



OUTCOMES-BASED EDUCATION (OBE) COURSE SYLLABUS

Course No.: ESci 115a

Course Title: **CHEMISTRY FOR ENGINEERS (Lecture)**

I. UNIVERSITY INFORMATION

1. Vision of the University

A globally competitive university for science, technology, and environmental conservation

2. Mission of the University

Development of a highly competitive human resource, cutting-edge scientific knowledge and innovative technologies for sustainable communities and environment.

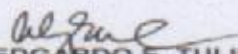
3. VSU Quality Policy Statement

The Visayas State University (VSU), a globally competitive university of science and technology and environmental conservation, is created by law to develop highly competitive human resource, cutting-edge scientific knowledge and innovative technologies for sustainable communities and environment.

Towards this end, we, at the Visayas State University, commit to:

- Produce highly competent, quality and world-class manpower in science and technology, especially for agriculture, environmental management and industry who are proficient in communication skills, critical thinking and analytical abilities;
- Generate and disseminate relevant knowledge and technologies that lead to improved productivity, profitability and sustainability in agriculture, environment and industry; and
- Satisfy the needs and applicable requirements of the industry, the community and government sectors who are in need of quality graduates and technology ready for commercialization through the establishment, operation, maintenance and continual improvement of a Quality Management System (QMS) which is aligned with the requirements of ISO 9001:2015.

It shall be the policy of the university that the quality policies and procedures are communicated to and understood by all faculty, staff, students and other stakeholders and that the system be continually improved for its relevance and effectiveness.


EDGARDO E. TULIN
President
v0 07-16-2019

4. Quality Goals of the College of Arts and Sciences

1. To produce quality manpower and graduates in liberal arts and behavioral sciences chemistry, biology, mathematics, physics, statistics to serve the development needs of the region.
2. To uplift the economic well-being of the region through relevant R and D and extension programs.
3. Enhance regional development of the Visayas for global competitiveness.

5. Quality Objectives of the Department of Pure and Applied Chemistry

- a) Produce highly qualified and skilled Chemists and Chemical Technicians for the university and academia;
- b) Generate relevant knowledge and technologies through basic and applied multi- and inter-disciplinary researches, and
- c) Achieve strong linkages and cooperation with domestic and international institutions and agencies involved in the pursuit of sustainable development.

II. PROGRAM INFORMATION

1. Name of the Program	Bachelor of Science in Civil Engineering, Bachelor of Science in Agricultural and Biosystems Engineering and Bachelor of Science in Mechanical Engineering
2. CHED CMO Reference	CMO 94, Series 2017
3. BOR Approval	BOR Resolution No. 76 s. 2018

4. Program Educational Objectives and Relationship to Institution Mission

Program Educational Objectives	Mission*		
	a	b	c
1. Provide leadership in planning, implementing, and monitoring engineering projects and programs.	✓	✓	✓
2. Occupy supervisory positions in private and public organizations; locally and internationally.	✓	✓	✓
3. Own and manage engineering-related firms and corporations	✓	✓	✓
4. Pursue advanced studies in engineering and emerging fields	✓	✓	✓
5. Occupy responsible positions in engineering education.	✓	✓	✓

*a - development of a highly competitive human resource, b - cutting-edge scientific knowledge, c - innovative technologies for sustainable communities and environment

III. COURSE INFORMATION

1. Course Code	ESci115a
2. Course Title	Chemistry for Engineers
3. Pre-requisite	High School Chemistry
4. Co-requisite	ESci115b - Chemistry for Engineers Laboratory
5. Credit	3 units
6. Semester Offered	1 st Semester (1 st year)
7. Number of hours	3 hours / week
8. Course Description	Core concepts of chemistry both theoretical and practical which are important in the practice of engineering profession.

