Student Learning Assessment Report (SLAR)

"How are students learning?"

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Department: Natural and Applied Sciences **Program Coordinator: Dr. Don Tosh**

Academic Program Evaluated: Applied Mathematics **Program Review Year: 2020-2021**

	Year 1 **Academic Year: 2019-2020**	Year 2 **Academic Year:**	Year 3 **Academic Year:**	Year 4 **Academic Year:**
Faculty members involved in this assessment process: (List all faculty members who participated: program coordinator, reviewers, committee members, etc.)	Dr. Don Tosh, full professor, program coordinator, and artifact assessor Mrs. Dianne Twigger, assistant professor and artifact assessor Dr. William Cook, associate professor and artifact assessor.			
Number of students in sample: (If known, supply the number of students in	Freshmen: Sophomores: Juniors:	Freshmen: Sophomores: Juniors:	Freshmen: Sophomores: Juniors:	Freshmen: Sophomores: Juniors:

each class/year who were used in the assessment report.)	Seniors: Graduate:	Seniors: Graduate:	Seniors: Graduate:	Seniors: Graduate:
Instrument(s) used in assessment: (List the exams, standardized tests, portfolios, etc. that were used in the assessment process.)	Instruments are listed by outcome measured: Developing Problem Solving Skills: • Related Rates Quiz Math 231 • Quiz 1 Math 232 • Quiz 5 Math 232 • Quiz 3 Phys 231 • Quiz 1 Phys 232 • Final exam Math 431 Improve Technological Skills: • Hypothesis testing assignment Math 210 • Modeling assignment Math 431 Model Electromagnetic Processes: • Quiz 9 Phys 232 • Quiz 3 Phys 245 Model Mechanical Processes: • Quiz 4 in Phys 231 • Quiz 6 in Phys 231			

	Model Thermodynamic Processes: • Quiz 3 Phys 232			
Additional Data: (List any additional information/data that informed this report.)				
Methodology: (Explain the method of data collection and the data analysis process.)	Using 4-point scale rubrics, assessors scored student work on instruments above in Course Commons. A score of 3 or higher indicates mastery, and if a student is assessed on multiple assignments, the highest score prevails. Data was exported into excel for analysis.			
Data: (Provide the graphs, charts, etc. that were used to show PLO data results. Do not include the raw data.)	**Results of Assessment (mea scores on a scale of 0-4; 3+ considered proficient)** Students are assessed on five themes (Program Level Outcomes) 1. Develop Problem Solving Skills (mean 3.769, n=6) 2. Improve Technological Skills			

	(mean 3.667, n=3) 3. Model Electromagnetic Processes: (mean 3.8, n=3) 4. Model Mechanical Processes: (mean 4, n=2) 5. Model Thermodynamic Processes: (mean 4, n=2)			
Results of Assessment: (What evidence exists that the program helps students achieve learning outcomes? What changes have been made since the last APR to ensure that outcomes are achieved and what changes will be made to the program following this APR? What have you learned from assessing the changes?)	Based on the data above, students are achieving mastery on these five program level outcomes as they progress through the program. Data counts are low, as this is the first year we have collected data for this program separate from the mathematics program. Since there are three tracks to the program, PLOs are assessed in courses that all students take. The juniors and seniors within our program had taken these courses prior to this			

	academic year so these students were not assessed on these outcomes.			
Strengths: **(From the findings, list the areas of strengths that currently exist in the academic program.)**	The program is meeting its goals in regards to program level outcomes. Faculty have begun independent data collection for this program.			
Areas in need of improvement: **(From the findings, list the areas of weakness(s) that currently exist in the academic program.)**	No major weaknesses noted. Due to Covid and the transition to online classes, less data was collected for improving technological skills as students were unable to access campus software. Given that the pandemic has the potential to continue on into the next academic year, faculty			

	should look into other options for meeting this objective.			
Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)** *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.	Ensure that all faculty are including new PLO data. Program coordinator will verify this with all artifact assessors. Program coordinator and full time faculty teaching within the program will re-evaluate program level outcomes for the following academic year.			
Improvements made: **(List completed improvement plans and dates of actual implementation.)** *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.	Not applicable as in first year of data collection.			

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Department: Natural and Applied Sciences **Program Coordinator:** **Michael Tenneson**

Academic Program Evaluated: Applied Science and Sustainability **Program Review Year:** **2019-2020**

	Year 1 **Academic Year:** 2016-2017	Year 2 **Academic Year:**	Year 3 **Academic Year: 2018-2019**	Year 4 **Academic Year: 2019-2020**
Faculty members involved in this assessment process: **(List all faculty members who participated: program coordinator, reviewers, committee members, etc.)**	1. Erica Harris, Assistant Professor of Biology Artifact Assessor 2. Joshua Kendall, Assistant Professor of Environmental Science Artifact Assessor 3. Jason Streubel, Associate Professor of Environmental Science Artifact Assessor		1. Erica Harris, Assistant Professor of Biology Artifact Assessor 2. Jonathan LeCureux, Assistant Professor of Biology Artifact Assessor 3. Jason Streubel, Associate Professor of Environmental Science Artifact Assessor 4. Michael Tenneson, Professor o Biology Artifact Assessor	1. Erica Harris, Assistant Professor of Biology Artifact Assessor 2. Jonathan LeCureux, Assistant Professor of Biology Artifact Assessor 3. Julie Mayne, Assistant Profess of Biology, Artifact Assessor 4. Jason Streubel, Associate Professor of Environmental Science Artifact Assessor 5. Michael Tenneson, Professor o Biology Artifact Assessor
Number of students in sample: **(If known, supply the number of**	Freshmen:4 Sophomores:3 Juniors:0	Freshmen: 2 Sophomores:0 Juniors: 3	Freshmen: 3 Sophomores:4 Juniors:2	Freshmen: Sophomores: Juniors:

students in each class/year who were used in the assessment report.)	Seniors:3 Graduate:0	Seniors:5 Graduate:	Seniors:5 Graduate:	Seniors: Graduate: N=6 total
Instrument(s) used in assessment: (List the exams, standardized tests, portfolios, etc. that were used in the assessment process.)	1. Ecosystem Observation Project BIOL 342 Ecology 2. Critical thinking assignment (Animal Behavior) in BIOL 20 Botany Critical thinking 3. Critical thinking assignment (Ethics of Extinction) in BIOL 343 Environmental Biology 4. Laboratory Final in BIOL 202 Botany 5. Laboratory worksheets in CHE 111 General Chemistry * 6. Laboratory worksheets in BIOI 202 Botany 7. SWOT Analysis of Mt. Suswa Kenya in BIOL 343 Environmental Biology 8. Traffic Analysis Springfield, M in BIOL 343 Environmental Biology		1. Ecosystem Observation Project BIOL 342 Ecology 2. Critical thinking assignment (Animal Behavior) in BIOL 20 Botany Critical thinking 3. Critical thinking assignment (Ethics of Extinction) in BIOL 343 Environmental Biology 4. Laboratory Final in BIOL 202 Botany 5. Laboratory worksheets in CHE 111 General Chemistry * 6. Laboratory worksheets in BIOI 202 Botany 7. SWOT Analysis of Mt. Suswa Kenya in BIOL 343 Environmental Biology 8. Traffic Analysis Springfield, M in BIOL 343 Environmental Biology 1.	Using 4-point scale rubrics, assessors scored student work on instruments above in Course Commons. 1. Taxonomy items on unit test in BIOL 201 Zoology 2. Laboratory exam 1 in BIOL 20 Zoology 3. Unknown microbe lab report in BIOL 335 Microbiology 4. Missouri plant visual identification exam in BIOL 34 Ecology 5. Group investigation lab report BIOL 200 General Biology 6. Take-home exam in BIOL 335 Microbiology 7. Primary article analysis in BIO 338 Genetics 8. Group investigation lab report BIOL 342 Ecology 9. Poster presentation in BIOL 43 Cell Biology 10. Literature review paper in BIO 496 Senior Seminar 11. Group investigation lab report BIOL 200 General Biology 12. Laboratory presentation in BIO 202 Botany 13. Oral exam in BIOL 335 Microbiology 14. Oral exam in BIOL 335 Microbiology 15. Primary article presentation in BIOL 338 Genetics

				16. Group investigation presentatic in BIOL 342 Ecology 17. Oral presentation in BIOL 496 Senior Seminar 18. Lab notebook reflection in BIC 202 Botany 19. Lab notebook in BIOL 338 Genetics 20. Lab exam in BIOL 200 Genera Biology 21. Primary article analysis in BIO 200 General Biology 22. Final exam in BIOL 342 Ecolo Paper critique in BIOL 437 Cell Biology
Additional Data: (List any additional information/data that informed this report.)				
Methodology: (Explain the method of data collection and the data analysis process.)	Using 4 point scale rubrics, assessors scored student work on instruments abo in Course Commons. For all four areas assessed, student average scores are wel above proficient (score of 3+). Students are doing particularly well in demonstrating the use technology associated with the study of environmer science.		Using 4 point scale rubrics, assessors scored student work on instruments abo in Course Commons. For all four areas assessed, student average scores are wel above proficient (score of 3+). Students are doing particularly well in demonstrating the use technology associated with the study of environmer science	Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**
Data: (Provide the graphs, charts, etc. that were used to show PLO **data results. Do not include the raw data.)**	**Results of Assessment (mean scores o scale of 1-4; 3+ considered proficient)** The student will be able to apply the scientific method to research problems in the environmental science field: **mean=3.15** Use classroom theory to field		**Results of Assessment (mean scores o scale of 1-4; 3+ considered proficient)** The student will be able to apply the scientific method to research problems in the environmental science field **Mean =3.57 (n=14)**	**Results of Assessment (mean scores o scale of 1-4; 3+ considered proficient)** The student will be able to apply the scientific method to research problems in the environmental science field **Mean =3.35 (n=4)**

