



OUTCOMES-BASED EDUCATION (OBE) COURSE SYLLABUS

CHEM157 Physical Chemistry I

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.

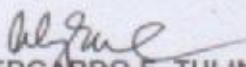
3. VSU Quality Policy Statement

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 Biology, Biotechnology, Chemistry, English, Liberal Arts and Behavioral Sciences, Mathematics, Physics and Statistics to serve the development needs of the region;
- (2) To uplift the economic well-being of the region through relevant R&D and extension programs; and
- (3) To enhance regional development of the Visayas for global competitiveness.

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	Bachelor of Science in Chemistry
2. CHED CMO Reference	CMO 36 s. 1998
3. BOR Approval	BOR 15b s. 1988; BOR 87 s. 2018

4. Program Educational Objectives and Relationship to Institution Mission

Program Educational Objectives	Mission*		
	a	b	c
1. Occupy supervisory or managerial positions in academic and research institution and industries both local and international.	√	√	√
2. Participate in multidisciplinary or cross-disciplinary research team.	√	√	√
3. Establish own chemical-based business/industries.	√	√	√
4. Pursue graduate studies and/or specialized training program in chemistry and related fields.	√	√	√
5. Pursue other degree programs.	√	√	√

*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 157
2. Course Title	Physical Chemistry I
3. Pre-requisite	Math 106 - Integral Calculus
4. Co-requisite	Chem 157.2
5. Credit	3 units
6. Semester Offered	Second Semester
7. Number of hours	3 hours lecture
8. Course Description	Fundamental laws of gases and chemical thermodynamics

9. Program Outcomes (POs) in relation to the Program Educational Objectives (POEs)						
Program Outcomes (POs)		Program Educational Objectives				
		1	2	3	4	5
a	Demonstrate a broad and coherent knowledge and	√	√	√	√	√

1	<p>OBE Course Syllabus (including VSU Vision Mission, and Quality Policy Statement)</p> <p>Class Policies</p> <p>Requirements</p> <p>Grading System and Activities</p> <p>Learning Guide / Instructional Workbook / Laboratory Manual</p> <p>Submission of requirements</p> <p>Values Integration: Relevance Integrity Truth Excellence Satisfaction</p>	<p>o Promote the Vision, Mission, Goals, Objectives and Core Values of the University</p>	<p>F2F Meeting #1:</p> <p>Q & A for clarification, setting of expectations, and getting-to-know-each other; Class interaction; Sharing of Ideas;</p> <p>Feedbacks</p> <p>VSUEE/VC*: Familiarization of the virtual classroom</p> <p>Printed Learning Guide (independent study)</p>	<p>Power point and video presentations</p>	<p>Oral recitation</p>
CO1. To know the underlying physical principles that govern the properties and behaviour of chemical systems;					
2	<p>Module No. 1 (Introduction to Physical Chemistry)</p> <p>Lesson No. 1.1 (The thermodynamic system)</p>	<p>o Familiarize the types and components of thermodynamic systems;</p>	<p>F2F Meeting #2:</p> <p>Printed Learning Guide; Independent study</p>	<p>VSUEE/VC: Note-taking; Downloading resource materials; Solving assigned tasks</p>	<p>LT (Assignment 1): Due Date: Week 2</p>
3	<p>Module No. 1 (Introduction to Physical Chemistry)</p> <p>Lesson No. 1.2 (Thermodynamic equilibrium and properties)</p>	<p>o Describe the kinds of thermodynamic equilibria and their properties;</p>	<p>F2F Meeting #3:</p> <p>Power point presentation; Class recitation</p>	<p>VSUEE/VC: Note-taking; Downloading resource materials Answerin</p>	<p>Quiz 1: Due Date: Week 3</p>

			Printed Learning Guide (independent study)	g lesson exercises	
4	Module No. 2 (Mathematical Formalism in Physical Chemistry) Lesson No. 2.1 (Total differentials and partial derivatives)	<ul style="list-style-type: none"> ○ Explain the importance of differentials in understanding the properties of a thermodynamic system as path or state dependent; 	F2F Meeting #4: Printed Learning Guide; Independent study	VSUEE/VC: Note-taking; Downloading resource materials; Solving assigned tasks	
5	Module No. 2 (Mathematical Formalism in Physical Chemistry) Lesson No. 2.2 (Exact and Inexact differentials)	<ul style="list-style-type: none"> ○ Demonstrate applications of differentials in solving simple problems associated with thermodynamic systems; 	F2F Meeting #5: Power point presentation; Class discussion Printed Learning Guide (independent study)	VSUEE/VC: Note-taking; Downloading resource materials; Answering lesson exercises	First Long Examination on Module Nos. 1 and 2. Due Date: Week 5
CO2. To explain the interrelationships of the various equilibrium properties of a system;					
6	Module No. 3 (Ideal Gases) Lesson No. 3.1 (Properties and kinetic molecular theory of gases)	<ul style="list-style-type: none"> ○ Describe the behavior of ideal gases through changes in independent variables such as pressure, temperature, and volume; 	F2F Meeting #6: Printed Learning Guide; Independent study	VSUEE/VC: Note-taking; Downloading resource materials; Solving assigned tasks	LT (Problem Set 1): Due Date: Week 6
7	Module No. 3 (Ideal Gases) Lesson No. 3.2 (Ideal gas laws)	<ul style="list-style-type: none"> ○ Illustrate how these gas laws work with the 	F2F Meeting #7: Power point	VSUEE/VC: Note-taking; Downloading	Quiz 2: Due Date: Week 7

