Evangel University
Natural and Applied Sciences Assessment Report

Program: Environmental Science

Faculty Members Involved

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
4. Michael Tenneson, Professor of Biology — Artifact Assessor

Number of Students in Sample:

100 level classes: 0
200 level classes: 12
300 level classes: 13
400 level classes: 0
Total number: 25

Instruments Used

1. Ecosystem Observation Project – BIOL 342 Ecology
2. Critical thinking assignment (Animal Behavior) in BIOL 202 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 CHEM 111 General Chemistry *
6. Laboratory worksheets in BIOL 202 Botany
7. SWOT Analysis of Mt. Suswa Kenya in BIOL 343 Environmental Biology
8. Traffic Analysis Springfield, MO in BIOL 343 Environmental Biology

*These assignments and others not listed will be measured in future semesters, but no current data are available at this time.

Methodology

Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons.

Results of Assessment (mean scores on a 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: 3.15

Use classroom theory to field understanding and application by participation in off campus class opportunities: 3.75

Demonstrate the use technology associated with the study of environmental science: 3.76

Communicate a scientifically informed world view through writing: 3.55

Strengths

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.

In Need of Improvement

Students showed the lowest levels of proficiency in applying the scientific method to research problems in environmental science.

Plans for Improvement

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

Improvements Made

These assessment scores will serve as a benchmark to evaluate student outcomes in the future. Biology faculty will develop pedagogical changes to be implemented in future semesters in each of the areas outlined above.

Evangel University Due: September 14, 2016
Academic Program Assessment Report

Instructions: Please complete a separate Report for every academic program/major.

Department: Natural and Applied Sciences **Term: Fall 2016**

Academic Program Evaluated: Biological Chemistry

Faculty members involved in this assessment process:

Name Title Assessment Role

1. Natasha DeVore, Associate Professor of Chemistry, Assessor
2. Matthew DeVore, Associate Professor of Chemistry, Assessor
3. Erica Harris, Assistant Professor of Biology, Assessor
4. Joshua Kendell, Assistant Professor of Biology, Assessor
5. Michael Tenneson, Professor of Biology, Assessor

Number of students in sample:

Breakdown by year if known

1st year: **2nd year:** 72 **3rd year**: 53 **4th year:** 12 **Total Students:** 137

Instrument(s) used in assessment:

1. Laboratory notebooks in CHEM 271, CHEM 272, CHEM 378, BIOL/CHEM 375, BIOL 335
2. Formal Lab Report on Enzyme Kinetics in BIOL/CHEM 375
3. Taxonomy matching items on unit test in BIOL 201
4. Microorganism Paper in BIOL 335
5. Microbiology annotated bibliography in BIOL 335
6. Literature review paper in BIOL 496
7. Oral Presentation in BIOL 496
8. Poster Presentation on Protein Crystallography Project in BIOL/CHEM 375*
9. Cell Biology Paper in BIOL 437*
10. Oral Presentation on Final Lab Project in CHEM 112*
11. Formal Lab Report in CHEM 272*
12. Method Development Paper in CHEM 378*
13. Group project in CHEM 112*
14. Design Experiment in CHEM 378 and CHEM 331*

**These instruments for assessment are not included in this report because either the assignment has not occurred by the date of report generation or courses have not been offered yet.*

Methodology:

Using a 4 point scale rubric for each of the desired outcomes for Biological Chemistry, assessors scored student work on instruments above in Course Commons.

Results of Assessment (mean scores on a scale of 1-4; 3+ considered proficient):

Develop understanding of function/structure/classification of life 2.98

Effectively communicate principles of biology through oral and written means
Oral 3.59
Written 3.58

Explain the principles of chemistry through oral and written means
Oral _____ (In progress in CHEM/BIOL 375)
Written _____ (In progress in CHEM/BIOL 375)

Integrate the principles of chemistry into biological systems 3.53

Demonstrate proficiency in laboratory recording through lab notebooks. 3.75

Strengths:

Students have been successful in communicating the principles of biology through oral and written means with a score of 3.6.

The integration of principles of chemistry into biological systems and proficiency in laboratory recording are also at satisfactory levels.

Areas in need of improvement:

Student understanding of function, structure, and classification of life could use some improvement. The current level of achievement is just below the acceptable 3.0 level.

