



OUTCOMES-BASED EDUCATION (OBE) COURSE SYLLABUS

Chem 138 Biochemistry II

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
VO 07-16-2019

4. Quality Goals of the College of the College of Arts and Sciences

- 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.
- To uplift the economic well-being of the region through relevant R and D and extension programs.
- Enhance regional development of the Visayas for regional competitiveness.

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

- To produce highly qualified and skilled Chemists and Chemical Technicians for the industry and academia.
- To generate relevant knowledge and technologies through basic and applied multi- and inter-disciplinary researches.
- To 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 No 47, Series 2017
3. BOR Approval	BOR Resolution No. 63 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 138
2. Course Title	Biochemistry 2 Lecture
3. Pre-requisite	Chem 137 - Biochemistry 1 Lec Chem 137.2 - Biochemistry 1 Laboratory
4. Co-requisite	Chem138.2 - Biochemistry II Laboratory
5. Credit	3.0 units
6. Semester Offered	Second Semester
7. Number of hours	3 hrs / week

8. Course Description	This course covers the basic chemistry of processes involved in the flow of biological information, the principles of metabolism and the chemistry of the primary metabolic pathways.
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9. Program Outcomes (POs) in relation to the Program Educational Objectives (PEOs)						
Program Outcomes (POs)		Program Educational Objectives				
		1	2	3	4	5
a.	Demonstrate a broad and coherent knowledge and understanding in the core areas of chemistry: inorganic, organic, physical, biological and analytical chemistry; and in addition the necessary background in mathematics and physics	√	√	√	√	√
b.	Gather data using standard laboratory equipment, modern instrumentation and classical techniques		√	√	√	√
c.	Identify & solve problems involving chemistry, using current disciplinary and inter-disciplinary principles	√	√	√	√	√
d.	Qualify for the study and/or for entry level professional employment in the general workplace	√	√	√	√	√
e.	Work effectively and independently in multi-disciplinary and multi-cultural teams	√	√	√	√	√
f.	Act in recognition of professional, social, and ethical responsibility	√	√	√	√	√
g.	Articulate and discuss the latest developments in the specific field of practice (PQF level 6 descriptor)	√	√	√	√	
h.	Interpret relevant scientific data and make judgments that include reflection on relevant scientific and ethical issues	√	√	√	√	√
i.	Preserve and promote "Filipino historical and cultural heritage" (RA 7722)		√		√	√

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			
CO1: explain how living organisms extract energy from the surroundings to perpetuate life.	I	I	I	I	I		I	I				
CO2: explain how organisms store and transmit genetic information to grow and to reproduce accurately.	E	E	E	E	E		E	E	E			
CO3: apply the key concepts in biochemistry to explain its practical applications in the field of agriculture, medicine, pharmacy, and allied fields	E	E	E	E	E	E	E	D	D			
CO4: present awareness of major issues at the forefront of biochemistry	E	E	D	E	E	E	D	E	E			
CO5: use computers as information and research tools in biochemistry	E	E	D	E	E	E	E	E	E			