		different independent variables that affect the behavior of ideal gases;	presentation; Group activity; Printed Learning Guide (independent study)	resource materials; Answering lesson exercises	
8	Module No. 4 (Real Gases) Lesson No. 4.1 (Properties of imperfect gases)	<ul style="list-style-type: none"> Explain the molecular interactions, expansion, and compression of imperfect gases; 	F2F Meeting #8: Printed Learning Guide; Independent study	VSUEE/V C: Note-taking; Downloading resource materials; Solving assigned tasks	
9	Module No. 4 (Real Gases) Lesson No. 4.2 (Real gas equation of states)	<ul style="list-style-type: none"> Describe the salient features of the different equations of state being formulated for real gases; 	F2F Meeting #9: Power point presentation; Individual activity Printed Learning Guide (independent study)	VSUEE/V C: Note-taking; Downloading resource materials; Answering lesson exercises	Midterm Exam on Modules 1-4: Due Date: Week 9
CO3. To appreciate how the thermodynamic laws relate to the changes of equilibrium properties in various processes; and					
10	Module No. 5 (Zeroth Law of Thermodynamics) Lesson No. 5.1 (Thermal evaluation and thermometry)	<ul style="list-style-type: none"> Discuss the unsuitability of liquid water as the expanding agent for a thermometer; 	F2F Meeting #10: Printed Learning Guide; Independent study	VSUEE/V C: Note-taking; Downloading resource materials; Solving assigned tasks	LT (Homework): Due Date: Week 10
11	Module No. 5 (Zeroth Law of Thermodynamics)	<ul style="list-style-type: none"> Explain clearly the 	F2F Meeting #11:	VSUEE/V C: Note-taking;	Quiz 3: Due Date: Week 11

	Lesson No. 5.2 (Zeroth law of thermodynamics and its application)	principle of thermal equilibrium;	Power point presentation; Class recitation Printed Learning Guide (independent study)	Download ing resource materials; Answerin g lesson exercises	
12	Module No. 6 (First Law of Thermodynamics) Lesson No. 6.1 (First law of thermodynamics)	<ul style="list-style-type: none"> Describe the changes in internal energy associated with heat exchanges and work. 	F2F Meeting #12: Printed Learning Guide; Independent study	VSUEE/V C: Note-taking; Download ing resource materials; Solving assigned tasks	
13	Module No. 6 (First Law of Thermodynamics) Lesson No. 6.2 (Heat capacity and thermochemistry)	<ul style="list-style-type: none"> Demonstrate the thermo-chemistry of reactions based on enthalpy; 	F2F Meeting #13: Power point presentation; Group discussion Printed Learning Guide (independent study)	VSUEE/V C: Note-taking; Download ing resource materials; Answerin g lesson exercises	Second Long Examination on Module Nos. 5 and 6. Due Date: Week 13
CO4. Relate chemistry with local, national and international concerns on industrial processes, energy and environmental conservation.					
14	Module No. 7 (Second Law of Thermodynamics) Lesson No. 7.1 (Postulates of the second law of thermodynamics)	<ul style="list-style-type: none"> Understand the developmental theories of the second law of thermo-dynamics; 	F2F Meeting #14: Printed Learning Guide; Independent study	VSUEE/V C: Note-taking; Download ing resource materials; Solving assigned tasks	LT (Problem Set 2): Due Date: Week 14

