Northern Oklahoma College
Mathematics and Physical Science Degree Program Review
Options: Astronomy, Chem/Physics, Mathematics, & Pre-Engineering
Program Assessment--June 2017

Description of the program's connection to the institutional mission and goals:

The mission of Northern Oklahoma College, the State's oldest community college, is a multi-campus, land-grant institution that provides high quality, accessible, and affordable educational opportunities and services which create life-changing experiences and develop students as effective learners and leaders within their communities in a connected, ever-changing world.

Northern Oklahoma College will be recognized as a model institution and leader in academic quality and cultural enrichment, promoting student success, collaborative learning, creative and forward thinking, and community responsiveness.

The core values of Northern Oklahoma College are that through personalized education we believe in providing individualized services leading our students to achieve their academic goals in a welcoming and safe environment, and we will provide support to students in and out of the classroom so that they receive a full college experience with diverse opportunities. Another core value is community and civic engagement, so we believe that educated citizens are necessary for a healthy, democratic society, and that free and open expression and an appreciation for diversity are cornerstones of higher education, and we believe in economic and environmental sustainability and the importance of enriching the intellectual, artistic, economic, and social resources of our communities.

We at Northern Oklahoma College also believe in the inherent value of intellectual pursuit for both personal and professional growth, as well as the need to prepare students for the 21st century professions, and that a knowledge-centered institution is vital to a knowledge-based economy, and we measure our success against national models and standards of excellence

3.7.5 Process (Internal/External Review):
Previous Reviews and Actions from those reviews:

Analysis and Assessment (including quantitative and qualitative measures) noting key findings from internal or external reviews and including developments since the last review:

Each semester faculty assess students on specific topics within each course related to a general education or a program requirement. Through the Assessment Committee review of general education competencies, there was a recommendation for an institutional focus on critical thinking for the 2016-2017 academic year. Assessment activities and rubrics were updated for math general education to further emphasize a focus on this competency. Each fall, the data collected is discussed among faculty to determine where weaknesses are occurring and where changes can be made. Common assessment questions and set grading rubrics have been put in place to more accurately assess the students' performance and have consistency across all campuses. Discussions took place to realign the curriculum so that the most important concepts are taught during the semester, with an option to cover less essential topics.

The math courses have begun to require a passing grade of "C" or better in the prerequisite course to be eligible to enroll in the subsequent course. This requirement has been set to ensure students are fully prepared to advance through the program requirements successfully.

Each year, Northern Oklahoma College faculty participate in articulation meetings with a number of colleges across the state to align curriculum and update articulation agreements.

A. Centrality of the Program to the Institution's Mission:

The mission of Northern Oklahoma College, the State's oldest community college, is a multi-campus, land-grant institution that provides high quality, accessible, and affordable educational opportunities and services. The A.S. in Mathematics and Physical Science provides the foundational coursework for students completing degrees in high interest STEM fields with numerous transfer and career options in engineering and research.

B. Vitality of the Program:

B.1.Program Objectives and Goals:

Each option under the Math and Physical Science degree program is evaluated based on the learner outcomes listed below:

Astronomy

- Use and apply physical data to solve problems
- Use logical reasoning to solve problems
- Explain evolutionary theory and its supporting principles

Chem/Physics

- Use and apply physical data to solve problems
- Use logical reasoning to solve problems
- Communicate scientific ideas through technical writing
- Solve problems related to thermodynamics

Mathematics

- Sketch or identify and interpret graphs.
- Manipulate, simplify and/or solve expressions or equations.
- Solve and interpret real world application problems.

Pre-Engineering

- Use and apply physical data to solve problems
- Use logical reasoning to solve problems
- Communicate scientific ideas through technical writing
- Recognize connections between physical concepts and engineering applications

B.2 Quality Indicators (including Higher Learning Commission issues):

All degree programs are assessed annually based on a rotation of competencies tested through required program classes. An example from 2016-2017 appears below for all degree options:

Astronomy	
Competency # and Description	1. Use and apply physical data to solve problems

