

Quantitative Literacy Core Competency Assessment Report: 2020-2021

Research Report No. 23-22

Office of Strategic Insights

NORTHERN VIRGINIA COMMUNITY COLLEGE

Office of Strategic Insights

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4001 Wakefield Chapel Road
Annandale, Virginia 22003-3796
703-323-3129
www.nvcc.edu/oieess

CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Introduction

The State Council of Higher Education for Virginia (SCHEV) adopted the *Policy on Student Learning Assessment and Quality in Undergraduate Education in July 2017*.² It mandates every Virginia public institution of higher education assess six general education competencies at least twice in a six-year period.³ Four core competencies are to be assessed by all institutions: critical thinking, written communication, quantitative literacy, and civic engagement. Two additional competencies, based upon SCHEV's guidelines, were to be selected by the institutions themselves. The VCCS selected professional readiness and scientific literacy as their two additional core competencies. Northern Virginia Community College (NOVA) refers to core competencies as core learning outcomes (CLOs). This document contains 45 critical thinking assessment reports contributed by programs and disciplines for NOVA.

VCCS Policy: General Education (5.0.2) defines critical thinking as “the ability to use information, ideas and arguments from relevant perspectives to make sense of complex issues and solve problems. Degree graduates will locate, evaluate, interpret, and combine information to reach well-reasoned conclusions or solutions.”⁴

NOVA employs embedded course assessment, which is a direct measure using students' actual work or student performance. In 2020-2021, NOVA assessed quantitative literacy and critical thinking.⁵ Over sixty programs and fifteen disciplines participated in the 2020-2021 assessment process, per best practice standards.

Tables One and Two indicate administrative and faculty responsible for the assessment process in 2020-2021. They include the assessment leads for each program and discipline, as well as the relevant academic deans, and provosts. Such widespread faculty participation is not only in compliance with SACSCOC *Principles of Accreditation*, but is also integral to maintaining a culture of assessment and promoting data-driven decision-making.⁶

This report documents the assessment of critical thinking by degree-granting programs, select certificates, and disciplines without degrees. All participating programs and disciplines report on their assessment methods and targets, their assessment results and analysis, and the ways in which the results will be used to seek improvement. This report is one of two *Compiled Core Competency Assessment Reports* completed for the 2020-2021 cycle. The second *Compiled Core Learning Outcomes Assessment Report for 2020-2021* concerns quantitative literacy assessments. Each document provides the CLO assessment reports for degree programs and standalone certificates first, followed by disciplines without degrees, and each section is presented alphabetically by program/discipline name.

¹ State Council of Higher Education for Virginia. *Policy on Learning Assessment and Quality in Undergraduate Education*. Richmond: SCHEV, 2017. Digital.

³ Virginia Community College System. "General Education, Section 5.0.2." *Policy Manual*, 2019. Digital.

⁴ Virginia Community College System. "General Education, Section 5.0.2." *Policy Manual*, 2019. Digital.

⁵ Eggen, Theo and Bernard Veldkamp. "A General Framework for the Validation of Embedded Formative Assessment." *Journal of Educational Measurement* (2019): 1-18. Digital. Gerretson, Helen and Emily Golson. "Introducing and Evaluating Course-Embedded Assessment in General Education." *Assessment Update* 16.6 (2004): 4-6. Digital. Garfalo, Blaine, et al. "The Use of Course Embedded Signature Assignments and Rubrics in Programmatic Assessment." *Academy of Business Journal* 1.1 (2016): 8-20. Digital. Kumar, Rita, et al. "Purposeful Assessment Design: Aligning Course-Embedded Assessment with Program-Level Learning Goals." *Business Education Innovation Journal* 10.1 (2018). Digital.

⁶ Carpenter, Rowanna and Celine Fitzmaurice. "Assessment and Faculty Support: Fostering Collegial Community to Strengthen Professional Practice." *Journal of General Education*. 67.1-2 (2018): 90-108. Digital. Elliott, Robert and Diane Oliver. "Linking Faculty Development to Community College Student Achievement: A Mixed Methods Approach." *Community College Journal of Research and Practice*. 40.2 (2016). Digital. National Institute for Learning Outcomes Assessment. "What Faculty Unions Say About Student Learning Outcomes Assessment." 2011.

CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Table 1. Program/Certificate Pathway Provost, Deans, and Faculty Assessment Leads and Outcomes Assessed

Pathway Dean	Program/Certificate	Assessment Lead Faculty	Core Competency	
			QL	CT
Business and Hospitality Management, Cathy Cogdill, MA	Accounting, A.A.S.	Steven Fritsche, MA	X	
	Business Administration, A.S.	Mohammad (Kabir) Jamal, AL		X
	Business Management, A.A.S.	Mohammad (Kabir) Jamal, AL		X
	Contract Management, A.A.S.			
	Hospitality Management, A.A.S.	Ben Wang, AN	X	
Education and Public Service, Barbara Hopkins (Interim), AN	Administration of Justice, A.A.S.	Timothy Dickinson, AL		X
	Criminology and Criminal Justice, A.S.	Timothy Dickinson, AL		X
	Driver Education Instructor, C.S.C.	Nicole Mancini, MA		X
	Early Childhood Development, A.A.S.	Susan Johnson, LO		X
	Paralegal Studies, A.A.S.	Joyce McMillan, AL		X
	Social Sciences: Teacher Education Specialization, A.S.	Ashley Wilkins, MA		X
	Substance Abuse Rehabilitation Counselor, Certificate	Chandell Miller, AL		
Engineering and Applied Technology, Abe Eftekhari, AN	Air Conditioning and Refrigeration, A.A.S.	John Meeker, WO	X	
	Architecture Technology, A.A.S.	Armen Simonian, AN		X
	Automotive Technology, A.A.S.	Myles Embrey, MA		X
	Construction Management Technology, A.A.S.	Mike Ghorbanian, AL		X
	Engineering, A.S.	Rudy Napisa, AN	X	
	Engineering Technology, A.A.S.	John Sound, MA		
	Welding: Basic Techniques, C.S.C.	Matthew Wayman, MA		
English and Deaf Studies, Jennifer Daniels, AN	American Sign Language to English Interpretation, A.A.S.	Paula Reece, AN		X
	Professional Writing, Certificate	Jennifer Nardacci, AN		X
General Studies, General Education, Barbara Hopkins, AN	General Studies, A.S.	Casey Maliszewski Lukszo, AN	X	
Health Sciences, Megan Cook (Interim), ME	Dental Assisting, Certificate	Sumera Rashid, ME		X
	Dental Hygiene, A.A.S.	Marina McGraw, ME	X	
	Diagnostic Medical Sonography, A.A.S.	Judi Green, ME		X
	Emergency Medical Services, A.A.S.	Gary Sargent, ME		X
	General Studies: Health Sciences Specialization, A.S.	Megan Cook, ME		X
	Health Information Management, A.A.S.	Dana Pratt, ME		X
	Medical Laboratory Technology, A.A.S.	Maria Torres-Pillot, ME	X	

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	Medical Laboratory Technology: Phlebotomy, C.S.C.	Maria Torres-Pillot, ME		X
	Occupational Therapy Assistant, A.A.S.	Kathi Skibek, ME		X
	Personal Training, C.S.C.	Rick Steele, AL		X
	Physical Therapist Assistant, A.A.S.	Jody Gundrum, ME	X	
	Radiography, A.A.S.	Jarice Risper, ME	X	
	Respiratory Therapy, A.A.S.	Sherleen Bose, ME		
	Veterinary Technology, A.A.S.	Kiana Adkisson-Selby, LO		X
Information Technology and Computer Science, Paula Ford, WO	Computer Science, A.S.	Larry Shannon, AN		X
	Cybersecurity, A.A.S.	Margaret Leary, AL		
	Information Systems Technology, A.A.S.	Judi Bartlett, WO		
	Information Technology, A.S.	Judi Bartlett, WO		
Liberal Arts, Jimmie McClellan, AL	Liberal Arts, A.A.	- (Jimmie McClellan)	X	
Life Sciences, Maggie Emblom-Callahan (Interim), AL	Biology, A.S.	Karla Henthorn, AN		X
	Biotechnology, A.A.S.	Xin Zhou, MA and Ryan Marcheschi, MA		X
	Horticulture Technology, A.A.S.	Anders Vidstrand, LO	X	
Mathematics, Alison Thimblin, WO	Science: Mathematics Specialization, A.S.	-(Alison Thimblin)	X	
Nursing, Gary Sargent (Interim), ME	Nursing, A.A.S.	Brenda Clarke, ME Fonya Atabong, ME		X
Physical Sciences, Ben Wang (Interim), AN	Science, A.S.	Mitra Jahangeri, LO, Anita Mohan, LO	X	
Social Sciences, Jennifer Rainey (Interim), LO	Psychology, A.S.	Karen Livesey, AN		X
	Public History and Historic Preservation, C.S.C.	Marc Dluger, LO		X
	Social Sciences, A.S.	- Jen Rainey, LO	X	
	Social Sciences: Geospatial Specialization, A.S.	Michael Harman, LO	X	
Visual, Performing, and Media Arts, David Epstein, WO	Cinema, A.F.A.	Bryan Brown, WO		X
	Graphic Design, A.A.S.	Gregory Eckler, AL		X
	Interior Design, A.A.S.	Kristine Winner, LO		X
	Liberal Arts: Theatre, C.S.C.	David Tyson, WO Kathryn O'Sullivan, MA		X
	Music, A.A., A.A.A.	Lisa Eckstein, AL		
	Music Recording Technology, Certificate	Sanjay Mishra, LO		X
	Photography and Media, A.A.S.	Aya Takashima, AL		X
Visual Art, A.F.A.	Fred Markham, AL		X	

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Table 2. *Disciplines without Degrees, Pathway Provost, Deans, and Faculty Assessment Leads and Outcomes Assessed*

Pathway Provost & Dean	Discipline	Faculty Department Chair/ Assessment Lead	Core Competency	
			QL	CT
Liberal Arts & Communications Jimmie McClellan	Liberal Arts: Art History Specialization	Thornton-Grant, Stephanie , AN		X
	Communication	Martina Green, LO		X
	English	LeeAnn Thomas, WO		X
	Humanities	Ivan Castaneda, AN		
	Philosophy	Steven Stakland, AN		X
	Religion	Joel Harrison, MA		
	World Languages	Dali Tan, AL;		X
Physical Sciences Mitra Jahangeri and Anita Mohan	Chemistry	Pirabalini Swaminathan, AN (Chair) Mitra Jahangeri, LO (Assessment Lead) Beth Schomber (Writes Report)	X	
	Environmental Science	Bozarth, Christine A.		X
	Geology	William Bour, LO		
	Physics	Tetteh Addy	X	
Social Sciences Jennifer Rainey	Economics	Ashlie Warnick, AN	X	X
	Geography	Melinda Alexander, AL		X
	History	Jennifer Winters, AN		X
	Political Science	Jack Lechelt, AL	X	
	Sociology	Erica Smith, AN (Chair)		X

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DENTAL HYGIENE, A.A.S.	5
ENGINEERING, A.S.	6
GENERAL STUDIES, A.S.....	8
HORTICULTURE TECHNOLOGY, A.A.S.	9
HOSPITALITY MANAGEMENT, A.A.S.	11
LIBERAL ARTS, A.A.....	12
MEDICAL LABORATORY TECHNOLOGY, A.A.S.....	13
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RADIOGRAPHY, A.A.S.....	18
SCIENCE, A.S.	20
SCIENCE: MATHEMATICS SPECIALIZATION, A.S.	22
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Program and Select Certificates

Accounting, A.A.S.

<p>NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.</p>																																																																	
<p>Program/Discipline Purpose Statement: The accounting curriculum is designed for persons who seek employment in the accounting field or for those presently in accounting who desire to increase their knowledge and update their skills. The occupational objectives include accounting trainee, accounting technician, junior accountant and accountant.</p>																																																																	
<p>Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy Operationalized Definition: Be able to use budgeting and product costing techniques and methods to evaluate business operations</p>																																																																	
Assessment Methods		Assessment Results		Use of Results																																																													
<p>Course Name/Number: Cost Accounting I – ACC 231</p> <p>Direct Measure Used: Chapter 9 Activity-Based Costing Homework Assignment</p> <p>CLO/Rubric Criteria or Question Concepts: Students were assessed on the following test questions:</p> <ol style="list-style-type: none"> 1. Qualitative information in making decisions 2. Value chain 3. Defects in products 4. Job-order costing systems 5. Process costing systems 6. Variance 7. Period versus product costs 8. Value-added 9. Balanced scorecard 10. Activity-Based Costing <p>Sample:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Campus/ Modality</th> <th style="text-align: center;">Total # of Sections Offered</th> <th style="text-align: center;"># Sections Assessed</th> <th style="text-align: center;"># Students Assessed</th> </tr> </thead> <tbody> <tr> <td>NOVA Online only</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">15</td> </tr> <tr> <td>Off-Site Dual Enrollment</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>Total</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">15</td> </tr> </tbody> </table>		Campus/ Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	NOVA Online only	1	1	15	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	1	1	15	<p>Semester/year data collected: Spring 2021</p> <p>Target: Students will earn an average of 70% for individual questions and an average of 70% for the SLO assessment as a whole. The average score for the SLO assessment as a whole is 86.7% this year.</p> <p>Results by Modality: Overall Average/Mean Scores</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Results by Modality</th> <th style="text-align: center;">Current Results Spring 2021</th> <th style="text-align: center;">Previous Results Fall 2018</th> </tr> </thead> <tbody> <tr> <td>All students assessed (weighted average)</td> <td style="text-align: center;">86.7%</td> <td style="text-align: center;">75.7%</td> </tr> <tr> <td>On-campus average</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">75.7%</td> </tr> <tr> <td>NOVA Online average</td> <td style="text-align: center;">86.7%</td> <td style="text-align: center;">N/A</td> </tr> </tbody> </table> <p>Results by CLO Criteria: Average/Mean Score per criteria</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Results by SLO Criteria/ Question Concepts</th> <th style="text-align: center;">Current Results Spring 2021</th> <th style="text-align: center;">Previous Results Fall 2018</th> </tr> </thead> <tbody> <tr><td>1. Qualitative information in making decisions</td><td style="text-align: center;">80.0%</td><td style="text-align: center;">61.5%</td></tr> <tr><td>2. Value chain</td><td style="text-align: center;">100.0%</td><td style="text-align: center;">100.0%</td></tr> <tr><td>3. Defects in products</td><td style="text-align: center;">93.3%</td><td style="text-align: center;">84.6%</td></tr> <tr><td>4. Job-order costing systems</td><td style="text-align: center;">73.3%</td><td style="text-align: center;">61.5%</td></tr> <tr><td>5. Process costing systems</td><td style="text-align: center;">93.3%</td><td style="text-align: center;">84.6%</td></tr> <tr><td>6. Variance</td><td style="text-align: center;">93.3%</td><td style="text-align: center;">88.4%</td></tr> <tr><td>7. Period versus product costs</td><td style="text-align: center;">66.7%</td><td style="text-align: center;">50.0%</td></tr> <tr><td>8. 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Variance	93.3%	88.4%	7. Period versus product costs	66.7%	50.0%	8. Variance	80.0%	84.6%	9. Balanced scorecard	100.0%	84.6%	10. Activity-based costing	86.7%	50.0%	<p>1. Changes put in place since previous assessment to improve student learning: No changes put in place. All topics addressed by this assessment were covered in detail in three formats: smartbook readings (interactive reading assignments), discussion forums, and graded homework assignments in objective format. Students read in depth material about each topic, which they then discussed and demonstrated comprehension in a homework assignment.</p> <p>2. Impact of changes on current results: The students demonstrated a better understanding of the material overall and in all but one conceptual area.</p> <p>3. According to current results, areas needing improvement: Sample size is a concern (15 responses). The results suggest that students need additional clarification of period versus product costs and job-order costing.</p> <p>4. Based on current results, new actions to improve student learning: It will be important to continue using a variety of learning tools and assessments. More examples, presented as discussion forum topics or exercises, will help students better understand material in the 2 areas with lower average scores, possibly implemented as early as Fall 2022.</p> <p>5. Next assessment of this CLO: AY 2023-2024</p>
Campus/ Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed																																																														
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Accounting, A.A.S.