We have had a high turnover in faculty (both chemistry professors and one biology professor) in the Biological Chemistry major the past two years, so many changes have been made in terms of the assessment instruments in each of these classes. We now have a system set up to assess student competency in each of these courses using the canvas learning management system. Continued assessment is required to gather increased statistics in all categories.

Plans for improvement:

Plan for Improvement	Timeline	Responsible Person
Need complete tracking of assessments in all involved course	By end of 2016-17 academic year, da should be entered from each of assessment instruments.	Natasha DeVore, Associate Professor of Chemistry Matthew DeVore, Associate Professor of Chemistry Erica Harris, Assistant Professor of Biology

		Joshua Kendell, Assistant Professor of Biology Michael Tenneson, Professor of Biology
Place a higher emphasis on the function/structure/classification of life in BIOL 201 and 202 since students seem to struggle with this objective.	Increased focus will be included in BIOL 202 in Spring 2017.	Erica Harris, Assistant Professor of Biology

Improvements made:

1. A lab section was added to BIOL/CHEM 375 which allows for assessment of several key outcomes in a laboratory setting. It also gives students the opportunity to learn the techniques that they read about in the lecture portion of the class.
2. We have acquired chemistry instrumentation which will enrich the laboratory experience. These instruments include a -80°C freezer, sonicator, several pH probes, two research grade scanning UV-vis spectrophotometers, a Shimadzu PC-2105 and a Cary Bio300, and two oxidation-reduction potential electrodes.
3. 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 with the new assessment assignments.
4. 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.

Evangel University
Natural and Applied Sciences Assessment Report

Program: Biology

Faculty Members Involved

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
4. Michael Tenneson, Professor of Biology — Artifact Assessor

Number of Students in Sample:

100 level classes: 0
200 level classes: 57
300 level classes: 58
400 level classes: 24
Total number: 139

Instruments Used

1. Taxonomy items on unit test in BIOL 201 Zoology
2. Plant collection in BIOL 202 Botany
3. Group investigation oral presentation in BIOL 200 General Biology *
4. Oral presentation in BIOL 335 Microbiology
5. Oral presentation in BIOL 496 Senior Seminar
6. Group investigation lab report in BIOL 200 General Biology *
7. Labs in BIOL 202 Botany
8. Microorganism paper in BIOL 335 Microbiology
9. Literature review paper in BIOL 496 Senior Seminar
10. Unknown microorganism lab exam in BIOL 335 Microbiology
11. Fruit fly gene propagation lab in BIOL 338 Genetics
12. Food systems project in BIOL 202 Botany *
13. Primer design exercise in BIOL 335 Microbiology *

*These assignments will be measured in future semesters, but no current data are available at this time.

Methodology

Using 4 point scale rubrics, assessors scored student work on instruments above in Course Commons.

Results of Assessment (mean scores on a scale of 1-4; 3+ considered proficient)

Develop understanding of function/structure/classification of life:	2.98
Effectively communicate principles of biology through oral means:	3.59
Effectively communicate principles of biology through written means:	3.58
Demonstrate proficiency in laboratory technique:	3.46
Demonstrate ability to know, analyze, and synthesize scientific principles:	3.38

Strengths

In four of the five assesses competencies, student averages are above the proficient score of 3. The lowest average is 2.98, which is pretty close to proficient. 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.

In Need of Improvement

Student knowledge about function and structure and classification need the greatest improvement, and should be targeted for improvement.

Plans for Improvement

Develop innovative ways to teach structure, function, and taxonomy.	Show 5% in mean proficiencies in this area at end of Fall 2017.	Kendall, Tenneson
Enhance instruction in analysis and synthesis of scientific principles.	Show 5% gains in mean proficiencies by end of Fall 2017.	Harris, Kendall, Streubel, Tenneson
Improve training in biology lab techniques.	Show 5% gains in mean proficiencies by end of Fall 2017.	Harris, Kendall, Streubel, Tenneson

Improvements Made

These assessment scores will serve as a benchmark to evaluate student outcomes in the future. Biology faculty will develop pedagogical changes to be implemented in future semesters in each of the areas outlined above.

Evangel University Due: September 14, 2016
Academic Program Assessment Report

Instructions: Please complete a separate Report for every academic program/major.