9. Program Outcomes (POs) in relation to the Program Educational Objectives (POEs)						
Program Outcomes (POs)		Program Educational Objectives				
		1	2	3	4	5
a	Apply knowledge of mathematics and science to solve complex engineering problems	√	√	√	√	√
b	Design and conduct experiments, as well as to analyze and interpret data					
c	Design a system, component, or process to meet desired needs within realistic constraints, in accordance with standards					
d	Function in multidisciplinary and multi-cultural teams					
e	Identify, formulate, and solve engineering problems	√	√	√	√	√
f	Apply professional and ethical responsibility					
g	Communicate effectively engineering activities with the engineering community and with society at large;					
h	Relate the impact of engineering solutions in global, economic, environmental and societal context					
i	Recognize the need for, and engage in lifelong learnings					
j	Relate to contemporary issues					
k	Use techniques, skills, and modern engineering tools necessary for engineering practice					
l	Apply engineering and management principles as a member and leader of a team, and to manage projects in a multidisciplinary environment					
m	Recognize at least one specialized field of engineering	√	√	√	√	√

10. Course Outcomes (COs) and Relationship to Program Outcomes (POs)													
After completing this course, the student must be able to perform the following COs:	Program Outcomes Code												
	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1 Discuss the application of chemistry in relation to the generation of energy.	E	D	D		I		E		E	E	D		
CO2 Explain the chemical principles and concepts of structures and bonding of common materials.	E	D	I		I		E		E	E	I		
CO3 Discuss the chemical processes that takes place in the environment.	E	D	I		I			E	E	E			

Legend: I – Introductory, E – Enabling, D – Demonstrative

Each letter indicates the expected level of competency that each CO should provide for each PO.

11. Course Content and Plan

Week	Topics	Learning Outcomes	Teaching and Learning Activities		Assessment Tasks
			Teaching Activities	Learning Activities	
Class Orientation					
1	<p>OBE Course Syllabus</p> <p>VSU Vision, Mission, and Quality Policy Statement</p> <p>Class Policies</p> <p>Requirements</p> <p>Learning Guide</p> <p>Grading System and Activities</p> <p>Submission of Requirements</p> <p>Netiquette Guide for Online Users</p> <p>Setting of Expectations</p> <p>Values Integration: Open-mindedness, Responsibility, and readiness for learning</p>	<p>Employ the class policies and values.</p> <p>Cite the VSU's mission and vision</p>	<p>Meeting 1 Face to Face Meeting</p> <p>Class Orientation</p> <p>Q & A for clarification, setting of expectations, and getting-to-know-each other</p> <p>Introduction and navigation of the Virtual Classroom:</p> <p>Virtual Meeting Conduct online class orientation</p> <p><i>VSUEE/VC: ESci 115a Chemistry for Engineers</i></p>	<p>Participate in the discussion</p> <p>Class interaction</p> <p>Sharing of Ideas</p> <p>Feedbacks</p> <p>Familiarization with the virtual classroom</p>	<p>Oral recitation</p>
CO1 Discuss the application of chemistry in relation to the generation of energy.					
2	<p>Module 1: Energy</p> <p>Lesson 1.1: Energy</p> <p>Lesson 1.2:</p>	<p>Define what is energy.</p> <p>Identify the forms and types of energy.</p> <p>Illustrate a scenario for inter-conversion of energy.</p>	<p>Meeting 2</p> <p>Face to Face Meeting</p> <p>Lecture with Discussion through PowerPoint presentation</p> <p>Facilitate group activities</p> <p>Give</p>	<p>Class interaction</p> <p>Note-taking</p> <p>Sharing of Ideas</p> <p>Peer discussion</p> <p>Group activity</p> <p>Seatwork and/or</p>	<p>Quiz #1 (Face-to-face and/or through VSU E-Learning Portal)</p> <p>Answer quiz during class schedule</p> <p>Quiz #2</p>