	<p>Current Results Improved vs. Previous Results: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Partially <input type="checkbox"/> N/A</p> <p>Narrative comparison of current results to previous results: The overall average shows Spring 2021 improving on Fall 2018. Additionally, students improved on all but one question concept/criterion.</p> <p>Areas where students met the target: Students met the target on 9 out of 10 concepts criteria.</p> <p>Areas where students did NOT meet the target: The results indicate that the distinction between period costs and product costs is still not clear.</p>	
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Air Conditioning and Refrigeration, A.A.S.

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<p>Program/Discipline Purpose Statement: This curriculum is designed to prepare students for jobs in the air conditioning and refrigeration field. The second year provides students with skills that lead to leadership positions in the HVACR industry. Occupational objectives include industry licensing, advanced critical thinking skills, and state tradesman licenses in HVACR. Occupational objective includes preparing graduates with the knowledge and skills to become industry certified technicians, as well as meeting the educational requirements to be licensed as a HVACR Tradesman in Virginia.</p>																																													
<p>Core Learning Outcome: [] Critical Thinking [X] Quantitative Literacy</p> <p>Operationalized Definition: Questions on the ESCO Electrical ER exam related to mathematical calculations</p>																																													
Assessment Methods	Assessment Results	Use of Results																																											
<p>Course Name/Number:</p> <ul style="list-style-type: none"> • Air Conditioning and Refrigeration Controls – AIR 111 • Circuits and Controls I – AIR 134 <p>Direct Measure Used: HVAC Excellence Employment Ready Exam on Electrical ER. These exams are offered by ESCO and are national ready-to-work certification exams for HVAC professionals.</p> <p>CLO/Rubric Criteria or Question Concepts: Students were assessed on the following topics:</p> <ol style="list-style-type: none"> 1. Electrical Components 2. Electrical Meter Usage 3. Electrical Safety 4. Electrical Theory 5. Electrical Troubleshooting 6. Fundamentals Motors / Capacitors 7. Interpreting Electrical Diagrams <p>Sample:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">Campus/Modality</th> <th style="width: 15%;">Total # of Sections Offered</th> <th style="width: 15%;"># Sections Assessed</th> <th style="width: 45%;"># Students Assessed</th> </tr> </thead> <tbody> <tr> <td>WO only (hybrid)</td> <td>6</td> <td>6</td> <td>71</td> </tr> <tr> <td>NOVA Online</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Off-Site Dual Enrollment</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Total</td> <td>6</td> <td>6</td> <td>71</td> </tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	WO only (hybrid)	6	6	71	NOVA Online	N/A	N/A	N/A	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	6	6	71	<p>Semester/year data collected: Fall 2020 & Spring 2021</p> <p>Target: Students will receive 70% (passing grade on the ESCO Exam)</p> <p>Results by Modality: Overall Average/Mean Scores</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 35%;">Results by Modality</th> <th style="width: 35%;">Current Results Fall 2020 & Spring 2021</th> <th style="width: 30%;">Previous Results</th> </tr> </thead> <tbody> <tr> <td>Synchronous hybrid (remote) average</td> <td>88%*</td> <td>N/A</td> </tr> </tbody> </table> <p>*National average for this exam was 85%. For this exam, 32 of 71 AIR students passed the exam (45%).</p> <p>Results by CLO Criteria: Percent of Students > target per criteria</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 60%;">Results by SLO Criteria/ Question Concepts</th> <th style="width: 40%;">Current Results Fall 2020 & Spring 2021</th> </tr> </thead> <tbody> <tr><td>1. Electrical Components</td><td>85</td></tr> <tr><td>2. Electrical Meter Usage</td><td>95</td></tr> <tr><td>3. Electrical Safety</td><td>100</td></tr> <tr><td>4. Electrical Theory</td><td>94</td></tr> <tr><td>5. Electrical Troubleshooting</td><td>89</td></tr> <tr><td>6. Fundamentals Motors / Capacitors</td><td>89</td></tr> <tr><td>7. Interpreting Electrical Diagrams</td><td>76</td></tr> </tbody> </table> <p>Target Met: [X] Yes [] No [] Partially</p> <p>Narrative comparison of current results to previous results: This is the first full academic year assessment of this SLO using this exam.</p> <p>Areas where students met the target: Students exceeded national averages in all categories.</p>	Results by Modality	Current Results Fall 2020 & Spring 2021	Previous Results	Synchronous hybrid (remote) average	88%*	N/A	Results by SLO Criteria/ Question Concepts	Current Results Fall 2020 & Spring 2021	1. Electrical Components	85	2. Electrical Meter Usage	95	3. Electrical Safety	100	4. Electrical Theory	94	5. Electrical Troubleshooting	89	6. Fundamentals Motors / Capacitors	89	7. Interpreting Electrical Diagrams	76	<p>1. Changes put in place since previous assessment to improve student learning: This year was the first full academic year to implement the ESCO Exams. These exams are national ready-to-work certification exams, and the program is requiring students to take these exams to demonstrate their competencies as well as receive national certification in this field. We include the exam topics in the class, reference exam questions in class, and correlate class topics with the questions. We also have study guides for the exams, and we hold test preparation sessions for students before the actual exam. The program plans to review program SLOs and assessments in the upcoming year (see #4 below).</p> <p>2. Impact of changes on current results: N/A</p> <p>3. According to current results, areas needing improvement: The number of students testing and passing has increased. Study guides and testing preparation specifically targeting each exam have been implemented into the course. We are testing only second year students. This exam was incorporated into the curriculum in 2019-20 and has been established as an expectation of the course starting in Fall 2021.</p> <p>4. Based on current results, new actions to improve student learning: Identify electrical diagram questions from the exam and dedicate more class time to those topics. Continue with testing and tracking. Need to revamp the SLOs and program curriculum mapping. This will also take place in 2021-22, spearheaded by the co-department chair.</p> <p>5. Next assessment of this CLO: Fall 2022</p>	
Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed																																										
WO only (hybrid)	6	6	71																																										
NOVA Online	N/A	N/A	N/A																																										
Off-Site Dual Enrollment	N/A	N/A	N/A																																										
Total	6	6	71																																										
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021
Air Conditioning and Refrigeration, A.A.S.

	Areas where students did NOT meet the target: Students scored lowest on #7: Interpreting electrical diagrams.	
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Dental Hygiene, A.A.S.

NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.																																							
Program/Discipline Purpose Statement: The program is designed to prepare students to serve in a dynamic and growing health profession as members of the dental health team. After successful completion of the program, the student will be eligible to take the National Board Dental Hygiene Examination and professional licensure examinations. Upon successful completion of the licensing process, the title "Registered Dental Hygienist" (R.D.H.) is awarded.																																							
Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy Operationalized Definition: To determine success of the program or areas of needed improvement																																							
Assessment Methods	Assessment Results		Use of Results																																				
Course Name/Number: Dental Public Health II - DNH 227 Direct Measure Used: Final Project: Program Development: Students develop and present an oral health educational program to a selected population CLO/Rubric Criteria or Question Concepts: Evaluation: Includes a comparative analysis using appropriate statistics, graphs and charts, and accurate labeling and explanation of graphs. Illustrate the change in pre/post-test assessment results. Also includes a determination of success of program goals & objectives and a reflective assessment of program implementation and follow-up. Also includes recommendations for program/project improvement. Did you accurately identify the needs of the population or did you find out additional information during implementation? Was the teaching style and materials appropriate to the population? Sample: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 20%;">Campus/Modality</th> <th style="width: 15%;">Total # of Sections Offered</th> <th style="width: 15%;"># Sections Assessed</th> <th style="width: 50%;"># Students Assessed</th> </tr> </thead> <tbody> <tr> <td>ME</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">27</td> </tr> <tr> <td>GCC (DH distance site)</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">6</td> </tr> <tr style="background-color: #ffffcc;"> <td>NOVA Online</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr style="background-color: #ffffcc;"> <td>Off-Site Dual Enrollment</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr style="background-color: #e0e0e0;"> <td>Total</td> <td style="text-align: center;">2</td> <td style="text-align: center;">2</td> <td style="text-align: center;">33</td> </tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	ME	1	1	27	GCC (DH distance site)	1	1	6	NOVA Online	N/A	N/A	N/A	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	2	2	33	Semester/year data collected: Spring 2021 Target: 80% of students will score 85% or higher Results by Modality: Overall Average/Mean Scores <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 30%;">Results by Modality</th> <th style="width: 35%;">Current Results Spring 2021</th> <th style="width: 35%;">Previous Results Spring 2018</th> </tr> </thead> <tbody> <tr> <td>All students assessed (weighted average)</td> <td style="text-align: center;">MEC: 97.3% GCC: 100%</td> <td style="text-align: center;">MEC: 94.5% GCC: no cohort</td> </tr> </tbody> </table> Results by CLO Criteria: Percent of Students > target per criteria <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 30%;">Results by SLO Criteria/Question Concepts</th> <th style="width: 35%;">Current Results Spring 2021</th> <th style="width: 35%;">Previous Results Spring 2018</th> </tr> </thead> <tbody> <tr> <td>Evaluation</td> <td style="text-align: center;">MEC: 92.5% GCC: 100%</td> <td style="text-align: center;">MEC: 92.8% GCC: no cohort</td> </tr> </tbody> </table> Target Met: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially Current Results Improved vs. Previous Results: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> N/A - Results decreased by 0.3% Narrative comparison of current results to previous results: The results are essentially the same only changing by 0.3% Areas where students met the target: All areas met target. Areas where students did NOT meet the target: No areas noted as not meeting target.		Results by Modality	Current Results Spring 2021	Previous Results Spring 2018	All students assessed (weighted average)	MEC: 97.3% GCC: 100%	MEC: 94.5% GCC: no cohort	Results by SLO Criteria/Question Concepts	Current Results Spring 2021	Previous Results Spring 2018	Evaluation	MEC: 92.5% GCC: 100%	MEC: 92.8% GCC: no cohort	1. Changes put in place since previous assessment to improve student learning: Utilized breakout rooms via Zoom for individualized instruction on assignments related to the final project. 2. Impact of changes on current results: Since this is a project, they work on all semester the use of the breakout rooms allowed for monitoring progress and redirecting, if necessary, on the project. 3. According to current results, areas needing improvement: The overall average for the assignment increased and for the specific "evaluation" criteria essentially stayed the same; therefore, no area of improvement. 4. Based on current results, new actions to improve student learning: No new actions currently. 5. Next assessment of this CLO: Academic year 2022-23
Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed																																				
ME	1	1	27																																				
GCC (DH distance site)	1	1	6																																				
NOVA Online	N/A	N/A	N/A																																				
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Engineering, A.S.

NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.																																													
Program/Discipline Purpose Statement: The curriculum is designed to prepare the student to transfer into a baccalaureate degree program in engineering fields such as mechanical engineering, civil engineering, chemical engineering, aeronautical engineering, and naval architecture/marine engineering.																																													
Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy Operationalized Definition: Student will apply and demonstrate engineering problem solving methodology																																													
Assessment Methods	Assessment Results	Use of Results																																											
Course Name/Number: Thermodynamics for Engineering – EGR 248 Direct Measure Used: EGR 248 Thermodynamics for Engineering SLO Question. Assessment of students successfully solving a comprehensive problem as described below. CLO/Rubric Criteria or Question Concepts: <ol style="list-style-type: none"> 1. Determine the physical laws and acquire data from the different thermodynamic tables. 2. Use interpolation to specify data for a given condition. 3. Solve the problem accurately and completely. Sample: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 25%;">Campus/Modality</th> <th style="width: 15%;">Total # of Sections Offered</th> <th style="width: 15%;"># Sections Assessed</th> <th style="width: 45%;"># Students Assessed</th> </tr> </thead> <tbody> <tr> <td>AN</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">18</td> </tr> <tr> <td>NOVA Online</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>Off-Site Dual Enrollment</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>Total</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">18</td> </tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	AN	1	1	18	NOVA Online	N/A	N/A	N/A	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	1	1	18	Semester/year data collected: Fall 2020 Target: 60% on each of the SLO Criteria/Question Concepts Results by CLO Criteria: Average/Mean Score per criteria EGR 248 Thermodynamics for Engineering <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 70%;">Results by SLO Criteria/Question Concepts</th> <th style="width: 30%;">Current Results Fall 2020</th> </tr> </thead> <tbody> <tr> <td>1. Determine the physical laws and acquire data from the different thermodynamic tables</td> <td style="text-align: center;">89%</td> </tr> <tr> <td>2. Use interpolation to specify data for a given condition</td> <td style="text-align: center;">78%</td> </tr> <tr> <td>3. Solve the problem accurately and completely.</td> <td style="text-align: center;">61%</td> </tr> </tbody> </table> Previous Results: EGR 240 Solid Mechanics – Statics <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 70%;">Results by SLO Criteria/Question Concepts</th> <th style="width: 30%;">Previous Results Spring 2018</th> </tr> </thead> <tbody> <tr> <td>1. Defining vectors of forces in 3D</td> <td style="text-align: center;">54%</td> </tr> <tr> <td>2. Solving problems using simultaneous equations with 3 unknowns and 3 equations</td> <td style="text-align: center;">42%</td> </tr> <tr> <td>3. Solving 3 questions of vector cross product</td> <td></td> </tr> <tr> <td style="padding-left: 20px;">One problem</td> <td style="text-align: center;">93%</td> </tr> <tr> <td style="padding-left: 20px;">Two problems</td> <td style="text-align: center;">73%</td> </tr> <tr> <td style="padding-left: 20px;">Three problems</td> <td style="text-align: center;">79%</td> </tr> </tbody> </table> Target Met: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially Current Results Improved vs. Previous Results: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Partially <input type="checkbox"/> N/A Narrative comparison of current results to previous results: In this assessment cycle, a new course, EGR 248 was used to assess Quantitative Literacy. In EGR 240, previously reported results showed that students	Results by SLO Criteria/Question Concepts	Current Results Fall 2020	1. Determine the physical laws and acquire data from the different thermodynamic tables	89%	2. Use interpolation to specify data for a given condition	78%	3. Solve the problem accurately and completely.	61%	Results by SLO Criteria/Question Concepts	Previous Results Spring 2018	1. Defining vectors of forces in 3D	54%	2. Solving problems using simultaneous equations with 3 unknowns and 3 equations	42%	3. Solving 3 questions of vector cross product		One problem	93%	Two problems	73%	Three problems	79%	1. Changes put in place since previous assessment to improve student learning: Mechanics instructors included additional lectures and added exercises on viewing mechanical illustrations and extracting the required information to define the vector equation. Engineering faculty recommended that Mechanics instructors shall include additional exercises on solving simultaneous equations. 2. Impact of changes on current results: Since the previously assessed course EGR 240 Solid Mechanics, Statics and EGR 248 Thermodynamics for Engineering are different in their computational requirements, a comparison of the previous data and current data were not provided. However, there is significant improvement in EGR 248, which implemented the recommendations of additional exercises, especially in reading thermodynamic property tables and using the data to perform interpolations. The math computation requirements are similar except in the mechanics courses where simultaneous equations are extensively used. 3. According to current results, areas needing improvement: The results showed that students were able to acquire the thermodynamic properties information and perform interpolation to find the required data. Focus should be on performing accurate calculations. While 89% of the students were able to interpret quantitative information from the different thermodynamic property tables, only 78% were able to use interpolation to find the data for a specific condition. Being able to solve the problem completely is a concern. It is only 1% above the target. 4. Based on current results, new actions to improve student learning: The areas needing improvements are	
Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed																																										
AN	1	1	18																																										
NOVA Online	N/A	N/A	N/A																																										
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021
Engineering, A.S.