	<p>1.1.1 Phases of Metabolism</p> <ul style="list-style-type: none"> • Anabolism • Catabolism <ul style="list-style-type: none"> ➤ Overview of metabolism ➤ Digestive System and Digestive Juices ➤ Hydrolytic enzymes ➤ Stages of digestion <p>1.1.2 Salivary digestion</p> <p>1.1.3 Gastric digestion</p> <p>1.1.4 Intestinal digestion</p>	<ol style="list-style-type: none"> 1. State the importance of metabolism 2. Give an overview of metabolism 3. Trace the pathway of the digestion of the following basic foodstuffs: starch, fat, proteins 4. Identify the digestive juices and the enzymes secreted during the digestion of starch, fats, and proteins 5. Describe the following: <ul style="list-style-type: none"> ➤ Action of salivary amylase on starch ➤ Action of the proteolytic enzymes in the stomach ➤ Effect of free HCl in gastric digestion ➤ Action of intestinal enzymes in the completion of digestion ➤ The components of bile and their function in the digestion of fats 6. Identify the end products of digestion of starch, fats, and proteins 7. State the role of the end products of digestion in metabolism 	<p>Computer-assisted powerpoint presentation</p> <p>Video presentation</p>	<p>VSUEE/V C: Note-taking</p> <p>Downloading resource materials</p>	<p>Module 1</p> <p>Learning Activity & Assessments 1.1</p> <p>Due Date: TBA</p> <p>Quiz 1 (real time)</p>
3	<p>Module 2. The Importance of Energy Changes and Energy Transfer in Metabolism</p> <p>Lesson 2.1 The Nature of Metabolism</p>	<ol style="list-style-type: none"> 1. Define metabolism 2. Differentiate anabolism and catabolism 	<p>Computer-assisted powerpoint presentations</p>	<p>VSUEE/V C: Note-taking</p> <p>Downloading</p>	<p>Module 2 Pretest</p> <p>Learning Activity/Assessment: 2.1, 2.2, 2.3, 2.4 & 2.5</p>

	<p>Lesson 2.2 The Role of Oxidation-Reduction Reaction in Metabolism</p> <p>Lesson 2.3 Classification of Biochemical Reactions</p> <ul style="list-style-type: none"> ➤ Oxidation-reduction ➤ Group-transfer ➤ Hydrolysis ➤ Non-hydrolytic cleavage ➤ Isomerization and rearrangement ➤ Bond formation reactions using energy from ATP <p>Lesson 2.4 Coenzymes in Biologically Important Oxidation-Reduction Reactions</p> <p>Lesson 2.5 Coupling of Reactions and Use of Energy</p>	<ol style="list-style-type: none"> 3. Relate metabolism with redox reactions 4. Give examples of redox reactions occurring in biological systems 5. Classify biological reactions in terms of six types of chemistry catalyzed by enzyme and occurring in biological systems 6. Explain the concept of free energy change and the role of ATP in the transferring energy from exergonic (energy-producing) processes to endergonic (energy-requiring) processes 		<p>resource materials</p> <p>set/board work</p>	<p>Due Date: TBA</p> <p>Quiz 2 (real time)</p>
4	<p>Module 3. Glycolysis</p> <p>Lesson 3.1 The Overall Pathway of Glycolysis</p> <ul style="list-style-type: none"> • Conversion of six carbon glucose to 3-carbon glyceraldehyde-3-phosphate • Glyceraldehyde-3-phosphate to pyruvate <p>Lesson 3.2 Anaerobic metabolism of pyruvate</p> <ul style="list-style-type: none"> • Lactate fermentation • Ethanol fermentation <p>Lesson 3.3 Energy production in glycolysis (aerobic and anaerobic)</p> <p>Lesson 3.4 Entry of other carbohydrates into glycolysis</p>	<ol style="list-style-type: none"> 1. Define glycolysis and show its overall pathway of reactions 2. Recall the importance of glucose in biological systems 3. Identify which organelle in the cell glycolysis occurs 4. Breakdown the glycolytic pathway in terms of: <ul style="list-style-type: none"> • ATP-requiring steps • ATP-producing steps 	<p>Computer-assisted powerpoint presentation</p> <p>Video presentation</p>	<p>VSUEEN/C: Note-taking</p> <p>Downloading resource materials</p> <p>Set/board work</p>	<p>Module 3 Pretest</p> <p>Learning Activity/Assessment 3.1-3.5:</p> <p>Due Date: TBA</p> <p>Quiz 3 (real time)</p>

	<ul style="list-style-type: none"> Dietary carbohydrates (starch, glycogen, maltose, sucrose, lactose) Fructose, lactose, glycerol 	<ul style="list-style-type: none"> NAD-involving steps Irreversible steps <ol style="list-style-type: none"> Classify the type of biochemical reaction involved in each step Identify the control points in glycolysis State the fate of pyruvate during anaerobic and explain its significance Calculate and compare the ATP production in aerobic and anaerobic glycolysis Outline the metabolism of other carbohydrates (i.e dietary carbohydrates, fructose, lactose and glycerol) by glycolysis 			
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FIRST LONG EXAMINATION ON MODULE NOS. 1-3

