



OUTCOMES-BASED EDUCATION (OBE) COURSE SYLLABUS

Chem212 Analytical Chemistry

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.

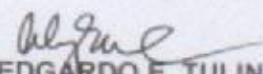
3. VSU Quality Policy Statement

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 and Objectives of the Graduate School

Goal:

Produce high quality manpower in agriculture and its allied fields through graduate education to serve the development needs of the region.

General Objective:

To strive for excellence in graduate education for regional growth and rural development.

Specific Objectives:

- (1) To offer graduate courses to teachers, researchers, extension workers, administrators and other professionals;
- (2) To train and guide graduate students in conducting productive and independent research studies relevant to agriculture and its allied fields, environmental management and industry;
- (3) To design and implement innovative strategies for the enhancement of managerial and leadership skills of professional and development workers; and
- (4) To strengthen personal discipline and moral character of graduate students to better serve their clientele.

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

- (1) Produce highly qualified and skilled Chemists and Chemical technicians for the industry and academia;
- (2) Generate relevant knowledge and technologies through basic and applied multi- and inter-disciplinary researches; and
- (3) 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	Master of Education
2. CHED CMO Reference	CHED CMO. No. 53 s. 2007 & CMO No. 15, S. 2019
3. BOR Approval	BOR Resolution 10, S. 2007

4. Program Educational Objectives and Relationship to Institution Mission

Program Educational Objectives	Mission*		
	a	b	c
1. Update and enrich classroom teachers' content knowledge in a specific subject area;	√		√
2. Enhance and expand classroom teachers' pedagogical knowledge and skills for teaching a specific subject area; and	√	√	√
3. Improve the classroom teachers' efficacy in producing innovative and creative instructional programs or materials that will improve the teaching-learning process.	√	√	√

*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	Chem 212
2. Course Title	Analytical Chemistry
3. Pre-requisite	COP
4. Co-requisite	None

5. Credit	3 units
6. Semester Offered	First Semester
7. Number of hours	3 hours lecture
8. Course Description	This course prepares professional teachers to acquire learning, description and integration of the theoretical principles, knowledge and techniques in analytical chemistry to better equip them in handling the basics of analytical chemistry for the young minds at heart.

9. Program Outcomes (POs) in relation to the Program Educational Objectives (POEs)				
Program Outcomes (POs)		Program Educational Objectives		
		1	2	3
a	In-depth understanding of a complex and coherent body of knowledge and skills in an area of study in education, which may be applied in many types of school or other educational environments;	√	√	√
b	A higher order level of skill in the analysis, critical assessment, and application and communication of knowledge in the field;	√	√	√
c	An ability to apply knowledge and skills in the field to new situations in more creative and flexible ways, and to solve complex problems in the field in ways that involve rigorous thinking and independent work;	√	√	√
d	Understand, develop, and sustain arguments about and critically evaluate the current problems, principles, and concepts of the field of study; most of which should be at the forefront of developments in the discipline;	√	√	√
e	Apply this current knowledge in original ways to specific problems or contexts by undertaking research, a complex project, or some other form of advanced scholarship;	√	√	√
f	Demonstrate a comprehensive understanding of the methods of inquiry in their own research or advance scholarship, and how these methods are used to create and interpret knowledge in the field;	√	√	√
g	Creatively and systematically deal with complex issues within a field, make judgements, or decisions in the absence of complete data, and clearly communicate one's justification for such actions to specialist and non-specialist audiences;	√	√	√
h	Demonstrate initiative, self-direction and originality in dealing with problems in the field (e.g. develop innovative teacher approaches and resources; establish new teacher supervisory systems, etc.) particularly in the planning and execution of tasks in the field;	√	√	√
i	Continue to advance their knowledge and skills in the field using the established sources of advanced information in the field; and	√	√	√
j	Undertake more advanced and specialized training for developing existing skills, acquiring higher level and more specialized competencies in the formal higher education context.	√	√	√

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. Illustrate the different methods of quantitative chemical analyses;	I	I	I	I	I	E	E	E	E	E	
CO2. Categorize the theoretical principles behind each quantitative inorganic analysis;	I	I	I	I	I	I	E	E	E	E	
CO3. Relate chemistry with local, national and international concerns on food safety and environmental conservation for community resiliency; and	I	I	I	E	E	E	D	D	D	D	
CO4. Integrate the current advancement of instruments for quantitative chemical analysis.	D	E	D	E	D	E	I	I	I	D	