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	Renewable Energy	<p>Recognize the different sources of energy.</p> <p>Discuss how each renewable energy are being harnessed from its sources</p>	<p>assignments/ problem sets/ worksheets</p> <p>Virtual Meeting</p> <p>Lecture with Discussion through PowerPoint presentation</p> <p>Educational Video Presentation</p>	<p>board work exercises</p> <p>Feedbacks</p> <p>VSUEE/VC:</p> <p>Downloading resource materials</p> <p>Answer Learning Tasks/Quiz</p> <p>Learning Guide: Independent study</p>	<p>(Face-to-face and/or through VSU E-Learning Portal)</p> <p>Answer quiz during class schedule</p>
3	<p>Module 1: Energy</p> <p>Lesson 1.3: Non-renewable Energy</p>	<p>Describe the different non-renewable energy sources.</p> <p>Cite an examples for each non-renewable energy.</p> <p>Discuss the crude oil processing.</p> <p>Define the technical terms in describing flammability conditions in liquids and vapor.</p> <p>Differentiate diesel engine from gasoline engine.</p> <p>Relate how each non-renewable energy sources are being used.</p>	<p>Meeting 3</p> <p>Face to Face Meeting</p> <p>Lecture with Discussion through PowerPoint presentation</p> <p>Facilitate group activities</p> <p>Give assignments/ problem sets/ worksheets</p> <p>Virtual Meeting</p> <p>Lecture with Discussion through PowerPoint presentation</p> <p>Educational Video Presentation</p>	<p>Class interaction</p> <p>Note-taking</p> <p>Sharing of Ideas</p> <p>Peer discussion</p> <p>Group activity</p> <p>Seatwork and/or board work exercises</p> <p>Feedbacks</p> <p>VSUEE/VC:</p> <p>Downloading resource materials</p> <p>Answer Learning Tasks/Quiz</p> <p>Learning Guide: Independent study</p>	<p>Quiz #3 (Face-to-face and/or through VSU E-Learning Portal)</p> <p>Answer quiz during class schedule</p>

4	Module 1: Energy Lesson 1.4: Chemical Energy Lesson 1.5: Nuclear Energy	Differentiate chemical energy from nuclear energy. Discuss basic nuclear concepts and the types of radioactive decay. Solve radioactivity related problems. Compare and contrast nuclear fusion and nuclear fission. Discuss how chemical and nuclear energy are harnessed.	Meeting 4 Face to Face Meeting Lecture with Discussion through PowerPoint presentation Facilitate group activities Give assignments/ problem sets/ worksheets Virtual Meeting Lecture with Discussion through PowerPoint presentation Educational Video Presentation	Class interaction Note-taking Sharing of Ideas Peer discussion Group activity Seatwork and/or board work exercises Feedbacks VSUEE/VC: Downloading resource materials Answer Learning Tasks/Quiz Learning Guide: Independent study	Quiz #4 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule Quiz #5 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule
	Module 2: Chemical Thermodynamics Lesson 2.1: Thermochemistry: Energy Flow and Chemical Change	Examine basic concepts of thermodynamics specifically H. Describe how heat is measured in calorimeter. Calculate the quantity of heat released or absorbed in	Meeting 5 Face to Face Meeting Lecture with Discussion through PowerPoint presentation Facilitate group activities Give assignments/ problem sets/ worksheets	Class interaction Note-taking Sharing of Ideas Peer discussion Group activity Seatwork and/or board work exercises Feedbacks VSUEE/VC:	Quiz #6 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule

		relation to the amounts of substances involved in a reaction.	Virtual Meeting Lecture with Discussion through PowerPoint presentation Educational Video Presentation	Downloading resource materials Answer Learning Tasks/Quiz Learning Guide: Independent study	
6	Module 2: Chemical Thermodynamics Lesson 2.2: Entropy, Free Energy, and Directions of Chemical Reactions	Examine basic concepts of thermodynamics specifically G and S. Predict the direction of a spontaneous change. Relate the free energy change and the equilibrium constant of a reaction.	Meeting 6 Face to Face Meeting Lecture with Discussion through PowerPoint presentation Facilitate group activities Give assignments/ problem sets/ worksheets Virtual Meeting Lecture with Discussion through PowerPoint presentation Educational Video Presentation	Class interaction Note-taking Sharing of Ideas Peer discussion Group activity Seatwork and/or board work exercises Feedbacks VSUEE/VC: Downloading resource materials Answer Learning Tasks/Quiz Learning Guide: Independent study	Quiz #7 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule
7	MIDTERM EXAMINATION				
	CO2. Explain the chemical principles and concepts of structures and bonding of common materials.				
8	Module 3: Electrochemistry Lesson 3.1: Electrochemistry	Balance equations of some redox reactions.	Meeting 8 Face to Face Meeting	Class interaction Note-taking	Quiz #8