5	Module 4.0 The Citric Acid Cycle Lesson 4.1 The Central Role of the Citric Acid Cycle in Metabolism <ul style="list-style-type: none"> Overall Pathway of the Citric Acid Cycle Conversion of Pyruvate to Acetyl-CoA Individual reactions of the Citric Acid Cycle Energetics and Control of the Citric Acid Cycle Lesson 4.2 The Glyoxylate Cycle: A Related Pathway	<ol style="list-style-type: none"> Define citric acid cycle Identify the role of mitochondria in aerobic metabolism Connect the glycolysis pathway to citric acid cycle Trace the production of energy and carbon dioxide in the citric acid cycle Calculate the net gain of ATP produced in the cycle Identify the end product in the total combustion of glucose and 	Computer-assisted powerpoint presentation Video presentation	VSUEEN/C: Note-taking Downloading resource materials	Module 4 Pretest Learning Activity/Assessment 4.1-4.2 Due Date: TBA Quiz 4 (realtime)
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		<p>the starting material that enters the citric acid cycle</p> <p>Give the importance of the glyoxylate pathway in plants</p>			
6	<p>Module 5. Electron Transport and Oxidative Phosphorylation</p> <p>Lesson 5.1 The Role of Electron Transport Chain in Metabolism</p> <ul style="list-style-type: none"> Reduction Potentials in the Electron Transport Chain Organization of Electron Transport Complexes The Connection between Electron Transport and Phosphorylation The Mechanism of Coupling in Oxidative Phosphorylation Respiratory Inhibitors Used to Study Electron Transport Shuttle Mechanisms The ATP Yield from Complete Oxidation of Glucose 	<ol style="list-style-type: none"> Define electron transport chain State the role of electron transport chain in metabolism Identify the hydrogen acceptors from the metabolite Differentiate the action of the hydrogen acceptors directly from the metabolite Identify the electron acceptors and their action on the electrons along the chain Show the redox reactions occurring in the chain Give the short forms of the reduced and oxidized states of the hydrogen acceptors Identify the shuttle systems involved in the transport from cytosol to mitochondria Describe the mechanism of transport of each shuttle system Describe the coupling of oxidation to phosphorylation in ATP 	<p>Computer-assisted powerpoint presentations</p> <p>Video presentation</p>	<p>VSUEE/V C:</p> <p>Note-taking</p> <p>Downloading resource materials</p>	<p>Module 5 Pretest</p> <p>Learning Activity/ Assessment 5.1</p> <p>Due Date: TBA</p>

		<p>production</p> <p>11. Give the number of molecules of ATP formed from each mole of NAD and FAD</p> <p>12. Identify inhibitors that can block the chain</p>			
7-8	<p>Module 6. Storage Mechanisms and Control in Carbohydrate Metabolism</p> <p>Lesson 6.1 Synthesis and Degradation of Glycogen (Glycogenesis and Glycogenolysis)</p> <ul style="list-style-type: none"> Diabetes Mellitus <p>Lesson 6.2 Gluconeogenesis</p> <p>Lesson 6.3 Control of Carbohydrate Metabolism</p> <p>Lesson 6.4 Pentose Phosphate Pathway</p> <ul style="list-style-type: none"> Hemolytic Anemia 	<p>1. Differentiate glycogenesis and glycogenolysis in terms of:</p> <ul style="list-style-type: none"> utilization of glucose its role in biological systems energy involved <p>2. Outline how glycogenesis and glycogenolysis take place, including the enzymes involved</p> <p>3. Explain how glycogen metabolism is controlled, and relate it to diabetes mellitus</p> <p>4. Define gluconeogenesis and describe its role in biological systems</p> <p>5. Identify smaller biomolecules that can be used to synthesize glucose</p> <p>6. Identify the three glycolytic pathways, bypassed in Glucone-</p>	Computer-assisted powerpoint presentations	<p>VSUEE/V C: Note-taking</p> <p>Downloading resource materials</p>	<p>Module 6 Pretest</p> <p>Learning Activity/Assessment 6.1-6.4</p> <p>Due Date: TBA</p> <p>Quiz 6 (real time)</p>

