



OUTCOMES-BASED EDUCATION (OBE) COURSE SYLLABUS

Chem 127n ORGANIC 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 and D and extension programs.
3. Enhance regional development of the Visayas for regional 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 the academia.
2. Generate relevant knowledge and technologies through basic and applied multi- and inter-disciplinary researches.
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 No. 47 s. 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 and managerial position and in educational, 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 specialized training program in chemistry and related field.	√	√	√
5. Pursue other degree program.	√	√	√

*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 127n
2. Course Title	Organic Chemistry I (Lecture)
3. Pre-requisite	Chem 115 – Principles of Chemistry (Lecture) Chem 115.2 – Principles of Chemistry (Laboratory)
4. Co-requisite	Chem 127.2 – Organic Chemistry I (Laboratory)
5. Credit	3 units
6. Semester Offered	1 st semester
7. Number of hours	3 hrs/week
8. Course Description	Fundamental chemical concepts on organic structure, stereochemistry, nomenclature, and comparative spectroscopic analysis of functional groups.

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 and solve problems involving chemistry, using current disciplinary and interdisciplinary principles.	√	√	√	√	√
D	Qualify for further study and/or for entry-level professional employment in the general workplace.	√	√	√	√	√
E	Work effectively and independently in multi-disciplinary and multi-cultural teams (PQF level 6 descriptor).	√	√		√	√
F	Act in recognition of professional, social, and ethical responsibility.	√	√	√	√	√
G	Effectively communicate orally and in writing using both English and Filipino.	√	√	√	√	
H	Articulate and discuss the latest developments in the specific field of practice (PQF level 6 descriptor).	√	√		√	
I	Interpret relevant scientific data and make judgments that include reflection on relevant scientific and ethical issues.	√	√		√	√
J	Preserve and promote "Filipino historical and cultural heritage" (based on 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	J
CO1 Apply the concepts of organic structural theory to explain and predict the physical properties and chemical reactivity of organic molecules ranging from simple organic compounds to macromolecules and biomolecules.	I		I	I			I	I		
CO2 Use molecular models/software for conformational analysis and stereochemical projections of chiral compounds.	I		I	I	I		I	I		
CO3 Recognize stereochemical differences, i.e. subtle differences in the three-dimensional structure of organic molecules which affect optical, physical and chemical properties; assign the configuration at each chiral center in an asymmetric molecule.	I		I	I			I	I		
CO4 Identify organic compounds, give their IUPAC names, and draw the molecular structures of these compounds.	I		I	I			I	I		
CO5 Apply chemical methods and spectroscopic techniques such as UV-Visible, IR, NMR, and MS for the analysis of simple organic compounds.	I		I	I	I		I	I		

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	Class Orientation <ul style="list-style-type: none"> OBE Course Syllabus VSU Vision Mission, and Quality Policy Statement Class Policies Grading System and Activities Submission of requirements Netiquette Guide for Online Users Setting of Expectations Values Integration: Integrity, Determination, Responsibility, Honesty, Patience, Open-mindedness, and Positive Attitude	At the end of this meeting, the student must be able to: <ul style="list-style-type: none"> State the basic information regarding the course. Recognize the VSU VMGO, Quality Policy Statement. Discuss the course policies Identify the class requirements Communicate his/her internet connection capabilities. Convey his/her expectations of the course. 	Face-to-Face Meeting <ul style="list-style-type: none"> Class Orientation Q & A for clarification, setting of expectations, and getting-to-know-each other Introduction and navigation of the Virtual Classroom: Conduct online class orientation VSUEE/VC: Chem 127n Organic Chemistry I 	<ul style="list-style-type: none"> Participate in the discussion Class interaction Sharing of Ideas Feedbacks Familiarization with the virtual classroom 	Oral Recitation
CO1: Apply the concepts of organic structural theory to explain and predict the physical properties and chemical reactivity of organic molecules ranging from simple organic compounds to macromolecules and biomolecules.					
1-3	Module No. 1 Introduction	Draw molecular structures			