		<p>Calculate cell's electrical output and relate the relative strengths of the redox species.</p> <p>Discuss the two cell types, how and why it works and its examples.</p> <p>Examine the free energy change and equilibrium nature of the cell reaction and how it relates to the cell output.</p>	<p>Lecture with Discussion through PowerPoint presentation</p> <p>Facilitate group activities</p> <p>Give assignments/ problem sets/ worksheets</p> <p>Virtual Meeting</p> <p>Lecture with Discussion through PowerPoint presentation</p> <p>Educational Video Presentation</p>	<p>Sharing of Ideas</p> <p>Peer discussion</p> <p>Group activity</p> <p>Seatwork and/or board work exercises</p> <p>Feedbacks</p> <p>VSUEE/VC: Downloading resource materials</p> <p>Answer Learning Tasks/Quiz</p> <p>Learning Guide: Independent study</p>	<p>(Face-to-face and/or through VSU E-Learning Portal)</p> <p>Answer quiz during class schedule</p>
9	<p>Module 3: Electrochemistry</p> <p>Lesson 3.2: Corrosion</p> <p>Lesson 3.3: Electrolysis</p>	<p>Balance equations of some redox reactions.</p> <p>Calculate cell's electrical output and relate the relative strengths of the redox species.</p> <p>Discuss the two cell types, how and why it works and its examples.</p> <p>Examine the free energy change and equilibrium nature of the cell reaction and</p>	<p>Meeting 9 Face to Face Meeting</p> <p>Lecture with Discussion through PowerPoint presentation</p> <p>Facilitate group activities</p> <p>Give assignments/ problem sets/ worksheets</p> <p>Virtual Meeting</p> <p>Lecture with Discussion through PowerPoint presentation</p>	<p>Class interaction</p> <p>Note-taking</p> <p>Sharing of Ideas</p> <p>Peer discussion</p> <p>Group activity</p> <p>Seatwork and/or board work exercises</p> <p>Feedbacks</p> <p>VSUEE/VC: Downloading resource materials</p> <p>Answer Learning</p>	<p>Quiz #9 (Face-to-face and/or through VSU E-Learning Portal)</p> <p>Answer quiz during class schedule</p> <p>Quiz #10 (Face-to-face and/or through VSU E-Learning Portal)</p> <p>Answer quiz during class schedule</p>

		how it relates to the cell output.	Educational Video Presentation	Tasks/Quiz Learning Guide: Independent study	
10	Module 4: Chemistry of Engineering Materials Lesson 4.1: Introduction to Engineering Materials	Define what is a chemical bond and its different types. Differentiate the types of solids based on its structure. Discuss the different types of solids and their properties.	Meeting 10 Face to Face Meeting Lecture with Discussion through PowerPoint presentation Facilitate group activities Give assignments/ problem sets/ worksheets Virtual Meeting Lecture with Discussion through PowerPoint presentation Educational Video Presentation	Class interaction Note-taking Sharing of Ideas Peer discussion Group activity Seatwork and/or board work exercises Feedbacks VSUEE/VC: Downloading resource materials Answer Learning Tasks/Quiz Learning Guide: Independent study	Quiz #11 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule
11	Module 4: Chemistry of Engineering Materials Lesson 4.2: Polymers and Plastics	Define polymers and plastics. Understand elementary concepts of the reaction mechanisms involved in polymer synthesis Recognize a polymer based	Meeting 11 Face to Face Meeting Lecture with Discussion through PowerPoint presentation Facilitate group activities Give assignments/	Class interaction Note-taking Sharing of Ideas Peer discussion Group activity Seatwork and/or board work	Quiz #12 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule

		on its classification and types.	problem sets/ worksheets Virtual Meeting Lecture with Discussion through PowerPoint presentation Educational Video Presentation	exercises Feedbacks VSUEE/VC: Downloading resource materials Answer Learning Tasks/Quiz Learning Guide: Independent study	
12	Module 4: Chemistry of Engineering Materials Lesson 4.3: Lubricants and Adhesives Lesson 4.4: Paints and Coatings	Define lubrication and lubricants. Discuss the different types of lubricants. Cite some examples for each types of lubricants. Identify the classifications and types of adhesives. Cite an example for each classification and types of adhesives. Discuss the different theory of adhesive bond. Identify the constituents of paints.	Meeting 12 Face to Face Meeting Lecture with Discussion through PowerPoint presentation Facilitate group activities Give assignments/ problem sets/ worksheets Virtual Meeting Lecture with Discussion through PowerPoint presentation Educational Video Presentation	Class interaction Note-taking Sharing of Ideas Peer discussion Group activity Seatwork and/or board work exercises Feedbacks VSUEE/VC: Downloading resource materials Answer Learning Tasks/Quiz Learning Guide: Independent study	Quiz #13 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule Quiz #14 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule

Grading System (% Passing: 60%)

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		Recognize the different types of paints and coatings based on its application.			
13	Module 4: Chemistry of Engineering Materials Lesson 4.5: Other Building Materials Lesson 4.6: Semiconductors	Discuss the chemistry behind other common building materials and their properties. Discuss how advanced materials are being produced and used.	Meeting 13 Face to Face Meeting Lecture with Discussion through PowerPoint presentation Facilitate group activities Give assignments/ problem sets/ worksheets Virtual Meeting Lecture with Discussion through PowerPoint presentation Educational Video Presentation	Class interaction Note-taking Sharing of Ideas Peer discussion Group activity Seatwork and/or board work exercises Feedbacks VSUEE/VC: Downloading resource materials Answer Learning Tasks/Quiz Learning Guide: Independent study	Quiz #15 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule Quiz #16 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule
CO3. Discuss the chemical processes that take place in the environment.					
14	Module 5: Chemistry and the Environment Lesson 5.1: Chemistry of the Atmosphere	Identify the layers and composition of the atmosphere. Discuss the chemical processes that takes place in the atmosphere. Apply chemical concepts involved in air pollutions.	Meeting 14 Face to Face Meeting Lecture with Discussion through PowerPoint presentation Facilitate group activities	Class interaction Note-taking Sharing of Ideas Peer discussion Group activity Seatwork	Quiz #17 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule

	Lesson 5.2: Chemistry of Water	<p>Discuss the physical and chemical properties of water.</p> <p>Apply the chemical concepts on water sterilization and water softening.</p> <p>Cite some techniques used in water sterilization and water softening.</p> <p>Cite factors causing water pollution and air pollution.</p> <p>Familiarize some laws concerning atmospheric and aquatic environment issues.</p>	<p>Give assignments/ problem sets/ worksheets</p> <p>Virtual Meeting Lecture with Discussion through PowerPoint presentation</p> <p>Educational Video Presentation</p>	<p>and/or board work exercises</p> <p>Feedbacks</p> <p>VSUEE/VC: Downloading resource materials</p> <p>Answer Learning Tasks/Quiz</p> <p>Learning Guide: Independent study</p>	<p>Quiz #18 (Face-to-face and/or through VSU E-Learning Portal)</p> <p>Answer quiz during class schedule</p>
15	<p>Module 5: Chemistry and the Environment</p> <p>Lesson 5.3: Chemistry of Soils</p> <p>Module 6: Explosives and Chemical Safety</p>	<p>Discuss the chemistry behind the soil and explosives.</p> <p>Cite the different types of soils.</p> <p>Describe the different properties of soils.</p> <p>Cite the different types of explosives.</p> <p>Recognize some examples for the different types of explosives.</p>	<p>Meeting 15 Face to Face Meeting</p> <p>Lecture with Discussion through PowerPoint presentation</p> <p>Facilitate group activities</p> <p>Give assignments/ problem sets/ worksheets</p>	<p>Class interaction</p> <p>Note-taking</p> <p>Sharing of Ideas</p> <p>Peer discussion</p> <p>Group activity</p> <p>Seatwork and/or board work exercises</p> <p>Feedbacks</p> <p>VSUEE/VC: Downloading resource materials</p>	<p>Quiz #18 (Face-to-face and/or through VSU E-Learning Portal)</p> <p>Answer quiz during class schedule</p> <p>Quiz #19 (Face-to-face and/or through VSU E-Learning Portal)</p> <p>Answer quiz during class schedule</p>