		<p>Genesis</p> <ol style="list-style-type: none"> 7. Compare and contrast glycolysis, glycogenesis, glycogenolysis, and gluconeogenesis 8. Differentiate of pentose phosphate pathway from other carbohydrate metabolic pathways 9. Identify the importance of pentose phosphate pathway in biological systems 10. Trace the oxidative and non-oxidative reactions in pentose phosphate pathway 11. Explain how pentose phosphate pathway is controlled 12. Relate how a defective enzyme in pentose phosphate pathway can result to hemolytic anemia 			
9	<p>Module 7. Photosynthesis</p> <p>Lesson 7.1 Site of Photosynthesis</p> <p>Lesson 7.2 Photosystems I and II and the Light and Dark Reactions of Photosynthesis</p> <p>Lesson 7.3 Photosynthesis and ATP Production</p> <p>Lesson 7.4 Inhibiting Photosynthesis</p>	<ol style="list-style-type: none"> 1. Rationalize how the structure of chloroplast affect photosynthesis 2. Compare and contrast chlorophyll, hemoglobin, and myoglobin in terms of structure 3. Relate photosynthesis with electron transport chain in 	<p>Computer-assisted powerpoint presentations</p> <p>Video presentation</p>	<p>VSUEE/VC: Note-taking</p> <p>Downloading resource materials</p>	<p>Module 7 Pretest</p> <p>Learning Activity/Assessment 7.1-7.4</p> <p>Due Date: TBA</p> <p>Quiz 7 (real time)</p>

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		terms of ATP production Describe how herbicides can inhibit photosynthesis			
SECOND LONG EXAMINATION Covering Modules 4 to 7					
10	Module 8. Lipid Metabolism Lesson 8. 1 Catabolism of Lipids 1. β -oxidation of fatty acids 2. Energy yield from the oxidation of fatty acids 3. Catabolism of unsaturated fatty acids 4. Ketone bodies Lesson 8.2 Fatty acid Biosynthesis 1. Synthesis of acylglycerol and compound lipids 2. Cholesterol biosynthesis	1. Trace the digestion, transport and storage of triacylglycerols and fatty acids, including the role of the different lipoproteins (HDL, LDL, VLDL) 2. Identify the hormones involved in the metabolism of dietary triacylglycerols 3. Calculate the ATP yield in β -oxidation 4. Identify the end products of β -oxidation 5. Relate β -oxidation to the citric acid cycle and electron transport chain 6. Relate the production and significance of ketone bodies to β -oxidation 7. Trace the biosynthesis of fatty acids, triacylglycerol and cholesterol and its control points	Computer-assisted powerpoint presentations	VSUEE/V C: Note-taking Downloading resource materials	Module 8 Pretest Learning Activity/Assessment 8.1-8.2 Due Date: TBA Quiz 8 (real time)
11-12	Module 9. Metabolism of Nitrogen Lesson 9.1 An Overview				