	<p>had difficulty in defining vectors of forces in 3D with a 54% success rate and solving simultaneous equations with 3 unknowns and 3 equations with only a 42% success rate. Part 3 (solving vector problems and cross product calculations) had 93% - 79%, with 79% of students completely solving three problems. In comparison, the EGR 248 results met the target. With 61% solved the problem correctly, 89% of the students were able to use thermodynamic tables to find the required thermodynamic properties, and 78% were able to interpolate the data.</p> <p>Areas where students met the target: All criteria for EGR 248 were met. However, solving the problem complete is still lagging.</p> <p>Areas where students did NOT meet the target: None</p>	<p>the ability to perform accurate calculations and the use of the results. Recommended action to improve accurate calculations is as follows:</p> <ul style="list-style-type: none"> • Illustrate using several examples, the use of a step-by-step approach in problem solving. This often simplifies problem solving. • When assumptions are made while solving engineering problems, they must be reasonable and justifiable. • Always check for reasonableness. The results obtained from an engineering analysis must be checked for reasonableness. <p>The Pathway Dean of Engineering, the Engineering Pathway Chair, the Engineering Steering Committee, and the Engineering Mechanics instructors will be responsible for implementing the recommendations Spring 2022.</p> <p>5. Next assessment of this CLO: Fall 2024</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

General Studies, A.S.

NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.																																																																			
Program/Discipline Purpose Statement: This program is a flexible associate degree. For students who plan to transfer, the degree can parallel the first two years of a four-year bachelor of science program if they choose courses that match the transfer institution's requirements. For those students who do not plan to transfer, the degree allows them to structure a program to suit their needs using accumulated credits from a variety of formal and experiential sources.																																																																			
Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy Operationalized Definition: Students will be able to retrieve economic information and data from a variety of web-based resources and databases and analyze and interpret that data to draw conclusions about the state of the economy																																																																			
Assessment Methods	Assessment Results		Use of Results																																																																
Course Name/Number: Principles of Macroeconomics - ECO 201 Direct Measure Used: The discipline assessed short-answer questions. SLO/Rubric Criteria or Question Concepts: Students were assessed on the following areas: 1. Report unemployment numbers 2. Evaluate trend 3. Non-farm payroll change 4. Unemployment by demographics Sample: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">Campus/Modality</th> <th style="text-align: center;">Total # of Sections Offered</th> <th style="text-align: center;"># Sections Assessed</th> <th style="text-align: center;"># Students Assessed</th> </tr> </thead> <tbody> <tr><td>AL</td><td style="text-align: center;">5</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td>AN</td><td style="text-align: center;">11</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td>MA</td><td style="text-align: center;">6</td><td style="text-align: center;">6</td><td style="text-align: center;">159</td></tr> <tr><td>LO</td><td style="text-align: center;">9</td><td style="text-align: center;">5</td><td style="text-align: center;">90</td></tr> <tr><td>WO</td><td style="text-align: center;">4</td><td style="text-align: center;">2</td><td style="text-align: center;">53</td></tr> <tr style="background-color: #ffffcc;"><td>NOVA Online</td><td style="text-align: center;">9</td><td style="text-align: center;">9</td><td style="text-align: center;">189</td></tr> <tr style="background-color: #ffffcc;"><td>Off-Site Dual Enrollment</td><td style="text-align: center;">N/A</td><td style="text-align: center;">N/A</td><td style="text-align: center;">N/A</td></tr> <tr style="background-color: #ffffcc;"><td>Total</td><td style="text-align: center;">44</td><td style="text-align: center;">22</td><td style="text-align: center;">491</td></tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	AL	5	0	0	AN	11	0	0	MA	6	6	159	LO	9	5	90	WO	4	2	53	NOVA Online	9	9	189	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	44	22	491	Semester/year data collected: Spring 2021 Target: 75% of students will score 75% or better on the assignment and on each component Results by Modality: Overall Average/Mean Scores <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">Results by Modality</th> <th style="text-align: center;">Current Results Spring 2021</th> <th style="text-align: center;">Previous Results</th> </tr> </thead> <tbody> <tr><td>All students assessed (weighted average)</td><td style="text-align: center;">86.97%</td><td style="text-align: center;">N/A</td></tr> <tr><td>On-campus average</td><td style="text-align: center;">N/A</td><td style="text-align: center;">N/A</td></tr> <tr><td>Synchronous hybrid (remote) average</td><td style="text-align: center;">89.74%</td><td style="text-align: center;">N/A</td></tr> <tr><td>NOVA Online average</td><td style="text-align: center;">82.54%</td><td style="text-align: center;">N/A</td></tr> <tr><td>Dual Enrollment average</td><td style="text-align: center;">N/A</td><td style="text-align: center;">N/A</td></tr> </tbody> </table> Results by SLO Criteria: Percent of Students > target per criteria <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">Results by SLO Criteria/Question Concepts</th> <th style="text-align: center;">Current Results Spring 2021</th> </tr> </thead> <tbody> <tr><td>1. Unemployment #</td><td style="text-align: center;">87.58%</td></tr> <tr><td>2. Evaluate trend</td><td style="text-align: center;">87.17%</td></tr> <tr><td>3. Non-farm payroll</td><td style="text-align: center;">87.37%</td></tr> <tr><td>4. Demographics</td><td style="text-align: center;">85.34%</td></tr> </tbody> </table> Target Met: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially Areas where students met the target: Students met all targets, both overall and on individual questions. Areas where students did NOT meet the target: None		Results by Modality	Current Results Spring 2021	Previous Results	All students assessed (weighted average)	86.97%	N/A	On-campus average	N/A	N/A	Synchronous hybrid (remote) average	89.74%	N/A	NOVA Online average	82.54%	N/A	Dual Enrollment average	N/A	N/A	Results by SLO Criteria/Question Concepts	Current Results Spring 2021	1. Unemployment #	87.58%	2. Evaluate trend	87.17%	3. Non-farm payroll	87.37%	4. Demographics	85.34%	1. Changes put in place since previous assessment to improve student learning: This was the first time the ECO discipline has tested Quantitative Literacy. 2. Impact of changes on current results: N/A 3. According to current results, areas needing improvement: Students did well at collecting and analyzing current data. The biggest challenge for the ECO discipline is not how the students perform but how and whether the faculty participate. Alexandria did not submit any results, and Annandale only reported the results from NOVA Online classes where the questions were built into the course. About half of the Loudoun and Woodbridge sections were tested. 4. Based on current results, new actions to improve student learning: Student learning isn't the problem based on the data we gathered. Of more concern is the lack of data from some campuses. The questions were developed and revised by the Steering Committee and distributed to all faculty. The assessment was put into Canvas Quiz form and shared with faculty through the Canvas Commons, but many did not administer it to their students. During 2022-2023, the Economics Discipline Group intends to create a plan to ensure we are testing SLOs and CLOs at the frequency that the college wishes. We have been doing one SLO per year. With 7 SLOs, that would mean it would take 14 years to do each one twice. It is our understanding that the college would like each SLO tested at least twice in a 5-year period. This will be a significant change for a discipline that is not very strong on getting widespread assessment less frequently. 5. Next assessment of this SLO: 2026-27
Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed																																																																
AL	5	0	0																																																																
AN	11	0	0																																																																
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Horticulture Technology, A.A.S.

<p>NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.</p>																																																		
<p>Program/Discipline Purpose Statement: The curriculum is designed to prepare students for full-time employment within the field of commercial horticulture as well as for those presently working who seek further knowledge and advancement. Graduates of the program are prepared for managerial/supervisory level positions in areas which include landscape design and installation, grounds maintenance, floristry, greenhouse and nursery management, garden center operation, and sales and marketing in related industries. Students in this program have an opportunity to gain career-related work experience through Cooperative Education or an internship in their area of emphasis</p>																																																		
<p>Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy</p> <p>Operationalized Definition: An adaptation of the rubric from NOVA's CLO resource website (Oregon Tech's Rubric) was applied to two projects in the HRT 205-Soils class in Spring 2021: Using mathematical calculations students will successfully calculate soil qualities (bulk density, etc.) and apply them in a real-life scenario.</p>																																																		
Assessment Methods	Assessment Results	Use of Results																																																
<p>Course Name/Number: Soils – HRT 205</p> <p>Direct Measure Used: The foundational measure was the correct calculation of bulk density and porosity using real laboratory data on soil samples in Lab 5 Bulk Density, and the practicing assessment was a single final exam question which required bulk density and porosity method descriptions, calculations and then an explanation of these results as applied to practical horticulture.</p> <p>CLO/Rubric Criteria or Question Concepts:</p> <ol style="list-style-type: none"> 1. Calculate 2. Interpret 3. Construct 4. Apply 5. Communicate <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 20%;">Campus/Modality</th> <th style="width: 15%;">Total # of Sections Offered</th> <th style="width: 15%;"># Sections Assessed</th> <th style="width: 50%;"># Students Assessed</th> </tr> </thead> <tbody> <tr> <td>LO only</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">24</td> </tr> <tr> <td>NOVA Online</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>Off-Site Dual Enrollment</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>Total</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">24</td> </tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	LO only	1	1	24	NOVA Online	N/A	N/A	N/A	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	1	1	24	<p>Semester/year data collected: Spring 2021</p> <p>Target: The target will be met if 75% of students achieve full credit on the foundational assignment (since the foundational lab assignment was graded on a credit/no credit basis for attempt and completion) and if 70% of students achieve full credit on the practicing assessment on the final exam.</p> <p>Results by Modality: Overall Average/Mean Scores</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 30%;">Results by Modality</th> <th style="width: 35%;">Current Results Spring 2021</th> <th style="width: 35%;">Previous Results</th> </tr> </thead> <tbody> <tr> <td>Foundational: All students assessed (on campus only)</td> <td style="text-align: center;">75%</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>Practicing: All students assessed (on campus only)</td> <td style="text-align: center;">50%</td> <td style="text-align: center;">N/A</td> </tr> </tbody> </table> <p>Results by CLO Criteria: Percent of Students > target per criteria</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 40%;">Results by CLO Criteria/Question Concepts from Rubric</th> <th style="width: 20%;">Current Results Spring 2021 Foundational</th> <th style="width: 40%;">Current Results Spring 2021 Practicing</th> </tr> </thead> <tbody> <tr> <td>1. 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Communicate</td> <td style="text-align: center;">75%</td> <td style="text-align: center;">58%</td> </tr> </tbody> </table> <p>Target Met: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Partially</p> <p>Narrative comparison of current results to previous results: This CLO has not been assessed previously by the current program head.</p>	Results by Modality	Current Results Spring 2021	Previous Results	Foundational: All students assessed (on campus only)	75%	N/A	Practicing: All students assessed (on campus only)	50%	N/A	Results by CLO Criteria/Question Concepts from Rubric	Current Results Spring 2021 Foundational	Current Results Spring 2021 Practicing	1. Calculate	75%	67%	2. Interpret	75%	58%	3. Construct	N/A	N/A	4. Apply	75%	58%	5. Communicate	75%	58%	<p>1. Changes put in place since previous assessment to improve student learning: Not applicable.</p> <p>2. Impact of changes on current results: Not applicable.</p> <p>3. According to current results, areas needing improvement: The results indicate that the application, interpretation, and communication of meaning of quantitative calculations need improvement. In a foundational context, the target was met, and interpretation, communication, and application seem to be achieved when they are listed out as a step-by-step process in a laboratory worksheet, but once applied similarly to a single final exam question, many students lost points and did not demonstrate an achievement of practicing quantitative literacy specifically in the areas of application, interpretation, and communication. Additionally, the 25% of students who failed to complete the foundational lab activity also mostly did not achieve practicing literacy on the final exam.</p> <p>4. Based on current results, new actions to improve student learning: The program head, who is the instructor for this course, will slightly redesign this foundational laboratory activity to better reflect not just the calculation techniques but also to foster quantitative literacy in the interpretation, application, and communication of the results. Additionally, the instructor will implement practice problems and a midterm exam question to better foster participation from those students who seem to be avoiding participating in this particular assessment. This should improve the outcomes overall within the course for the final practicing assessment on</p>	
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021
Horticulture Technology, A.A.S.

	<p>Areas where students met the target: Students met the target in the foundational lab activity where they did basic quantitative calculations related to bulk density and porosity. Students had to interpret, apply, and communicate the meaning of those results on the lab activity, and they met the target in that area as well. Students also almost met the target in the practicing final exam question in regard to the criteria (in the subscores) involving calculations of bulk density and porosity alone.</p> <p>Areas where students did NOT meet the target: Students overall did not meet the target from a practicing standpoint on the rubric used. Although with calculations alone, students were very close to achieving the target, but when considering the other criteria of interpretation, application and communication of the results, the target was not met. Additionally, the 25% of students who did not complete the foundational lab activity also were unable to demonstrate practicing quantitative literacy on the final assessment.</p>	<p>the final exam. This will be implemented in the Spring 2022 Soils course.</p> <p>5. Next assessment of this CLO: If assessed on a two-year cycle, this CLO will be assessed again in the 2022-2023 academic year, specifically in the HRT 205 Soils course in Spring 2023.</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Hospitality Management, A.A.S.

NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.																																							
Program/Discipline Purpose Statement: The curriculum is designed both to enable the student to enter executive training and management positions in the hospitality industry, and for those presently employed who desire updating in the field.																																							
Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy Operationalized Definition: Students will scale, standardize, and cost out recipes																																							
Assessment Methods	Assessment Results	Use of Results																																					
Course Name/Number: Food and Beverage Cost Control I - HRI 251 Direct Measure Used: Students were to create and submit for approval a restaurant menu. Once the menu items were approved, students were to then determine the dollar cost of each menu item by determining the cost of each recipe ingredient to calculate the total dollar cost of the menu item. Sample: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr style="background-color: #e0e0e0;"> <th style="width: 25%;">Campus/Modality</th> <th style="width: 15%;">Total # of Sections Offered</th> <th style="width: 15%;"># Sections Assessed</th> <th style="width: 45%;"># Students Assessed</th> </tr> </thead> <tbody> <tr> <td>AN only</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">32</td> </tr> <tr style="background-color: #ffffcc;"> <td>NOVA Online</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr style="background-color: #ffffcc;"> <td>Off-Site Dual Enrollment</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr style="background-color: #e0e0e0;"> <td>Total</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">32</td> </tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	AN only	1	1	32	NOVA Online	N/A	N/A	N/A	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	1	1	32	Semester/year data collected: Fall 2020 Target: 90% of the student will earn 60% or greater on the recipe cost exercise. Results by CLO Criteria: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr style="background-color: #e0e0e0;"> <th colspan="4" style="text-align: center;">Results</th> </tr> <tr> <th style="width: 25%;">Priced and calculated perfectly 50 pts</th> <th style="width: 25%;">Priced and calculated with minor mistakes 30 – 45 pts</th> <th style="width: 25%;">Priced and calculated with major mistakes 15 – 20 pts</th> <th style="width: 25%;">Did not turn in calculation 0 pts</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">9 students</td> <td style="text-align: center;">7</td> <td style="text-align: center;">3</td> <td style="text-align: center;">13</td> </tr> <tr style="background-color: #e0e0e0;"> <td colspan="2" style="text-align: center;">50% of total</td> <td colspan="2" style="text-align: center;">50% of total</td> </tr> </tbody> </table>	Results				Priced and calculated perfectly 50 pts	Priced and calculated with minor mistakes 30 – 45 pts	Priced and calculated with major mistakes 15 – 20 pts	Did not turn in calculation 0 pts	9 students	7	3	13	50% of total		50% of total		<p>1. Changes put in place since previous assessment to improve student learning: This is the first semester this CLO was assessed for the HRI program.</p> <p>2. Impact of changes on current results: Since this is the first time the CLO is being assessed, there is no comparison available.</p> <p>3. According to current results, areas needing improvement: Student participation needs to be addressed. The instructor indicated that some students may not have completed this part of the assignment due to not being able to correctly complete the previous components. At the same time, some students may not have participated because the grade on the calculation exercise would not have altered their grade for the overall project.</p> <p>4. Based on current results, new actions to improve student learning: Students' participation must be increased. When students did participate, 85% completed the calculations correctly or with minor mistakes. To ensure participation, the instructor will assign the calculation exercise as a separate assignment. The instructor will also have a pre-set menu and recipe for students to use if they do not complete the menu planning part correctly.</p> <p>5. Next assessment of this CLO: The program has been discontinued as of Fall 2021. This will be the last APER reported for the program.</p>	
Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed																																				
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Narrative comparison of current results to previous results: This is the first semester CLO was assessed for HRI program.																																							
Areas where students met the target: Of the 19 students who participated, 16 students (85%) did well. They either made the correct calculation or they made only few mistakes.																																							
Areas where students did NOT meet the target: The majority of the class did not participate in the exercise. This contributed to the major decline in the success rate.																																							

CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Liberal Arts, A.A.