Course	ASTR 2513 – Observatory Methods, MATH 2145 –Calculus I, MATH 2155 – Calculus II
Activity	ASTR 2513 – Quiz MATH 2145 – Word problems involving derivations MATH 2155 – Word problems involving vectors.
Measurement	ASTR 2513 - Quiz MATH 2145 - Common questions assessed on a quiz MATH 2155 - Common questions assessed on a quiz
Evaluation Criteria	For all 3 courses, students will earn 70% or better on the designated quiz/exam.
Results	ASTR 2513 No enrollment MATH 2145 – 7/7 (100%) of students met competency MATH 2155 – 31/35 (88.57%) of students met competency MATH 2145 – 26/35 (74.28%) of students met competency MATH 2155 – 4/7 (57.14%) of students met competency
Competency # and Description	2. Use logical reasoning to solve problems
Course	ASTR 2513 – Observatory Methods, MATH 2145 –Calculus I, MATH 2155 – Calculus II
Activity	ASTR 2513 – Quiz MATH 2145 – Word problems involving derivations MATH 2155 – Word problems involving vectors.
Measurement (attached copy of instrument with point distribution)	ASTR 2513 – Quiz MATH 2145 - Common questions assessed on a quiz MATH 2155 - Common questions assessed on a quiz
Evaluation Criteria	70% pass rate on activity
Results	NA – ASTR 2513 not offered MATH 2145 – 7/7 (100%) of students met competency MATH 2155 – 31/35 (88.57%) of students met competency MATH 2145 – 26/35 (74.28%) of students met competency MATH 2155 – 4/7 (57.14%) of students met competency
Competency # and Description	3. Explain evolutionary theory and its supporting principles.
Course	ASTR 1523 – Planetary Science
Activity/Measurement	ASTR 1523 - Exam
Evaluation Criteria	Pass rate of 70% on each activity
Results	ASTR 1523 17 out of 17 – 100%
Chem/Physics	
Competency # and Description	1. Use and apply physical data to solve problems
Course	CHEM 1414 – General Chemistry II, PHYS 2014 – Engineering Physics I, MATH 2145 – Calculus I, MATH 2155 – Calculus II

Activity	CHEM 1414 – Quizzes, exams PHYS 2014 - Quizzes, exams MATH 2145 – Word problems involving derivations MATH 2155 – Word problems involving vectors.
Measurement	CHEM 1414 / PHYS 2014 – Quizzes, exams MATH 2145 / MATH 2155 - Common questions assessed on a quiz
Evaluation Criteria	70% pass rate on designated quiz/exam
Results	CHEM 1414 39 out of 51 – 76.5% PHYS 2014 25 out of 25 – 100% MATH 2145 – 7/7 (100%) of students met competency MATH 2155 – 31/35 (88.57%) of students met competency MATH 2145 – 26/35 (74.28%) of students met competency MATH 2155 – 4/7 (57.14%) of students met competency
Competency # and Description	2. Use logical reasoning to solve problems
Course	CHEM 1414 – General Chemistry II, PHYS 2014 – Engineering Physics I, MATH 2145 – Calculus I, MATH 2155 – Calculus II
Activity	CHEM 1414 – Quizzes, exams PHYS 2014 - Quizzes, exams MATH 2145 – Word problems involving derivations MATH 2155 – Word problems involving vectors.
Measurement	CHEM 1414 / PHYS 2014 – Quizzes, exams MATH 2145 / MATH 2155 - Common questions assessed on a quiz
Evaluation Criteria	70% pass rate on exam
Results	CHEM 1414 38 out of 55 – 69.1% PHYS 2014 25 out of 25 – 100% MATH 2145 – 7/7 (100%) of students met competency MATH 2155 – 31/35 (88.57%) of students met competency MATH 2145 – 26/35 (74.28%) of students met competency MATH 2155 – 4/7 (57.14%) of students met competency
Competency # and Description	3. Communicate scientific ideas through technical writing
Course	CHEM 1414 – General Chemistry II, PHYS 2014 – Engineering Physics I
Activity/Measurement	CHEM 1414 – Labs PHYS 2014 – Labs
Evaluation Criteria	Pass rate of 70% on each activity
Results	CHEM 1414 44 out of 53 – 83.0% PHYS 2014 26 out of 28 – 92.8%
Competency # and Description	4. Solve problems related to thermodynamics
Course	CHEM 1414 – General Chemistry II
Activity/Measurement	CHEM 1414 – Quiz, exam