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	OBE Course Syllabus (including VSU Vision Mission, and Quality Policy Statement) Class Policies Requirements Grading System and Activities Learning Guide / Instructional Workbook / Laboratory Manual Submission of requirements Values Integration:	At the end of the lesson, the students will be able to: <ul style="list-style-type: none">Promote the Vision, Mission, Goals, Objectives and Core Values of the University	F-2-F Mode: Class Meeting/ Viewing of recorded presentation: Q & A for clarification, setting of expectations, and getting-to-know-each other Class interaction Sharing of Ideas	Online Mode: Role play through a video	Oral recitation

	Relevance Integrity Truth Excellence Satisfaction		Feedbacks F2F mode*: Familiarization of the Chemistry classroom	Offline Mode:	
CO1: Illustrate the different methods of quantitative chemical analyses;					
2	Module No. 1 (Introduction to Analytical Chemistry) Lesson No. 1.1 (Functions and Classifications of quantitative analysis)	○ Familiarize the functions and classification of quantitative analyses.	F2F mode Classroom Access	Online Mode: VSUEE/ VC: Note-taking Downloading resource materials Offline Mode: Solving assigned tasks	Pretest for Module 1 Due Date: Week 2 Assignment 1: Due Date: Week 2
3	Module No. 1 (Introduction to Analytical Chemistry) Lesson No. 1.2 (The Analytical Process)	○ Illustrate the flow of the analytical process.	F2F Mode Classroom Meeting #1: Power point presentation; Class recitation Printed Learning Guide (independent study)	Online Mode: VSUEE/ VC: Note-taking Downloading resource materials Offline Mode: Answering lesson exercises	Quiz 1: Due Date: Week 3 Post-Test: Due Date: Week 3
4	Module No. 2 (Errors and Statistical Treatment of Data) Lesson No. 2.1 (Errors in Measurement)	○ Describe the errors in quantitative measurement	F2F Mode Classroom Meeting	Online Mode: VSUEE/ VC: Note-taking	Pre-Test for Module 2 Due Date: Week 4 Homework

			Learning Guide; Independent study	Downloading resource materials	1: Due Date: Week 4
				Offline Mode: Solving assigned tasks	
5	<p>Module No. 2 (Errors and Statistical Treatment of Data)</p> <p>Lesson No. 2.2 (Statistical Treatment of Quantitative Data)</p>	<p>○ Explain the statistical concepts of treating qualitative measurements.</p>	<p>F2F Mode Classroom Meeting #2:</p> <p>Power point presentation;</p> <p>Class discussion</p> <p>Learning Guide (independent study)</p>	<p>Online Mode: VSUEE/VC: Note-taking</p> <p>Downloading resource materials</p> <p>Offline Mode: Answering lesson exercises</p>	<p>Quiz 2: Due Date: Week 5</p> <p>Post-Test: Due Date: Week 5</p> <p>First Long Examination on Module Nos. 1 and 2. Due Date: Week 5</p>
CO2. Categorize the theoretical principles behind each quantitative inorganic analysis;					
6	<p>Module No. 3 (Ionic Equilibria)</p> <p>Lesson No. 3.1 (Conservation of Mass Principle)</p>	<p>○ Illustrate how mass conservation principle works in solving problems on ionic equilibria.</p>	<p>F2F Mode Classroom Meeting</p> <p>Learning Guide; Independent study</p>	<p>Online Mode: VSUEE/VC: Note-taking</p> <p>Downloading resource materials</p> <p>Offline Mode: Solving assigned tasks</p>	<p>Pre-Test for Module 3 Due Date: Week 6</p> <p>Problem Set 1: Due Date: Week 6</p>