	understanding and application by participation in off campus class opportunities: **mean =3.75** Demonstrate the use technology associated with the study of environmental science: **mean = 3.76** Communicate a scientifically informed world view through writing: **mean= 3.55**		Use classroom theory to field understanding and application by participation in off campus class opportunities **Mean = 3.17 (n=47)** Use technology associated with the study of environmental science **Mean = 3.15 (n=14)** Communicate a scientifically informed world view through writing. **Mean = 3.15 (n=48)**	Use classroom theory to field understanding and application by participation in off campus class opportunities **Mean = 3.67 (n=2)** Use technology associated with the study of environmental science **Mean = 3.89 (n=2)** Communicate a scientifically informed world view through writing. **Mean = 3.51 (n=6)**
Results of Assessment: (What evidence exists that the program helps students achieve learning outcomes? What changes have been made since the last APR to ensure that outcomes are achieved and what changes will be made to the program following this APR? What have you learned from assessing the changes?)	For all four areas assessed, student aver scores are well above proficient (score c 3+). Students are doing particularly wel demonstrating the use technology associated with the study of environmer science. Students showed the lowest levels of proficiency in applying the scientific method to research problems in environmental science.		For all four areas assessed, student average scores are well above proficient (score of 3+).	1) For all four areas assessed, student average scores are well above proficient (score of 3+). Students are doing particularly well in demonstrating the use technology associated with the study of environmental science. 2) Students are scoring the lowest in applying principles to real world problems.
Strengths: (From the findings, list the areas of strengths that currently exist in the academic program.)			1) Students are doing particularly well in demonstrating the use technology associated with the study of environmental science. 2) Students are continuing to grasps the interconnectedness of the study of environment and the rest of the sciences.	Since students weren't sorted by major in previous analyses, we aren't able to make comparative statements with previous years. However, it appears students are doing very well in demonstrating appropriate technologies.

			3) Students are leaving EU undergraduate education and going onto MS and PhD programs successfully succeed at that level.	
Areas in need of improvement: (From the findings, list the areas of weakness(s) that currently exist in the academic program.)	Students showed the lowest levels of proficiency in applying the scientific method to research problems in environmental science.		1) Students showed the lowest levels of proficiency in "Use classroom theory to field understanding and application by participation in off campus class opportunities," "Use technology associated with the study of environmental science," and "Communicate a scientifically informed world view through writing."	Students need the most improvement in making real life applications of those technologies
Plans for improvement: (Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.) *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.	Develop innovative ways to apply the scientific method to problem solving in the real world. Show 10% in mean proficiencies in this area at end of Fall 2017. Kendall, Streubel Improve training in scientific writing skills. Show 10% gains in mean proficiencies by end of Fall 2017. Harris, Kendall, Streubel, Tenneson	Create new name Fall 18 Mike Tenneson, Jason Streubel	Increase lab instrumental proficiency 2019 – 2020 School year Jason Streubel Divide Major into two tracks Fall 2019 Mike Tenneson, Jason Streubel Increase assessment reporting Fall 2019 Jason Streubel	Make an internship a requirement for the major. Implemented Fall 2019. Program coordinator and full time faculty teaching within the program will reevaluate program level outcomes for the following academic year.
Improvements made: (List completed improvement plans and dates of actual implementation.) *If an A.A. degree is part of this program, describe how the changes to this	These assessment scores will serve as a benchmark to evaluate student outcome in the future. Applied Science faculty w develop pedagogical changes to be implemented in future semesters in each the areas outlined above.	New name Applied Science and Sustainability Spring 2018	Students made research proposals using newer chemistry analytical equipment Divided major into environmental science and compassion tracks Su2019 Mike Tenneson Jason Streubel Streubel increased assessment	Made an internship a requirement for the major. Implemented Fall 2019.

program affect the A.A. degree, if any.			reporting	

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Department: Natural and Applied Sciences **Program Coordinator: Jonathan LeCureux**

Academic Program Evaluated: Biology **Program Review Year: 2019-2020**

	Year 1 Academic Year: 2016-2017	**Year 2 Academic Year:** 2017-2018	**Year 3 Academic Year:** 2018-2019	**Year 4 Academic Year:** 2019-2020
Faculty members involved in this assessment process: (List all faculty members who participated: program coordinator, reviewers, committee members, etc.)	4. Erica Harris, Assistant Professor of Biology Artifact Assessor 5. Joshua Kendall, Assistant Professor of Environmental Science Artifact Assessor 6. Jason Streubel, Associate Professor of Environmental Science Artifact Assessor		5. Erica Harris, Assistant Professor of Biology Artifact Assessor 6. Jonathan LeCureux, Assistant Professor of Biology Artifact Assessor 7. Jason Streubel, Associate Professor of Environmental Science Artifact Assessor 8. Michael Tenneson, Professor o Biology Artifact Assessor	1. Jonathan LeCureux, Assistant Professor of Biology Artifact Assessor 2. Erica Harris, Associate Professor of Biology Artifact Assessor 3. Julie Mayne, Assistant Professor of Biology Artifact Assessor 4. Michael Tenneson, Professor of Biology Artifact Assessor
Number of students in sample: (If known,	Freshmen: 29 Sophomores: 21 Juniors: 8	Freshmen: Sophomores: Juniors:	Freshmen: 36 Sophomores: 27 Juniors: 15	Freshmen: 38 Sophomores: 24 Juniors: 22

supply the number of students in each class/year who were used in the assessment report.)	Seniors: 10 Graduate: 0 Total: 68	Seniors: Graduate:	Seniors: 14 Graduate: 0 Total: 92	Seniors: 16 Graduate: 0 Total: 100
Instrument(s) used in assessment: **(List the exams, standardized tests, portfolios, etc. that were used in the assessment process.)**	Using 4-point scale rubrics, assessors scored student work on instruments above in Course Commons. 9. Taxonomy items on unit test i BIOL 201 Zoology 10. Plant collection in BIOL 202 Botany 11. Group investigation oral presentation in BIOL 200 General Biology 12. Oral presentation in BIOL 335 Microbiology 13. Oral presentation in BIOL 496 Senior Seminar 14. Group investigation lab report BIOL 200 General Biology 15. Labs in BIOL 202 Botany 16. Microorganism paper in BIOL 335 Microbiology 17. Literature review paper in BIC 496 Senior Seminar 18. Unknown microorganism lab exam in BIOL 335 Microbiolog 19. Fruit fly gene propagation lab BIOL 338 Genetics 20. Food systems project in BIOL 202 Botany 21. Primer design exercise in		Using 4-point scale rubrics, assessors scored student work on instruments above in Course Commons. 2. Taxonomy items on unit test i BIOL 201 Zoology 3. Laboratory exam 1 in BIOL 20 Zoology 4. Unknown microbe lab report i BIOL 335 Microbiology 5. Missouri plant visual identification exam in BIOL 34 Ecology 6. Group investigation lab report BIOL 200 General Biology 7. Take-home exam in BIOL 335 Microbiology 8. Primary article analysis in BIO 338 Genetics 9. Group investigation lab report BIOL 342 Ecology 10. Poster presentation in BIOL 4 Cell Biology 11. Literature review paper in BIC 496 Senior Seminar 12. Group investigation lab report BIOL 200 General Biology 13. Laboratory presentation in BI 202 Botany	Using 4-point scale rubrics, assessors scored student work on instruments above in Course Commons. 1. BIOL 200-Class oral participation 2. BIOL 200-Conference day session 3. BIOL 200-Group investigation lab report 4. BIOL 200-Group investigation presentation 5. BIOL 200-Laboratory exam 6. BIOL 200-Laboratory I-forms 7. BIOL 200-Scientific journal analysis 8. BIOL 200-Unit exams 9. BIOL 201-Laboratory midterm exam 10. BIOL 201-Laboratory reports 11. BIOL 201-Taxonomy unit test 12. BIOL 202-Annotated bibliography 13. BIOL 202-Annotated bibliography presentation

	BIOL 335 Microbiology		14. Oral exam in BIOL 335 Microbiology 15. Oral exam in BIOL 335 Microbiology 16. Primary article presentation in BIOL 338 Genetics 17. Group investigation presentation in BIOL 342 Ecology 18. Oral presentation in BIOL 496 Senior Seminar 19. Lab notebook reflection in BIO 202 Botany 20. Lab notebook in BIOL 338 Genetics 21. Lab exam in BIOL 200 General Biology 22. Primary article analysis in BIO 200 General Biology 23. Final exam in BIOL 342 Ecolog 24. Paper critique in BIOL 437 Cel Biology	14. BIOL 202-Botany laboratory exam 15. BIOL 202-Children's book 16. BIOL 202-Laboratory exam 17. BIOL 202-Laboratory notebook 18. BIOL 202-Oral presentation of human effects project 19. BIOL 202-Photosynthesis unit paper 20. BIOL 202-Plant taxonomy project 21. BIOL 311-Chapter pretests 22. BIOL 311-Laboratory final exam 23. BIOL 311-Laboratory midterm exam 24. BIOL 311-Scientific journal/case study analysis 25. BIOL 311-Unit exams 26. BIOL 312-Class oral participation 27. BIOL 312-Laboratory final exam 28. BIOL 312-Laboratory midterm exam 29. BIOL 312-Laboratory review sheets 30. BIOL 312-Medical terminology quizzes 31. BIOL 312-Scientific journal/case study analysis 32. BIOL 312-Unit exams 33. BIOL 334-Case studies

				34. BIOL 334-Chapter exams 35. BIOL 334-Physician transcript evaluation 36. BIOL 335-Disease team presentation 37. BIOL 335-Exam 1 38. BIOL 335-Exam 2 39. BIOL 335-Exam 2 in office 40. BIOL 335-Exam 3 41. BIOL 335-Microbiology unknown lab project 42. BIOL 335-Take home exam 43. BIOL 335-Team case study worksheet 44. BIOL 338-Final exam 45. BIOL 338-Laboratory notebook 46. BIOL 338-Session A exam 47. BIOL 338-Team paper presentation 48. BIOL 341-Laboratory journal 49. BIOL 341-Unit exams 50. BIOL 342-Final exam 51. BIOL 342-Group investigation lab report 52. BIOL 342-Group investigation presentation 53. BIOL 342-Laboratory notebook 54. BIOL 342-Missouri plant identification exam 55. BIOL 343-Final exam