15	<p>Module No. 7 (Second Law of Thermodynamics)</p> <p>Lesson No. 7.2 (Entropy and the second law of thermodynamics)</p>	<ul style="list-style-type: none"> Differentiate entropy thermodynamically and statistically; 	<p>F2F Meeting #15:</p> <p>Power point presentation; Class activity;</p> <p>Printed Learning Guide (independent study)</p>	<p>VSUEE/VC:</p> <p>Note-taking; Downloading resource materials;</p> <p>Answering lesson exercises</p>	
16	<p>Module No. 8 (Third Law of Thermodynamics)</p> <p>Lesson No. 8.1 (Entropy application on expansion and compression)</p>	<ul style="list-style-type: none"> Illustrate the simple application of entropy on free expansion, adiabatic and isothermal compressions; and 	<p>F2F Meeting #16:</p> <p>Printed Learning Guide; Independent study</p>	<p>VSUEE/VC:</p> <p>Note-taking; Downloading resource materials;</p> <p>Solving assigned tasks</p>	Quiz 4: Due Date: Week 16
17	<p>Module No. 8 (Third Law of Thermodynamics)</p> <p>Lesson No. 8.2 (Spontaneity of chemical reactions)</p>	<ul style="list-style-type: none"> Differentiate spontaneous and non-spontaneous processes from thermodynamic potentials and functions. 	<p>F2F Meeting #17:</p> <p>Power point presentation; Individual task</p>	<p>VSUEE/VC:</p> <p>Note-taking; Downloading resource materials;</p> <p>Answering lesson exercises</p>	
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 and understanding on the fundamental laws of gases and chemical thermodynamics. It is envisioned for the students to appreciate how thermodynamic laws relate to the changes in equilibrium properties in various processes. 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

Atkins, P. and J. de Paula. 2010. Physical Chemistry (9th ed), Oxford University Press, Oxford, England.

Ball, D. W. and T. Baer. 2015. Physical Chemistry. Second Edition. Wadsworth CENGAGE Learning, Australia

Carter, A. H. 2001. Classical and Statistical Thermodynamics, Prentice Hall, England. 392p.

Castellan, G. W., 1983. Physical Chemistry. 3rd Edition. The Benjamin/Cummings Publishing Company, Inc., California, USA.

Cengel, Y., M. Boles and M. Kanoglu. 2021. Thermodynamics. 8th Edition. Open - Access Book.

Chandra, S. 2016. Energy, Entropy and Engines: An Introduction to Thermodynamics. Third Edition. John Wiley & Sons, New Jersey, USA. 400p.

Chang, R. 2005. Physical Chemistry for the Biosciences. Sausalito, California: University Science Books, USA.

Honig, J.M. 2021. Thermodynamics: Principles Characterizing Physical and Chemical Processes. Fifth Edition. Academic Press, New York, USA. 477p.

Jain, D. V. S. and S. P. Jauhar. 1988. Physical Chemistry: Principles and Problems. Tata McGraw-Hill Publishing Company Limited, New Delhi.

Laidler, K. L., J. H. Meiser, and B. C. Sanctuary. 2003. Physical Chemistry. Fourth Edition. Houghton Mifflin Company, Boston, MA, USA.

McQuarrie, D.A. and J.D. Simon. 1997. Physical Chemistry: A Molecular Approach. 1st Edition University Science Books, 1360p.

Struchtrup, H. 2020. Thermodynamics and Energy Conservation. Open – Access Book.

Tandon, O.P. and A.S. Singh. 2019. A Textbook of Physical Chemistry. Bathla Publications Pvt. Ltd., New Delhi, India. 995p.

Zain, S. 2021. Thermodynamics and Statistical Mechanics: An introduction for physicists and engineers. IOP Publishing Ltd., Philadelphia, USA.

B. Other Learning Resources

Journals

Belmonte, I.D., A.V. Borges and I.T.S. Garcia. 2022. Adaptation of Physical Chemistry Course in COVID-19 Period Reflections on Peer Instruction and Team-Based Learning. *Journal of Chemical Education*, 99(6):2252-2258.

Britter, M., D. Donnelly-Hermosillo and O. Gulacar. 2022. Shifts in Power Relations across Group Work Activities for Gas Laws. *Journal of Chemical Education*, 99(7):2484-2492.

Davidson, R.D., T.E. O'Loughlin, T.E.G. Alivio, S. Lim and S. Banerjee. 2022. Thermodynamics of Wettability: A Physical Chemistry Laboratory Experiment. *Journal of Chemical Education*, 99(7):2689-2696.

Felmy, A.R. and D. Rai. 1999. Application of Pitzer's Equations for Modeling the Aqueous Thermodynamics of Actinide Species in Natural Waters: A Review. *Journal of Solution Chemistry*,

Giordano, A.N. and D. Styers-Barnett. 2022. Training Tomorrow's Scientists: Embedding Professional Skills in the Physical Chemistry Curriculum with a Guided Grant and Laboratory Project. *Journal of Chemical Education*, 99(6):2417-2424.

Grevel, K.D. and N.D. Chatterjee. 1992. A modified Redlich-Kwong equation of state for H₂O-H₂O fluid mixtures at high pressures and at temperatures above 400°C. *Eur. J. Mineral*, 4:1303-1310.

Ingold, K. U. and J.S.Wright, 2020. Understanding trends in C-H, N-H, and O-H bond dissociation enthalpies. *J. Chem. Educ.*, 77:1062-1064.