Evaluation Criteria	Pass rate of 70% on each activity
Results	CHEM 1414 46 out of 53 - 86.8%
Mathematics	
Competency # and Description	1. Sketch or identify and interpret graphs
Course	MATH 1613 – Trigonometry, MATH 2145 – Calculus I, MATH 2155 – Calculus II
Activity	MATH 1613 – Identify amplitude, period and sketch graph of the 6 trig functions MATH 2145 – Discuss the continuity of a given function at a point and on an interval MATH 2155 – Find the second derivative, slope of the tangent line and the y direction of a point of a function
Measurement	MATH 1613 / 2145 / 2155 - Common question assessed on quiz
Evaluation Criteria	MATH 1613/2145/2155 - Students will earn 70% or better on quiz
Results	MATH 1613 – 39/49 (79.59%) of students met competency MATH 2145 – 9/9 (100%) of students met competency MATH 2155 – 27/35 (77.14%) of students met competency MATH 2145 – 27/35 (77.14%) of students met competency MATH 2155 – 6/7 (85.71%) of students met competency
Competency # and Description	2. Manipulate, simplify and/or solve expressions or equations
Course	MATH 1613 – Trigonometry, MATH 2145 – Calculus I, MATH 2155 – Calculus II, MATH 2613 – Differential Equations
Activity	MATH 1613 – Verify each identity justifying each step MATH 2145 – Fundamental rules of integration. MATH 2155 – Evaluate and apply double and triple integrals in rectangular and polar coordinates MATH 2613 – Solve various type of equations including Laplace transforms and determining if an equation is exact.
Measurement	MATH 1613/2145/2155/2613 - Common questions assessed on a quiz
Evaluation Criteria	MATH 1613/2145/2155/2613 - Students will earn 70% or better on the quiz
Results	MATH 1613 – 20/30 (66.67%) of students met competency MATH 2145 – 7/9 (77.78%) of students met competency MATH 2155 – 30/35 (85/71%) of students met competency MATH 2613 – N/A MATH 1613 – N/A MATH 2145 – 6/7 (85.71%) of students met competency MATH 2155 – 24/35 (68.75%) of students met competency MATH 2613 – 21/28 (75%) of students met competency
Competency # and Description	3. Solve and interpret real world application problems
Course	MATH 1613 – Trigonometry. MATH 2155 – Calculus II
Activity	MATH 1613 – Word problems involving trig functions MATH 2155 – Word problems involving vectors.
Measurement	MATH 1613/2155 - Common questions assessed on a quiz

Evaluation Criteria	MATH 1613/2155 - Students will earn 70% or better on the quiz
Results	MATH 1613 – 39/48 (81.25%) of students met competency MATH 2145 – 7/7 (100%) of students met competency MATH 2155 – 31/35 (88.57%) of students met competency MATH 1613 – N/A MATH 2145 – 26/35 (74.29%) of students met competency MATH 2155 – 4/7 (57.14%) of students met competency
Chem/Phys & Pre-Engineering Option	
Competency # and Description	1. Use and apply physical data to solve problems
Course	MATH 2145 – Calculus I, MATH 2155 – Calculus II
Activity	MATH 1613 – Word problems involving trig functions MATH 2145 – Word problems involving derivations MATH 2155 – Word problems involving vectors.
Measurement	MATH 2145 / 2155 - Common questions assessed on a quiz
Evaluation Criteria	MATH 2145/2155 - Students will earn 70% or better on the quiz
Results	MATH 2145 – 7/7 (100%) of students met competency MATH 2155 – 31/35 (88.57%) of students met competency MATH 2145 – 26/35 (74.28%) of students met competency MATH 2155 – 4/7 (57.14%) of students met competency
Competency # and Description	2. Use logical reasoning to solve problems
Course	MATH 2145 – Calculus I, MATH 2155 – Calculus II
Activity	MATH 2145 – Word problems involving derivations MATH 2155 – Word problems involving vectors.
Measurement	MATH 2145/2155 - Common questions assessed on a quiz
Evaluation Criteria	MATH 2145/2155 - Students will earn 70% or better on the quiz
Results	MATH 2145 – 7/7 (100%) of students met competency MATH 2155 – 31/35 (88.57%) of students met competency MATH 2145 – 26/35 (74.28%) of students met competency MATH 2155 – 4/7 (57.14%) of students met competency
Pre-Engineering	
Competency # and Description	1. Use and apply physical data to solve problems
Course	PHYS 2014 – Engineering Physics I, PHYS 2114 – Engineering Physics II, MATH 2145 – Calculus I, MATH 2155 – Calculus II
Activity	PHYS 2014 / PHYS 2114- Quizzes, exams MATH 2145 – Word problems involving derivations MATH 2155 – Word problems involving vectors.
Measurement	PHYS 2014 / PHYS 2114 - Quizzes, exams PHYS 2114 – Quizzes, exams MATH 2145 - Common questions assessed on a quiz