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<p>Program/Discipline Purpose Statement: An Associate of Arts degree in Liberal Arts is designed to provide an understanding and appreciation for the ideas and ideals that are the basis of human civilization. It offers a foundation in the arts and sciences and prepares students for transfer into a Bachelor of Arts program. Liberal arts BA degrees prepare graduates for careers in a wide array of professions by enabling them to write well, critically analyze issues, place problems in a variety of contexts, and work competently with diverse groups of colleagues.</p>																																																																			
<p>Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy Operationalized Definition: Students will be able to retrieve economic information and data from a variety of web-based resources and databases and analyze and interpret that data to draw conclusions about the state of the economy</p>																																																																			
Assessment Methods	Assessment Results		Use of Results																																																																
<p>Course Name/Number: Principles of Macroeconomics - ECO 201</p> <p>Direct Measure Used: The discipline assessed short-answer questions.</p> <p>SLO/Rubric Criteria or Question Concepts: Students were assessed on the following areas:</p> <ol style="list-style-type: none"> 5. Report unemployment numbers 6. Evaluate trend 7. Non-farm payroll change 8. Unemployment by demographics <p>Sample:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Campus/Modality</th> <th>Total # of Sections Offered</th> <th># Sections Assessed</th> <th># Students Assessed</th> </tr> </thead> <tbody> <tr><td>AL</td><td>5</td><td>0</td><td>0</td></tr> <tr><td>AN</td><td>11</td><td>0</td><td>0</td></tr> <tr><td>MA</td><td>6</td><td>6</td><td>159</td></tr> <tr><td>LO</td><td>9</td><td>5</td><td>90</td></tr> <tr><td>WO</td><td>4</td><td>2</td><td>53</td></tr> <tr><td>NOVA Online</td><td>9</td><td>9</td><td>189</td></tr> <tr><td>Off-Site Dual Enrollment</td><td>N/A</td><td>N/A</td><td>N/A</td></tr> <tr><td>Total</td><td>44</td><td>22</td><td>491</td></tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	AL	5	0	0	AN	11	0	0	MA	6	6	159	LO	9	5	90	WO	4	2	53	NOVA Online	9	9	189	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	44	22	491	<p>Semester/year data collected: Spring 2021</p> <p>Target: 75% of students will score 75% or better on the assignment and on each component</p> <p>Results by Modality: Overall Average/Mean Scores</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Results by Modality</th> <th>Current Results Spring 2021</th> <th>Previous Results</th> </tr> </thead> <tbody> <tr><td>All students assessed (weighted average)</td><td>86.97%</td><td>N/A</td></tr> <tr><td>On-campus average</td><td>N/A</td><td>N/A</td></tr> <tr><td>Synchronous hybrid (remote) average</td><td>89.74%</td><td>N/A</td></tr> <tr><td>NOVA Online average</td><td>82.54%</td><td>N/A</td></tr> <tr><td>Dual Enrollment average</td><td>N/A</td><td>N/A</td></tr> </tbody> </table> <p>Results by SLO Criteria: Percent of Students > target per criteria</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Results by SLO Criteria/Question Concepts</th> <th>Current Results Spring 2021</th> </tr> </thead> <tbody> <tr><td>1. 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Changes put in place since previous assessment to improve student learning: This was the first time the ECO discipline has tested Quantitative Literacy.</p> <p>2. Impact of changes on current results: N/A</p> <p>3. According to current results, areas needing improvement: Students did well at collecting and analyzing current data. The biggest challenge for the ECO discipline is not how the students perform but how and whether the faculty participate. Alexandria did not submit any results, and Annandale only reported the results from NOVA Online classes where the questions were built into the course. About half of the Loudoun and Woodbridge sections were tested.</p> <p>4. Based on current results, new actions to improve student learning: Student learning isn't the problem based on the data we gathered. Of more concern is the lack of data from some campuses. The questions were developed and revised by the Steering Committee and distributed to all faculty. The assessment was put into Canvas Quiz form and shared with faculty through the Canvas Commons, but many did not administer it to their students. During 2022-2023, the Economics Discipline Group intends to create a plan to ensure we are testing SLOs and CLOs at the frequency that the college wishes. We have been doing one SLO per year. With 7 SLOs, that would mean it would take 14 years to do each one twice. It is our understanding that the college would like each SLO tested at least twice in a 5-year period. This will be a significant change for a discipline that is not very strong on getting widespread assessment less frequently.</p> <p>5. Next assessment of this SLO: 2026-27</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Medical Laboratory Technology, A.A.S.

<p>NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.</p>																																															
<p>Program/Discipline Purpose Statement: The curriculum is designed to prepare students to perform essential laboratory testing on blood and body fluids that is critical to the detection, diagnosis, and treatment of disease. In a medical laboratory, the medical laboratory technician (MLT) is part of a team of highly skilled pathologists, technologists, and phlebotomists working together to determine the presence, extent or absence of disease, and helping to evaluate the effectiveness of treatment. This program emphasizes "hands-on" practice of laboratory methods in a state-of-the-art laboratory at the Medical Education Campus in Springfield, followed by clinical experience at various affiliating healthcare organizations. Upon completion of the program, graduates will be eligible to take the American Society for Clinical Pathology (ASCP) Board of Certification examination and other national certification examinations offered at the technician level.</p>																																															
<p>Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy Operationalized Definition: Calculate Mean, SD, and CV to develop Q.C Levey Jennings charts and apply Westgard rules to determine validity of analytical test results</p>																																															
Assessment Methods	Assessment Results		Use of Results																																												
<p>Course Name/Number: Laboratory Instrumentation I - MDL 260</p> <p>Direct Measure Used: Questions embedded in MDL 260 Exam 1</p> <p>CLO/Rubric Criteria or Question Concepts: Students were assessed on the following criteria:</p> <ol style="list-style-type: none"> Select Westgard rule that detects random error. Levy Jennings graph Interpretation of gradual change in mean control value. Percentage of values within $\pm 3SD$ in Gaussian graph. Calculate acceptable control range given mean value and SD. Interpret point in Levey Jennings QC chart to detect rule violation. <p>Sample:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Campus/Modality</th> <th>Total # of Sections Offered</th> <th># Sections Assessed</th> <th># Students Assessed</th> </tr> </thead> <tbody> <tr> <td>ME only</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">23 (15 MLT + 8 MLA in same section)</td> </tr> <tr> <td>NOVA Online</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>Off-Site Dual Enrollment</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>Total</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">23</td> </tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	ME only	1	1	23 (15 MLT + 8 MLA in same section)	NOVA Online	N/A	N/A	N/A	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	1	1	23	<p>Semester/year data collected: Spring 2021</p> <p>Target: 80% of first year MLT students will be scoring 75% or more on each question related to calculation and interpretation of statistical parameters of confidence limits of QC Levey Jennings charts that provide validity to analytical testing.</p> <p>Results by Modality: Overall Average/Mean Scores</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Results by Modality</th> <th>Current Results Spring 2021</th> <th>Previous Results Spring 2020</th> </tr> </thead> <tbody> <tr> <td>Synchronous hybrid (remote) average</td> <td style="text-align: center;">75%</td> <td style="text-align: center;">70%</td> </tr> </tbody> </table> <p>Results by CLO Criteria: Percent of Students > target per criteria</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Results by SLO Criteria/ Question Concepts</th> <th>Current Results Spring 2021</th> <th>Previous Results Spring 2020</th> </tr> </thead> <tbody> <tr> <td>1. 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Changes put in place since previous assessment to improve student learning: Basic principles of statistical measures are included at different levels of first-year courses. Utilization of control material which are samples of known values with similar characteristics of the patient samples (serum, urine, whole blood) are run with patients, and their values are plotted in graphs that show dispersion from mean up to the calculated standard deviations. The calculation of statistical values, plotting them in QC charts, and application of Westgard rules is reinforced in other courses. This is a first-year course and is the first time students are applying these concepts from the first step up to the end. The visualization of the correlation of control values plotted in QC chart zones with statistical measures has been an abstract concept that is sometimes challenging to some students.</p> <p>2. Impact of changes on current results: There has been some areas in which evaluation demonstrated better percentages than the previous year, but students do not show the expected level of knowledge needed to manage efficiently the concepts of interpretation and set up of the QC Levey Jennings charts.</p> <p>3. According to current results, areas needing improvement: More time explaining the statistical correlations of control values with zones in the QC chart will stimulate students to understand the concept of values lying within statistical accepted limits of variability that show the random variability. Demonstrations of the step-by-step application of concepts with examples showing the variability introduced by system malfunction</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021
Medical Laboratory Technology, A.A.S.

	<p>Current Results Improved vs. Previous Results: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Partially <input type="checkbox"/> N/A</p> <p>Narrative comparison of current results to previous results: Students have been demonstrating difficulties in the correlation of Gaussian distribution areas corresponding to 1 SD, 2 SD and 3SD, and a look back to last year showed that this area needed revision.</p> <p>Areas where students met the target: Moderate understanding of the interpretation of Quality Control charts and application of Westgard's rules to detect random error versus systematic error shows better results.</p> <p>Areas where students did NOT meet the target: Correlation of Gaussian graph to areas of within \pmSD did not meet the target as well as how to determine the range of acceptable variability (random error) using the criteria of 95% confidence given by accepting values within \pm2SD and observing points between 2SD and 3SD on consecutive days for early detection of systematic error.</p>	<p>is needed to appreciate the utility of the interpretation of QC charts. Analytical systems showing to be in control are vital for test validity. The knowledge of statistical parameters used for QC charts is important to decide if results are valid and reportable.</p> <p>4. Based on current results, new actions to improve student learning: Faculty are revising the strategies and activities used for this unit with more guided demonstrations and feedback sessions. These will be implemented during the 2021-2022 academic year by the MDL 260 course instructor and within other core courses like MDL 263 that have the opportunity to provide additional practice in the application of these concepts in lecture and laboratory practices.</p> <p>5. Next assessment of this CLO: Spring 2022</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Physical Therapist Assistant, A.A.S.

NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.																							
Program/Discipline Purpose Statement: The program is designed to prepare students to utilize exercise, specialty equipment, and other treatment procedures to prevent, identify, correct, and alleviate movement dysfunction. The program design provides students with the philosophical, theoretical, and clinical knowledge necessary to deliver high-quality patient care. Ultimately, students are prepared as skilled technical healthcare providers who work under the direction and supervision of a physical therapist to provide selected components of physical therapy treatments. Upon successful completion of the program, students must take and pass a licensing examination to begin their career as a physical therapist assistant (PTA). Students are prepared for employment in a variety of healthcare settings, including acute care hospitals, outpatient clinics, extended care facilities, rehabilitation centers, contract agencies, and schools.																							
Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy Operationalized Definition: Present sound rationales for clinical problem solving within the plan of care established by the physical therapist																							
Assessment Methods Course Name/Number: Clinical Education III- PTH 232 Direct Measure Used - Summative Assessment: The summative evaluation method is performance on Criterion #7 Clinical Problem Solving on the PTA Clinical Performance Instrument (CPI) in Clinical Education III-PTH 232 in the Spring semester of the second year. One of the listed skills for the Problem Solving criterion is "Collects and compares data from multiple sources to determine patient's readiness before initiating interventions." For this year's CLO, the focus is on the ability to interpret vital signs/lab values data accurately to make correct intervention choices. Per the CPI, criteria which must be met in order for a student to achieve "entry level performance" are: <ul style="list-style-type: none"> • Is capable of completing tasks, clinical problem solving, and interventions/data collection for patients with simple or complex conditions under general supervision of the physical therapist • Is consistently proficient and skilled in simple and complex tasks, clinical problem solving, and interventions/data collection • Is capable of maintaining 100% of a full-time PTA's patient care workload in a cost-effective manner with direction and supervision from the physical therapist <p>"Entry level" is the single point, highest level terminal benchmark without gradations. Students achieving this benchmark are deemed ready to practice as physical therapist assistants. There are no strengths or weaknesses defined or identified for individual criterions on this national performance assessment tool.</p>	Assessment Results Semester/year data collected: <ul style="list-style-type: none"> • PTH 232: Spring 2021 • PTH 105: Fall 2020 • PTH 122: Spring 2021 • PTH 231: Fall 2020 Target: 100% of students will score "Entry Level" on Clinical Education III-PTH 232 CPI criterion #7. Results by Modality: Overall Average/Mean Scores <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 33%;">Results by Modality</th> <th style="width: 33%;">Current Results Spring 2021</th> <th style="width: 33%;">Previous Results Summer 2020/ Fall 2020 (COVID delayed clinics)</th> </tr> </thead> <tbody> <tr> <td>On-campus average</td> <td style="text-align: center;">100%</td> <td style="text-align: center;">96.7%</td> </tr> </tbody> </table> Results by CLO Criteria: Percent of Students > target per criteria <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 33%;">Results by SLO Criteria/ Question Concepts</th> <th style="width: 33%;">Current Results Fall 2020/ Spring 2021</th> <th style="width: 33%;">Previous Results Fall 2019/ Spring 2020</th> </tr> </thead> <tbody> <tr> <td>1. 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Changes put in place since previous assessment to improve student learning: Because face-to-face lab time in Fall 2020 was reduced due to COVID building use limitations, in depth online pre-lab assignments were created for students in the Class of 2022 in Introduction to Physical Therapy-PTH 105 to assist them to make more effective use of their limited face-to-face lab time. For the Class of 2021, to increase both student and clinical instructor early awareness of any deficits in clinical decision making based on correct interpretation of vital signs/lab values, a question regarding the level of assistance required was added to the Midterm Assessment Form in Clinical Education II-PTH 231 and Clinical Education III-PTH 232. 2. Impact of changes on current results: Compared to the Class of 2021, more students in the Class of 2022 with reduced lab time in Introduction to Physical Therapy-PTH 105 correctly interpreted respiratory rate data, but fewer were able to recognize respiratory distress. The presence of the vital signs/lab values interpretation question on the Midterm Assessment form which was available to both students and clinical instructors prior to the start of the clinical experience may have triggered early awareness of correct clinical decision making, as 15 of 16 students in Clinical Education II-PTH 231 had already achieved the final benchmark level of assistance required by midterm. At midterm of the final clinical experience in Clinical Education II-PTH 232, 7 of 18 of the students had already achieved the final Entry level. 3. According to current results, areas needing improvement: Students across both cohorts struggled
Results by Modality	Current Results Spring 2021	Previous Results Summer 2020/ Fall 2020 (COVID delayed clinics)																					
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Physical Therapist Assistant, A.A.S.