	<p>on the Metabolism of Nitrogen 1. Nitrogen fixation</p> <p>Lesson 9.2 Amino acids Biosynthesis</p> <p>Lesson 9.3 Amino acids Catabolism 1. Urea cycle</p> <p>Lesson 9.4 Purine and Pyrimidine Biosynthesis</p> <p>Lesson 9.5 Purine and Pyrimidine Catabolism</p>	<ol style="list-style-type: none"> 1. Describe the process of nitrogen fixation 2. Define transamination reaction 3. Trace the biosynthesis of the following amino acids: <ul style="list-style-type: none"> • Glutamate family • Aspartate family • Serine family • Pyruvate family • Aromatic family • Histidine family 4. Explain why glutamate plays a major role in the biosynthesis of amino acids 5. Differentiate between glucogenic and ketogenic amino acids and give examples of each 6. Describe the urea cycle and state its importance 7. Write an equation for the net reaction of the urea cycle 8. Show how urea cycle is linked to the citric acid cycle 9. Trace the biosynthesis of purine and pyrimidine (nucleic acids) 10. Show how the purine and pyrimidine (nucleic acids) are broken down 	Computer-assisted powerpoint presentations	VSUEE/V C: Note-taking Downloading resource materials	Module 9 Pretest Learning Activity/Assessment 9.1-9.4 Due Date: TBA Quiz 9 (real time)
	THIRD LONG EXAMINATION COVERING MODULES 8 & 9				

		<p>of recombinant DNA</p> <p>5. Outline the fundamentals of polymerase chain reaction and summarize its applications</p> <p>Identify and appraise the broad scope of biotechnology applications in the market today</p>			
FOURTH EXAMINATION COVERING MODULES 10-11					
* VSUEEVC – VSU E-Learning Environment/ Virtual Classroom					
12. Life-long Learning Opportunities The student will visualize and trace the different metabolic pathways in the body and biological systems, identify the biomolecules involved, correlate them to the biochemical processes in the laboratory and associate the biochemical concepts learned with everyday living.					
13. Contribution of Course to Meeting the Professional Component (%) General Education: _____% Basic Education (Foundation): _____% Professional Education (Major Field): 100%					
14. References and Other Learning Resources A. References <ul style="list-style-type: none"> Alberts B, Johnson A, Lewis J (2014) Molecular Biology of the Cell 6th ed., Garland Science (or later edition) Karp G (2013) Cell and Molecular Biology: Concepts and Experiments 7th ed., Wiley (or later edition) Lodish H, Berk A, Kaiser CA, Krieger M, Bretcher A, Ploegh H, Amon A, Scott MP (2012) Molecular Cell Biology, 6th ed. W.H. Freeman (or later edition). The National Center for Biotechnology Information, National Library of Medicine, National Institutes of Health USA www.pubmed.gov or www.ncbi.nlm.nih.gov B. Textbooks <ul style="list-style-type: none"> Berg J.M. Tymoczko, J.L., Gatto GJ, and Stryer, L. (2015) Biochemistry, 8th ed., W.H. Freeman (or later edition). Campbell, M.K. and Farrell, S.O. (2014) Biochemistry, 8th ed., Brooks Cole (or later edition) Mathews, C.K., van Helde, K.E, Appling DR, Anthony-Cahill SJ. (2012) Biochemistry, 4th ed., Benjamin Cummings (or later edition). Nelson, D.L. and Cox, M.M. (2012) Lehninger Principles of Biochemistry, 6th ed., W.H. Freeman (or later edition). Pratt CW and Cornely K (2013) Essential Biochemistry, 3rd ed., Wiley (or later edition) Voet, D. and Voet, J.G. (2010) Biochemistry, 4th ed., John Wiley and Sons (or later edition) 					

C. Other Learning Resources

Open Educational Resources/Websites:

: http://serc.carleton.edu/microbelife/research_methods/genomics/replication.html

Videos:

https://www.youtube.com/watch?v=rXzN89I4_Yk
<https://www.youtube.com/watch?v=TNKWgcFPHqw>
<https://www.youtube.com/watch?v=bKlpDtJdK8Q>
<https://www.youtube.com/watch?v=sX6LncNjTFU>
<https://www.youtube.com/watch?v=gG7uCskUOrA>
<https://www.youtube.com/watch?v=kmrUzDYAmEI>
<https://www.youtube.com/watch?v=MvuYATh7Y74>
<https://www.youtube.com/watch?v=rA8MUR4pqNE>
<https://www.youtube.com/watch?v=2JUu1WqidC4>
<https://www.youtube.com/watch?v=ezfwqmKC9Uc>
<https://www.youtube.com/watch?v=uM1t0mWXU30>
<https://www.youtube.com/watch?v=CHJsaq2lNjU>
<https://www.youtube.com/watch?v=8FqITslU22s>
<https://www.youtube.com/watch?v=ulut0oVWCEg>
<https://www.youtube.com/watch?v=RN81h85V6D4>
https://www.youtube.com/watch?v=joZ1EsA5_NY
<https://www.youtube.com/watch?v=KfvYQgT2M-k>
<https://www.youtube.com/watch?v=NDIJexTT9j0>