				56. BIOL 343-Group investigation lab report 57. BIOL 343-Group investigation presentation 58. BIOL 343-Laboratory notebook 59. BIOL 437-Exam 1 60. BIOL 437-Exam 2 61. BIOL 437-Exam 3 62. BIOL 437-Team presentation 63. BIOL 496-Literature review paper 64. BIOL 496-Oral presentation
Additional Data: (List any additional information/data that informed this report.)				
Methodology: **(Explain the method of data collection and the data analysis process.)**	Using 4-point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**		Using 4-point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**	Using 4-point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**
Data: **(Provide the graphs, charts, etc. that were used to show** PLO **data results. Do not include the raw data.)**	-Develop understanding of function/structure/classification of life Mean= 2.98 -Effectively communicate principles of biology through oral means Mean= 3.59		-Develop understanding of function/structure/classification of life Mean=3.59 (n=272) -Effectively communicate principles of biology through oral means Mean=3.37 (n=286)	-Develop understanding of function/structure/classification of life Mean=3.11 (n=69) -Effectively communicate principles of biology through oral means Mean=3.68 (n=86)

	-Effectively communicate principles of biology through written means Mean= 3.46 -Demonstrate proficiency in laboratory technique Mean= 3.58 -Demonstrate ability to know, analyze, and synthesize scientific principles Mean=3.38		-Effectively communicate principles of biology through written means Mean=3.65 (n=488) -Demonstrate proficiency in laboratory technique Mean=3.57 (n=155) -Demonstrate ability to know, analyze, and synthesize scientific principles Mean=3.69 (n=250)	-Effectively communicate principles of biology through written means Mean=3.64 (n=84) -Demonstrate proficiency in laboratory technique Mean=3.69 (n=80) -Demonstrate ability to know, analyze, and synthesize scientific principles Mean=3.62 (n=87)
Results of Assessment: (What evidence exists that the program helps students achieve learning outcomes? What changes have been made since the last APR to ensure that outcomes are achieved and what changes will be made to the program following this APR? What have you learned from assessing the changes?)	In four of the five assessed competencies, student averages are above the proficient score of 3. The lowest average is 2.98, which is pretty close to proficient.		Student averages are above the proficient score of 3 in all five assessed competencies.	Student averages are above the proficient score of 3 in all five assessed competencies.
Strengths: **(From the findings, list the areas of strengths that currently exist in the academic program.)**	Students are scoring strongest in the communication areas, indicating we are doing a good job of training them to communicate their findings orally and in written form. Lab techniques and analysis follow closely.		Students have increased their competency in developing understanding of function/structure/ classification life and in demonstrating their ability to know, analyze, and synthesize scientific principles in the last two years.	Four of the five PLOs (exception being function/structure/ classification) maintained or increased slightly to have a strong 3.6+ mean.
Areas in need of improvement:	Student knowledge about function and structure and		Students' ability to effectively communicate principles of	Students' ability to understand the function, structure, and

(From the findings, list the areas of weakness(s) that currently exist in the academic program.)	classification need the greatest improvement, and should be targeted for improvement.		biology through oral means scores are the lowest and should be targeted for improvement.	classification of life was the lowest outcome and should be targeted for improvement.
Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)** *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.	Introduction of cadaver lab for BIO 211/212 and BIOL 311/312 labs has enhanced the teaching of structure and function of the human body. -Fall 2016 -Harris, Kendall, Streubel, Tenneson		1. Increase of focus on oral presentations and assignments -Summer and Fall 2019 -LeCureux and Mayne 2. Department chair will seek out new faculty who would promote program learning goals in each class -Fall 2019 -Tenneson	1. Increase offerings of study sessions in order to increase students' ability to understand the function, structure, and classification of life -Fall 2020 and Spring 2021 -Harris, Tenneson 2. Increase of pre-quizzes in order to encourage personal study time -Fall 2020 and Spring 2021 -Harris, Tenneson, Mayne, Lecureux
Improvements made: **(List completed improvement plans and dates of actual implementation.)** *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.	Fall 2016 through present, the cadaver lab has been in use.		1. The following classes are adding oral presentation assignments: BIOL 202, BIOL 335, BIOL 338, and BIOL 437. 2. Faculty personnel changes have improved the assessments related to each of the five competencies.	1. The number of instruments used to measure outcomes tripled in order to more accurately assess outcomes. 2. Outcomes now include biology majors only instead of all students in the classes which leads to more accurate measurements. 3. Outcomes have been

				added to all biology courses rather than just required courses.

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Department: Natural and Applied Sciences **Program Coordinator: Michael Tenneson**

Academic Program Evaluated: Biology Education **Program Review Year: 2019-2020**

	Year 1 **Academic Year:** 2019-2020	Year 2 **Academic Year:**	Year 3 **Academic Year:**	Year 4 **Academic Year:**
Faculty members involved in this assessment process: **(List all faculty members who participated: program coordinator, reviewers, committee members, etc.)**	1. Erica Harris, Assistant Professor of Biology Artifact Assessor 2. Jonathan LeCureux, Assistant Professor of Biology Artifact Assessor 3. Jason Streubel, Associate Professor of Environmenta Science Artifact Assessor Michael Tenneson, Profess of Biology Artifact Assessor		9.	4.

Number of students in sample: **(If known, supply the number of students in each class/year who were used in the assessment report.)**	Freshmen: Sophomores: Juniors: Seniors: Graduate: N=6	Freshmen: Sophomores: Juniors: Seniors: Graduate:	Freshmen: Sophomores: Juniors: Seniors: Graduate:	Freshmen: Sophomores: Juniors: Seniors: Graduate:
Instrument(s) used in assessment: **(List the exams, standardized tests, portfolios, etc. that were used in the assessment process.)**	Using 4-point scale rubrics, assessors scored student work on instruments above in Course Commons. 22. Taxonomy items on unit te in BIOL 201 Zoology 23. Plant collection in BIOL 20 Botany 24. Group investigation oral presentation in BIOL 200 General Biology 25. Oral presentation in BIOL 335 Microbiology 26. Oral presentation in BIOL 496 Senior Seminar 27. Group investigation lab report in BIOL 200 Genera Biology 28. Labs in BIOL 202 Botany 29. Microorganism paper in BIOL 335 Microbiology 30. Literature review paper in BIOL 496 Senior Seminar 31. Unknown microorganism exam in BIOL 335 Microbiology			

	32. Fruit fly gene propagation lab in BIOL 338 Genetics 33. Food systems project in BIOL 202 Botany 34. Primer design exercise in BIOL 335 Microbiology			
Additional Data: (List any additional information/data that informed this report.)				
Methodology: **(Explain the method of data collection and the data analysis process.)**	Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**			
Data: **(Provide the graphs, charts, etc. that were used to show** PLO **data results. Do not include the raw data.)**	Develop understanding of function/structure/classification of life Mean= 3.07 (n=6) Effectively communicate principles of biology through oral means Mean= 3.66 (n=6) Effectively communicate principles of biology through written means Mean= 3.51 (n=6) Demonstrate proficiency in laboratory technique Mean= 3.68 (n=6) Demonstrate ability to know, analyze, and synthesize			

	scientific principles Mean= 3.42 (n= 6)			
Results of Assessment: (What evidence exists that the program helps students achieve learning outcomes? What changes have been made since the last APR to ensure that outcomes are achieved and what changes will be made to the program following this APR? What have you learned from assessing the changes?)	Student averages are above the proficient score of 3 in all five assessed competencies.			
Strengths: (From the findings, list the areas of strengths that currently exist in the academic program.)	Students have competency in developing understanding of function/structure/ classification of life and in demonstrating their ability to know, analyze, and synthesize scientific principles in the last two years.			
Areas in need of improvement: (From the findings, list the areas of weakness(s) that currently exist in the academic program.)	Develop understanding of function/structure/classification of life mean scores are the lowest and should be targeted for improvement.			
Plans for improvement: (Provide the improvement plan, when it will be implemented, and person who will	Develop MOCA review materials (study guides, practice tests)			

administer the improvement plan.) *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.				
Improvements made: (List completed improvement plans and dates of actual implementation.) *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.	n.a.		3.	