CLO/Rubric Criteria or Question Concepts: The focus of this CLO was accurate interpretation of vital signs/lab values to correctly modify physical therapy interventions. Student competence in this skill was assessed in the first year during written exams in the Fall and Spring of the first year. Students' ability to perform the skill in the clinic was also assessed halfway through the second and third clinical experiences in the second year. The formative evaluation methods included:

1. In Introduction to Physical Therapy-PTH 105 in the Fall 2020 semester for the 31 students in the Class of 2022, final written exam questions assessed interpretation of respiratory rates and recognition of vital signs associated with respiratory distress.
2. In Therapeutic Procedures II-PTH 122 in the Spring 2021 semester for the 29 students in the Class of 2022, final written exam questions assessed interpretation of vital signs in Phase I of Cardiac Rehab and in a patient experiencing dizziness.
3. In Clinical Education II in the second half of the Fall 2020 semester in the second year, the Midterm Assessment Form asked clinical instructors the question for the 16 students in the Class of 2021 placed in facilities in which vital signs were routinely measured: "How much assistance does your student require to make decisions based on vital signs and/or lab values?"
4. In Clinical Education III-PTH 232 in the second half of the Spring 2021 semester in the second year, the Midterm Assessment Form asked clinical instructors the same question for the 18 students in the Class of 2021 placed in facilities in which vital signs were routinely measured.

Sample:

Campus/ Modality: ME Campus only	Total # of Sections Offered	# Sections Assessed	# Students Assessed
PTH 232	1	1	34
PTH 105	1	1	31
PTH 122	1	1	29
PTH 231	1	1	33
NOVA Online	N/A	N/A	N/A
Off-Site Dual Enrollment	N/A	N/A	N/A
Total	4	4	127

exam question (PTH 122)		
5. Midterm Clinical Instructor Assessment of Assistance Needed with Decisions Based on Vital Sign/Lab Value Interpretation (PTH 231)	100% achieved or exceeded target of between 25-50% assist. 37.5% exceeded the target Class of 2021	Not previously assessed in this format
6. Midterm Clinical Instructor Assessment of Assistance Needed with Decisions Based on Vital Sign/Lab Value Interpretation (PTH 232)	94.5% achieved or exceeded target of between 0-25% assist. 38.9% exceeded the target Class of 2021	Not previously assessed in this format

Target Met: [X] Yes [] No [] Partially

Current Results Improved vs. Previous Results:
[X] Yes [] No [] Partially [] N/A

Narrative comparison of current results to previous results: One student in the Class of 2020 did not achieve entry level in Criterion #1 Safety which included appropriately modifying physical therapy interventions based on correctly interpreting vital signs/lab values compared to 100% in the Class of 2021.

Areas where students met the target: Students in the Class of 2021 met the summative target. 100% of students in Clinical Education II-PTH 231 met or exceeded the target of requiring between 25-50% assistance of clinical instructors to correctly interpret vital signs/lab values. The target is consistent with the expectation that students are at the Intermediate level at the beginning of the clinical experience and must achieve the Advanced Intermediate level by the end.

Areas where students did NOT meet the target: One of 18 students in Clinical Education III-PTH 232 did not meet the target of requiring between 0-25% assistance of clinical instructor assistance at midterm to correctly interpret vital signs/lab values. The target is consistent with the expectation that students are at the Advanced Intermediate level at the beginning of the clinical experience and must achieve Entry level by the end. The

with correct interpretation of data to recognize respiratory distress. Fewer students in the Class of 2022 compared to the Class of 2021 were able to interpret vital signs in Phase 1 of Cardiac Rehab.

4. Based on current results, new actions to improve student learning: For the Class of 2022, a clinic skills Boot Camp was conducted by faculty for students just prior to their first full time clinical experience in Clinical Education I-PTH 131 in Summer 2021. This boot camp included case studies for which students were required to make the correct clinical decision based on interpretation of vital signs/lab values. 100% of students made the correct decisions. Faculty plan to continue to include this activity in the Summer 2022 Boot Camp for the Class of 2023. With the return to more face-to-face lab time in Fall 2021 in Introduction to Physical Therapy-PTH 105, the pre-lab assignments created for Fall 2020 have been retained to complement hands-on learning. The scripted patient scenarios added to the human patient simulation lab in this course will include a respiratory distress scenario. In Therapeutic Procedures II-PTH 122 a Phase I Cardiac Rehab question will be added to a quiz to emphasize the importance of the material.

5. Next assessment of this CLO: Spring 2022

CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021
Physical Therapist Assistant, A.A.S.

	<p>student did meet the benchmark by the end of the clinical experience. 83-94% of students in the Class of 2022 answered 3 of 4 quiz and exam questions requiring interpretation of vital signs correctly in the first year of the program, but only 52% in the first semester could correlate vital signs to respiratory distress.</p>	
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Radiography, A.A.S.

<p>NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.</p>																																																								
<p>Program/Discipline Purpose Statement: Program/Discipline Purpose Statement: The curriculum is designed to prepare students to produce diagnostic images of the human body through safe application of x-radiation. The radiographer is a central member of the health care team and assists the radiologist, a physician specialized in body image interpretation. Upon successful completion of degree requirements, the student will be eligible to take the American Registry of Radiologic Technology (ARRT) examination leading to certification as a Registered Technologist in Radiography: A.S., R.T. (R).</p>																																																								
<p>Core Learning Outcome: [] Critical Thinking [X] Quantitative Literacy Operationalized Definition: Apply knowledge of radiation protection to minimize patient dose</p>																																																								
Assessment Methods	Assessment Results	Use of Results																																																						
<p>Course Name/Number: Radiation Protection and Radiology - RAD 205</p> <p>Direct Measure Used: Quiz 4-Radiation Quantities and Units</p> <p>CLO/Rubric Criteria or Question Concepts: Question Topics:</p> <ol style="list-style-type: none"> 1. SI unit of Electrical Current-1 coulomb/sec= 2. Air Volume increase-number of electron-ion pairs 3. Work-Force x Distance 4. SI units 5. Photoelectric absorption 6. X-ray Therapy absorbed dose calculations 7. Energy absorption -1 joule per kilogram of matter-1Gy 8. Total sum air kerma overexposed human skin. <p>GRADING SCALE: A- 94.50 - 100.00 B- 89.50 - 94.499 C - 84.50 - 89.499 D - 74.50 - 84.499 F - Below - 74.499</p> <p>Sample:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 20%;">Campus/Modality</th> <th style="width: 15%;">Total # of Sections Offered</th> <th style="width: 15%;"># Sections Assessed</th> <th style="width: 50%;"># Students Assessed</th> </tr> </thead> <tbody> <tr> <td>ME only</td> <td>2</td> <td>2</td> <td>73</td> </tr> <tr style="background-color: #ffff00;"> <td>NOVA Online</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr style="background-color: #ffff00;"> <td>Off-Site Dual Enrollment</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr style="background-color: #e0e0e0;"> <td>Total</td> <td>2</td> <td>2</td> <td>73</td> </tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	ME only	2	2	73	NOVA Online	N/A	N/A	N/A	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	2	2	73	<p>Semester/year data collected: Fall 2020</p> <p>Target: 80% of students score 85% or higher on Quiz 4: Radiation Quantities and Units</p> <p>Results by Modality: Overall Average/Mean Scores</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 30%;">Results by Modality</th> <th style="width: 35%;">Current Results Fall 2020</th> <th style="width: 35%;">Results 2017-2018</th> </tr> </thead> <tbody> <tr> <td>All students assessed (weighted average)</td> <td>94.25</td> <td>N/A*</td> </tr> </tbody> </table> <p><small>*Different assessment/CLO utilized - 80% of students scored 90% or higher on Radiographic Image Analysis</small></p> <p>Results by CLO Criteria: Average/Mean Score per criteria</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 50%;">Results by SLO Criteria/ Question Concepts</th> <th style="width: 20%;">Current Results Fall 2020</th> <th style="width: 30%;">Previous Results Summer 2020</th> </tr> </thead> <tbody> <tr><td>1. 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The following changes were put into place in Fall 2015 - Spring 2016:</p> <ol style="list-style-type: none"> 1. Additional lab modules were introduced into RAD 205 to further enhance knowledge of patient dose limits. 2. Inclusion of more math related assignments for radiation protection questions. 3. Adaptive quizzes were introduced in RAD 205 in Spring 2021. Adaptive quiz software adjusts to the students' knowledge base, as the students answers more questions the quizzes become more challenging. <p>2. Impact of changes on current results: Since this SLO has not been assessed since the 2014-15 cycle, we will need to assess this CLO again in order to accurately assess the information. RAD faculty will review the results of the inclusion of adaptive quizzing in Spring 2022.</p> <p>3. According to current results, areas needing improvement: The results of the current assessed information show a slight decrease in student scores. Areas of improvement include the following: SI units absorbed dose calculations and total sum air kerma.</p> <p>4. Based on current results, new actions to improve student learning: RAD faculty will continue to focus on adding modules to address these deficiencies. RAD faculty will confer with the RAD Advisory Board for additional feedback on improvement in Spring 2022.</p>	
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

	<p>Areas where students met the target: Students met the target in all eight assessed categories.</p> <p>Areas where students did NOT meet the target: None</p>	<p>5. Next assessment of this CLO: 2021-2022</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Science, A.S.

<p>NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.</p>																																																							
<p>Program/Discipline Purpose Statement: The curriculum is designed for individuals who are interested in a professional or scientific program and who plan to transfer to a four-year college or university to complete a baccalaureate degree with a major in one of the following fields: agriculture, biology, chemistry, pre-dentistry, forestry, geology, oceanography, pharmacy, physics, physical therapy, pre-medicine, science education, or mathematics</p>																																																							
<p>Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy</p> <p>Operationalized Definition: Students will demonstrate the principles of physics in the analysis of physics problems. Students will demonstrate ability to read, understand, and critically analyze their observations and measurements</p>																																																							
Assessment Methods	Assessment Results	Use of Results																																																					
<p>Course Name/Number: Introduction to Physics I - PHY 101</p> <p>Direct Measure Used: Students performed laboratory experiments to interpret data. Students took tests aimed to analyze simple physics problems. Average grades from laboratory and from tests assessments were collected. In addition, to gauge the correctness of the application and the analysis of the physics learned, the overall course grade was used as a measure of success.</p> <p>CLO/Rubric Criteria or Question Concepts:</p> <ul style="list-style-type: none"> • Data Interpretation: Criterion 1 used the grade average of Laboratory reports. • Correct Calculations: Criterion 2 used the grade average of tests. • Application and analysis: Criterion 3 used the overall course grade. <p>Sample:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 20%;">Campus/Modality</th> <th style="width: 15%;">Total # of Sections Offered</th> <th style="width: 15%;"># Sections Assessed</th> <th style="width: 15%;"># Students Assessed</th> </tr> </thead> <tbody> <tr> <td>AN</td> <td>5</td> <td>4</td> <td>72</td> </tr> <tr> <td>MA</td> <td>2</td> <td>1</td> <td>25</td> </tr> <tr> <td>LO</td> <td>2</td> <td>1</td> <td>24</td> </tr> <tr> <td>WO</td> <td>2</td> <td>2</td> <td>26</td> </tr> <tr style="background-color: #ffff00;"> <td>NOVA Online</td> <td>4</td> <td>4</td> <td>77</td> </tr> <tr style="background-color: #ffff00;"> <td>Off-Site Dual Enrollment</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr style="background-color: #ffff00;"> <td>Total</td> <td>15</td> <td>12</td> <td>224</td> </tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	AN	5	4	72	MA	2	1	25	LO	2	1	24	WO	2	2	26	NOVA Online	4	4	77	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	15	12	224	<p>Semester/year data collected: Spring 2021</p> <p>Target: 70% of students earning a grade of 70% or higher</p> <p>Results by Modality: Overall Average/Mean Scores</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 30%;">Results by Modality</th> <th style="width: 30%;">Current Results Spring 2021</th> <th style="width: 40%;">Previous Results</th> </tr> </thead> <tbody> <tr> <td>All students assessed (weighted average)</td> <td>80%</td> <td>N/A</td> </tr> <tr> <td>Synchronous hybrid (remote) average</td> <td>81%</td> <td>N/A</td> </tr> <tr> <td>NOVA Online average</td> <td>78%</td> <td>N/A</td> </tr> </tbody> </table> <p>Results by CLO Criteria: Percent of Students > target per criteria - In the table below, the percentage of students who scored 70% or higher is reported for each criterion</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 60%;">Results by SLO Criteria/ Question Concepts</th> <th style="width: 40%;">Current Results Spring 2021</th> </tr> </thead> <tbody> <tr> <td>1. Data Interpretation</td> <td>85%</td> </tr> <tr> <td>2. Correct calculations</td> <td>75%</td> </tr> <tr> <td>3. Application / Analysis</td> <td>82%</td> </tr> </tbody> </table> <p>Target Met: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially</p> <p>Narrative comparison of current results to previous results: In 2011, the Physics SLO, "Students will demonstrate the principles of physics in the analysis of physics problems," was carried out for PHY 101 sections. The current CLO is aligned with the physics SLO in particular on the third criterion, Application and Analysis. The success rate in 2011 was 71%. Although the direct measure was different, it is interesting to note how the current results surpass the previous.</p>	Results by Modality	Current Results Spring 2021	Previous Results	All students assessed (weighted average)	80%	N/A	Synchronous hybrid (remote) average	81%	N/A	NOVA Online average	78%	N/A	Results by SLO Criteria/ Question Concepts	Current Results Spring 2021	1. Data Interpretation	85%	2. Correct calculations	75%	3. Application / Analysis	82%	<p>1. Changes put in place since previous assessment to improve student learning: One of the action plans that stemmed from the last Physics discipline review was to rewrite the PHY 101 objectives to better align them with the students' own academic and professional interests and goals. Physics 101 is a course for non-science majors. The change was put in place to increase student engagement and hence increase student success. A second change inaugurated this remote semester was a different rubric. Instructors had to collect the final semester scores of their students in three different areas: laboratory reports, test assessments, and overall course grade.</p> <p>2. Impact of changes on current results: The higher success rate of the students is a tangible measure of the impact of the changes introduced. The new rubric provided a more holistic approach to measuring student success. This change also facilitated data collection from the instructors, greatly improving the faculty participation, with 12 out of 15 sections assessing the CLO.</p> <p>3. According to current results, areas needing improvement: The Physics discipline group will continue to perfect the new rubric and to adapt it to an even more comprehensive data collection. The goal is for all sections to take part of the assessment. In the future, Associate Deans will be asked to participate in the effort of communicating the importance of the CLO.</p> <p>4. Based on current results, new actions to improve student learning: In the near future, Transfer VA will ask for this specific conceptual physics course to be combined with the following semester sequence course, so the two semesters will join into one: PHY 101 and</p>	
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Science, A.S.

	<p>Areas where students met the target: Students were able to successfully interpret data, perform the relevant calculations, and draw logical conclusions in their analysis.</p> <p>Areas where students did NOT meet the target: None</p>	<p>PHY 102 will become PHY 100. Work will be done to support a smooth transition.</p> <p>5. Next assessment of this CLO: The CLO Quantitative Literacy will next be assessed for Science, A.S. by Geology (GOL 105) in Fall 2026.</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Science: Mathematics Specialization, A.S.

NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.

Program/Discipline Purpose Statement: The curriculum is designed for individuals who plan to transfer to a four-year college or university to complete a baccalaureate degree. This curriculum is designed to prepare students to major in one of the following fields: mathematics, mathematics education, statistics, operations research, applied mathematics, or computer science.