Lesson No. 1.1 Nature, scope, and relevance of organic chemistry	(Lewis, skeletal, condensed, resonance), calculate the formal charge/s, and identify the chemical bonds of a molecule.	<i>Face-to-Face Meeting</i>	Class interaction	Quizzes: Face-to- face and/or through VSU E- Learning Portal
Lesson No. 1.2 Brief history		Lecture with Discussion through PowerPoint presentation	Note-taking	
Lesson No. 1.3 Atomic structure: Carbon and other elements commonly found in organic compounds	Determine the geometry and forces of attraction in organic molecules	Give assignments/ problem sets/ worksheets	Sharing of Ideas	
Lesson No. 1.4 Electron accounting and Lewis structure of organic molecules	Identify the different classes of organic compounds		Peer discussion	Quiz # 1
Lesson No. 1.5 Hybridization and the geometry and shape of simple organic molecules: bond strength			Seatwork and/or board work exercises	
Lesson No. 1.6 Intermolecular and intramolecular attractive forces			Feedbacks	Quiz # 2
Lesson No. 1.7 Lewis and Bronsted- Lowry acids and bases			VSUEE/VC:	
Lesson No. 1.8 Functional group			Downloading resource materials	Quiz # 3
			Answer Learning Tasks/Quiz	Quiz # 4
				Quiz # 5
				Quiz # 6
				Quiz # 7
Values Integration: Integrity, Determination, Responsibility, Honesty, Patience, Open-mindedness, and Positive Attitude				First Long Examination (Module No. 1): Face-to- Face
CO2: Use molecular models/software for conformational analysis and stereochemical projections of chiral compounds.				
CO3: Recognize stereochemical differences, i.e. subtle differences in the three-dimensional structure of organic molecules which affect optical, physical and chemical properties; assign the configuration at each chiral center in an asymmetric molecule.				

4	Module No. 2 Stereochemistry and Stereochemical Analysis	Predict the property and reactivity of a molecule based on its shape.	<i>Face-to-Face Meeting</i>	Class interaction	Quizzes: Face-to- face and/or through VSU E- Learning Portal
	Lesson No. 2.1 Optical activity and chirality	Identify the different stereoisomers and conformers	Lecture with Discussion through PowerPoint presentation	Note-taking	
	Lesson No. 2.2 Types of configurational isomers (enantiomers, diastereomers, and meso compounds), racemic mixtures		Give assignments/ problem sets/ worksheets	Sharing of Ideas	Quiz # 8
	Lesson No. 2.3 Use of stereochemical drawings (flying wedge, Fischer, Newman, and sawhorse projection)			Peer discussion	Quiz # 9
	Lesson No. 2.4 Molecular configuration (R and S designations)			Seatwork and/or board work exercises	
	Lesson No. 2.5 Conformations and conformational analysis			Feedbacks	
	Lesson No. 2.6 Relevance to biological activity (e.g., drugs, flavor compounds and agrochemicals)			VSUEE/VC: Downloading resource materials Answer Learning Tasks/Quiz	Quiz # 10
	Values Integration: Integrity, Determination, Responsibility, Honesty, Patience, Open-mindedness, and Positive Attitude				Second Long Examination (Module No. 2): Face-to- Face

CO4: Identify organic compounds, give their IUPAC names, and draw the molecular structures of these compounds.

5-8	<p>Module No. 3 Chemistry of the different classes of Organic Compounds</p> <p>Lesson No. 3.1 Different classes of organic compounds based on their functionality, nomenclature, physical properties, sources, uses, preparation, and analysis</p> <p>3.11 Saturated hydrocarbons: aliphatic and cyclic</p> <p>3.12 Unsaturated hydrocarbons: aliphatic, cyclic and polyenes</p> <p>3.13 Benzene and aromatic derivatives</p> <p>3.14 Alkyl halides</p> <p>Values Integration: Integrity, Determination, Responsibility, Honesty, Patience, Open-mindedness, and Positive Attitude</p>	<p>Name, draw, and distinguish the different functional groups of organic compounds.</p> <p>Familiarize with the physical properties, sources, uses, preparation and analysis the different classes of organic compounds</p>	<p><i>Face-to-Face Meeting</i></p> <p>Lecture with Discussion through PowerPoint presentation</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>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>Quizzes: Face-to-face and/or through VSU E-Learning Portal</p> <p>Quiz # 11</p> <p>Quiz # 12</p> <p>Quiz # 13</p> <p>Third Long Examination (Module No. 3.11-3.13): Face-to-Face</p> <p>Quiz # 14</p>
9	MIDTERM EXAMINATION				