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Department: Natural and Applied Sciences **Program Coordinator: Dr. William Cook**

Academic Program Evaluated: Chemistry **Program Review Year: 2020-2021**

	Year 1 **Academic Year:**	Year 2 **Academic Year: 2018-2019**	Year 3 **Academic Year: 2019-2020**	Year 4 **Academic Year:**
Faculty members involved in this assessment process: (List all faculty members who participated: program coordinator, reviewers, committee	Matt DeVore, Assoc. Prof. Chemistry Natasha DeVore, Assoc. Prof. Chemistry	Matt DeVore, Assoc. Prof. Chemistry; Natasha DeVore, Assoc. Prof. Chemistry; William Cook, Assoc. Professor of Chemistry	Nicholas Hestand, Assistant Professor of Chemistry; William Cook, Associate Professor of Chemistry; Jonathan LeCureux, Assistant Professor of Biology	

members, etc.)				
Number of students in sample: (If known, supply the number of students in each class/year who were used in the assessment report.)	Freshmen:10 Sophomores:7 Juniors:6 Seniors:14 Graduate:	Freshmen:2 Sophomores:1 Juniors:3 Seniors:5 Graduate:	Freshmen: 0 Sophomores: 1 Juniors: 1 Seniors: 2 Graduate:	Freshmen: Sophomores: Juniors: Seniors: Graduate:
Instrument(s) used in assessment: (List the exams, standardized tests, portfolios, etc. that were used in the assessment process.)	35. Laboratory notebooks in CHEM 271, CHEM 272, CHEM 378, CHEM 331, CHEM 332, CHEM 431, CHEM 432 36. HCL/DCL Laboratory report in CHE 432* 37. Iodine Clock Laboratory report in CHE 431* 38. Oral Presentatio n on Final	Explain the principles of chemistry through oral and written means CHEM 112: Oral Presentation on Final Lab Project CHEM 272: Formal Lab Report CHEM 378: Method Development Paper CHEM 332: Poster on Final Project CHEM 431: Paper presentation from scientific literature CHEM 432: Paper presentation from scientific literature CHEM 496: Literature review report CHEM 496: Oral Presentation on literature review CHEM 375: Literature: Identifying Key Concepts in Introduction CHEM 375: Literature: Team Concept Mapping Introduction CHEM 375: Amino Acid Quiz CHEM 375: Nucleic Acid Quiz CHEM 375: Glucose/Phosphatidycholine Quiz CHEM 375: Glycolysis Quiz	1. Literature presentation (CHEM 435) 2. Video (CHEM 112) 3. Discussion (CHEM 496) 4. Seminar Presentation (CHEM 496) 5. Laboratory report (CHEM 112) 6. Journal Article Report (CHEM 496) 7. Lab report describing use of chemical instrumentation (CHEM 112) 8. Proposed laboratory procedure (CHEM 112)	

	Lab Project in CHEM 112* 39. Method Developme nt Paper in CHEM 378* 40. Formal Lab Report in CHEM 272* 41. UVvis Laboratory report in CHE 332* 42. HPLC Laboratory Report in CHE 332* 43. Acid/Base titration repo in CHEM 331* 44. Laboratory report assignment in CHEM 111, CHEM 112, CHEM 271, CHEM 272* 45. Literature review paper CHEM 496* 46. Oral Presentation i CHEM 496*		CHEM 375	Citric Acid Cycle Quiz			
			CHEM 375	Final Exam Paper Analysis			
			CHEM 375	Literature: Future Experiment Analysis			
			CHEM 375	Literature: Experimental Analysis			
			CHEM 375	Literature: Methods Analysis			
			CHEM 375	Final Synthetic Biology Presentation			
			CHEM 375	Final Paper Presentation			
		Demonstrate proficiency in the use of chemical analysis and instrumentat ion	CHEM 111	Laboratory report assignment			
			CHEM 112	Laboratory report assignment			
			CHEM 271	Laboratory report assignment			
			CHEM 272	Laboratory report assignment			
			CHEM 331	Acid/Base titration report			
			CHEM 332	HPLC Laboratory report			
			CHEM 332	UVvis Laboratory report			
			CHEM 431	Iodine Clock Laboratory Report			
			CHEM 432	HCL/DCL laboratory report (FTIR)			
			CHEM 375	Design and Build a Functional Synthetic Biology Device			
		Demonstrate proficiency in laboratory recording through lab notebooks.	CHEM 271	Laboratory notebook assignment			
			CHEM 272	Laboratory notebook assignment			
			CHEM 378	Laboratory notebook assignment			
			CHEM 331	Laboratory notebook assignment			
			CHEM 332	Laboratory notebook assignment			
			CHEM 431	Laboratory notebook assignment			
			CHEM 432	Laboratory notebook assignment			
			CHEM 375	Design and Build a Functional Synthetic Biology Device			
		Design experiments using the	CHEM 112	Group project			
			CHEM 378	Design Experiment			
			CHEM 331	Design Experiment			

	47. Group project in CHEM 112* 48. Design Experiment in CHEM 378, CHEM 331, CHEM 332, and CHEM 431*	scientific method CHEM 332 Design Experiment CHEM 375 Design and Build a Functional Synthetic Biology Device Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons.			
Additional Data: (List any additional information/data that informed this report.)					
Methodology: (Explain the method of data collection and the data analysis process.)	Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**	Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**		Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**	
Results of Assessment: (List the findings	Incomplete. Never updated by professors.			Results were good, but were based on a very small sample in each category. Four people	

in summary format as narrative.)			provided data for oral communication, two people for written communication, and one person for the others.	
Data: (Provide the graphs, charts, etc. that were used to show data results. Do not include the actual data.)	Explain the principles of chemistry through oral and written mea ___ (in progre for FA 2016 in CHEM 431) Demonstrate proficiency in the use chemical analysis and instrumentation __ (progress for FA 2016 CHEM 431 and CHEM 271) Demonstrate proficiency in laboratory recording through lab notebook 3.84	Explain the principles of chemistry: No data (professor resigned) Demonstrate proficiency in laboratory recording through lab notebooks. No data (professors resigned) Design experiments using the scientific method mean = 3.56 (n=23) Demonstrate proficiency in the use of chemical instrumentation mean = 4.0 (n=5)	Oral Communication: 3.6 Written Communication: 4 Demonstrate proficiency in the use of chemical instrumentation: 3 Design experiments using the scientific method: 3	
Strengths: (From the findings, list the areas of strengths that currently exist in the academic program.)	A plan is in place for continued assessment in future semesters. However, data is only available for one objective from	• Students are actively engaged in undergraduate research, including the presentation of their work at conferences. • Strong expertise in experimental methods.	Quality of students in the program is high. Students have a great ability to explain the principles of chemistry orally.	

	CHEM 271– to demonstrate proficiency in laboratory recording through laboratory notebooks. This objective had an average score of 3.84 indicating that our students are currently excelling at this objective. At the time of this report, this objective, among others, is in progress for CHEM 431 and assessment data will be available at the end of the Fall 2016 semester.		Major improvement in the quality of instrumentation.	
Areas in need of improvement: **(From the findings, list the areas of weakness(s) that currently exist in the academic program.)**	Most of the assignments that would go into the chemistry assessment for Fall 2016 are assignments near the end of the semester. At the time this report	• The quality and number of instruments for chemical analysis need improvement. • Faculty assessment of students using Chemistry PLOs	Number of students in the major is low. Program coordinator and full time faculty within the program will review and rewrite program level outcomes for the following academic year.	

	was generated, several assessed assignments are in progress but not completed for this semester, Fall 2016. For this reason they are not included in the current report. Data from previous years are not available because Drs. Matthew and Natasha DeVore were new hires in 2015 and 2016, respectively. This assessment plan was designed at the end of Spring 2016 by Dr. Matthew DeVore.			

Year 1:

Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)**

*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

Plan for Improvement	Timeline	Responsible Person
Need complete tracking of assessments in all involved courses	By end of 2016-17 academic year, data should be entered from each of assessment	Natasha DeVore, Associate Professor of Chemistry Matthew DeVore, Associate

	instruments.	Professor of Chemistry

Improvements made: **(List completed improvement plans and dates of actual implementation.)**
If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

Improvement Plan	Implementation Date
Numerous improvements have been made to the chemistry program in the past two years. We have acquired a modern analytical balance, multiple pH electrodes, a -80 °C freezer, two research grade scanning UV-vis spectrophotometers, a Carey Bio300 and a Shimadzu PC-2105, a sonicator, and two oxidation-reduction potential electrodes. This has enabled us to improve our student's proficiency in the use of modern chemical instrumentation.	6/1/2017
Lab courses have been restructured to give students experience in experimental design throughout their training in chemistry. We have not been able to assess these proposed changes yet because many of these classes have not yet been taught in the rotation schedule.	6/1/2017
We have begun research projects within the chemistry and biochemistry fields to give students experience performing publishable research under the direction of Drs. Matthew and Natasha DeVore.	6/1/2017

Year 2:

Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

Plan for Improvement	Timeline	Responsible Person
Obtain additional, modern instrumentation	6/2019	Devore, N

Improvements made: **(List completed improvement plans and dates of actual implementation.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

Improvement Plan	Implementation Date
Incubator obtained	10/18
Shaker obtained	10/18

Year 3:

Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

Plan for Improvement	Timeline	Responsible Person
Obtain FTIR	10/19	Faculty
Obtain NMR	6/20	Faculty
Begin new undergraduate research program in computational chemistry	6/20	Hestand

Improvements made: **(List completed improvement plans and dates of actual implementation.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

Improvement Plan	Implementation Date
Obtained FTIR	10/19

Obtained NMR	12/19

Year 4:

Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

Plan for Improvement	Timeline	Responsible Person
Expand undergraduate research program.	6/21	Hestand, Cook
Expose students to current research through conference attendance.	12/20	Hestand

Improvements made: **(List completed improvement plans and dates of actual implementation.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

Improvement Plan	Implementation Date

Student Learning Assessment Report (SLAR)

"How are students learning?"

Instructions: This template is a running document of each annual Academic Program Assessment Report due to the department chairs and Provost the last Friday in October. The final report in the document should be the official report of the year of the full Program Review. All reports below use the same report template. If the report is the Program Review year, please indicate it next to "Program Review Year" and also submit the Academic Program Review (APR).