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	Learning Task/Assessments/Quiz	40	22	1.81
2	Long Examinations/ /Oral paper presentation	60	5	12
...		100%		

COs	Assessment Tasks	Weight in Percent	Minimum Average for Satisfactory Rating	Target and Standards
CO1 CO3 CO4 CO6	Quizzes (Q)/ Assignment/Assessment (1-20) Long Examinations 1-3	36.36 36.00	60 %	At least 60% of the students have at least 60% score
CO3 CO4 CO6 CO6	Quizzes (Q)/ Assignment/Assessment (2) Long Examination 4/Oral Paper Presentation/Term	3.62 24.00	60 %	

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	Paper/Blogging/Facebooking			
TOTAL		100%		

Grading System (% Passing: 60%)

Range	Grade	Range	Grade
97-100	1.00	65-69	2.75
93-96	1.25	60-64	3.00
89-92	1.50	59 below	5.00
85-88	1.75		
80-84	2.00		
75-79	2.25		
70-74	2.50		

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 in cases Face to face real-time class meetings will not be possible. Username and password link will be posted in VSUEE/VC or will be sent through active VSU email account.
- 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 virtual meeting is our avenue for synchronous learning. Whether the class will be conducted virtually or in Face to Face mode, class interaction and participation are 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 (VSU email account) but if internet connection is not stable or you do not have an internet connection, you may send your activities to the office.



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 BS Chemistry
0920 - 1234567
juandelacruz@gmail.com
Course Title: _____
Date submitted: _____
Course Professor: _____
Department _____, College _____

Sealed

Submitted through: _____

The office address:

Name of Instructor
DEPARTMENT OF PURE AND APPLIED CHEMISTRY,
COLLEGE OF ARTS AND SCIENCES,
Visayas State University, Baybay City, Leyte,
Philippines.

- 6) Original copies of all answers, and solutions should be kept by the student, put in a folder/envelope one after the other, and should be bound together to form a "portfolio" as part of the final requirements of the course.
- 7) In answering the Learning Task/Activities/Assessments, it can be done in any of the following:
 - a. Use the Chem 138 Learning Guide, 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 are given real time either announced or unannounced and will open every after a topic has been discussed.
- 9) Long examinations/Midterm Examination/ Final examination will be given face to face.
- 10) The Chem 138 Learning Guide 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.
- 11) In the submission of activities, there are no deduction for late submissions but ON-TIME submission is much appreciated.
- 12) If you have any inquiries/clarifications, you may contact the course instructor/professor during official class schedule; Monday to Friday only.

13) 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.

14) 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.

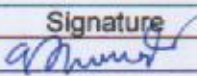
17. Course Materials and Facilities Available

1. DLP (Face-to-face)
 2. Laptop
 3. Internet sources
 4. Whiteboard and whiteboard markers (Face-to-face)
- VSUEE

18. Revision History

Revision number	Date of Revision	Date of Implementation	Highlights of Revision	Revised by
0		09/2020		Candelario L. Calibo
1	11/20/2020	12/18/2020	VSUEE-based delivery of learning materials and submission of learner's outputs; OBE-compliant CHED CMO No 49 s. 2017; ISO compliant format	Elizabeth S. Quevedo
2	08/16/2021	08/23/2021	<ul style="list-style-type: none"> Metabolism concepts which were discussed in Chem 137 were transferred to Chem138-Biochemistry II 	Elizabeth S. Quevedo
3	9/06/2022	09/12/2022	<ul style="list-style-type: none"> Semester/AY is deleted; Learning Activities/Assessments will be done on Flexible/Blended Mode (both Face to Face and Online); 	Elizabeth S. Quevedo