Department: Natural and Applied Sciences **Term:** Fall 2016

Academic Program Evaluated: Chemistry

Faculty members involved in this assessment process:

Name	Title	Assessment Role

1. Natasha DeVore, Associate Professor of Chemistry, Assessor
2. Matthew DeVore, Associate Professor of Chemistry, Assessor

Number of students in sample:
Breakdown by year if known

1st year: **2nd year:** 15 **3rd year**: **4th year:** **Total Students:** 15

Instrument(s) used in assessment:

1. Laboratory notebooks in CHEM 271, CHEM 272, CHEM 378, CHEM 331, CHEM 332, CHEM 431, CHEM 432
2. HCL/DCL Laboratory report in CHEM 432*
3. Iodine Clock Laboratory report in CHEM 431*
4. Oral Presentation on Final Lab Project in CHEM 112*
5. Method Development Paper in CHEM 378*
6. Formal Lab Report in CHEM 272*
7. UVvis Laboratory report in CHEM 332*
8. HPLC Laboratory Report in CHEM 332*
9. Acid/Base titration report in CHEM 331*
10. Laboratory report assignment in CHEM 111, CHEM 112, CHEM 271, CHEM 272*
11. Literature review paper in CHEM 496*
12. Oral Presentation in CHEM 496*
13. Group project in CHEM 112*
14. Design Experiment in CHEM 378, CHEM 331, CHEM 332, and CHEM 431*

**These instruments for assessment are not included in this report because either the assignment has not occurred by the date of report generation or courses have not been offered yet*

Methodology:

Using a 4 point scale rubric for each of the desired outcomes for Chemistry, assessors scored student work on instruments above in Course Commons.

Results of Assessment (mean scores on a scale of 1-4; 3+ considered proficient):

Explain the principles of chemistry through oral and written means ___ (in progress for FA 2016 in CHEM 431)

Demonstrate proficiency in the use of chemical analysis and instrumentation __ (in progress for FA 2016 in CHEM 431 and CHEM 271)

Demonstrate proficiency in laboratory recording through lab notebooks. 3.84

Strengths:

A plan is in place for continued assessment in future semesters. However, data is only available for one objective from 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.

Areas in need of improvement:

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 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.

Plans for improvement:

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 instruments.	Natasha DeVore, Associate Professor of Chemistry Matthew DeVore, Associate Professor of Chemistry

Improvements made:

1. 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.

2. 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.
3. 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.

Evangel University
Academic Program Assessment Report

Department: Natural & Applied Sciences **Term: FA16**

Academic Program Evaluated: Computer Information Systems

Faculty members involved in this assessment process:

1. Douglas Mitcham, Assoc. Professor of Computer Science Artifact Assessor
2. Jeremy Harris, Assoc. Professor of Computer Information Systems Artifact Assessor

Number of students in sample:

2015: 24 2016: 23 Total Students: 47

Instruments Used:

1. Graded Final Exam – Systems, Analysis, and Design
2. Graded Final Exam – DCD and Sequence Diagrams
3. Graded Final Exam – Information Systems
4. Graded Final Exam – Internet, LAN, WAN
5. Graded Homework Assignment – CRC and DCD's
6. Graded Homework Assignment – TCP/IP

Methodology:

Exams and assignments for Computer Information Systems students were evaluated. The assignment items (listed as 'instruments' above) were evaluated based on a 4 point scale (4 being best), as specified in the rubric developed for the Computer Information System program assessment. From these evaluations, strengths and weaknesses may be identified with regard to meeting the four major outcomes described in the computer science assessment plan (and listed below).

Results of Assessment (data in summary format):

I	Computer Architecture & System Hardware		
	IIa	Systems Analysis and Design	3.3
	IId	DCD and Sequence Diagrams	3.4
	IIe	Internet, LAN, WAN	3.2

II	System Software		
	IIIa	CRC's and DCD's	4.0
	IIIb	TCP/IP	3.3
III	Business Systems and Methodologies		
	Va	Information Systems	3.2

Strengths:

- Although several areas showed strong results, the CRC's and DCD's in the System Software section along with DCD and Sequence Diagrams section (IIa) of the Computer Architecture & System Hardware are highest.
- Overall average for all is 3.4/4.

Areas in need of improvement:

- Internet, LAN, and WAN (IIe) with Information Systems (Va) are the lowest averages The low averages will be addressed below.

- Systems Analysis and Design (IIa) has the next to lowest average and will be addressed.