Kandahari, E., E.J. Smith and J.C. Goeltz. 2021. Beyond the Textbook: Introducing Undergraduates to Practical Electrochemistry. *Journal of Chemical Education*, 98(10):3263-3268.

Miles, D.T. and E.E. Joslin. 2021. Building a Steady Foundation through Equilibrium: Solution and Solid-State Chemistry. *Journal of Chemical Education*, 98(11):3457-3463.

Quintano, M.M., M.X. Silva, J.C. Belchior and J.P. Braga. 2021. Electronic Entropy as a Periodic Property of the Elements: A Theoretical Chemistry Approach. *Journal of Chemical Education*, 98(8):2574-2577.

Satter, S. 2000. Thermodynamics of Mixing Real Gases. *J. Chem. Educ.*, 77:1361-1365.

Smellie, I.A., C.L. Carpenter-Warren, B.A. Chalmers, D.B. Cordes, R.P.F. De A. Gouy, N.S. Keddie, T. Lebl, I.L.J. Patterson and A.M.Z. Slawin. 2021. Simple and Inexpensive Method for the Detection of Carbon Monoxide Released from Thermal Cheletropic Decarbonylation Reactions. *Journal of Chemical Education*, 98(11):3608-3613.

Sobko, A.A. 2014. Description of Evaporation Curve by the Generalized Van-der-Waals-Berthelot Equation. *Journal of Physical Science and Application*, 4(8):524-530.

Sonopoulos, C., Heidman, J. L. 1985. "From Redlich-Kwong to the Present". *Fluid Phase Equilibria*. 24 (1-2): 1-23. doi:10.1016/0378-3812(85)87034-5.

Wisniak, J. 2003. Heike Kamerlingh – The Virial Equation of State. *Indian Journal of Chemical Technology*, 10:564-572.

VandenPlas, J.R., D.G. Herrington, A.D. Shrode and R.D. Sweeder. 2021. Use of Simulations and Screencasts to Increase Student Understanding of Energy Concepts in Bonding. *Journal of Chemical Education*, 98(3):730-744.

Videos

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

Websites

https://chem.libretexts.org/.../State_vs_Path_Functions

<https://www.sciencedirect.com/topics/engineering/isothermal-compression>

<https://www.sciencedirect.com/topics/engineering/clausius-statement>

<https://www.sciencedirect.com/topics/mathematics/legendre-transformation>

<https://www.toppr.com/ask/question/entropy-change-for-an-irreversible...>

15. Course Assessment and Evaluation

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

$$\underline{50\%} \text{ Midterm} + \underline{50\%} \text{ Final Term} = 100\% \text{ (Overall Final)}$$

Item No.	Assessment Tasks	Percentage Contribution	No. of Times in the Semester	Individual Task % Contribution
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		(1)	(2)	(1/2)
1	Quizzes	15	4	3.75%/Q
2	LT: Assignment/HW/PS	30	4	7.50%/A
3	Long Exam	20	2	10.0%/LE
4	Term Exam	<u>35</u>	2	17.5%/TE
		100%		

COs	Assessment Tasks	Weight in Percent	Minimum Average for Satisfactory Rating	Target and Standards
CO 1	Assignment Quiz 1 First Long Exam	21.25	<u>60</u> %	At least <u>70</u> % of the students have at least <u>60</u> % score
CO 2	Problem Set 1 Quiz 2 Midterm Exam	28.75	<u>60</u> %	At least <u>70</u> % of the students have at least <u>60</u> % score
CO 3	Homework Quiz 3 Second Long Exam	21.25	<u>60</u> %	At least <u>70</u> % of the students have at least <u>60</u> % score
CO 4	Problem Set 2 Quiz 4 Final Exam	28.75	<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

- 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.

JUAN DELA CRUZ
 3rd year BSED - Math
 0920 - 1234567
juandelacruz@gmail.com
 Course Title: _____
 Date submitted: _____
 Course Professor: _____
 Department _____, College _____

Submitted through:
 VSU Learning Dropbox or
 VSU-LGU Kiosks

Sealed



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 "proffolio" 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 157 (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 157 (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

Revision number	Date of Revision	Date of implementation	Highlights of Revision	Revised by
0	Mar 10, 2021	Mar 15, 2021	New Normal Format	Felix M. Salas
1	Feb 10, 2022	Feb 15, 2022	Updated References	Felix M. Salas

19. Preparation			
Prepared by	Name	Signature	Date Signed
	FELIX M. SALAS		Feb 10, 2023

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
5. Consultation Time	4:00 pm -5:00 pm MWF; 7:00 am – 8:30 am TTh

20. Department Instructional Materials Review Committee:

Committee	Name	Signature	Date Signed
Member	VIVIAN P. LINA		
Member	MARIA ROBELYN A. INSIK		
Department Head	ELIZABETH S. QUEVEDO		

	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: OIMD, College, Department, Faculty and ODQA