7	<p>Module No. 3 (Ionic Equilibria)</p> <p>Lesson No. 3.2 (The Electroneutrality Principle)</p>	<ul style="list-style-type: none"> Understand how the electroneutrality principle can be applied in solving problems on ionic equilibria. 	<p>F2F Mode Classroom Meeting #3:</p> <p>Power point presentation; Group activity</p> <p>Learning Guide (independent study)</p>	<p>Online Mode: VSUEE/ VC: Note-taking Downloading resource materials</p> <p>Offline Mode: Answering lesson exercises</p>	<p>Quiz 3: Due Date: Week 7</p> <p>Post-Test: Due Date: Week 7</p>
8	<p>Module No. 4 (Gravimetry)</p> <p>Lesson No. 4.1 (Requirements for Gravimetric Analysis)</p>	<ul style="list-style-type: none"> Explain the theoretical principle behind gravimetric method of analysis. 	<p>F2F Mode Classroom Meeting</p> <p>Learning Guide; Independent study</p>	<p>Online Mode: VSUEE/ VC: Note-taking Downloading resource materials</p> <p>Offline Mode: Solving assigned tasks</p>	<p>Pre-Test for Module 4 Due Date: Week 8</p> <p>Assignment 2: Due Date: Week 8</p>
9	<p>Module No. 4 (Gravimetry)</p> <p>Lesson No. 4.2 (Gravimetric Calculations)</p>	<ul style="list-style-type: none"> Demonstrate solving chemical problems under gravimetry. 	<p>F2F Mode Classroom Meeting #4:</p> <p>Power point presentation; Individual activity</p> <p>Learning Guide (independent study)</p>	<p>Online Mode: VSUEE/ VC: Note-taking Downloading resource materials</p> <p>Offline Mode: Answering lesson exercises</p>	<p>Quiz 4: Due Date: Week 9</p> <p>Post-Test: Due Date: Week 9</p> <p>Midterm Exam on Modules 1-4: Due Date: Week 9</p>

10	Module No. 5 (Acids and Bases) Lesson No. 5.1 (Concepts of Acids and Bases)	○ Describe the different concepts of acids and bases	F2F Mode Classroom Meeting	F2F Mode Classroom Meeting	Pre-Test for Module 5 Due Date: Week 10 Homework 2: Due Date: Week 10
11	Module No. 5 (Acids and Bases) Lesson No. 5.2 (pH calculation)	○ Illustrate how pH of acid and basic solutions can be calculated.	F2F Mode Classroom Meeting #5: Power point presentation; Class recitation Learning Guide (independent study)	Online Mode: VSUEE/ VC: Note-taking Downloading resource materials Offline Mode: Answering lesson exercises	Quiz 5: Due Date: Week 11 Post-Test: Due Date: Week 11
CO3. Relate chemistry with local, national and international concerns on food safety and environmental conservation for community resiliency; and					
12	Module No. 6 (Ionic Strength of Solutions) Lesson No. 6.1 (Activity, Activity Coefficients and Ionic Strength of Solutions)	○ Understand the concept of ionic strength in analytical chemistry.	F2F Mode Classroom Meeting Learning Guide; Independent study	Online Mode: VSUEE/ VC: Note-taking Downloading resource materials Offline Mode: Solving assigned tasks	Pre-Test for Module 6 Due Date: Week 12 Problem Set 2: Due Date: Week 12
13	Module No. 6 (Ionic Strength of Solutions) Lesson No. 6.2 (Activity, Solubility and Ionic Strength of Solutions)	○ Draw the relationship between activity, solubility, and ionic strength of solutions.	F2F Mode Classroom Meeting #6: Power point presentation;	Online Mode: VSUEE/ VC: Note-taking Download	Quiz 6: Due Date: Week 13 Post-Test: Due Date: Week 13

			Group discussion Learning Guide (independent study)	ding resource materials Offline Mode: Answering lesson exercises	Second Long Examination on Module Nos. 5 and 6. Due Date: Week 13
14	Module No. 7 (Volumetry) Lesson No. 7.1 (Requirements of Volumetric Analysis)	<ul style="list-style-type: none"> ○ Explain the theoretical principles required for volumetric analysis. 	F2F Mode Classroom Meeting Learning Guide; Independent study	Online Mode: VSUEE/VC: Note-taking Downloading resource materials Offline Mode: Solving assigned tasks	Pre-Test for Module 7 Due Date: Week 14 Assignment 3: Due Date: Week 14
15	Module No. 7 (Volumetry) Lesson No. 7.2 (Volumetric Calculations)	<ul style="list-style-type: none"> ○ Illustrate how quantitative analysis is facilitated by volumetry. 	F2F Mode Classroom Meeting #7: Power point presentation; Class activity Learning Guide (independent study)	Online Mode: VSUEE/VC: Note-taking Downloading resource materials Offline Mode: Answering lesson exercises	Quiz 7: Due Date: Week 15 Post-Test: Due Date: Week 15
CO4. Integrate the current advancement of instruments for quantitative chemical analysis.					
16	Module No. 8 (Optical Methods of Analysis) Lesson No. 8.1 (UV-visible)	<ul style="list-style-type: none"> ○ Familiarize the theoretical principles behind each optical 	F2F Mode Classroom Meeting Learning Guide;	Online Mode: VSUEE/VC: Note-taking	Pre-Test for Module 8 Due Date: Week 16 Homework