Plans for improvement:

Plan for Improvement	Timeline	Responsible Person
Devote more time and vary the learning techniques to focus on student mastery of the Internet, LAN, and WAN concepts in CPSC 325	Changes to be implemented for CPSC 325 in the SP18 semester	Jeremy Harris
Devote more time in CIS 111 to covering the concepts of Information Systems with hands-on exercises	Changes to be implemented for CIS 314 in the SP17 semester (CIS 111 is being phased out)	Jeremy Harris
Devote more time in CIS 111 to covering the concepts of Systems Analysis and Design with hands-on exercises	Changes to be implemented for CIS 314 in the SP17 semester (CIS 111 is being phased out)	Jeremy Harris
To improve overall assessment averages by varying learning techniques and include more video tutorials, hands-on learning exercises, and project based assessments.	Changes to be implemented starting SP17	Jeremy Harris

Identify and refine more accurate assessment instruments	Changes to be implemented SP17	Jeremy Harris

Improvements made:

- Regular gathering of assessment data now happens each semester and is scored/tabulated for records. Needed improvements are identified based on assessment scores.

- Prior assessment scores have improved and are higher on average from FA15 to FA16 for CIS 111 due to inclusion of textbook concepts in the form of videos, web searches, and off campus site visits.

- Student feedback has been positive with CIS 111's off campus visits to actual data centers for the purpose of experience and application of concepts taught in class.

- Student feedback indicated a desire to have more 'hands-on', interactive learning for some classes. CPSC 311 has been designed to include hands-on diagram creation using MS Visio and MS Project which are industry leading programs. 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.

- The inclusion of video tutorials and student web searches for concept data has been included in CPSC 325.

Evangel University
Academic Program Assessment Report

Department: Natural & Applied Sciences **Term: FA16**

Academic Program Evaluated: Computer Science

Faculty members involved in this assessment process:

1. Douglas Mitcham, Assoc. Professor of Computer Science — Artifact Assessor
2. Jeremy Harris, Asst. Professor of Computer Information Systems — Artifact Assessor
3. Don Tosh, Professor of Mathematics — Artifact Assessor

Number of students (graduates) in sample:
(The last evaluation assessed graduates through 2013)

2014: 3 2015: 3 2016: 8 Total Students: 14

Instruments Used:
1. Graded program from a second Higher Order Language
2. Graded CPSC 211 lab exhibiting algorithm analysis and implementation
3. Graded MATH 212 test covering algorithm development and analysis
4. Graded Senior Project (CPSC 493) components (as well as overall grade)
5. Graded assembly language program
6. Scores for CPSC 225 chapter/subject quizzes and homework
7. CPSC 231 score from the quiz on auxiliary storage devices
8. CPSC 441 (Database Management Systems) homework scores
9. CPSC 415 (Operating Systems) homework scores
10. Graded team programming assignment
11. Graded research paper from either CPSC 415 and/or CPSC 441
12. Oral presentation grades from CPSC 415

Methodology:

Portfolios for computer science graduates were evaluated. The portfolio items (listed as 'instruments' above) were evaluated based on a 4 point scale (4 being best), as specified in the rubric developed for computer science program assessment. From these evaluations, strengths and weaknesses may be identified with regard to meeting the four major outcomes described in the computer science assessment plan (and listed below).

Results of Assessment (data in summary format):

I	Algorithm Development & Implementation		
	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		
	IIa	practical application	3.3
	IIb	practical knowledge:	
		digital logic, circuits, concept. machines	3.7
		basic architecture	3.8
		addressing	3.8
		the processor	3.6
		I/O organization	3.4
	IIc	storage device knowledge	3.1
	IId	computer component knowledge:	
		digital logic, circuits, concept. machines	3.1
		basic architecture	2.7
		addressing	2.4
		the processor	2.9
		I/O organization	3.1
		memory	2.6
III	System Software		
	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
		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
		protection and security	3.8
IV	Communication Skills		
IVa	peer collaboration		3.9
IVb	written communication- storage/data		3.6
IVc	oral communication:		
		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	written communication – systems		3.3

Strengths:

Although several areas showed strong results, the communication skill components of peer collaboration and oral presentation scored exceptionally high.

Areas in need of improvement:

- Algorithm analysis (Ia) scored lower and would be one area to focus on.

- Computer component knowledge (IId) also scored lower than other areas and should be addressed.