10-14	Module No. 3 Chemistry of the different classes of Organic Compounds	Name, draw, and distinguish the different functional groups of organic compounds.	<i>Face-to-Face Meeting</i>	Class interaction	Quizzes: Face-to- face and/or through VSU E- Learning Portal
	Lesson No. 3.1 Different classes of organic compounds based on their functionality, nomenclature, physical properties, sources, uses, preparation, and analysis	Familiarize with organic compounds obtained from local/natural sources.	Lecture with Discussion through PowerPoint presentation	Note-taking Sharing of Ideas Peer discussion	
	3.15 Alcohols, phenols, ethers and epoxides		Give assignments/ problem sets/ worksheets	Seatwork and/or board work exercises	Quiz # 15
	3.16 Thiols and Sulfides			Feedbacks	
	3.17 Amines			VSUEE/VC: Downloading resource materials	Quiz # 16 Quiz # 17
				Answer Learning Tasks/Quiz	Fourth Long Examination (Module No. 3.14- 3.17): Face-to- Face
	3.18 Aldehydes and Ketones				Quiz # 18:
	3.19 Carboxylic acids and its derivatives				Quiz # 19 Quiz # 20
	Lesson No. 3.2 Polymer and its properties				Fifth Long Examination (Module No. 3.18- 3.19): Face-to- Face
	Lesson No. 3.3 Introduction to biomolecules:				Quiz # 21 Quiz # 22

	Carbohydrates, Lipids, Nucleic acids, and proteins				
	Lesson No. 3.4 Introduction to Green Chemistry				Quiz # 23
	Values Integration: Integrity, Determination, Responsibility, Honesty, Patience, Open-mindedness, and Positive Attitude				

CO5: Apply chemical methods and spectroscopic techniques such as UV-Visible, IR, NMR, and MS for the analysis of simple organic compounds.

and MS for the analysis of simple organic compounds.					
15-16	Module No. 4 Introduction to Spectroscopy	Interpret UV-Vis, IR, MS, and NMR spectra.	<i>Face-to-Face Meeting</i>	Class interaction	Quizzes: Face-to-face and/or through VSU E-Learning Portal
	Lesson No. 4.1 UV-Visible		Lecture with Discussion through PowerPoint presentation	Note-taking	Quiz # 24
	Lesson No. 4.2 Infrared			Sharing of Ideas	
	Lesson No. 4.3 Mass Spectrometry		Give assignments/ problem sets/ worksheets	Peer discussion	
	Lesson No. 4.4 Nuclear Magnetic Resonance			Seatwork and/or board work exercises	Quiz # 25
	Values Integration: Integrity, Determination, Responsibility, Honesty, Patience, Open-mindedness, and Positive Attitude			Feedbacks	Sixth Long Examination (Lesson No. 3.2-3.4 and Module 4): Face-to-Face
				VSUEE/VC:	
				Downloading resource materials	
				Answer Learning Tasks/Quiz	
FINAL EXAMINATION					

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

12. Life-long Learning Opportunities

The student will be able to differentiate organic chemistry from inorganic chemistry; identify the hybridization and types of bonds in a hydrocarbon molecule; write the names and draw the structures of the different isomers of hydrocarbon and its derivatives; know their

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properties, sources and uses; and specify the spectroscopic technique to determine the functional group of the organic molecule.

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

Baker, A. D., J.I. Rizzo and R. Engel. 2008. Organic Chemistry. Pearson Custom Publishing.

Banzal, R.K. and R.V. Banzal. 2006. Organic Chemistry. Problems and Solutions. 2nd Edition. New Age International Ltd.

Bell, B. and C. Gunter. 2006. Organic Chemistry Microscience Experiments. UNESCO.

Brown, W.H., C.S. Foote, B.L. Iverson and E.V. Anslyn. 2018. Organic Chemistry. 8th Edition. Brooks/Cole Publishing

Bruice, P.Y. 2016. Organic Chemistry, 8th Edition. Pearson Education, Inc.