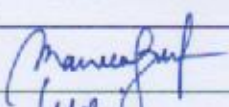
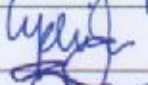
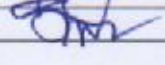
			<ul style="list-style-type: none"> • Course Policies on Learning Modality, etc are revised 	
4	2/13/2023	02/20/2023	<ul style="list-style-type: none"> • Addition of the co-requisite subject (Chem 138.2 – Biochemistry II laboratory) • Lecture classes could be done on blended modality: Face to Face (75%), On-line (25%) • Examinations will be given face to face. • Course Policies on Learning Modality, giving of examinations and submission of outputs are revised 	Elizabeth S. Quevedo

19. Preparation			
Prepared by	Name	Signature	Date Signed
	ELIZABETH S. QUEVEDO		2/16/2023

IV. INSTRUCTOR/PROFESSOR INFORMATION

1. Name of Instructor/Professor	ELIZABETH S. QUEVEDO
2. Office and Department	Department of Pure and Applied Chemistry
3. Telephone/Mobile Numbers	09178905658
4. Email Address	elizabeth.quevedo@vsu.edu.ph
5. Consultation Time	TBA

20. Department Instructional Materials Review Committee:

Committee	Name	Signature	Date Signed
Member:	MARIA ROBELYN A. INSIK		2/16/2023
Member:	VIVIAN P. LINA		2/16/2023
Chairperson:	Dr. FELIX M. SALAS		2/17/2023

	Name	Signature	Date Signed
Verified by:	MA. THERESA P. LORETO College Dean		
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.

REMINDER:

1. *The author should not be part of the DIMRC.*
2. **If the author is the Department Head, he/she will be replaced by another chairperson from among the senior faculty members.*
3. ***If the author is the College Dean, the Head of Instructional Materials Development will approve.*
4. *Follow the next higher supervisor, no same person*
5. *For the component campuses, if the author is the College Dean, the Director for Academic Affairs will approve.*
6. *If the author is the Department Head and at the same time the College Dean, the Director for Academic Affairs will be the Chairperson of the DIMRC, and the Chancellor will approve it.*

(3) Distribution of copies: OHIMD, Department, Faculty



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EVALUATION OF OUTCOMES-BASED EDUCATION (OBE) COURSE SYLLABUS

Chem 138 – Biochemistry II
2nd Semester and A.Y. 2022 - 2023

Name of faculty : Elizabeth S. Quevedo
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:				

a. varied and relevant	✓			
b. outcomes-based	✓			
c. encourage active learning	✓			
d. develop the students' critical – thinking skills and reflective judgment	✓			
LEARNING ASSESSMENT				
1) Learning outcomes and methods of assessment are aligned	✓			
2) Assessment methods used are varied and relevant	✓			
3) Schedule and frequency of assessment, and expected outputs are clearly defined	✓			

General Recommendation (Pls. check):

✓	APPROVED for use
	Needs to be REVISED (please see comments)

Department Instructional Materials Review Committee:

Committee	Name	Signature	Date Signed
Member:	VIVIAN P. LINA	<i>V. Lina</i>	2/16/2023
Member:	MARIA ROBELYN A. INSIK	<i>M. Robelyn A. Insik</i>	2/16/2023
Chairperson	FELIX M. SALAS	<i>F. Salas</i>	2/17/2023

	Name	Signature	Date Signed
Verified by ^{1/} :	MA. THERESA P. LORETO Dean, CAS		
Validated by ^{2/} :	NANCY D. ABUNDA Head, IMD		

^{1/} Means of Verification: Ratings on Individual evaluation sheets of the DIMRC members

^{2/} Means of Validation: Final action of the College Dean

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