Department: Natural and Applied Sciences **Program Coordinator: Mr. Doug Mitcham**

Academic Program Evaluated: Computer Science **Program Review Year: 2019-2020**

	Year 1 **Academic Year: 2016-2017**	Year 2 **Academic Year: 2017-2018**	Year 3 **Academic Year: 2018-2019**	Year 4 **Academic Year: 2019-2020**
Faculty members involved in this assessment process: (List all faculty members who participated: program coordinator, reviewers, committee members, etc.)	Artifact Assessors: 1. Douglas Mitcham, Assoc. Professor of Computer Science 2. Jeremy Harris, Asst. Professor of Computer Information Systems 3. Don Tosh, Professor of Mathematics		Artifact Assessors: 1. Douglas Mitcham, Assoc. Professor of Computer Science 2. Jeremy Harris, Asst. Professor of Computer Information Systems 3. Don Tosh, Professor of Mathematics	Artifact Assessors: 1. Douglas Mitcham Assoc. Professor of Computer Science 2. Jeremy Harris, Assoc. Professor of Computer Information Systems

Number of students in sample: **(If known, supply the number of students in each class/year who were used in the assessment report.)**	Freshmen: 4 Sophomores: 7 Juniors: 6 Seniors: 6 Graduate: 0 (These are CPSC major numbers, not sample size)	Freshmen: Sophomores: Juniors: Seniors: Graduate:	Freshmen: 4 Sophomores: 5 Juniors: 6 Seniors: 10 Graduate: 0 (These are CPSC major numbers, not sample size)	Freshmen: 1 Sophomores: 4 Juniors: 7 Seniors: 7 Graduate: 0 (These are CPSC majors used in the assessment, not sample size)
Instrument(s) used in assessment: **(List the exams, standardized tests, portfolios, etc. that were used in the assessment process.)**	Using 4 point scale rubrics, assessors scored student work on instruments in Course Commons. The instruments used for each program outcome are as follows: Ia MATH 212 algorithm test Ib HOL program Ic CPSC 211 algorithm lab Id CPSC 493 project grades IIa CPSC 215 program IIb CPSC 225 homework IIc CPSC 231 aux. storage quiz IId CPSC 225 quizzes IIIa CPSC 441 homework IIIb CPSC 415 homework IVa CPSC 231 team project IVb CPSC 441 paper IVc CPSC 415 oral report IVd CPSC 415 paper		Using 4 point scale rubrics, assessors scored student work on instruments in Course Commons. The instruments used for each program outcome are as follows (with sample size n): Ia MATH 212 algorithm test (n = 13) Ib HOL program (n = 7) Ic CPSC 211 algorithm lab (n = 11) Id CPSC 493 project grades (n = 6) IIa CPSC 215 program (n = 5) IIb CPSC 225 homework (n = 0) IIc CPSC 231 aux. storage quiz (n = 0) IId CPSC 225 quizzes (n = 0) IIIa CPSC 441 homework	Using 4 point scale rubrics, assessors scored student work on instruments in Course Commons. The instruments used for each program outcome are as follows (with sample size n): Ia MATH 212 algorithm test (n = 0) Ib CPSC 142 program (n = 5) Ic CPSC 211 algorithm lab (n = 3) Id CPSC 493 project grades (n = 6) IIa CPSC 215 program (n = 0) IIb CPSC 225 homework (n = 5) IIc CPSC 231 aux. storage quiz (n = 11)

			(n = 5) IIIb CPSC 415 homework (n = 10) IVa CPSC 231 team project (n = 0) IVb CPSC 441 paper (n = 4) IVc CPSC 415 oral report (n = 10) IVd CPSC 415 paper (n = 10)	IId CPSC 225 quizzes (n = 5) IIIa CPSC 441 homework (n = 7) IIIb CPSC 415 homework (n = 0) IVa CPSC 231 team project (n = 11) IVb CPSC 441 paper (n = 7) IVc CPSC 415 oral report (n = 0) IVd CPSC 415 paper (n = 0)
Additional Data: (List any additional information/data that informed this report.)	14 portfolios containing all of the above instruments were evaluated		Evaluations were done for entire classes, rather than just the CPSC majors, as was previously done. Evaluations include all courses from FA18 through SP19. In the reporting of results **NA** (Not Available) indicates that the class exercising the assessment instrument was not offered during the 2018/2019 school year. The sample size for these items are listed as n = 0 above.	Evaluations were done just for CPSC majors. Evaluations include all courses from FA19 through SP20. In the reporting of results **NA** (Not Available) indicates that the class exercising the assessment instrument (or the instrument itself) was not offered during the 2019/2020 school year. The sample size for these items are listed as n = 0 above

Methodology: **(Explain the method of data collection and the data analysis process.)**	Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**		Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**	Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**
Results of Assessment: **(List the findings in summary format as narrative.)**	Although several areas showed strong results, the communication skill components of peer collaboration and oral presentation scored exceptionally high.		Capstone project scores remained exceptionally high (and even improved) with the exception of the requirements phase, which dropped to 2.8. Communication skills remained high and even improved. Algorithm analysis (Ia) remained at 2.8. The process synchronization component of IIIb rose from 2.9 to 3.9. Outcome IIa (Practical application of computer architecture and system hardware) rose from 3.3 to 4.0.	

Data: (Provide the graphs, charts, etc. that were used to show data results. Do not include the actual data.)	**Results of Assessment (mea scores on a scale of 1-4; 3+ considered proficient)** I Algorithm Development & Implementation (overall average 3.5) Ia Analysis 2.8 Ib Implementation 3.5 Ic Development, implementation, and analysis 3.7 Id Capstone: - Proposal 4.0 - Requirements 3.6 - Design 3.3 - Code 3.7 - Demo 3.7 - Overall project: 3.6 II Computer Architecture & System Hardware (overall average 3.2) IIa Practical application 3.3 IIb Practical knowledge: - Digital logic, circuits, and concept. machines 3.7		**Results of Assessment (mea scores on a scale of 1-4; 3+ considered proficient)** I Algorithm Development & Implementation (overall average 3.4) Ia Analysis 2.8 Ib Implementation 3.0 Ic Development, implementation, and analysis 3.1 Id Capstone: - Proposal 4.0 - Requirements 2.8 - Design 3.5 - Code 4.0 - Demo 4.0 - Overall project: 3.7 II Computer Architecture & System Hardware (overall average 4.0 but only includes IIa) IIa Practical application 4.0 IIb Practical knowledge: - Digital logic, circuits, and concept.	**Results of Assessment (mea scores on a scale of 1-4; 3+ considered proficient)** I Algorithm Development & Implementation (overall average 3.5) Ia Analysis NA Ib Implementation 4.0 Ic Development, implementation, and analysis 2.0 Id Capstone: - Proposal 4.0 - Requirements 3.8 - Design 3.5 - Code 3.8 - Demo 3.7 - Overall project: 3.8 II Computer Architecture & System Hardware (overall average 3.5) IIa Practical application NA IIb Practical knowledge: - Digital logic, circuits, and concept. machines 4.0

	- Basic architect. 3.8 - Addressing 3.8 - The Processor 3.6 - I/O Org. 3.4 IIc Storage device knowledge 3.1 IId Computer component knowledge: - Digital logic, circuits, concept. machines 3.1 - Basic architect. 2.7 - Addressing 2.4 - The processor 2.9 - I/O Org. 3.1 - Memory 2.6 III System Software (overall average 3.5) IIIa Database Software: - Overview of DB management 3.2 - DB system architecture 3.6 - Intro to relational databases 3.7 - Intro to SQL 3.5 - Types 3.2		machines NA - Basic architect. NA - Addressing NA - The Processor NA - I/O Org. NA IIc Storage device knowledge NA IId Computer component knowledge: - Digital logic, circuits, concept. machines NA - Basic architect. NA - Addressing NA - The processor NA - I/O Org. NA - Memory NA III System Software (overall average 3.6) IIIa Database Software: - Overview and evolution of DB management 3.6 - Data Models 3.4 - Intro to relational databases 3.4 - ER Modeling 3.0 - Advanced	- Basic architect. 3.8 - Addressing 4.0 - The Processor 4.0 - I/O Org. NA - Memory 4.0 IIc Storage device knowledge 2.5 IId Computer component knowledge: - Digital logic, circuits, concept. machines 2.8 - Basic architect. 3.0 - Addressing 3.0 - The processor 4.0 - I/O Org. NA - Memory 3.4 III System Software (overall average 3.5) IIIa Database Software: - Overview and evolution of DB management 3.4 - Data Models 3.7 - Intro to relational databases 3.3 - ER Modeling 3.7 - Advanced

	- Relations 3.5 - Relational algebra 3.5 - Relational calculus 3.9 - Integrity 3.5 - Views 3.7 - FDs and normalization through BCNF 3.3 - Higher normal forms, semantic modeling 3.3 - Recovery and concurrency 3.4 IIIb Operating system software: - Introduction 3.8 - OS structures 3.4 - Processes 3.3 - Threads 3.5 - CPU scheduling 3.6 - Process synchronization 2.9 - Deadlocks 3.2 - Main memory 3.3 - Virtual memory 3.6 - File system interface and implementation 3.9 - Mass storage structure 3.4 - I/O systems 3.3		modeling 3.6 - Normalization 3.4 - Intro to SQL 4.0 - Advanced SQL 4.0 IIIb Operating system software: - Introduction 3.5 - OS structures 3.9 - Processes 3.3 - Threads 3.3 - CPU scheduling 3.0 - Process synchronization 3.9 - Deadlocks 3.9 - Main memory 3.4 - Virtual memory 3.4 - File system interface and implementation 3.5 - Mass storage structure 3.7 - I/O systems 3.7	modeling 3.5 - Normalization 2.5 - Intro to SQL 3.9 - Advanced SQL 4.0 IIIb Operating system software: - Introduction NA - OS structures NA - Processes NA - Threads NA - CPU scheduling NA - Process synchronization NA - Deadlocks NA - Main memory NA - Virtual memory NA - File system interface and implementation NA - Mass storage structure NA - I/O systems NA

	- Protection and security 3.8 IV Communication Skills (overall average 3.8) IVa Peer collaboration 3.9 IVb DB research written comm. 3.6 IVc Research oral comm. OS: - Use of visual aids 3.5 - Eye contact 4.0 - Not reading notes verbatim 4.0 - Technically understood 4.0 - Clear, audible, non-distractive speaking 3.8 - Optimal length 3.8 - Overall presentation: 3.8 IVd OS research written comm. 3.3		- Protection and security 3.9 IV Communication Skills (overall average 3.9) IVa Peer collaboration NA IVb DB research written comm. 3.5 IVc Research oral comm. OS: - Use of visual aids 4.0 - Eye contact 3.9 - Not reading notes verbatim 3.9 - Technically understood 4.0 - Clear, audible, non-distractive speaking 4.0 - Optimal length 4.0 - Overall presentation: 4.0 IVd OS research written comm. 3.8	- Protection and security NA IV Communication Skills (overall average 3.7) IVa Peer collaboration 4.0 IVb DB research written comm. 3.4 IVc Research oral comm. OS: - Use of visual aids NA - Eye contact NA - Not reading notes verbatim NA - Technically understood NA - Clear, audible, non-distractive speaking NA - Optimal length NA - Overall presentation: NA IVd OS research written comm. NA

