msds-search
13. Modelos http://www.chemeddl.org/resources/models360/models.php
14. Brown,T., Lemay, H., Bursten, B., Murphy, C., Woodward, P. (2012). *Chemistry: The Central Science* (12th ed.).Boston: Prentice Hall.

IX. SPECIAL NOTES

A. **Subsidiary services or special needs**: Any student who requires auxiliary services or special assistance must request them at the beginning of the course, or as soon as they acquire knowledge of their needs, through the corresponding record in the Guidance Office with Mr. José Rodríguez.

B. **Honesty, fraud and plagiarism**: Dishonesty, fraud, plagiarism any other inappropriate behavior in relation to academic work constitute major infractions sanctioned by General Student Manual. Major infractions, as specified in General Student Manual, may result in suspension from the University for a definite period exceeding one year or permanent expulsion from the University, among other sanctions.

C. **Use of Electronic Devices**: Cell phones and other electronic devices, that could interrupt the teaching and learning or alter the environment conducive to academic excellence, shall be disabled. The use of electronic devices that allow access, store or send data during tests or examinations is prohibited.

Revised on: August 2016