Core Learning Outcome: Critical Thinking Quantitative Literacy

Operationalized Definition: Choose an appropriate method to solve problems

Assessment Methods	Assessment Results	Use of Results																																																										
<p>Course Name/Number: Calculus I - MTH 263</p> <p>Direct Measure Used: Common 7-part application problem. Instructors used discretion to assess the outcome in a homework assignment, quiz, or exam.</p> <p>CLO/Rubric Criteria or Question Concepts:</p> <ol style="list-style-type: none"> a. Given a position function, find instantaneous velocity in terms of t (worth 1 point) b. Given a position function, find instantaneous velocity at given value of t (worth 1 point) c. State units of instantaneous velocity (worth 1 point) d. Given a position function, find acceleration in terms of t (worth 1 point) e. Given a position function, find acceleration at given value of t (worth 1 point) f. State units of instantaneous velocity (worth 1 point) g. Determine if accelerating or decelerating and explain why (worth 2 points) <p>No partial credit awarded. For each part, 1 point awarded if correct. 0 points if attempted and incorrect.</p> <p>Sample:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Campus/Modality</th> <th>Total # of Sections Offered</th> <th># Sections Assessed</th> <th># Students Assessed</th> </tr> </thead> <tbody> <tr><td>AL</td><td>7</td><td>1</td><td>35</td></tr> <tr><td>AN</td><td>5</td><td>0</td><td>0</td></tr> <tr><td>MA</td><td>7</td><td>5</td><td>146</td></tr> <tr><td>LO</td><td>6</td><td>4</td><td>82</td></tr> <tr><td>WO</td><td>3</td><td>1</td><td>35</td></tr> <tr><td>NOVA Online</td><td>8</td><td>2</td><td>43</td></tr> <tr><td>Off-Site Dual Enrollment</td><td>N/A</td><td>N/A</td><td>N/A</td></tr> <tr><td>Total</td><td>36</td><td>13</td><td>341*</td></tr> </tbody> </table> <p>*Out of the 341 students, 58 did not complete the question on the assessment. The data is based on the 283 who attempted at</p>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	AL	7	1	35	AN	5	0	0	MA	7	5	146	LO	6	4	82	WO	3	1	35	NOVA Online	8	2	43	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	36	13	341*	<p>Semester/year data collected: Spring 2021</p> <p>Target: 56% of students will score a minimum of 62.5% (at least 5 out of 8 points).</p> <p>Results by Modality: Overall Average/Mean Scores</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Results by Modality</th> <th>Current Results Spring 2021</th> <th>Previous Results Fall 2015</th> </tr> </thead> <tbody> <tr> <td>All students assessed (weighted average)</td> <td>$(211 + 30)/283 = 85\%$</td> <td>56%*</td> </tr> <tr> <td>Synchronous hybrid (remote) average</td> <td>$211/248 = 85\%$</td> <td>N/A</td> </tr> <tr> <td>NOVA Online average</td> <td>$30/35 = 86\%^{**}$</td> <td>N/A</td> </tr> </tbody> </table> <p>* 56% of students scored at least a 60% on this question in Fall 2015. ** NOL sections did not use the same question. A similar problem which assessed only parts (a) and (b) was used for data collection. Students received 0, 1 or 2 points for attempting the NOL exercise. 86% of students received a score of 2. As a result, the current results of all students assessed</p> <p>Results by CLO Criteria: Percent of Students > target per criteria: at least 50% of students will score a 1 (out of 1) on concepts 1 through 6; at least 50% of students will score a 2 (out of 2) on concept 7.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Results by SLO Criteria/ Question Concepts</th> <th>Current Results Spring 2021</th> </tr> </thead> <tbody> <tr> <td>1. Given a position function, find instantaneous velocity in terms of t. (worth 1 point)</td> <td>$251/283 = 89\%$</td> </tr> <tr> <td>2. Given a position function, find instantaneous velocity at given value of t. (worth 1 point)</td> <td>$247/281 = 88\%$</td> </tr> <tr> <td>3. 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Changes put in place since previous assessment to improve student learning: Since the data was last collected (Fall 2015), the MTH 263 course has been reduced in credit from the 5-credit MTH 173 to the new 4-credit course, although no significant content was reduced. In Fall 2018, the Math discipline came to an agreement on a common textbook for MTH 263, with all 5 campuses and NOL using the same resource. Dual enrollment sections do not necessarily use the same resource. The data question for Spring 2021 is not identical to that used in Fall 2015. The question used to assess Spring 2021 NOL sections was similar, but not identical to Spring 2021 non-NOL sections. The Fall 2015 question awarded 2 points for parts (a) and (b) combined, 2 points for parts (d) and (e) combined, 1 point for parts (c) and (f) combined, and 1 point for part (g), for a total of 6 points. The data in Fall 2015 was not disaggregated by concept, although partial credit was awarded. For 2020-2021, the collection of data was further disaggregated by concepts to help identify where students are struggling, since Fall 2015 data indicated that students were not understanding the objective. Based on instructor feedback, students typically are able to perform processes (concepts a - e), but have difficulty with interpretation of processes (concepts f and g). Therefore, the target of 56% (based on fall 2015 data) was based on earning 5 out of the 7 concepts. Note that concept (g) was worth 2 points. The Spring 2021 data was collected during the COVID pandemic. During this time, students did not have access to the Virginia Placement Test (VPT) and instead took a Canvas assessment developed by Math faculty. The SIS upgrade made it difficult for faculty to report data, so campuses with traditionally high rates of data collection had unusually low rates. In addition, the faculty collecting data at these campuses were new to the process. No</p>
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Science: Mathematics Specialization, A.S.

<p>least part of the assessment. The 283 students who attempted the assessment did not necessarily answer all seven parts.</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">5. Given a position function, find acceleration at given value of t. (worth 1 point)</td> <td style="text-align: right; padding: 2px;">$215/239 = 90\%$</td> </tr> <tr> <td style="padding: 2px;">6. State units of instantaneous velocity. (worth 1 point)</td> <td style="text-align: right; padding: 2px;">$188/241 = 78\%$</td> </tr> <tr> <td style="padding: 2px;">7. Determine if accelerating or decelerating and explain why. (worth 2 points)</td> <td style="text-align: right; padding: 2px;">$91/239 = 38\%$</td> </tr> </table> <p>Target Met: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Partially</p> <p>Current Results Improved vs. Previous Results: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> N/A</p> <p>Narrative comparison of current results to previous results: Students showed an increase in performance in this SLO, from 56% of students who scored at least a 60% on this exercise to 85%.</p> <p>Areas where students met the target: Students far exceeded the target overall and in the first 6 of the seven concepts.</p> <p>Areas where students did NOT meet the target: Students did not meet the target for concept 7: 106/239 (44%) students received a score of 1, and 197/239 (82%) students received a score of 1 or 2.</p>	5. Given a position function, find acceleration at given value of t . (worth 1 point)	$215/239 = 90\%$	6. State units of instantaneous velocity. (worth 1 point)	$188/241 = 78\%$	7. Determine if accelerating or decelerating and explain why. (worth 2 points)	$91/239 = 38\%$	<p>specific pedagogical changes were put in place in the course college-wide.</p> <p>2. Impact of changes on current results: The scores were not disaggregated by how the student placed into the course, i.e., by completion of precalculus, VPT scores, or by Canvas assessment for placement, so it is not possible to tell if the lack of VPT had an impact on results. However, the data was disaggregated by concept for the first time, which allows a better understanding of the data. Disaggregation of objective by concept allows the math discipline to better understand where students are struggling.</p> <p>3. According to current results, areas needing improvement: It is difficult to compare results from NOL sections to non-NOL sections since the question in NOL sections did not include all concepts in the question. Regardless, 85% of students earned a score of at least 5 of the 8 points. For concepts 1 through 6, between 78% and 92% of students who attempted the question received full credit for the concept. For concept 7, only 38% received full credit for the concept. Since 44% received only 1 point (out of 2) and 82% received 1 or 2 points (out of 2) for the concept, it is an indication that students were able to determine if the object was accelerating or decelerating but did not explain why. It is not clear if students have an inability to explain why, or if they simply did not answer that portion of the question. These results confirmed faculty suspicions that students are likely able to conduct processes, but have difficulty in interpreting results.</p> <p>4. Based on current results, new actions to improve student learning: NOL assessments are being edited to include the same SLO questions in academic year 2020-2021, so comparison can be more meaningful. The Math faculty will discuss the collection of data at the Fall discipline meeting to determine if all data should be collected on in a common way, such as on a proctored assessment. Since students demonstrated mastery of concepts 1 through 6, it may be useful to focus on concept 7, and to separate the concept into two sub-concepts, such as determining if the object is accelerating or decelerating, and an explanation of why.</p>
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Science: Mathematics Specialization, A.S.

		<p>The Math discipline steering committee will consider this revision prior to the next assessment of this CLO in MTH 263. Results will be shared with the calculus workgroup to determine if additional focus should be placed on interpretation of results.</p> <p>5. Next assessment of this CLO: This CLO is not scheduled for assessment in MTH 263 until after Spring 2023. The SLO schedule has not been developed past that point.</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Social Sciences: Geospatial Specialization, A.S.

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<p>Program/Discipline Purpose Statement: This program is designed to help students develop both the theoretical knowledge and a practical facility with GIS. Students who already hold a baccalaureate or master's degree will acquire the requisite skills and knowledge to switch careers, or to apply spatial analysis in their present workplaces. Students will be positioned to pursue additional coursework toward an associate degree and/or transfer to a four-year institution for further study in the geospatial, environmental, or physical sciences; in civil engineering; in information technology; or in business/marketing at a four-year institution.</p>																																					
<p>Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy</p> <p>Operationalized Definition: We evaluate hands on examples of quantitative literacy by evaluating final class projects against a QL rubric</p>																																					
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<p>Course Name/Number: Geographical Information Systems II - GIS 201</p> <p>Direct Measure Used: Final evaluation rubric of final project</p> <p>CLO/Rubric Criteria or Question Concepts: The Rubric Criteria for evaluation of the final project included 3 specific criteria:</p> <ol style="list-style-type: none"> 1. Students can translate problems into a geospatial context. 2. Students can interpret quantitative information from geospatial procedures. 3. Students can generate visual products that explain quantitative information. <p>Within a criteria, each student was evaluated on a 1-4 scale:</p> <p>1 = Student below expected level, showing little sign of progression</p> <p>2 = Student below expected level, but progressing toward satisfactory achievement</p> <p>3 = Student at expected achievement level</p> <p>4 = Student understanding beyond required level</p> <p>Sample:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 20%;">Campus/Modality</th> <th style="width: 15%;">Total # of Sections Offered</th> <th style="width: 15%;"># Sections Assessed</th> <th style="width: 50%;"># Students Assessed</th> </tr> </thead> <tbody> <tr> <td>LO only</td> <td>1</td> <td>1</td> <td>15</td> </tr> <tr> <td>NOVA Online</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Off-Site Dual Enrollment</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Total</td> <td>1</td> <td>1</td> <td>15</td> </tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	LO only	1	1	15	NOVA Online	N/A	N/A	N/A	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	1	1	15	<p>Semester/year data collected: Spring 2021</p> <p>Target: 80% students score 3 or higher</p> <p>Results by Modality: Overall Average/Mean Scores</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 30%;">Results by Modality</th> <th style="width: 35%;">Current Results Spring 2021</th> <th style="width: 35%;">Previous Results</th> </tr> </thead> <tbody> <tr> <td>Synchronous hybrid (remote) average</td> <td>81.0%</td> <td>N/A</td> </tr> </tbody> </table> <p>Results by CLO Criteria: Percent of Students > target per criteria</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 60%;">Results by SLO Criteria/ Question Concepts</th> <th style="width: 40%;">Current Results Spring 2021</th> </tr> </thead> <tbody> <tr> <td>1. Student can translate problems into a geospatial context</td> <td>86.7%</td> </tr> <tr> <td>2. Student can interpret quantitative information from geospatial procedures</td> <td>80.0%</td> </tr> <tr> <td>3. Students can generate visual products that explain quantitative information</td> <td>80.0%</td> </tr> </tbody> </table> <p>Target Met: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially</p> <p>Narrative comparison of current results to previous results: As the evaluation of CLOs are a newer undertaking. We have yet to duplicate the evaluation of a specific CLO. Overall, we did have greater success this evaluation cycle, but it was a different CLO and cannot be compared directly.</p> <p>Areas where students met the target: In all assessment areas (question 1-3), students surpassed our target of 80% of our students evaluate at a level of 3 or higher.</p> <p>Areas where students did NOT meet the target: In this evaluation cycle, students met all our evaluation criteria.</p>	Results by Modality	Current Results Spring 2021	Previous Results	Synchronous hybrid (remote) average	81.0%	N/A	Results by SLO Criteria/ Question Concepts	Current Results Spring 2021	1. Student can translate problems into a geospatial context	86.7%	2. Student can interpret quantitative information from geospatial procedures	80.0%	3. Students can generate visual products that explain quantitative information	80.0%	<p>1. Changes put in place since previous assessment to improve student learning: In this cycle, the biggest change was the shift to synchronous hybrid remote instruction. While not specifically put in place for the purpose of improving student outcomes, it was put in place as a significant improvement to the initial format options we had to choose from when the pandemic started. As the adoption of this technology set in, students became more accustomed to it and began utilizing some new modalities for assistance and meeting with faculty. Students frequently utilized remote office visits for academic counseling, scheduling, and assistance in class.</p> <p>2. Impact of changes on current results: We have seen a multiple fold increase in student use of office hours and a general increase in overall program enrollment.</p> <p>3. According to current results, areas needing improvement: While students can generate visual products that explain quantitative information, this seems to be harder for them than it should be.</p> <p>4. Based on current results, new actions to improve student learning: The Geospatial program will continue to evaluate course materials, assignments, deadlines, instruction format and student performance, class by class, semester by semester, within and outside of the APERS context. However, we plan to add more map production in the earlier phases of the course to eliminate or reduce and student difficulties in explaining quantitative information.</p> <p>5. Next assessment of this CLO: Spring 2024</p>	
Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed																																		
LO only	1	1	15																																		
NOVA Online	N/A	N/A	N/A																																		
Off-Site Dual Enrollment	N/A	N/A	N/A																																		
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Social Sciences, A.S.