Strengths: **(From the findings, list the areas of strengths that currently exist in the academic program.)**	Although several areas showed strong results, the communication skill components of peer collaboration and oral presentation scored exceptionally high.		Although several areas showed strong results, the communication skills (written and oral) remained exceptionally high, some scoring even higher than the previous assessment. All components of the capstone project (Id) scored higher except for the requirements phase. Outcome IIa rose to 4.0 from 3.3. This is the practical application of computer architecture and system hardware being assessed by an assembler program.	All four PLOs retain an overall level of 3.5 or greater. The overall capstone project (Id) score remained high (3.8) but the requirements component went from 2.8 to 3.8. This component was a target for improvement generated during the previous assessment. A target of the last assessment were the components of PLO IId. Previously, 4 of the 6 items were below 3.0. All are now at least 3.0 except the digital logic/circuits/conceptual machine item, which was 2.8.
Areas in need of improvement: **(From the findings, list the areas of weakness(s) that currently exist in the academic program.)**	Algorithm analysis (Ia) scored lower and would be one area to focus on. Computer component knowledge (IId) also scored		Algorithm analysis (Ia) remained at 2.8 from the last assessment, short of the 3.0 goal. The requirements phase of	Algorithm Development & Implementation (PLO I) overall remained high (3.5) but item Ic (Development, Implementation, and Analysis, assessed by CPSC

	lower than other areas and should be addressed.		the capstone project (Id) dropped from 3.6 to 2.8, short of the 3.0 goal. (All other outcomes that were assessed scored a 3.0 or greater. It should also be noted that CPSC 441 (Database Systems) (IIIa) homework was recategorized based on revamping of that course and the use of a newer text. All scores were 3.0 or higher)	211 lab) dropped from 3.1 to 2.0. Computer Architecture & System Hardware (PLO II) overall remained high (3.5) but item IIc (assessed by CPSC 231 auxiliary Storage Device quiz) was 2.5 and item IId (CPSC 225 digital logic quiz component) was 2.8. System Software (PLO III) overall remained high (3.5) but item IIIa (CPSC 441 normalization quiz component) dropped from 3.4 to 2.5. All four PLOs remained well above 3.0. Each has multiple assessment tools. The above-mentioned items are just some of several assessment tools for each PLO. Program coordinator and full time faculty within the program will reevaluate program level outcomes for the following academic year.

Year 1 (2016 – 2017):

Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

Plan for Improvement	Timeline	Responsible Person
Devote more time to algorithm analysis and present more examples (in both MATH 212 and CPSC 211)	Changes to be implemented for MATH 212 and CPSC 211 in the SP17 semester	Doug Mitcham
Devote more time in CPSC 225 to covering the circuitry and intracacies of computer components. Possibly enhance these lectures with video clips or other learning aids	Changes to be implemented for CPSC 225 in the SP18 semester (CPSC 225 is offered in the spring of even years)	Doug Mitcham

Year 1 (2016 – 2017):

Improvements made: **(List completed improvement plans and dates of actual implementation.)**
If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

- Prior assessments showed students doing poorly on software design activities. Added design assignments and added time discussing design were incorporated primarily into CPSC 111 (FA16) and CPSC 211 (SP17). More design examples were shown in CPSC 493 (SP16) and a higher weight was given to the design phase in that course. The design phase of the senior project now scored a 3.3 and is on an upward trend.

- Prior assessments showed students scoring poorly with regard to machine addressing. More time was devoted to this subject in the CPSC 225 class and more examples covered (SP16). The practical knowledge component (IIb) scored 3.8 on this assessment. This is a significant improvement. It should be noted, however, that addressing within the computer component outcome (IId) scored 2.4 and is part of the improvement plan specified above.

- Prior assessments showed students scoring poorly of various aspects of their oral communication. Corrective actions were made and this area is listed above as a strength for this current assessment (FA16).

- Student feedback indicated a desire to have more 'hands-on', interactive learning for some classes. The database class was completely revamped in the FA16 semester to include the use of MS SQL Server to build a database and do 'hands-on' SQL training with it. This is a valuable experience/knowledge students can put in their resumes, making them an attractive candidate for employment in that field. Other changes are being considered for courses in the major.

- Electives have been, and are being, added to the program to cover additional material beneficial and interesting to the students. Past courses include Data Communications (required for CIS majors and an elective for CPSC majors) and Java Programming. Mobile App Development and Security courses are planned for the upcoming semesters (FA17, SP18).

- Student support and interaction has been enhanced with the development of an equipped collaboration room for students to use. Other enhancements are currently being developed including the formation of a student chapter of ACM (with the valuable activities and support services it will provide) as well the development/promotion of internships (FA17).

Year 2 (2017 – 2018):

Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

- Although no assessment report and analysis was done for this academic year, assessment activities such as peer review, student feedback, and self-evaluation did continue, leading to the improvements specified below.

Year 2 (2017 – 2018):

Improvements made: **(List completed improvement plans and dates of actual implementation.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

- The **Intro to Cybersecurity** course was developed and taught in the SP18 semester. The importance of this subject area in industry called for this course to be added to the program (currently as an elective, but is now mandatory for the CIS program). It satisfies the recommendations of the ACM/IEEE Computer Science Curricula (specifically, the Information Assurance and Security (IAS) knowledge area). Student feedback was positive with the security exercises being popular.

- A 5 week online version of the cybersecurity course was developed (and taught in the FA18 semester) for the Adult Studies program. Although the online enrollment was small, feedback was extremely positive. Approximately 200 hours were spent in the development of this online course.

- As a second HOL, Visual Basic is being phased out and replaced with the Java programming language. Visual Basic is becoming outdated and Java is very popular with industry as well as academic institutions. It will help with graduate employability and in the past, has been needed for some going to graduate school. The first time Java was taught was the FA15 semester.

- After attending the ACM SIGCSE (Special Interest Group on Computer Science Education) Symposium in Seattle, WA, zyBooks were used in the CPSC 111 (FA17) and CPSC 211 (SP18) classes. These are on-line, interactive texts that are accessible from any browser and are much less expensive than the hardcopy texts previously used. They include online exercises and coding, eliminating the need for separate lab sessions done previously. They prove to be very effective and popular with the students. Additionally, our outside programming environment was also continued (MS Visual Studio).

Year 3 (2018 – 2019):

Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

Plan for Improvement	Timeline	Responsible Person
For outcome Ia, continue to devote more time to algorithm analysis and present more	Changes to be implemented for SP21 MATH 212 and SP20 CPSC 211 classes.	Doug Mitcham

examples (in both MATH 212 and CPSC 211). Look at the effectiveness of the examples that have been given previously to see if better examples are needed. In-class exercises should be considered.		
For outcome Id, show more examples of requirements to students doing their capstone project and spend more time explaining them. Emphasize the importance of the requirements phase when discussing the software life cycle in CPSC 211, perhaps with examples.	Changes to be implemented for SP20 CPSC 211 and CPSC 493 (capstone) classes.	Doug Mitcham

Year 3 (2018 – 2019):

Improvements made: **(List completed improvement plans and dates of actual implementation.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

- As a result of a prior peer review suggestion, transparencies used in CPSC classes (primarily the CPSC 231 File Processing class) have been converted to powerpoints, accessible for students through Course Commons. (FA18)

- Work has begun on creating a 5 week online version of the CPSC 225 (Computer Hardware Organization) course. Improvements were made to the existing cybersecurity online course. (FA18)

- The process synchronization component of IIIb (Operating System Software) rose from 2.9 to 3.9 due to changes in the FA18 semester.

- From the previous assessment, 4 components of IId (computer component knowledge) were short of the 3.0 goal. These covered basic

computer architecture, memory and memory addressing, and the processor. These areas will be addressed in the upcoming SP20 CPSC 225 (Computer Hardware Organization) course.

- CPSC 497 (Internship) is being added as a program requirement starting with incoming majors for the FA19 semester. More opportunities are arising for student internships (and being done) and more relationships are being fostered with local businesses. This is proving to be valuable experience for our students, enhancing their employability and practical knowledge (applying classroom knowledge to real-world environments). It also has shed a favorable light on Evangel's CPSC program since our interns have performed extremely well. Half of the internship grade is provided by the intern's Supervisor and all interns have received either an A or A-.

Year 4 (2019 – 2020):

Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

Plan for Improvement	Timeline	Responsible Person
Algorithm Analysis has been a target for improvement, specifically items Ia and Ic. Previous plans for improvement targeted the SP21 MATH 212 class (for item Ia). Ic was assessed during this SP20 semester in the CPSC 211 class. That assignment/tool was during the transition from seated to remote learning, which may have contributed to the lower grade. The plan would be to devote more time to the algorithm analysis portion of MATH 212	Changes to be implemented for MATH 212 and CPSC 211 in the SP21 semester.	Doug Mitcham

and CPSC 211 and provide more (or better) examples. This may include adding supplemental video material to Course Commons for the students to look at.		
Although PLO II (Computer Architecture & System Hardware) overall scored 3.5, items IIc and IId graded below the desired 3.0 level. The plan would be to prioritize the information more, providing a greater emphasis on the important concepts/items that the quizzes will cover for the CPSC 231 auxilliary storage device quiz (for item IIc) and the CPSC 225 digital logic/circuits/ conceptual machine quiz (for item IId). This would more adequately prepare the students for those quizzes. The plan may also include adding supplemental video material to Course Commons for the students to look at.	Changes to be implemented for the FA21 CPSC 231 class and the SP22 CPSC 225 class.	Doug Mitcham
Although PLO III (System Software) overall scored 3.5,	Changes to be implemented for the FA21 CPSC 441 class.	Doug Mitcham

item IIIa graded below the desired 3.0 level. The plan would be to spend more time on normalization in the CPSC 441 class, going through more examples. The plan may also include adding supplemental video material to Course Commons for the students to look at.		