	MATH 2155 - Common questions assessed on a quiz
Evaluation Criteria	70% pass rate on exam
Results	PHYS 2014 25 out of 25 – 100% PHYS 2114 18 out of 20 – 90% MATH 2145 – 7/7 (100%) of students met competency MATH 2155 – 31/35 (88.57%) of students met competency MATH 2145 – 26/35 (74.28%) of students met competency MATH 2155 – 4/7 (57.14%) of students met competency
Competency # and Description	2. Use logical reasoning to solve problems
Course	PHYS 2014 – Engineering Physics I, PHYS 2114 – Engineering Physics II, MATH 2145 – Calculus I, MATH 2155 – Calculus II
Activity	PHYS 2014 / PHYS 2114 - Quizzes, exams MATH 2145 – Word problems involving derivations MATH 2155 – Word problems involving vectors.
Measurement	PHYS 2014 / PHYS 2114 - Quizzes, exams MATH 2145 - Common questions assessed on a quiz MATH 2155 - Common questions assessed on a quiz
Evaluation Criteria	70% pass rate on exam
Results	PHYS 2014 25 out of 25 – 100% PHYS 2114 18 out of 20 – 90% MATH 2145 – 7/7 (100%) of students met competency MATH 2155 – 31/35 (88.57%) of students met competency MATH 2145 – 26/35 (74.28%) of students met competency MATH 2155 – 4/7 (57.14%) of students met competency
Competency # and Description	3. Communicate scientific ideas through technical writing
Course	PHYS 2014 – Engineering Physics I, PHYS 2114 – Engineering Physics II
Activity/Measurement	PHYS 2014 and PHYS 2114– Lab
Evaluation Criteria	Pass rate of 70% on each activity
Results	PHYS 2014 26 out of 28 – 92.8% PHYS 2114 18 out of 20 – 90%
Competency # and Description	4. Recognize connections between physical concepts and engineering applications
Course	PHYS 2014 – Engineering Physics I, PHYS 2114 – Engineering Physics II
Activity/Measurement	PHYS 2014 / PHYS 2114 – Assignments, exam
Evaluation Criteria	Pass rate of 70% on each activity
Results	PHYS 2014 not collected PHYS 2114 18 out of 20 – 90%

B.3. Minimum Productivity Indicators:

Time Frame (e.g.: 5 year span)	Head Count/Graduates				
	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
Mathematics and Physical Sci	0/0	0/0	0/1	3/0	7/0
Astronomy	0/1	0/0	2/0	2/0	0/0
Chem/Physics	10/3	7/5	6/6	9/0	13/0
Mathematics	24/8	47/7	61/14	69/7	58/18
Pre-Engineering	107/5	90/18	102/18	184/3	232/19
Total	**141/16**	**144/30**	**171/38**	**267/10**	**310/37**

B.4. Other Quantitative Measures:

a. Number of courses taught exclusively for the major program for each of the last five years and the size of classes:

Course Number	Course Name	**Sections/Average Size of Class**				
		2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
ASTR 1523	Planetary Science	1/22	1/20	1/17	1/22	1/31
ASTR 2513	Observatory Methods	0	0	1/10	1/2	0
MATH 2145	Calculus I	3/16	2/25	2/21.5	2/24	3/15.7
MATH 2155	Calculus II	2/10	2/18	2/10.5	2/12	3/15.7
MATH 2613	Differential Equations	1/9	1/21	2/8	2/9.5	2/15
PHYS 2014	Engineering Physics I	1/26	1/23	1/18	1/24	1/33
PHYS 2114	Engineering Physics II	1/12	1/20	1/15	1/7	1/23

b. Student credit hours by level generated in all major courses that make up the degree program for five years:

Course Number	Course Name	**Hours Generated**				
		2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
ASTR 1523	Planetary Science	66	60	51	66	93
ASTR 2513	Observatory Methods	0	0	30	6	0
MATH 2145	Calculus I	240	250	215	240	235
MATH 2155	Calculus II	100	180	105	120	235
MATH 2613	Differential Equations	27	63	48	57	90
PHYS 2014	Engineering Physics I	104	92	72	96	132
PHYS 2114	Engineering Physics II	48	80	60	28	92
Total		**585**	**725**	**581**	**613**	**877**

c. Direct instructional costs for the program for the review period:

The program cost for the Math degree and options with salary and fringe benefits was $6703 average per 3-credit hour class taught.
$11,172 X 23 sections of 5-credit hour courses = $256,956
$6703 X 15 sections of 3 credit hour courses = $100,545
$8937 X 10 sections of 4-credit hour courses = $89,370
Total Instructional Cost for Offering Program Courses: $446,871

d. The number of credits and credit hours generated in the program that support the general education component and other major programs including certificates:

Course Number	Course Name	**Hours Generated**				
		2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
CHEM 1414	General Chemistry II	240	312	256	288	140
PHYS 1114	General Physics I	184	188	228	212	204
Total		**424**	**500**	**484**	**500**	**344**

e. A roster of faculty members, faculty credentials and faculty credential institution(s). Also include fte equivalent:

Full-time Faculty Teaching Math Degree Program Courses	**Credential**	**Institution that granted degree**
Dee Cooper (Calc)	M.Ed, Math emphasis	Southwestern Oklahoma State
Jack Cnossen (Chem)	Ph.D.	Worcester Polytechnic Institute
Mary Ann Harris (Chem)	Ph.D. in Science	University of Arizona
Christi Hook (Calc/Diffi)	M.S. in Mathematics	Chadron State College
Lisa McGaw (Chem)	M.S. in Chemistry	Texas A & M
Charmaine Munro (Chem/Phys)	Ph.D. in Chemistry	Oklahoma State University
Darrel Negelein (Chem)	M.S. in Chemistry	University of Oklahoma
Kristi Orr (Calc)	M.Ed. in Mathematics	University of North Dakota
Fritz Osell (Astr)	M.Ed. in Ed Tech and graduate work in Geology/Oceanography	University of Hawaii
Frankie Wood-Black- (Chem/Physics)	Ph.D. in Physics	Oklahoma State University

f. If available, information about employment or advanced studies of graduates of the program over the past five years:

N/A

g. If available, information about the success of students from this program who have transferred to another institution:

As one indication of student success, Northern receives annual reports of transfer students' performance in the NOC-Gateway program in Stillwater through the Memo of Understanding. In the last two years, this report has indicated that the retention rate of NOC transfer students is greater than the first year at OSU retention rate of other transfer students for each of the years studied indicating that NOC graduates are well prepared for continued success at the four-year institution.

B.5. Duplication and Demand Issues:

Address Duplication:

The Mathematics and Physical Science degree offers four options: Astronomy, Chemistry/Physics, Mathematics, and Pre-Engineering. These options contain at least 50% of the program requirements with the remaining program requirements and electives focused in the area of specialization for the degree for ease of transfer.

Address Demand:

Career opportunities for Chemistry/Physics: scientist, teacher, meteorologist, geologist
Career opportunities for Mathematics: teacher, scientist, mathematician, actuary
Career opportunities for Pre-Engineering: architect, civil, chemical, electrical, mechanical, or petroleum engineer

B.5.a. Detail demand from students, taking into account the profiles of applicants, enrollment, completion data, and occupational data:

According to 2016-2025 Oklahoma Labor Market Projections, the following increases are anticipated for job opening with bachelor's degrees: Math or Science Teacher—5%, Mechanical Engineer-12%, Electrical Engineer-9%, Petroleum Engineers-14%, and Civil Engineers-11%.

B.5.b. Detail demand for students produced by the program, taking into account employer demands, demands for skills of graduates, and job placement data:

This degree enables students to declare that they have an associate's degree when applying for various employment, which according to recent College Study Board data increases earning potential by 13%. While the associate degree is intended as a transfer degree, students who continue on to receive a bachelor's or master's degree may pursue careers such as actuaries, statisticians, education, engineer, or architect.
According to US Bureau of Labor statistics, with a bachelor's degree, the median pay in 2016 for civil, mechanical, electrical or chemical engineers ranged from $49,980-$98,340 while petroleum engineers earned a median pay of $128,230. The job outlook for 2024 is expected to increase 1-9.8% in these fields, depending on area of specialty.
With a bachelor's degree the median pay in 2016 for a high school teacher was $56,720 although lower in our region. Job outlook is expected to grow by 6.4% in 2024 for employment in education and training occupations, according to OESC.