	Lesson 6.1: Explosives	Provide some applications of explosives in the field of engineering.	Virtual Meeting Lecture with Discussion through PowerPoint presentation Educational Video Presentation	Answer Learning Tasks/Quiz Learning Guide: Independent study	Quiz #20 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule
16	Module 6: Explosives and Chemical Safety Lesson 6.2: Chemical Safety	Practice safety in a chemical laboratory setup. Interpret information found in MSDS and in hazard symbols and pictograms.	Meeting 16 Face to Face Meeting Lecture with Discussion through PowerPoint presentation Facilitate group activities Give assignments/ problem sets/ worksheets Virtual Meeting Lecture with Discussion through PowerPoint presentation Educational Video Presentation	Class interaction Note-taking Sharing of Ideas Peer discussion Group activity Seatwork and/or board work exercises Feedbacks. VSUEE/VC: Downloading resource materials Answer Learning Tasks/Quiz Learning Guide: Independent study	Quiz #21 (Face-to-face and/or through VSU E-Learning Portal) Answer quiz during class schedule

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FINAL EXAMINATION

* VSUEE/VC – VSU E-Learning Environment/ Virtual Classroom

12. Life-long Learning Opportunities

The students will learn and gain a deeper understanding on the concepts of Chemistry which they can apply in their chosen field of profession. In addition, this course could instill in them an appreciation on how Chemistry plays a vital role in our daily life.

The BS CE, BS ME and BS ABE students can also apply his / her knowledge in Chemistry concepts in explaining various environmental phenomena.

13. Contribution of Course to Meeting the Professional Component (%)

General Education: 100%
Basic Education (*Foundation*): 100%
Professional Education (*Major Field*): 100%

14. References and Other Learning Resources

A. E-books/Main Textbook

1. CHANG R. and GOLDSBY K. 2016. Chemistry. 12th Edition. McGraw – Hill Companies Inc.
2. ROUSSAK, O.V. and GESSER, H.D. 2013. Applied Chemistry A Textbook for Engineers and Technologies. 2nd Edition. Springer Science+ Business Media New York
3. SILBERBERG, M.S. 2007. Principles of General Chemistry, McGraw – Hill Companies Inc.

B. YouTube Links

1. ACCIONA. (2017, November 10). Blue Energy – Salinity gradient power | ACCIONA Innovation [Video file]. Retrieved from <https://m.youtube.com/watch?v=5UxCUuk4CEs>
2. Richard Komp. [TED-Ed]. (2016, January 5). How do solar panels work? [Video file]. Retrieved from <https://m.youtube.com/watch?v=xKxrkt7CpY>
3. Rohan Patel. (2015, October 9). Ocean Wave Energy Conversion System [Video File]. Retrieved from <https://m.youtube.com/watch?v=Fzlv89wRBps>
4. Student Energy. (2015, May 7). Tidal Power 101 [Video File]. Retrieved from <https://m.youtube.com/watch?v=VkJTRcTyDSyk>
5. TU Delft. (2016, June 8). TU Delft – OTEC [Video file]. Retrieved from <https://m.youtube.com/watch?v=FHBVgRWA13c>

C. Open Educational Sources

1. AVERILL, B.A. & ELDREDGE, P. Principles of General Chemistry (v 1.0). Retrieved from <https://2012books.lardbucket.org/books/principles-of-general-chemistry-v1.0/index.html>. CC BY license.
2. <https://www.solarschools.net/>

D. Other Learning Resources

Journals
Videos
Websites
Webinars

15. Course Assessment and Evaluation

The performance of students will be assessed and evaluated based on the following:

50% Midterm + 50% Final Term = 100% (Overall Final)

Item No	Assessment Tasks	Percentage Contribution (1)	No. of Times in the Semester (2)	Individual Task % Contribution (1/2)
1	Quizzes (Q) Assessments (A) Learning Tasks (LT)	30	21	0.97/Q&A<
2	Term Examination (TE)	70	2	35/TE
		100%		

COs	Assessment Tasks	Weight in Percent	Minimum Average for Satisfactory Rating	Target and Standards
CO 1 – CO 5	Quizzes (Q)	40%	60 %	At least 60% of the students have at least 60% score
	Assessments (A)			
	Learning Tasks (LT)	50%		
	Term Examination (TE)	10%		
	Problem Sets (PS)			
TOTAL		100%		