Carey, F.A. and R.M. Giuliano. 2017. Organic Chemistry. 10th Edition. The McGraw-Hill Companies, Inc.

Hornback, J.M. and B. Murugaverl. 2006. Organic Chemistry. 2nd Edition. Thomson Brooks/Cole

Klein, D.R. 2017. Organic Chemistry. John Wiley and Sons, Inc.

McMurry, J. 2016. Organic Chemistry. 9th Edition. Cengage Learning

Meislich, H., H. Mechamkin, J. Sharafkin, and G. Hademenos. 2010. Organic Chemistry. Schaum's Outline. 4th Edition. The McGraw-Hill Companies, Inc.

Ouellette, R. J. and J. D. Rawn. 2015. Principles of Organic Chemistry. Elsevier Inc.

Solomons, T.W.G., C.B. Fryhle and S.A. Snyder. 2016. Organic Chemistry. 12th Edition. John Wiley and Sons, Inc.

Volhardt, P. and N. Schore. 2014. Organic Chemistry. Structure and Function. 7th Edition. W.H. Freeman and Company

Wade, L.G. Jr. 2013. Organic Chemistry. 8th Edition. Pearson Education, Inc.

B. Other Learning Resources*Journals**Videos**Websites**Webinars**Open Educational Resources***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)	40	25	1.6% / Q
2	Long Exams (LE)	60	6	10% / LE
		100%		

COs	Assessment Tasks	Weight in Percent	Minimum Average for Satisfactory Rating	Target and Standards
CO 1	Quizzes (1-7)	11.20	60 %	At least 60% of the students have at least 60% score
	Long Exam (1st)	10.00		
CO 2 to 3	Quizzes (8-10)	4.80	60 %	At least 60% of the students have at least 60% score
	Long Exam (2nd)	10.00		
CO 4	Quizzes (11-23)	20.80	60 %	At least 60% of the students have at least 60% score
	Long Exam (3rd to 5th)	30.00		
CO 5	Quizzes (24-25)	3.20	60 %	At least 60% of the students have at least 60% score
	Long Exam (6th)	10.00		
TOTAL		100%		

Grading System (% Passing: 60 %)

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**Vision:**

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Mission:

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. In case when face-to-face meeting is not possible due to certain circumstances, 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. Class interaction and participation are encouraged during meetings. Students will be sharing ideas, feedback on 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, 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. 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.
3. Make sure your answers are original. Once caught cheating with your classmates or retrieving answers from any solving site on the internet, your answers 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

This Chem 127n Biochemistry OBE Syllabus and the pdf files of lecture powerpoint presentations posted in VSUEE are the official instructional materials in this subject. They will serve as your guide in 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.

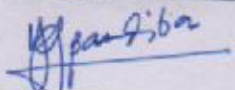
These class policies shall serve as our written agreement for the whole semester and are solely applicable to this subject. If there are any changes to enhance the class learning opportunity within the semester, the instructor/professor will communicate with you accordingly.

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

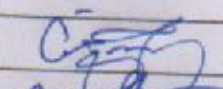
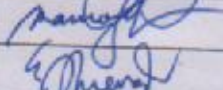
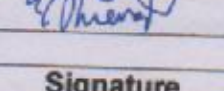
Revision number	Date of Revision	Date of implementation	Highlights of Revision
01	07/05/2018	08/01/2018	OBE-compliant CMO No. 47 s. 2017
02	12/26/2019	01/01/2020	ISO compliant format
03	09/07/2022	09/12/2022	Newly approved template (v1 11-19-2021) Updated for Blended Learning Approach (Face-to-Face and/or Virtual Meeting)

19. Preparation			
Prepared by	Name	Signature	Date Signed
	YHENA L. BANDIBAS		Sept. 7, 2022

IV. INSTRUCTOR/PROFESSOR INFORMATION

1. Name of Instructor/Professor	Yhena L. Bandibas
2. Office and Department	Department of Pure and Applied Chemistry
3. Telephone/Mobile Numbers	09175552712
4. Email Address	yhena.lazona@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		Sept 7, 2022
Member:	MA. ROBelyn A. INSIK		Sept 7, 2022
Chairperson:	ELIZABETH S. QUEVEDO		Sept. 8, 2022

	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.

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