Plans for improvement:

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

Improvements made:

- Prior assessments showed students doing poorly on software design activities. Added design assignments and added time discussing design were incorporated primarily into CPSC 111 and CPSC 211. More design examples were shown in CPSC 493 and a higher was weight 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. 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.

- 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.

- 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.

Evangel University **Due: September 14, 2016**

Academic Program Assessment Report

Instructions: Please complete a separate Report for every academic program/major.

Department: Natural and Applied Sciences **Term: SP16 and FA16**

Academic Program Evaluated: Mathematics / Mathematics Education

Faculty members involved in this assessment process:

Name	Title	Assessment Role
1. Dianne Twigger	Assistant Professor	Assessor
2. Don Tosh	Professor	Assessor

Number of students in sample: 46

Instrument(s) used in assessment:*
1. Exam; Differential Equations (Outcome 1)
2. Quiz; Calculus III (Outcome 1)
3. Exam; Calculus II (Outcome 1)
4. Exam; Discrete Mathematics (Outcome 2)
5. Homework; Linear Algebra (Outcome 2)
6. Take Home Midterm; Algebraic Structures (Outcome 2)
7. Take Home Final; Advanced Calculus (Outcome 2)
8. Presentation; Senior Seminar (Outcome 2)
9. Homework; Calculus II (Outcome 3)
10. Quiz; Calculus III (Outcome 3)
11. Exam 3; Linear Algebra (Outcome 3)
12. Homework; Differential Equations (Outcome 3)

*Other instruments are used for assessment, but have not been included in this assessment cycle.

Methodology:

Outcomes were assessed using a variety of different instruments, in a variety of different classes. Mastery was set at three on a four point scale. For overall outcome results when a student had been assessed on multiple outcomes, the students highest score was recorded (this explains the reduction in sample size when discussing overall results).

Results of Assessment (data in summary format):

Outcome 1: Develop Problem Solving Skills

This outcome is assessed in three different courses.

Overall Score: 3.25/4 (n=32)
Score in Calculus II: 2.82/4 (n=17)
Score in Calculus III: 3.93/4 (n=15)
Score in Differential Equations: 2.85/4 (n=13)

Outcome 2: Improve Proof Techniques

This outcome is assessed in five different courses.

Overall Score: 3.3/4 (n=30)
Score in Discrete Mathematics: 3.05/4 (n=19)
Score in Linear Algebra: 3.32/4 (n=22)
Score in Algebraic Structures: 3.73/4 (n=15)
Score in Advanced Calculus 3.36/4 (n=11)
Score in Senior Seminar: 3.29/4 (n=7)

Outcome 3: Model Real Life Phenomena

This outcome is assessed in four different courses.

Overall Score: 3.53/4 (n=38)
Score in Calculus II: 3.59/4 (n=17)
Score in Calculus III: 3.27/4 (n=15)
Score in Linear Algebra: 3.37/4 (n=19)
Score in Differential Equations: 3.38/4 (n=13)

Outcome 4: Improve Technological Skills

No data available for semesters included in this report.

Strengths:

Three of the four outcomes are currently assessed in multiple courses, using multiple instruments. This ensures that students have multiple exposures to important concepts in mathematics. Average student scores were all near or above mastery level set in the outcome assessment plan. Also, data shows that student scores improve as they progress through the program.

Areas in need of improvement:

Currently, the only course that assesses outcome 4 is Numerical Analysis. Numerical Analysis is taught once every two years, and so assessment data is limited. We are considering other courses in which we can add a technological component to be assessed. Potential courses include Differential Equations and Linear Algebra. This would provide us with multiple assessment opportunities to address this outcome.

Plans for improvement:

Plan for Improvement	Timeline	Responsible Person
Include technological components (to assess outcome 4) to other courses	SP17 – Differential Equations SP17 – Numerical Analysis FA18 – Linear Algebra	Twigger Tosh Twigger
Incorporate modeling component into other courses	FA18 – Probability and Statistical Inference	Tosh
Compile Assessment Report at the end of each academic year	SP17	Tosh/ Twigger

Improvements made:

1. A proof component was added to weekly quizzes in Advanced Calculus as well as Algebraic Structures. This contributed to a significant increase in outcome assessment scores.

2. An introduction to proof techniques unit was added to Discrete Mathematics in spring 2016. This has given our students a firm foundation in proof writing techniques.