B.5.c. Detail demand for services or intellectual property of the program, including demands in the form of grants, contracts, or consulting:

N/A

B.5.d. Detail indirect demands in the form of faculty and student contributions to the cultural life and well-being of the community:

Faculty and students in the Mathematical and Physical Science degree programs have assisted with science fairs, area public school science demonstrations, and workshops for AP instruction.

B.5.e. The process of program review should address meeting demands for the program through alternative forms of delivery. Detail how the program has met these demands:

Due to many courses requiring a lab component or the complexity of the material, most of the program courses are limited in the forms of delivery. Some of the math courses are offered via ITV to meet needs of students on multiple campuses.

B.6. Effective Use of Resources:

Resources include financial support, (state funds, grants and contracts, private funds, student financial aid); library collections; facilities including laboratory and computer equipment; support services, appropriate use of technology in the instructional design and delivery processes, and the human resources of faculty and staff.

Northern's Information Technology department has provided needed resources for the success of Mathematics Program courses taught through ITV studios maintained for general education and other program courses. Quality Matters and Blackboard Training has been provided for faculty of both distance education and on-site courses who use the internet for web-enhanced courses, therefore, the costs have not been exclusive to any one program.

Institutional Program Recommendations: (describe detailed recommendations for the program as a result of this thorough review and how these recommendations will be implemented, as well as the timeline for key elements)

Recommendations	Implementation Plan	Target Date
Common assessment questions will be given within each program course that have been developed by the full-time math faculty. Results will be examined by the mathematics faculty at Northern Oklahoma College and adjustments and corrections will be made as needed.	All students enrolled in each course will be assessed across all the campuses and evaluated using an agreed upon rubric for each question. All full-time and adjunct faculty within the Northern Oklahoma College Division of Mathematics will be involved as well as the academic administration.	Yearly review

Program-Level Outcomes Timeline

Program Objectives	Course Mapping	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
A.S. in Mathematics and Physical Science – Astronomy Option						
Objective 1: Use and apply physical data to solve problems	ASTR 2513 MATH 2145 MATH 2155					
Objective 2: Use logical reasoning to solve problems	ASTR 2513 MATH 2145 MATH 2155					

Objective 3: Explain evolutionary theory and its supporting principles	ASTR 1523					
A.S. in Mathematics and Physical Science – Chem/Physics Option						
Objective 1: Use and apply physical data to solve problems	CHEM 1414 PHYS 2014 MATH 2145 MATH 2155	X	X	X	X	X
Objective 2: Use logical reasoning to solve problems	CHEM 1414 PHYS 2014 MATH 2145 MATH 2155	X	X	X	X	X
Objective 3: Communicate scientific ideas through technical writing	CHEM 1414 PHYS 2014	X	X	X	X	X
Objective 4: Solve problems related to thermodynamics	CHEM 1414	X	X	X	X	X
A.S. in Mathematics and Physical Science – Mathematics Option						
Objective 1: Sketch or identify and interpret graphs	MATH 1513 MATH 1613 MATH 2145 MATH 2155	X	X	X	X	X
Objective 2: Manipulate, simplify and/or solve expressions or equations.	MATH 1513 MATH 1613 MATH 2145 MATH 2155 MATH 2613	X	X	X	X	X
Objective 3 : Solve and interpret real world application problems.	MATH 1613 MATH 2155	X	X	X	X	X
A.S. in Mathematics and Physical Science–Pre-Engineering Option						
Objective 1: Use and apply physical data to solve problems	PHYS 2014 PHYS 2114 MATH 2145 MATH 2155	X	X	X	X	X
Objective 2: Use logical reasoning to solve problems	PHYS 2014 PHYS 2114 MATH 2145 MATH 2155	X	X	X	X	X
Objective 3: Communicate scientific ideas through technical writing	PHYS 2014 PHYS 2114	X	X	X	X	X

Objective 4: Recognize connections between physical concepts and engineering applications	PHYS 2014 PHYS 2114	X	X	X	X	X

Summary of Recommendations:

	Department	**Institutional**
Possible Recommendations:	The math department will continue to watch numbers for Calculus to determine if offering each semester is reasonable. It appears that numbers continue to increase and offering them each semester is meeting a need.	As needs for more upper level math courses rise, we will need more instructors to fill in the college algebra and other entry level math courses.