	spectrophotometry)	method of analysis.	Independent study	Downloading resource materials Offline Mode: Solving assigned tasks	3: Due Date: Week 16
17	Module No. 8 (Optical Methods of Analysis) Lesson No. 8.2 (Atomic absorption spectrophotometry and turbidimetry)	○ Appreciate the advancement of instrumentation for analytical chemistry.	F2F Mode Classroom Meeting #8: Power point presentation; Individual task Learning Guide (independent study)	Online Mode: VSUEE/VC: Note-taking Downloading resource materials Offline Mode: Answering lesson exercises	Quiz 8: Due Date: Week 17 Post-Test: Due Date: Week 17
18					Final Examination Due Date: Week 18

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

12. Life-long Learning Opportunities

This course is designed to enable students acquire knowledge, skills, and develop appropriate techniques in quantitative inorganic analyses. It is envisioned for the students to appreciate the advancement of instrumentation as a rapid tool for quantitative chemical analysis of inorganic substances. These experiences will help and better equip them in their future career.

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

General Education: 0 %
Basic Education (Foundation): 0 %
Professional Education (Major Field): 100 %

14. References and Other Learning Resources

A. Textbook(s)/ E-Books

Carol, J. 2017. Analytical Chemistry: Concepts and Applied Principles. NY Research Press, New York, USA. 219p.
Christian, G.D., P.K. Dasgupta and K.A Schug. 2013. Analytical Chemistry. Seventh Edition. John Wiley & Sons Inc., Oregon, USA. 837p.

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No. 22-OPAC-1-06

- Harris, D.C. 2020. Quantitative Chemical Analysis. 10th Edition. W.H. Freeman and Company, New York, USA. 878p.
- Laitinen, H.A. and W.E. Harris. 2009. Chemical analysis: an advanced text and reference. Second edition. University of Florida Press, USA.
- Mendenhall, W.M. and T.L. Sincich. 2015. Statistics for Engineering and the Sciences. Sixth Edition. Chapman and Hall/CRC Press, Florida, USA. 1182p.
- Oriakhi, C.O. 2021. Chemistry in Quantitative Language. Second Edition. Oxford University Press, New York, USA. 528p.
- Robinson, J.W., E.M.S. Frame and G.M. Frame II. 2021. Instrumental Analytical Chemistry: An Introduction, International Student Edition. CRC Press Taylor & Francis Group, Florida, USA. 920pp.
- Salas, F.M. and Y.A. Salas. 2021. Learning Guide in Quantitative Chemistry. Department of Pure & Applied Chemistry, College of Arts and Sciences, Visayas State University, Baybay City, Leyte, Philippines.
- Skoog, D.A., D.M. West and F.J. Holler. 2002. Fundamentals of Analytical Chemistry. 7th edition.
- Wilde, B. 2018. Analytical Chemistry: Quantitative and Qualitative Analysis. NY Research Press, New York, USA. 217p.

B. Other Learning Resources

Journals

- Allred, Z.R., A.D. Shrode, J. Gonzalez, A. Rose, A.I. Green, U. Swamy, R.L. Matz and S.M. Underwood. 2022. Impact of Ocean Acidification on Shelled Organisms: Supporting Integration of Chemistry and Biology Knowledge through Multidisciplinary Activities. *Journal of Chemical Education*, 99(5):2182-2189.
- Bruininks, B. and L.B.F. Juurlink. 2022. An Inexpensive 3D Printed Periscope-Type Smartphone-Based Spectrophotometer for Emission, Absorption, and Fluorescence Spectrometry. *Journal of Chemical Education*, 99(5):2168-2174.
- Chutakool, W. and T. Praneenarat. 2022. Characterization of Carotenoids from Pineapples: An Integrated and Modular Experiment for Practical Learning of UV-vis Spectroscopy, Chromatography, Mass Spectrometry, and Chemometrics. *Journal of Chemical Education*, 99(5):2079-2085.
- Grabowski, L.E. and S.R. Goode. 2017. Determining a Solubility Product Constant by Potentiometric Titration to Increase Students' Conceptual Understanding of Potentiometry and Titrations. *Journal of Chemical Education*, 94(5):636-639.
- Filqueiras, M.F. and E.M. Borges. 2022. Iron Quantification in Dietary Supplements using Four Colorimetric Assays. *Journal of Chemical Education*, 99(5):2067-2078.
- Passos, M.L.C., M. Lucia and M.F.S. Saraiva. 2019. Detection in UV-visible spectrophotometry: Detectors, detection systems, and detection strategies. *Measurement*, 135:896-904.
- Yadav, P., H. Laddha, M. Agarwal and R. Gupta. 2022. Fun with Smartphones: Handy Solution for Quantification of Debilitating Fluoride Ions in Drinking Water. *Journal of Chemical Education*, 99(7):2677-2683.
- Zapata, F., A. Lopez-Fernandez, F. Ortega-Ojeda, G. Quintanilla, C. Garcia-Ruiz and G. Montalvo. 2021. Introducing ATR-FTIR Spectroscopy through Analysis of Acetaminophen Drugs: Practical Lessons for Interdisciplinary and Progressive Learning for Undergraduate Students. *Journal of Chemical Education*, 98(8):2675-2686.