<p>NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.</p>																																																																			
<p>Program/Discipline Purpose Statement: The Associate of Science degree in Social Sciences focuses on how human beings interact with each other in the past and present. It emphasizes, through quantitative and qualitative research methods, how social scientists develop an understanding of the ways in which humans relate to themselves and each other through beliefs, customs, organizations, and institutions. The Associate of Science degree in Social Sciences prepares students for transfer to a broad range of Bachelor of Science and Bachelor of Arts programs, in fields such as economics, geography, geographic information systems, history, political science, psychology, sociology, teacher education, and more.</p>																																																																			
<p>Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy Operationalized Definition: Students will be able to retrieve economic information and data from a variety of web-based resources and databases and analyze and interpret that data to draw conclusions about the state of the economy</p>																																																																			
Assessment Methods	Assessment Results		Use of Results																																																																
<p>Course Name/Number: Principles of Macroeconomics - ECO 201</p> <p>Direct Measure Used: The discipline assessed short-answer questions.</p> <p>SLO/Rubric Criteria or Question Concepts: Students were assessed on the following areas: 9. Report unemployment numbers 10. Evaluate trend 11. Non-farm payroll change 12. Unemployment by demographics</p> <p>Sample:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Campus/Modality</th> <th style="text-align: center;">Total # of Sections Offered</th> <th style="text-align: center;"># Sections Assessed</th> <th style="text-align: center;"># Students Assessed</th> </tr> </thead> <tbody> <tr><td>AL</td><td style="text-align: center;">5</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td>AN</td><td style="text-align: center;">11</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td>MA</td><td style="text-align: center;">6</td><td style="text-align: center;">6</td><td style="text-align: center;">159</td></tr> <tr><td>LO</td><td style="text-align: center;">9</td><td style="text-align: center;">5</td><td style="text-align: center;">90</td></tr> <tr><td>WO</td><td style="text-align: center;">4</td><td style="text-align: center;">2</td><td style="text-align: center;">53</td></tr> <tr style="background-color: #ffffcc;"><td>NOVA Online</td><td style="text-align: center;">9</td><td style="text-align: center;">9</td><td style="text-align: center;">189</td></tr> <tr style="background-color: #ffffcc;"><td>Off-Site Dual Enrollment</td><td style="text-align: center;">N/A</td><td style="text-align: center;">N/A</td><td style="text-align: center;">N/A</td></tr> <tr style="background-color: #ffffcc;"><td>Total</td><td style="text-align: center;">44</td><td style="text-align: center;">22</td><td style="text-align: center;">491</td></tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	AL	5	0	0	AN	11	0	0	MA	6	6	159	LO	9	5	90	WO	4	2	53	NOVA Online	9	9	189	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	44	22	491	<p>Semester/year data collected: Spring 2021</p> <p>Target: 75% of students will score 75% or better on the assignment and on each component</p> <p>Results by Modality: Overall Average/Mean Scores</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Results by Modality</th> <th style="text-align: center;">Current Results Spring 2021</th> <th style="text-align: center;">Previous Results</th> </tr> </thead> <tbody> <tr><td>All students assessed (weighted average)</td><td style="text-align: center;">86.97%</td><td style="text-align: center;">N/A</td></tr> <tr><td>On-campus average</td><td style="text-align: center;">N/A</td><td style="text-align: center;">N/A</td></tr> <tr><td>Synchronous hybrid (remote) average</td><td style="text-align: center;">89.74%</td><td style="text-align: center;">N/A</td></tr> <tr><td>NOVA Online average</td><td style="text-align: center;">82.54%</td><td style="text-align: center;">N/A</td></tr> <tr><td>Dual Enrollment average</td><td style="text-align: center;">N/A</td><td style="text-align: center;">N/A</td></tr> </tbody> </table> <p>Results by SLO Criteria: Percent of Students > target per criteria</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Results by SLO Criteria/ Question Concepts</th> <th style="text-align: center;">Current Results Spring 2021</th> </tr> </thead> <tbody> <tr><td>1. 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Non-farm payroll	87.37%	4. Demographics	85.34%	<p>1. Changes put in place since previous assessment to improve student learning: This was the first time the ECO discipline has tested Quantitative Literacy.</p> <p>2. Impact of changes on current results: N/A</p> <p>3. According to current results, areas needing improvement: Students did well at collecting and analyzing current data. The biggest challenge for the ECO discipline is not how the students perform but how and whether the faculty participate. Alexandria did not submit any results, and Annandale only reported the results from NOVA Online classes where the questions were built into the course. About half of the Loudoun and Woodbridge sections were tested.</p> <p>4. Based on current results, new actions to improve student learning: Student learning isn't the problem based on the data we gathered. Of more concern is the lack of data from some campuses. The questions were developed and revised by the Steering Committee and distributed to all faculty. The assessment was put into Canvas Quiz form and shared with faculty through the Canvas Commons, but many did not administer it to their students. During 2022-2023, the Economics Discipline Group intends to create a plan to ensure we are testing SLOs and CLOs at the frequency that the college wishes. We have been doing one SLO per year. With 7 SLOs, that would mean it would take 14 years to do each one twice. It is our understanding that the college would like each SLO tested at least twice in a 5-year period. This</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021
Social Sciences, A.S.

		<p>will be a significant change for a discipline that is not very strong on getting widespread assessment less frequently.</p> <p>5. Next assessment of this SLO: Quantitative/Data Literacy will next be assessed for Social Sciences in 2023-24.</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Disciplines Chemistry

<p>NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.</p>																						
<p>Program/Discipline Purpose Statement: The curriculum is designed for individuals who are interested in a professional or scientific program and who plan to transfer to a four-year college or university to complete a baccalaureate degree with a major in one of the following fields: agriculture, biology, chemistry, pre-dentistry, forestry, geology, oceanography, pharmacy, physics, physical therapy, pre-medicine, science education, or mathematics. (https://catalog.nvcc.edu/preview_program.php?catoid=8&moid=1329).</p>																						
<p>Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy Operationalize your CLO here: AS Science SLO: Students will be able to utilize mathematical calculation skills to resolve STEM-related problems</p>																						
Assessment Methods	Assessment Results	Use of Results																				
<p>Course Name/Number: General Chemistry I (CHM 111)</p> <p>Direct Measure Used: The CLO assessment was administered online through the CANVAS LMS using a four-question multiple-choice quiz. Each of questions 1 – 3 was derived from a randomized bank of equivalent questions; Question 4 was identical for all students, but multiple-choice options were randomized. Answers to subsequent questions were not dependent upon students' answers to previous questions. Students were required to: 1) View a professional-quality photo of volumetric glassware, interpret and record the liquid volume with correct significant figures; 2) Use provided values to perform a simple calculation and 3) a more complex dimensional analysis, again demonstrating correct use of significant figures; 4) Identify sources of error which could impact the precision and accuracy of their quantitative results.</p> <p>CLO/Rubric Criteria or Question Concepts:</p> <p>#1: Quantitative Data Interpretation</p> <ul style="list-style-type: none"> Did student interpret and record liquid volume in buret using correct numerical value and correct number of significant figures? <p>#2: Calculation</p> <ul style="list-style-type: none"> Did student complete volume subtraction calculation correctly and report with the correct number of significant figures? <p>#3: Thoughtful Analysis/Application</p> <ul style="list-style-type: none"> Did student use correct formula/dimensional analysis to determine molar concentration of acid with correct number of significant figures? <p>#4: Communicate Qualitatively/Identify Assumptions</p>	<p>Semester/year data collected: Spring 2021</p> <p>Target</p> <ol style="list-style-type: none"> Overall average (weighted) and individual modality average is set to 80% Average score for each criterion is set to 80%. Maintain the percentage of course sections participating in the evaluation at least 80% (for the results to be meaningful) <p>Table 2: Results – Overall Average/Mean Score by On-Campus, Online, and Dual Enrollment:</p> <table border="1"> <thead> <tr> <th>Results by Modality</th> <th>Spring 2021</th> </tr> </thead> <tbody> <tr> <td>All students assessed (weighted average)</td> <td>0.638/1 (63.8%)</td> </tr> <tr> <td>On-campus average</td> <td>N/A</td> </tr> <tr> <td>Synchronous/Asynchronous/Hybrid (Remote) average</td> <td>0.602/1 (60.2%)</td> </tr> <tr> <td>NOVA Online average</td> <td>0.762/1 (76.2%)</td> </tr> <tr> <td>Dual Enrollment average</td> <td>0.867/1 (86.7%)</td> </tr> </tbody> </table> <p>Table 3: Results by CLO Criteria <input checked="" type="checkbox"/> Average/Mean Score per criteria <input type="checkbox"/> Percent of Students > target per criteria</p> <table border="1"> <thead> <tr> <th>Results by SLO Criterion/ Question Concepts</th> <th>Spring 2021</th> </tr> </thead> <tbody> <tr> <td>1. Quantitative data interpretation</td> <td>0.668/1 (66.8%)</td> </tr> <tr> <td>2. Calculation</td> <td>0.735/1 (73.5%)</td> </tr> <tr> <td>3. Thoughtful Analysis</td> <td>0.602/1 (60.2%)</td> </tr> </tbody> </table>	Results by Modality	Spring 2021	All students assessed (weighted average)	0.638/1 (63.8%)	On-campus average	N/A	Synchronous/Asynchronous/Hybrid (Remote) average	0.602/1 (60.2%)	NOVA Online average	0.762/1 (76.2%)	Dual Enrollment average	0.867/1 (86.7%)	Results by SLO Criterion/ Question Concepts	Spring 2021	1. Quantitative data interpretation	0.668/1 (66.8%)	2. Calculation	0.735/1 (73.5%)	3. Thoughtful Analysis	0.602/1 (60.2%)	<p>1. Changes put in place since previous assessment to improve student learning and assessment: Quantitative Literacy was assessed in the current delivery method for the first time in Spring 2021. The previous delivery method (hand-graded formal lab reports) resulted in low faculty participation (only 28.9% of CHM 111/112 sections reporting data) and potentially subjective scoring.</p> <p>Since faculty and campus participation in past assessments has been low, actions were taken to improve involvement in college-wide evaluations:</p> <ol style="list-style-type: none"> The steering committee took a hands-on approach in reaching out to all full-time and adjunct faculty teaching CHM 111. Mandatory participation in the assessment was stressed repeatedly to all faculty teaching CHM 111 by steering committee members and associate deans, as well as the subject dean. The Chair sent multiple reminders of the assessment, and the importance of collecting data and sharing the data with the steering committee was emphasized via multiple emails and individual campus MSTB/Chemistry meetings. Recognizing the time and effort of faculty to administer and collect the data, the steering committee updated the assessment and delivery method by providing a standardized multiple-choice quiz that could be launched through Canvas to all CHM 111 students by their respective course instructors. Scoring was simplified and unambiguous. An Excel spreadsheet with clear, updated explanations was provided to each full-time and adjunct faculty member to document their results. <p>2. Impact of changes on current results: Target 3 results (see Table 1) demonstrate the positive impact of college-wide participation. As a result of the</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Chemistry

- Did student identify sources of quantitative titration error from the provided list?

4. Communicate Qualitatively / Identify Assumptions	0.546/1 (54.6%)
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Other Method (if used): No other method was used.

Table 1: Sample

Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed
AL	6	5	140
AN	11	10	173
MA	7	6	104
ME	N/A	N/A	N/A
LO	6	5	88
WO	6	6	82
NOVA Online	2	1	21
Off-Site Dual Enrollment	3	3	81
Total	41	36	689

Targets Met: [] Yes [] No [X] Partially

Current Results improved vs. Previous Results:
[] Yes [] No [] Partially [X] N/A

Narrative comparison of current results to previous results:

Due to major changes in the format of the Quantitative Literacy assessment and the courses assessed, comparison of current semester results to previous results is neither valid nor beneficial. The previous assessment (Spring 2018) evaluated QL criteria using *hand-graded formal laboratory reports from both CHM 111 and CHM 112*. The current assessment employs a standardized multiple-choice quiz that is launched through Canvas to all CHM 111 students by their respective course instructors. The rubric has been modified and grading is now completed within the LMS, thus eliminating ambiguity.

NOTE: All students were fully remote for the lecture and laboratory components of CHM 111 in Spring 2021, due to COVID-19 pandemic restrictions. Laboratory activities were limited to pre-recorded videos, commercial (vendor) simulations, and/or synchronous Zoom demonstrations.

Areas where students met the target:

Target 1. Off-Site Dual Enrollment students exceeded Target 1, with an average score of 86.7% (see **Table 2**). Students' scores in the one reporting **NOVA Online** section fell slightly short of Target 1, with an average score of 76.2%.

Areas where students did NOT meet the target:

Target 1. Synchronous/Asynchronous/Hybrid (Remote) students did not meet Target 1, scoring an average of 60.2% on the assessment. Given that this modality comprised 85% of the students assessed, the weighted average score for **all** students was 63.8% (see **Table 2**).
Target 2. Average student scores for each of the four criteria were less than the target of 80% - see **Table 3**.

concerted effort to improve participation in these college-wide assessments, 87.8% (36/41) of all sections of CHM 111 submitted results, as opposed to a 28.9% participation rate in 2018. The sample population of students assessed has increased dramatically, and the method of delivery no longer includes subjective grading.

3. According to current results, areas needing improvement:

According to current results, areas needing improvement include Quantitative Data Interpretation, Data Analysis/Application, and Identification of Quantitative Assumptions/Errors.

All students were fully remote for the lecture and lab components of CHM 111 in Spring due to COVID-19 pandemic restrictions, *which hampered instructor efforts to provide experiential learning opportunities and practice that incorporated immediate instructor feedback, especially in the laboratory component of the course.*

4. Based on current results, new actions to improve student learning:

CHM 111 instructors college-wide will be given the results of this assessment and feedback from the steering committee, emphasizing the need to reinforce quantitative interpretation and analysis skills, with layered/repeated exposure to concepts and skills.

Instructors will be encouraged to incorporate additional experiential learning opportunities/assignments that allow individual student misconceptions and quantitative errors to be remediated immediately. As of Fall 2021, 97% of all CHM 111 lab sections require on-campus student attendance. It is anticipated that the resumption of experiential "in-person" lab activities will also improve student learning opportunities.

5. Next assessment of this SLO: Spring 2024

CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Chemistry

	<p>Question 1 required students to view a professional-quality photo of volumetric glassware, interpret and record the liquid volume with correct significant figures. 66.8% of students were able to interpret the photo and report the volume successfully, despite not having had opportunity to practice using the volumetric glassware in the lab.</p> <p>Question 2 required students to complete a volume subtraction calculation and report with the correct significant figures. Students had greatest success with this skill, at 73.5% success. This activity is ordinarily practiced in both the classroom and lab throughout the semester.</p> <p>Question 3 required students to utilize appropriate dimensional analysis techniques to determine the molar concentration of acid – requiring more advanced analysis skills than Question 2. Although introduced in lecture, this skill is routinely applied/reinforced during laboratory data analysis. Students struggled with this question, achieving 60.2% success college-wide.</p> <p>Question 4 required students to identify sources of quantitative titration error. It required both familiarity with sources of quantitative error and knowledge of titration vocabulary. Not having had an opportunity to practice using the titration glassware in lab, many students struggled to visualize the variety of practical mistakes that lead to quantitative errors, resulting in 54.6% success.</p> <p>Target 3 is discussed in <i>Use of Results</i> section.</p>	
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Economics

NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.

Program/Discipline Purpose Statement: Economics provides an objective interpretation of human behavior. Rational and predictable economic behavior allows for the quantification and logical analysis of many social problems. Also, an understanding of how the national and international economy functions is critical to success in today's business environment. At the macro-level, how national governments influence the economy and how that affects industry are pertinent to students entering the business world. At the micro-level, explorations of consumer theory, theory of the firm, market structures, and resource markets contribute to students' understanding of the underpinnings of capitalism.

Core Learning Outcome: **Critical Thinking** **Quantitative Literacy**
 Operationalized Definition: Students will be able to retrieve economic information and data from a variety of web-based resources and databases and analyze and interpret that data to draw conclusions about the state of the economy. [Modification of SLO 5b]

Assessment Methods	Assessment Results	Use of Results																																																														
<p>Course Name/Number: Principles of Macroeconomics, ECO 201</p> <p>Direct Measure Used: Short-answer questions (attached)</p> <p>CLO/Rubric Criteria or Question Concepts:</p> <ul style="list-style-type: none"> 13. Report unemployment numbers 14. Evaluate trend 15. Non-farm payroll change 16. 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If you assessed the same CLO as you did in 2017-2018.</small></p> <p>Results by CLO Criteria:</p> <p><input type="checkbox"/> Average/Mean Score per criteria or <input checked="" type="checkbox"/> Percent of Students > target per criteria</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Results by CLO Criteria/Question Concepts</th> <th>Current Results Spring 2021</th> </tr> </thead> <tbody> <tr><td>1. Unemployment #</td><td>87.58%</td></tr> <tr><td>2. Evaluate trend</td><td>87.17%</td></tr> <tr><td>3. Non-farm payroll</td><td>87.37%</td></tr> <tr><td>4. 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The biggest challenge for the ECO discipline is not how the students perform but how and whether the faculty participate. Alexandria did not submit any results and Annandale only reported the results from NOVA Online classes where the questions were built into the course. About ½ of the Loudoun and Woodbridge sections were tested.</p> <p>4. Based on current results, new actions to improve student learning: Student learning isn't the problem based on the data we gathered. Of more concern is the lack of data from some campuses. The questions were developed and revised by the Steering Committee and distributed to all faculty. The assessment was put into Canvas Quiz form and shared with faculty through the Canvas Commons but many did not administer it to their students. During 2022-2023, the Economics Discipline Group intends to create a plan to ensure we are testing SLOs and CLOs at the frequency that the college wishes. We have been doing one SLO per year. With 7 SLOs, that would mean it would take 14 years to do each one twice. It is our understanding that the college would like each SLO tested at least twice in a 5 year period. This will be a significant change for a discipline that is not very strong on getting widespread assessment less frequently.</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021
Economics

	<p>Current Results improved vs. Previous Results: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Partially <input type="checkbox"/> N/A</p> <p>Narrative comparison of current results to previous results: In 2017-2018, the ECO discipline measured Critical Thinking BUT there was not enough participation for a report to be completed.</p> <p>Areas where students met the target: Students met all targets, both overall and on individual questions.</p> <p>Areas where students did NOT meet the target: None</p>	<p>5. Next assessment of this CLO: 2026-27 AY</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Physics

NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.