Range	Grade	Range	Grade
97 - 100	1.00	75 - 79	2.25
93 - 96	1.25	70 - 74	2.50
89 - 92	1.50	65 - 69	2.75
85 - 88	1.75	60 - 64	3.00
80 - 84	2.00	Below 60	5.00

16. Course Policies

A. Classroom Rules

a. Face-to-face (offline) Mode:

1. All students are required to maintain the cleanliness of the classroom at all times. Thus, all chairs, tables, and other items present in the classrooms must be returned to their proper places after every class.
2. Trashes are to be thrown in garbage bins near the classroom.
3. Students are to turn their cellular phones off or in silent mode for the class duration and are not allowed to use their cellular phones except for emergency purposes.
4. Students are encouraged to take down notes using pen and paper. Upon the approval of the instructor, notes written on the board or presented may be photographed.
5. Working/reading/studying on subject matters not related to the subject matter of the class or course is not allowed.

b. Online Mode:

1. In blended learning, the official virtual classroom is VSU E-Learning Environment (VSUEE) (<https://elearning.vsu.edu.ph>). Therefore, a class orientation concerning the use and navigation of the platform will be done.
2. ZOOM or Google Meet will be used for web-conferencing and real-time class meetings. The username and password link will be posted in VSUEE/VC.
3. The virtual meeting is our avenue for synchronous learning. Class interaction and participation are encouraged. Students will be sharing ideas, feedback on your outputs, and other related concerns in the subject during this time.

B. Attendance and Absences

1. Students who commit six (6) consecutive absences without prior notice to the faculty are considered dropped.

2. Suppose a student is absent and wishes to be excused for the said absence. In that case, he/she must write an excuse letter or present a medical certificate from the university health services to the faculty. (Section 298 and 299, ViSCA Code)
3. For online classes, attending virtual meetings is highly encouraged. However, if you cannot attend due to internet connection limitations, keep up with the lessons and do all the necessary exercises.

C. Quizzes, Problem Sets, and Examinations

1. Quizzes should be done and completed within the allotted time. These are either announced or unannounced. Meanwhile, online quizzes must be submitted and completed through the VSUEE portal within the allotted time.
2. In answering the Learning Tasks/Problem sets, he/she can do the following:
 - a. Handwritten or encoded in MS Word file format
 - b. General format:
 - i. A4 size bond paper
 - ii. 1" margin on all sides
 - iii. Arial, 12 font size, double space (for encoded outputs)

This requirement should be submitted on or before the due date. Late submission will no longer be accepted.

3. All examinations will be done on-site based on the schedule agreed upon by the class or the registrar for term examinations. Special/make-up exams will not be given without a valid excuse. A reasonable proof to justify your absence must be presented if an exam is missed without advance notice due to illness or emergency. The validity of the reason will be up to the discretion of the instructor/professor.
4. Make sure your answers are original. Once caught cheating with your classmates or retrieving answers from any solving site on the internet will be considered wrong. Consequently, a failing grade of 5.00/DR will be given. Furthermore, University rules on cheating will be strictly implemented.

D. Reference/Instructional Materials

The Learning Guide and this ESci 115a Chemistry for Engineers OBE-Syllabus posted in VSUEE are the official instructional materials in this subject. It will serve as your guide in blended learning for the whole semester.

E. Consultation/Clarifications

For any inquiries/clarifications, you may contact the course instructor/professor through email or in person during the official class schedule: Monday to Friday from 8:00 AM to 5:00 PM only.

F. Other Important Rules

1. All students must adhere to the VSU Health and Safety Protocol while attending on-site meetings.
2. All students are reminded to observe all university policies, regulations, and rules. In addition, everyone is advised to read, understand, and practice the provisions of the VSU Student Manual. Non-compliance to the said policies shall have their respective consequences set by the instructor.
3. By the end of the first half of the semester, students who have not complied with any

course requirements (less than 50% compliance) and have been absent without official leave (AWOL) are considered unqualified. Hence, a final remark of dropped will be given at the end of the semester.

These class policies shall serve as our written agreement for the whole semester and are solely applicable to this subject. If there are any changes to enhance the class learning opportunity within the semester, the instructor/professor will communicate with you accordingly.