Videos

<https://www.youtube.com/watch?v=atN5fqNGTfA>

Websites

<https://www.britannica.com/science/gravimetric-analysis>
<https://www.britannica.com/science/turbidimetry>
<https://www.studyread.com/atomic-absorption-spectroscopy/>
<http://www.titrations.info/complexometric-titration-end-point-detection>
<https://www2.chemistry.msu.edu/VirtTxtJml/Spectrpy/UV-Vis/uvspec.htm>

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	15	8	1.875%/Q
2	Assignment/HW/PS	30	8	3.750%/A
3	Long Exam	25	2	12.5%/LE
4	Term Exam	30	2	15.0%/TE
		100%		

COs	Assessment Tasks	Weight in Percent	Minimum Average for Satisfactory Rating	Target and Standards
CO 1	Assignment 1 & quiz 1	5.625	<u>60</u> %	At least <u>70</u> % of the students have at least <u>60</u> % score
CO 2	Assignment 2, Homework 1, Problem Set 1 & quizzes 2, 3 & 5 and Midterm Exam	31.875	<u>60</u> %	At least <u>70</u> % of the students have at least <u>60</u> % score
CO 3	Homework 2-3, quizzes 4 & 8, Long Exam 1; and Final Exam	38.75	<u>60</u> %	At least <u>70</u> % of the students have at least <u>60</u> % score
CO 4	Assignment 3, Problem Set 2 & quizzes 6 & 7, Long Exam 2	23.750	<u>60</u> %	At least <u>70</u> % of the students have at least <u>60</u> % score
TOTAL		100%		

Grading System (% Passing: 60 %)

Range	Grade	Range	Grade
96-100	1.00	72 - 75	2.25
91- 95	1.25	68 - 71	2.50
86- 90	1.50	64 - 67	2.75
81- 85	1.75	60 - 63	3.00
76- 80	2.00	1 - 59	5.00

16. Course Policies (sample only)

Vision:
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No. 22-OPAC-1-06

- 1) The official virtual classroom is VSU E-Learning Environment (VSUEE) (<https://elearning.vsu.edu.ph>). A class orientation will be done in relation to the use and navigation of the platform.
- 2) ZOOM or Google Meet will be used for web-conferencing and real-time class meetings. Username and password link will be posted in VSUEE/VC.
- 3) Attending the virtual meeting is highly - encouraged but not compulsory. If you cannot attend due to internet connection limitation, there is no problem. Just keep up with the lessons and do all the necessary exercises that is required of you.
- 4) The F2F classroom meeting is our avenue for synchronous learning. Class interaction and participation is encouraged, sharing of ideas, feedbacking of your outputs and other related concerns in the subject will be done during this time.
- 5) All requirements will be submitted preferably through the VSUEE or email but if internet connection is not stable or you do not have an internet connection, you may submit your activities to the office or during the F2F classroom meeting.



ONLINE Submission:

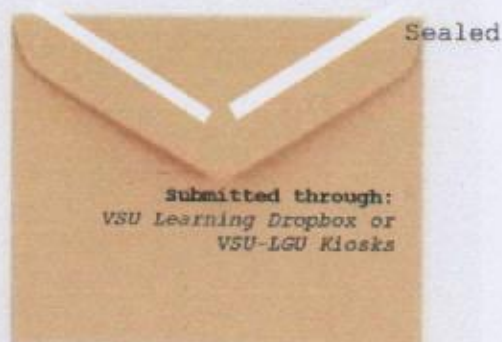
Scan (.pdf) / take a picture (.jpg) / MS Word file (.docx) of the Learning task/activity then send through the VSUEE/VC or email.