Program/Discipline Purpose Statement: The curriculum is designed for individuals who are interested in a professional or scientific program and who plan to transfer to a four-year college or university to complete a baccalaureate degree with a major in one of the following fields: agriculture, biology, chemistry, pre-dentistry, forestry, geology, oceanography, pharmacy, physics, physical therapy, pre-medicine, science education, or mathematics.

Core Learning Outcome: **Critical Thinking** **Quantitative Literacy**
 Operationalized Definition: Operationalized Definition: (Physics SLOs #1 and 5): Students will demonstrate the principles of physics in the analysis of physics problems. Students will demonstrate ability to read, understand, and critically analyze their observations and measurements

Assessment Methods	Assessment Methods	Assessment Methods																																																
<p>Course Name/Number: Introduction to Physics I - PHY 101.</p> <p>Direct Measure Used: Students performed laboratory experiments to interpret data. Students took tests aimed to analyze simple physics problems. Average grades from laboratory and from tests assessments were collected. In addition, to gauge the correctness of the application and the analysis of the physics learned, the overall course grade was used as a measure of success.</p> <p>CLO/Rubric Criteria or Question Concepts:</p> <ul style="list-style-type: none"> • Data Interpretation: criterion 1 used the grade average of Laboratory reports. • Correct Calculations: criterion 2 used the grade average of tests. • Application and analysis: criterion 3 used the overall course grade. <p>Sample:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Campus/Modality</th> <th>Total # of Sections Offered</th> <th># Sections Assessed</th> <th># Students Assessed</th> </tr> </thead> <tbody> <tr><td>AN</td><td>5</td><td>4</td><td>72</td></tr> <tr><td>MA</td><td>2</td><td>1</td><td>25</td></tr> <tr><td>LO</td><td>2</td><td>1</td><td>24</td></tr> <tr><td>WO</td><td>2</td><td>2</td><td>26</td></tr> <tr style="background-color: #ffffcc;"><td>NOVA Online</td><td>4</td><td>4</td><td>77</td></tr> <tr style="background-color: #ffffcc;"><td>Off-Site Dual Enrollment</td><td>N/A</td><td>N/A</td><td>N/A</td></tr> <tr style="background-color: #d3d3d3;"><td>Total</td><td>15</td><td>12</td><td>224</td></tr> </tbody> </table>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	AN	5	4	72	MA	2	1	25	LO	2	1	24	WO	2	2	26	NOVA Online	4	4	77	Off-Site Dual Enrollment	N/A	N/A	N/A	Total	15	12	224	<p>Semester/year data collected: Spring 2021</p> <p>Target: 70% of students earning a grade of 70% or higher</p> <p>Results: Overall Average/Mean Score by On-Campus, Online, and Dual Enrollment:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Results by Modality</th> <th>Current Results Spring 2021</th> </tr> </thead> <tbody> <tr><td>All students assessed (weighted average)</td><td>80%</td></tr> <tr><td>Synchronous hybrid (remote) average</td><td>81%</td></tr> <tr><td>NOVA Online average</td><td>78%</td></tr> </tbody> </table> <p>Results by CLO Criteria: Percent of Students > target per criteria - In the table below, the percentage of students who scored 70% or higher is reported for each criterion.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Results by SLO Criteria/ Question Concepts</th> <th>Current Results Spring 2021</th> </tr> </thead> <tbody> <tr><td>1. 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Although the direct</p>	Results by Modality	Current Results Spring 2021	All students assessed (weighted average)	80%	Synchronous hybrid (remote) average	81%	NOVA Online average	78%	Results by SLO Criteria/ Question Concepts	Current Results Spring 2021	1. Data Interpretation	85%	2. Correct calculations	75%	3. Application / Analysis	82%	<p>1. Changes put in place since previous assessment to improve student learning: One of the action plans that stemmed from the last physics discipline review was to rewrite the PHY 101 objectives to better align them with the students’ own academic and professional interests and goals. Physics 101 is a course for non-science majors. The change was put in place to increase the student engagement and hence increase student success. A second change inaugurated this remote semester was a different rubric. Instructors had to collect the final semester scores of their students in three different areas: laboratory reports, test assessments, and overall course grade.</p> <p>2. Impact of changes on current results: The higher success rate of the students is a tangible measure of the impact of the changes introduced. The new rubric provided a more holistic approach to measuring student success. This change also facilitated data collection from the instructors, greatly improving the faculty participation. 12 out of 15 sections assessed the CLO.</p> <p>3. According to current results, areas needing improvement: The physics discipline group will continue to perfect the new rubric and to adapt it to an even more comprehensive data collection. The goal is for all sections to take part of the assessment. In the future, Associate Deans will be asked to participate in the effort of communicating the importance of the CLO.</p> <p>4. Based on current results, new actions to improve student learning: In the near future, Transfer VA will ask for this specific conceptual physics course to be combined with the following semester sequence course, the two semesters will join into one: PHY 101 and PHY</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Physics

	<p>measure was different, it is interesting to note how the current results surpass the previous.</p> <p>Areas where students met the target: Students were able to successfully interpret data, perform the relevant calculations, and draw logical conclusions in their analysis.</p> <p>Areas where students did NOT meet the target: None</p>	<p>102 will become PHY 100. Work will be done to support a smooth transition.</p> <p>5. Next assessment of this CLO: The specific CLO Quantitative reasoning will be assessed for physics on the spring 2027.</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

Political Science

<p>NOVA Mission Statement: With commitment to the values of access, opportunity, student success, and excellence, the mission of Northern Virginia Community College is to deliver world-class in-person and online post-secondary teaching, learning, and workforce development to ensure our region and the Commonwealth of Virginia have an educated population and globally competitive workforce.</p> <p>Program/Discipline Purpose Statement: This program is designed for individuals who plan to transfer to a four-year college or university to complete a baccalaureate degree. Graduates will have the knowledge, skills, and abilities equivalent to students entering the junior level at four-year colleges and universities.</p> <p>Core Learning Outcome: <input type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Quantitative Literacy</p> <p>Operationalized Definition: PLS SLO #3: "Students will be able to recognize the methods, approaches, or theories used in accumulating and interpreting information applicable to the discipline of political science."</p>																																																													
Assessment Methods	Assessment Results	Use of Results																																																											
<p>Course Name/Number: American National Politics, PLS 135</p> <p>Direct Measure Used: Multiple Choice questions focused on basic polling concepts and interpreting a Gallup Poll.</p> <p>CLO/Rubric Criteria or Question Concepts: Ability to understand and interpret polling data in American politics. The first set of questions focuses on a broad understanding of polling, and the second set of questions focuses on an analysis of polling.</p> <p>Other Method (if used):</p> <p>Sample:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 20%;">Campus/Modality</th> <th style="width: 15%;">Total # of Sections Offered</th> <th style="width: 15%;"># Sections Assessed</th> <th style="width: 50%;"># Students Assessed</th> </tr> </thead> <tbody> <tr><td>AL</td><td>2</td><td>1</td><td>21</td></tr> <tr><td>AN</td><td>1</td><td>1</td><td>21</td></tr> <tr><td>MA</td><td>1</td><td>1</td><td>7</td></tr> <tr><td>ME</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>LO</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>WO</td><td>0</td><td>0</td><td>0</td></tr> <tr style="background-color: #ffff00;"><td>NOVA Online</td><td>3</td><td>3</td><td>53</td></tr> <tr style="background-color: #ffff00;"><td>Off-Site Dual Enrollment</td><td>0</td><td>0</td><td>0</td></tr> <tr style="background-color: #ffff00;"><td>Total</td><td>8</td><td>6</td><td>108*</td></tr> </tbody> </table> <p>*Approximate number: data counts number of people who answered questions, and some questions were skipped.</p>	Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed	AL	2	1	21	AN	1	1	21	MA	1	1	7	ME	0	0	0	LO	1	0	0	WO	0	0	0	NOVA Online	3	3	53	Off-Site Dual Enrollment	0	0	0	Total	8	6	108*	<p>Semester/year data collected: Spring 2021</p> <p>Target: 70%</p> <p>Results: Overall Average/Mean Score by On-Campus, Online, and Dual Enrollment:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 50%;">Results by Modality</th> <th style="width: 50%;">Current Results Semester Year</th> </tr> </thead> <tbody> <tr><td>All students assessed (weighted average)</td><td>62%</td></tr> <tr><td>On-campus average</td><td>56%*</td></tr> <tr><td>Synchronous hybrid (remote) average</td><td>61%</td></tr> <tr><td>NOVA Online average</td><td>66%</td></tr> <tr><td>Dual Enrollment average</td><td>NA</td></tr> </tbody> </table> <p>*On-campus was actually synchronous Zoom classes because of COVID. We did not assess CLO Quantitative Literacy so there is nothing to compare to.</p> <p>Results by CLO Criteria: <input checked="" type="checkbox"/> Average/Mean Score per criteria or <input type="checkbox"/> Percent of Students > target per criteria</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 50%;">Results by CLO Criteria/Question Concepts</th> <th style="width: 50%;">Current Results Semester Year</th> </tr> </thead> <tbody> <tr><td>1. General Polling Concepts</td><td>69%</td></tr> <tr><td>2. Polling Data Analysis</td><td>61%</td></tr> </tbody> </table> <p>Target Met: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Partially With a 70% target, 69% for General Polling Concepts, rounding up has PLS hitting the minimum target of 70%. But the Polling Data Analysis comes up short. It is possible that students just did not prepare adequately to understand the questions, but it's also possible that they did not read the article preceding the questions, which indisputably</p>	Results by Modality	Current Results Semester Year	All students assessed (weighted average)	62%	On-campus average	56%*	Synchronous hybrid (remote) average	61%	NOVA Online average	66%	Dual Enrollment average	NA	Results by CLO Criteria/Question Concepts	Current Results Semester Year	1. General Polling Concepts	69%	2. Polling Data Analysis	61%	<p>1. Changes put in place since previous assessment to improve student learning: NA.</p> <p>2. Impact of changes on current results: NA</p> <p>3. According to current results, areas needing improvement: PLS Faculty need to carefully assess students' reading comprehension abilities to make sure they are provided with the time necessary to answer questions. There were no time limits with the material, so faculty will consider if more explanation is necessary to address all material. For the General Polling Concepts, although the target was met, the score can improve, so a more thorough explanation of margins of error and confidence intervals will be provided. Faculty will discuss a shared information source, perhaps through Google Docs or Slides, to make sure all are covering these important terms and sharing that information with students. In-class sessions will take place to assess students' abilities to read through and understand reading materials.</p> <p>4. Based on current results, new actions to improve student learning: Much of what PLS Faculty will do was presented above, in the answer to question 3. Efforts by faculty will include the following:</p> <ul style="list-style-type: none"> - Meeting of PLS Faculty to assess questions and essay. - Design Google Doc and Slide material to make sure concepts are presented from a basic area of understanding. - Allow Doc and Slide material to be accessible to students. 	
Campus/Modality	Total # of Sections Offered	# Sections Assessed	# Students Assessed																																																										
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021
Political Science

	<p>contained all the information they needed to successfully answer the questions. Considering students did better on the questions that did not contain information in the essay, making sure students know to read more carefully in taking this assessment will be important for future efforts.</p> <p>Current Results improved vs. Previous Results: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially <input checked="" type="checkbox"/> N/A</p> <p>Narrative comparison of current results to previous results: NA</p> <p>Areas where students met the target: Students were able to answer questions of a general nature on polling, which included the following questions: 1) A question on a famous 1936 polling error; and 2) Two questions related to understanding margin of error and confidence intervals, which relate to basic concepts of polling accuracy and statistics.</p> <p>Areas where students did NOT meet the target: As mentioned above, students performed below the target regarding questions related to Gallup polling data that appeared in essay form. A more careful reading of the essay could have provided students with the information they needed to answer the questions correctly.</p>	<p>- Evaluate student abilities with in-class exercises that involve presentation or essays, reading comprehension, and ability to answer questions regarding polling data. This will help faculty design assessment measures that consider diverse capabilities.</p> <p>5. Next assessment of this CLO: For the spring semester that the Assessment Office designates as the Quantitative Literacy CLO period.</p>
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CORE LEARNING OUTCOMES ASSESSMENT REPORTS: QUANTITATIVE LITERACY 2020-2021

PATHWAY TO THE AMERICAN DREAM

NOVA's Strategic Plan 2017-2023

THE NOVA COMMITMENT

As its primary contributions to meeting the needs of the Commonwealth of Virginia, the Northern Virginia Community College pledges to advance the social and economic mobility of its students while producing an educated citizenry for the 21st Century.

THE STRATEGIC PLAN GOALS AND OBJECTIVES

To deliver on this commitment NOVA will focus its creativity and talent, its effort and energy, and its resources and persistence, on achieving three overarching goals—success, achievement, and prosperity. It will strive to enable **Every Student to Succeed, Every Program to Achieve, and Every Community to Prosper.**

To advance the completion agenda described above, thereby promoting students' success and enhancing their social mobility, ensuring that programs achieve, and producing an educated citizenry for the 21st Century, the following goals and objectives are adopted:

GOAL 1: Every Student Succeeds

- **Objective 1:** Develop a College-wide approach to advising that ensures all students are advised and have access to support throughout their time at NOVA
- **Objective 2:** Implement VIP-PASS System as the foundational technology based on NOVA Informed Pathways for student self-advising, assignment and coordination of advisors, and course registration

GOAL 2: Every Program Achieves

- **Objective 3:** Develop comprehensive, fully integrated Informed Pathways for every program to ensure seamless transitions from high school and other entry points to NOVA, and from NOVA to four-year transfer institutions or the workforce
- **Objective 4:** Develop effective processes and protocols for programmatic College-wide collective decisions that include consistent, accountable leadership and oversight of each academic program with designated "owners," active advisory committees, clear student learning outcomes and assessments, and program reviews in all modalities of instruction
- **Objective 5:** Align NOVA's organizational structures, position descriptions, and expectations for accountability with its overarching mission to support student engagement, learning, success and institutional effectiveness

GOAL 3: Every Community Prospers

- **Objective 6:** Enhance the prosperity of every community in Northern Virginia by refocusing and prioritizing NOVA's workforce development efforts
- **Objective 7:** Further develop NOVA's IT and Cybersecurity programs to support regional job demand and position NOVA as the leading IT community college in the nation
- **Objective 8:** Re-envision workforce strategies and integrate workforce development into a NOVA core focus
- **Objective 9:** Plan to expand the breadth and reach of NOVA's healthcare and biotechnology programs, and prioritize future programs to support regional economic development goals

NOVA

**Northern Virginia
Community College**

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