Year 4 (2019 – 2020):

Improvements made: **(List completed improvement plans and dates of actual implementation.)**
*If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.

- As a result of a prior peer review suggestion, transparencies used in CPSC classes (during this period, primarily the CPSC 225 File Processing class) have been converted to powerpoints, accessible for students through Course Commons. (SP20)

- During the last assessment period, the requirements phase of the capstone project (CPSC 493, PLO item Id) was a target for improvement. This requirements component improved to 3.8 (from 2.8). (SP20)

- As mentioned in the plans for the previous assessment period, an internship requirement was approved and added to the CPSC requirements and applied to all incoming CPSC majors during this assessment period. (FA19)

- A target of the last assessment were the components of PLO IId (computer component knowledge, as assessed by the CPSC 225 quiz scores). Previously, 4 of the 6 items were below 3.0. All are now at least 3.0 except the digital logic/circuits/conceptual machine item, which was 2.8. (SP20)

- Data Science and Cybersecurity tracks were developed and approved and will be available starting in the FA20 semester. (SP20)

- Course syllabi were converted to the required format. (FA19 and SP20)

- For the transition to remote learning for the CPSC 211 and CPSC 225 classes, additional content and videos were added to Course Commons along with auto-graded online quizzes/tests and practice questions/quizzes. This material could be used to enhance the future seated classes. (SP20)

- Rubrics were added and populated to assess course level outcomes (although no assessment analysis for CLOs have been done to date). (FA19 and SP20)

Student Learning Assessment Report (SLAR)

"How are students learning?"

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Department: Natural and Applied Sciences **Program Coordinator: Erica Harris**

Academic Program Evaluated: Healthcare **Program Review Year: 2020-2021**

	Year 1 Academic Year: 2016-2017	**Year 2 Academic Year: 2017-2018**	**Year 3 Academic Year: 2018-2019**	**Year 4 Academic Year: 2019-2020**
Faculty members involved in this assessment process: **(List all faculty members who participated: program coordinator, reviewers, committee members, etc.)**	7. Erica Harris, Assistant Professor of Biology Artifact Assessor 8. Joshua Kendall, Assistant Professor of Environmenta Science Artifact Assessor 9. Jason Streubel, Associate Professor of Environmenta Science Artifact Assessor 10. Michael Tenneson		1. Erica Harris, Assistant Professor of Biology Artifact Assessor 2. Jonathan LeCureux, Assistant Professor of Biology Artifact Assessor 3. Michael Tenneson, Professor o Biology Artifact Assessor	1. Erica Harris, Associate Professor of Biology Program Coordinator 2. Bill Cook, Associate Professor of Chemistry Artifact Assessor 3. Jonathan LeCureux, Assistant Professor of Biology Artifact Assessor 4. Michael Tenneson, Profess of Biology

	Professor of Biology Artifact Assessor			Artifact Assessor
Number of students in sample: **(If known, supply the number of students in each class/year who were used in the assessment report.)**	Freshmen: 23 Sophomores: 9 Juniors: 5 Seniors: 0 Graduate:0 Total: 37	Freshmen: Sophomores: Juniors: Seniors: Graduate:	Freshmen: 13 Sophomores: 12 Juniors: 8 Seniors: 1 Graduate: 0 Total: 34	Freshmen: 24 Sophomores: 9 Juniors: 5 Seniors: 0 Graduate: 0 Total: 38
Instrument(s) used in assessment: **(List the exams, standardized tests, portfolios, etc. that were used in the assessment process.)**	Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. 49. Laboratory midterm exam BIOL 211 Anatomy & Physiology I for Health Sciences 50. Laboratory final exam in BIOL 212 Anatomy & Physiology II for Health Sciences 51. Critical thinking assignmer in BIOL 211 Anatomy & Physiology I for Health Sciences 52. Critical thinking assignmer in BIOL 212 Anatomy & Physiology II for Health Sciences 53. Annotated bibliography in BIOL 235 Microbiology for Health Sciences		Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. 1. Laboratory midterm exam in BIOL 211 Anatomy & Physiolo I for Health Sciences 2. Laboratory final exam in BIOL 212 Anatomy & Physiology II f Health Sciences 3. Critical thinking assignment in BIOL 211 Anatomy & Physiolo I for Health Sciences 4. Critical thinking assignment in BIOL 212 Anatomy & Physiolo II for Health Sciences 5. Unknown microorganism lab project in BIOL 235 Microbiology for Health Scienc 6. Laboratory notebook in BIOL 235 Microbiology for Health Sciences	Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. 1. Laboratory midterm exam BIOL 211 Anatomy & Physiology I for Health Sciences 2. Laboratory final exam in BIOL 211 Anatomy & Physiology I for Health Sciences 3. Laboratory review sheets i BIOL 211 Anatomy & Physiology I for Health Sciences 4. Medical terminology quizz in BIOL 211 Anatomy & Physiology I for Health Sciences 5. Laboratory midterm exam BIOL 212 Anatomy & Physiology II for Health Sciences

	54. Unknown microorganism l exam in BIOL 235 Microbiology for Health Sciences 55. Laboratory notebook in BIOL 235 Microbiology for Health Sciences 56. Laboratory worksheets in CHEM 110 Chemistry for Health Sciences 57. Diet analysis project in BIC 123 Nutrition 58. Lecture final exam in BIOL 211 Anatomy & Physiology for Health Sciences 59. Critical thinking case study in BIOL 212 Anatomy & Physiology II for Health Sciences 60. Lecture final exam in BIOL 212 Anatomy & Physiology II for Health Sciences		7. Vaccine oral presentation in BIOL 235 Microbiology for Health Sciences 8. Disease oral presentation in BIOL 235 Microbiology for Health Sciences 9. In-office exam in BIOL 235 Microbiology for Health Scienc 10. Lecture final exam in CHEM 11 Chemistry for Health Sciences 11. Critical thinking case study in BIOL 211 Anatomy & Physiolo I for Health Sciences 12. Critical thinking case study in BIOL 212 Anatomy & Physiolo II for Health Sciences	6. Laboratory final exam in BIOL 212 Anatomy & Physiology II for Health Sciences 7. Laboratory review sheets i BIOL 212 Anatomy & Physiology II for Health Sciences 8. Case study 7 in BIOL 360 Pathophysiology 9. Oral class participation in BIOL 211 Anatomy & Physiology I for Health Sciences 10. In-office oral exam in BIOL 235 Microbiology for Healt Sciences 11. Vaccine oral presentation i BIOL 235 Microbiology for Health Sciences 12. Disease team oral presentation in BIOL 235 Microbiology for Health Sciences 13. Critical thinking assignmer in BIOL 211 Anatomy & Physiology I for Health Sciences 14. Critical thinking assignmer in BIOL 212 Anatomy & Physiology II for Health Sciences

				15. Unknown lab project in BI 235 Microbiology for Heal Sciences 16. Laboratory final grade in CHEM 110 Chemistry for Health Sciences 17. Lecture final exam in CHE 110 Chemistry for Health Sciences 18. Case study 4 in BIOL 360 Pathophysiology
Additional Data: (List any additional information/data that informed this report.)				
Methodology: **(Explain the method of data collection and the data analysis process.)**	Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**		Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**	Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons. Data were compiled for each PLO and summarized. **mean scores on a scale of 1-4; 3+ considered proficient**
Data: **(Provide the graphs, charts, etc. that were used to show** PLO **data results. Do not include the raw data.)**	Develop understanding of function/structure/classification o human beings and their pathogens Mean=3.55 Effectively communicate principle of biology through written means Mean=3.75 Demonstrate proficiency in laboratory techniques		Develop understanding of function/structure/classification of human beings and their pathogens Mean=2.93 (n=71) Effectively communicate principles of biology through written means Mean=3.76 (n=38) Demonstrate proficiency in laboratory technique	Develop understanding of function/structure/classification of human beings and their pathogens Mean=3.0 (n=34) Effectively communicate principles of biology through written means Mean=3.65 (n=32)

	Mean= 3.15 Demonstrate ability to know, analyze, and synthesize scientific principles Mean=3.56		(n=0) Demonstrate ability to know, analyze, and synthesize scientific principles Mean=3.30 (n=103)	Effectively communicate principles of biology through oral means Mean=3.94 (n=29) Demonstrate proficiency in laboratory technique Mean=3.52 (n=21) Demonstrate ability to know, analyze, and synthesize scientific principles Mean=3.66 (n=36)
Results of Assessment: (What evidence exists that the program helps students achieve learning outcomes? What changes have been made since the last APR to ensure that outcomes are achieved and what changes will be made to the program following this APR? What have you learned from assessing the changes?)	Student averages in all four assessed competencies are above the proficient score of 3.		Student averages are lower than the proficient score of 3 in one of the competency areas. Data are lacking on the laboratory techniques competency.	Student averages in all five assessed competencies are at or above the proficient score of 3.
Strengths: (From the findings, list the areas of strengths that currently exist in the academic program.)	For all four areas assessed, student average scores are well above proficient (score of 3+). Students are doing particularly well in the ability to analyze and synthesize scientific principles and effective communication of principles of biology		Students are consistently scoring strongest in the written communicatic area, indicating we are doing a good jo of training them to communicate their findings in written form.	We have just started assessment of the oral communication competency, but students scored extremely high in that area. Compared to last year, students had a higher mean score for the ability to know, analyze, and synthesize scientific principles.