OFFLINE Submission:

Place your answers in a SEALED BROWN ENVELOPE. On the envelope, write your FULLNAME, YEAR LEVEL, COURSE, CONTACT NUMBER, EMAIL ADDRESS, COURSE NUMBER, COURSE TITLE, and DATE OF SUBMISSION, COURSE PROFESSOR.

<p>JUAN DELA CRUZ 3rd year BSSED - Math 0920 - 1234567 juandelacruz@gmail.com Course Title: _____ Date submitted: _____ Course Professor: _____ Department _____, College _____</p>
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Submit through a courier: The office address is DEPARTMENT OF CHEMISTRY, COLLEGE OF ARTS AND SCIENCES, Visayas State University, Baybay City, Leyte, Philippines.

VSU Learning Dropbox: Drop your outputs and look for the VSU Learning

Dropbox (College of Arts and Sciences), located at the parking space near ATM Machine, Lower Guard Post 2.

VSU – Academic/LGU Kiosks: Drop your outputs in the designated VSU – Academic/LGU Kiosks of your respective LGU.

- 6) Original copies of all answers, solutions, and laboratory reports should be kept by the student, put in a folder/envelope one after the other, and should be bound together to form a "profffolio" as part of the final requirements of the course.
- 7) In answering the Learning Task/Activities, it can be done in any of the following:
 - a. Use the Learning Guide in Chemistry 212 (type of IM), in answering the given activities/tasks. Additional sheet of paper may be used as necessary.
 - b. Handwritten or encoded in MS Word file format
 - c. General format for additional sheet either handwritten/Word file:
 - i. A4 size bond paper
 - ii. 1" margin all sides
 - iii. Arial, 12 font size, double space (for encoded outputs)
- 8) Quizzes is set on VSUEE - VC. All quizzes are announced and will open every after a topic has been discussed.
- 9) This Learning Guide in Chem 212 (type of IM) is our official instructional material in this subject. It will serve as your guide for the whole semester. Whether you have internet connection or not, use it.
- 10) In the submission of activities, there are deductions for late submissions and ON-TIME submission is much appreciated.
- 11) If you have any inquiries/clarifications, you may contact the course instructor/professor during official class schedule; Monday to Friday only.
- 12) All students are reminded to observe all policies, regulations, and rules of the university and other related laws of the land and are advised to read, understand, and practice the provisions of the VSU Student Manual.
- 13) Lastly, as we embark in this "new normal". Let us have an open mind and heart as we adjust in this new way of delivering the teaching-learning process and still continue to aim for quality in education.

This class policy serves as our written agreement for the whole semester. If there are any changes to enhance the class learning opportunity within the semester, it will be communicated accordingly.

17. Course Materials and Facilities Available

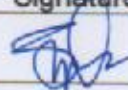
- Lecture notes and videos
- LCD/LED Projector and Projector Screen
- Classroom filled with armchairs
- Electric fans and fluorescent light
- Computer table, whiteboard, and markers
- Updated periodic table

18. Revision History

Vision:
Mission:

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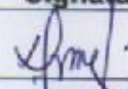
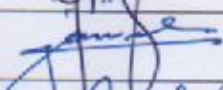
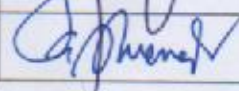
Revision number	Date of Revision	Date of implementation	Highlights of Revision
1	Jan 2, 2020	August 1, 2020	New Format (ISO)
2	Aug 20, 2020	October 5, 2020	New Normal Format
3	Aug 19, 2022	September 12, 2022	New Normal with F2F Format

19. Preparation			
Prepared by	Name	Signature	Date Signed
	FELIX M. SALAS		August 19, 2022

III. INSTRUCTOR/PROFESSOR INFORMATION

1. Name of Instructor/Professor	Felix M. Salas
2. Office and Department	Department of Pure and Applied Chemistry
3. Telephone/Mobile Numbers	Office: 053-565-0600 (loc 1032); Mobile: 09088103742; Residence: 053-563-0271
4. Email Address	felix.salas@vsu.edu.ph; and fmsalas_dopac@yahoo.com
5. Consultation Time	TBA

20. Department Instructional Materials Review Committee:

Committee	Name	Signature	Date Signed
Member:	ALLAN A. RAMAL		9/9/2022
Member:	JACOB GLENN F. JANSALIN		9/15/2022
Department Head:	ELIZABETH S. QUEVEDO		9/10/2022

	Name	Signature	Date Signed
Verified by:	ANABELLA B. TULIN Dean, OGS		
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.

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