17. Course Materials and Facilities Available

- 1] Learning Guide/Handouts/Lecture Notes
- 2] Wifi/Internet/Videos
- 3] Laptop/Desktop/Smartphone
- 4] DLP Projector and Projector Screen
- 5] Classroom

18. Revision History

Revision number	Date of Revision	Date of implementation	Highlights of Revision
01	1/ 11/ 2019	1/14/2019	OBE-compliant CHED CMO No 47s. 2017
02	12/17/2019	01/13/2020	ISO compliant format
03	09/30/2020	10/07/2020	ISO compliant format (in compliance for the new normal)
04	09/01/2022	09/09/2022	ISO compliant format

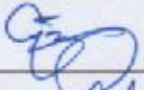
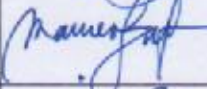
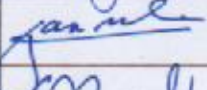
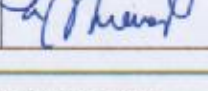
19. Preparation

	Name	Signature	Date Signed
Prepared by	JAILENN JANNARAIN S. PURAY		09/12/2022

IV. INSTRUCTOR/PROFESSOR INFORMATION

1. Name of Instructor/Professor	JAILENN JANNARAIN S. PURAY
2. Office and Department	Department of Pure and Applied Chemistry
3. Telephone/Mobile Numbers	09124475153
4. Email Address	jailenn.puray@vsu.edu.ph
5. Consultation Time	Mon - Fri 8 AM - 5 PM (if available)

20. Department Instructional Materials Review Committee:

Committee	Name	Signature	Date Signed
Member:	ATOZ A. VASQUEZ		9/12/2022
Member:	MA. ROBelyn A. INSIK		9/12/2022
Member:	JACOB GLENN F. JANSALIN		9/13/2022
Chairperson:	ELIZABETH S. QUEVEDO		9/12/2022

Vision:
Mission:

A globally competitive university for science, technology, and environmental conservation.
Development of a highly competitive human resource, cutting-edge scientific knowledge and innovative technologies for sustainable communities and environment.

	Name	Signature	Date Signed
Verified by:	MA. THERESA P. LORETO Dean, CAS		
Validated by:	NANCY D. ABUNDA Head, IMD		

Note:

- 1) The number of POs will depend on each degree program offered
- 2) COs and Relationship to POs
 - a. (I) - **Introductory** – an Introductory Course to an outcome
 - b. (E) - **Enabling** – an Enabling Course or a course that strengthens the outcome
 - c. (D) - **Demonstrated** – a Demonstrative Course or a course demonstrating an outcome.

Distribution of copies: OHIMD, Department, Faculty



EVALUATION OF OUTCOMES-BASED EDUCATION (OBE) COURSE SYLLABUS

Course No.: ESci115a and Course Title: Chemistry for Engineers (Lecture)

1st Semester and A.Y. 2022-2023

Name of faculty : Jailenn Jannaraine S. Puray
Department/Institute : Department of Pure and Applied Chemistry
College : College of Arts and Sciences

CRITERIA	Complied	Partially Complied	Not Complied	Remarks
FORMAT				
1) The OBE course syllabus follows the university-prescribed format	✓			
2) The course syllabus covers the required number of weeks in one academic term	✓			
3) Course policies and grading system are clearly defined	✓			
4) The syllabus is designed to align with the CMO-prescribed curriculum in relation to:				
a. Program Educational Objectives to VSU Vision, Mission, and Quality Policy Statement	✓			
b. Program Outcomes to Program Educational Objectives	✓			
c. Course Outcomes to Program Outcomes	✓			
CONTENT				
1) Learning outcomes are clearly articulated (<i>Specific, Measurable, Attainable, Realistic, Time-bounded (SMART) and anchored on Bloom's Taxonomy of Objectives</i>)	✓			
2) Course coverage completely follows the course description	✓			
3) Topics/lessons are arranged in a logical – sequence	✓			
4) Gender-sensitivity and values education are integrated in the syllabus whenever applicable	✓			
5) References are relevant, varied and updated. Contains at least five book titles copyrighted within the last 5 years as prescribed by CHED	✓			
TEACHING-LEARNING				
1) Teaching-learning activities are:				