Areas in need of improvement: **(From the findings, list the areas of weakness(s) that currently exist in the academic program.)**	Students showed the lowest levels proficiency in laboratory techniqu		We are lacking data for proficiency in the laboratory techniques. Also, student scores in understanding the function/structure/classification of human beings and their pathogens have dropped in the last two years.	Student scores for understanding the function/structure/classification of human beings and their pathogens rose slightly from last year, but this competency still needs improvement. Also, the mean score for the ability to communicate effectively through written means declined compared to last year and needs improvement.
Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)** *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.	1. Develop innovative ways to teach structure, function, and classification of human beings and their pathogens: Show 5% gains in mean proficiencies in this area at end of Fall 2017. 2. Improve training in biology lab techniques: Show 5% gains in mean proficiencies in this area at end of Fall 2017.		1. Delay student entry into the CHEM 110 class until proficiency in algebra is met- start in spring 2019 2. Department chair sought out new faculty who would promote program learning goals in each class – start in spring 2019	1. Schedule focused study sessions before the BIOL 211/212 lab exams to help better prepare students for those assessments. – Start in Fall 2020 and Spring 2021 (Harris, Tenneson) 2. Increase the number of assignments being used to measure effective communication through written means as we currently only have three assignments. We need to broaden the students' exposure to writing assignments. – Start in Fall 2020 and Spring 2021 (Cook, LeCureux) 3. Program coordinator and full time faculty teaching within the

				program will reevaluate program level outcomes for the following academic year.
Improvements made: **(List completed improvement plans and dates of actual implementation.)** *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.	1. These assessment scores will serve as a benchmark to evaluate student outcomes in the future. 2. Biology faculty will develop pedagogical changes to implement in future semesters in each of the areas outlined above.		1. Faculty personnel changes have improved the assessments related to each of the four competencies and added additional assessments for laboratory techniques – implemented in fall 2019 2. Students are proficient in math before entering the Chemistry class – implemented in fall 2019	1. We have created new assessments to measure proficiency in lab techniques since there were no data last year for that outcome. – Fall 2019 and Spring 2020 2. We have added more assessments overall for this program (18 this year vs. 12 last year) and are now accurately measuring outcomes for only the students in this program. – Fall 2019 and Spring 2020

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Department: Natural and Applied Sciences **Program Coordinator: Don Tosh**

Academic Program Evaluated: Mathematics **Program Review Year: 2019-2020**

	Year 1 **Academic Year: 2016-2017**	Year 2 **Academic Year: 2017-2018**	Year 3 **Academic Year: 2018-2019**	Year 4 **Academic Year: 2019-2020**
Faculty members involved in this assessment process: (List all faculty members who participated: program coordinator, reviewers, committee members, etc.)	*see previous document	*see previous document	*see previous document	Dr. Don Tosh, full professor, program coordinator and artifact assessor Mrs. Dianne Twigger, assistant professor and artifact assessor.
Number of students in sample: (If known, supply the number of students in each class/year who were used in the assessment report.)	Freshmen: Sophomores: Juniors: Seniors: Graduate:	Freshmen: Sophomores: Juniors: Seniors: Graduate:	Freshmen: Sophomores: Juniors: Seniors: Graduate:	Freshmen: 0 Sophomores: 1 Juniors: 3 Seniors: 3 Graduate: 0
Instrument(s) used in assessment: (List the				Instruments are listed by outcome measured:

exams, standardized tests, portfolios, etc. that were used in the assessment process.)				Developing Problem Solving Skills: • Related Rates Quiz math 231 • Quiz 1 math 232 • Quiz 5 math 232 Improve Proof Techniques • Midterm math 212 • Exam 3 math 334 Improve Technological Skills • Homework assignment math 210 Model Real Life Phenomena • Homework assignment math 210 • Quiz math 210 • Quiz math 233
Additional Data: (List any additional information/data that informed this report.)				
Methodology: (Explain the method of data collection and the data analysis process.)				Using 4-point scale rubrics, assessors scored student work on instruments above in Course Commons. A score of 3 or higher indicates mastery, and if a student is assessed on multiple assignments, the highest score prevails. Data was exported into excel for analysis.

Data: **(Provide the graphs, charts, etc. that were used to show** PLO **data results. Do not include the raw data.)**				**Results of Assessment (mean scores on a scale of 0-4; 3+ considered proficient)** Students are assessed on four themes (Program Level Outcomes) 6. Develop Problem Solving Skill (mean 4, n=1) 7. Model Real Life Phenomena (mean 2.8, n=5) 8. Improve Proof Techniques (mean 4, n=7) 9. Improve Technological Skills (mean 4 n=2)
Results of Assessment: (What evidence exists that the program helps students achieve learning outcomes? What changes have been made since the last APR to ensure that outcomes are achieved and what changes will be made to the program following this APR? What have you learned from assessing the changes?)				Based on the data above, students are achieving mastery on three of the four program level outcomes as they progress through the program. In previous years, sample size was much higher but was including non-majors who were also enrolled in these courses.
Strengths: **(From the findings, list the areas of strengths that currently exist in the academic program.)**				The program is generally meeting its goals in relation to mastery of outcomes. Data collection on improving proof techniques increased.
Areas in need of improvement: **(From the**				A weakness in modelling real life phenomena was noted.

findings, list the areas of weakness(s) that currently exist in the academic program.)				Due to splitting math majors into 3 categories (math, math ed, and applied math) the numbers in each category dropped substantially and led to only having reports in this outcome from one artifact. Hopefully we will get a more complete picture in future semesters to get a more comprehensive picture.
Plans for improvement: (Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.) *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.				Faculty need to look into other artifacts that will provide more information about this outcome. The one artifact used will be examined for extenuating circumstances and the material will be adjusted if necessary. Program coordinator and full-time faculty teaching in the program will re-evaluate program level outcomes for the following academic year.
Improvements made: (List completed improvement plans and dates of actual implementation.) *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.				Data collection on improving proof techniques has increased, and all sections of courses on the curriculum map are now assessing program level outcomes.

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Department: Natural and Applied Sciences **Program Coordinator: Dianne Twigger**

Academic Program Evaluated: Mathematics Education **Program Review Year: 2019-2020**

	Year 1 **Academic Year: 2016-2017**	Year 2 **Academic Year: 2017-2018**	Year 3 **Academic Year: 2018-2019**	Year 4 **Academic Year: 2019-2020**
Faculty members involved in this assessment process: **(List all faculty members who participated: program coordinator, reviewers, committee members, etc.)**	*see previous document	*see previous document	*see previous document	Dr. Don Tosh, full professor and artifact assessor Mrs. Dianne Twigger, assistant professor, program coordinator, and artifact assessor Mrs. Michelle Parker, adjunct faculty and artifact assessor.
Number of students in sample: **(If known, supply the number of students in each class/year who were**	Freshmen: Sophomores: Juniors:	Freshmen: Sophomores: Juniors:	Freshmen: Sophomores: Juniors:	Freshmen: 3 Sophomores: 3 Juniors:1

used in the assessment report.)	Seniors: Graduate:	Seniors: Graduate:	Seniors: Graduate:	Seniors: 1 Graduate: 0
Instrument(s) used in assessment: **(List the exams, standardized tests, portfolios, etc. that were used in the assessment process.)**				Instruments are listed by outcome measured: Developing Problem Solving Skills: • Related Rates Quiz math 231 • Quiz 1 math 232 • Quiz 5 math 232 Improve Proof Techniques • Midterm math 212 • Exam 3 math 334 Improve Technological Skills • Homework assignment math 210 Model Real Life Phenomena • Homework assignment math 210 • Quiz math 210 • Quiz math 233
Additional Data: (List any additional information/data that informed this report.)				
Methodology: **(Explain the method of data collection**				Using 4-point scale rubrics, assessors scored

and the data analysis process.)				student work on instruments above in Course Commons. A score of 3 or higher indicates mastery, and if a student is assessed on multiple assignments, the highest score prevails. Data was exported into excel for analysis.
Data: (Provide the graphs, charts, etc. that were used to show PLO data results. Do not include the raw data.)				**Results of Assessment (mea scores on a scale of 0-4; 3+ considered proficient)** Students are assessed on four themes (Program Level Outcomes) 10. Develop Problem Solving Skills (mean 3.5, n=4) 11. Model Real Life Phenomena (mean 4, n=3) 12. Improve Proof Techniques (mean 3.14, n=7) 13. Improve Technological Skills (mean 3.5 n=2)
Results of				Based on the data above,

Assessment: (What evidence exists that the program helps students achieve learning outcomes? What changes have been made since the last APR to ensure that outcomes are achieved and what changes will be made to the program following this APR? What have you learned from assessing the changes?)				students are achieving mastery on these four program level outcomes as they progress through the program. On previous years, sample size was much higher but was including non-majors who were also enrolled in these courses.
Strengths: **(From the findings, list the areas of strengths that currently exist in the academic program.)**				The program is meeting its goals in relation to mastery of outcomes. Data collection on improving proof techniques increased.
Areas in need of improvement: **(From the findings, list the areas of weakness(s) that currently exist in the academic program.)**				No major weaknesses noted. Due to covid and the transition to online classes, less data was collected for improving technological skills as students were unable to access campus software. Given that the pandemic has the potential to continue on into the next academic year, faculty should look into other options for meeting this objective.

Plans for improvement: **(Provide the improvement plan, when it will be implemented, and person who will administer the improvement plan.)** *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.				Faculty need to look into alternative methods of technology that can be used in a hybrid or online format to prepare for the upcoming school year. Program coordinator and full-time faculty teaching within the program will re-evaluate program level outcomes for the following academic year.
Improvements made: **(List completed improvement plans and dates of actual implementation.)** *If an A.A. degree is part of this program, describe how the changes to this program affect the A.A. degree, if any.				Data collection on improving proof techniques has increased, and all sections of courses on the curriculum map are now assessing program level outcomes.