



Physics Program Portfolio

Description of Program

2006-08 Catalog: The Physics degree is a true liberal arts degree, preparing the student for many options after graduation, from immediate employment to graduate school in a wide range of disciplines. The problem-solving approaches developed in the physics curriculum can be applied in multiple career paths. Students are strongly encouraged to engage in research, either with faculty members or through summer internships. Our emphasis is on quality instruction, full student participation and individual attention to the student.

The place of Physics in the liberal arts curriculum. We wish to quote some material from the University of Maryland Physics Education Research Group. (Reference: <http://www.physics.umd.edu/perg/role/description.htm>). We believe this is a remarkable summary of the place of physics in the curriculum. It is not just about plugging numbers into formulas, or making laboratory measurements and praying that they come out right.

“A physics class can be one of the best places for students to learn how to think about scientific thinking. Physics deals with universal issues that apply to all matter and energy. Physics focuses on fundamental laws and in finding the simplicities around which to organize one's thinking about complex real-world situations. Physics is the ideal place to learn how to apply mathematics to help organize one's thinking about the physical world. Physics is also an excellent place to learn about the character and nature of measurement. Understanding difficulties with simple measurements such as length or temperature can help students understand what kinds of issues arise in more complex measurements.

But perhaps the most compelling reason for bioscientists to study physics is that physics presents a tractable example of learning about coherence. The spontaneous reasoning of non-physics-trained individuals about the real world tends to be ad hoc – limited to specific narrow phenomena, inconsistent, and ungeneralizable: “knowledge in pieces.” Physics focuses on building consistent and coherent theories of phenomena, and at the introductory level, they are sufficiently large to illustrate the principle, but come in sufficiently small chunks for students to be able to take the point.”

Comments from the 2008 self-study. The Physics minor provides quality education for those pursuing a career in scientific research, engineering, or other fields requiring exceptional problem-solving skills. Our graduates have had successful careers in industry and are well prepared for graduate school, should they choose that route.

Any liberal education requires scientific literacy as an outcome, and physics is at the foundation of all the physical sciences. The Physics program supports the General Education mission of the University through high-quality algebra-based and calculus-based

introductory physics courses, as well as through innovative general education courses such as the Physics of Music and participation in teaching the SCI 101, 102 courses aimed at Education majors. In addition, the physics program provides foundational courses for students majoring in biology and chemistry. for many pre-professional programs, including those in engineering, medicine, dentistry, physical therapy, and others.

Until recently, the Physics program provided a 3/2 option for students interested in engineering: student complete the requirements for a physics degree in 3 years and then spend 2 years in a school of engineering at a major university. At the end of the 5 years they have a BS in physics from EOU and a BS in engineering from the other university. Our students have completed the final two years at a variety of universities, from such as OSU, PSU, WSU, U of I, and Cal Poly. Until recently, the program also offered a minor in Engineering Science.

How Program serves the Mission of the University and needs of region

The Physics minor prepares students for many options after graduation, from immediate employment to graduate school in a wide range of disciplines. The problem-solving approaches developed in the physics curriculum can be applied to a wide range of endeavors, including the many engineering professions. Students engage in research, either with faculty members or through summer internships. The Pre-Engineering sequence is designed to initiate the process that leads to engineering licensure while maintaining a unique liberal arts base.

Recent Programmatic Changes

2008 Self-Study:

Engineering Science minor: Soon after arriving at Eastern, Dr. Tovar developed an Engineering Science minor, to improve retention and aid recruitment. A significant number of students obtained this minor during its short life, but at this time we cannot offer it since the resource faculty engineering position is now unfilled.

Physics of Music course: Dr. Herrmann developed a general education course aimed at attracting fine arts majors to science courses.

Changes in the capstone: Some minor changes in the capstone course were implemented. The course was divided into 2 hours Winter term and 1 hour Spring term, to give students time to effectively complete their senior project. This is working very well.

Decrease in program support: The clear trend is a steady erosion of support for the program. The final blow has been the elimination of the pre-engineering program support position. With the present level of support from the administration, it will be extremely difficult to recruit majors to restore former levels of graduation. Indeed, in the current repositioning plan, the Physics major has been eliminated.

Assess, Analyze and Appraise:

Despite the quality of program offerings, the elimination of the Physics major has resulted from disinvesting in Physics, particularly the loss of the pre-engineering option and the failure to hire

resource faculty support for Physics labs.

Effect of eliminating the pre-engineering option: There are a few high school students who know what physics is and are interested in becoming majors. (Many do not know what a chemist or a mathematician does, either.) But nearly always a given student will have heard of engineering. Often, they have an uncle or cousin or friend of their parents who is an engineer, so they have some familiarity with the profession. All of them have heard that engineers are well-paid, which definitely piques their interest. Therefore, when they look for colleges, they look for those with engineering or at least pre-engineering. This type of student will NOT give a second look at a university without engineering.

In the past, the Physics program recruited many physics majors from those who expressed an interest in engineering. After taking Physics courses, students would take two paths: (1) often, they would decide that a straight 4-year physics degree was more interesting and would fill their engineering needs, since a graduate with such a degree may work in many types of engineering positions. But this is not widely known and can only be communicated if the student is here. (2) About 1/3 of our graduates found the 3/2 physics/engineering option attractive. Such graduates are highly desirable by employers since the strong physics background makes them more broad and flexible than those with only engineering degrees.

Elimination of the pre-engineering option eliminates the dominant recruiting tool of the Physics program, virtually choking off its life-blood, and elimination of the pre-engineering option is making Eastern less attractive to at least 20 students per year who are unsure of their career goals and mildly interested in engineering.

Effect of elimination of resource faculty: The load problems in Physics are exacerbated by the Union contract requirement that labs now be counted as 1 load hour for each face hour of lab, instead of the 2/3 ratio used before. That means that Dr. Herrmann's load during an "on year" for Experimental Techniques is over 60 hours. This year (2006/07) the effect is being patched up (we are not certain of all the details) by denying both of the physics faculty full load credit for any course with fewer than 5 students. This is a temporary and only partially effective fix.

Program Objectives/Outcomes

The Physics Program will produce well-rounded students who reflect, understand, and be socially responsible leaders in a rapidly changing and increasingly technological world. This is achieved in the following manner:

Students are required to

- 1) Understand the main areas of physics, including mechanics, electricity and magnetism, wave phenomena (including optics), thermodynamics, and quantum theory.
- 2) Be proficient in the mathematical problem-solving approaches used by physicists.
- 3) Understand laboratory instrumentation, and be able to Design specialized instrumentation as needed.
- 4) Perform computer simulations of physical phenomena.
- 5) Be able to design and conduct physical research.
- 6) Communicate the knowledge and applications of physics to both peers and the general public, orally and in writing.
- 7) Be knowledgeable about the history of physics.

In addition, students will be given opportunities to pursue the following enrichment activities:

- a) Additional physics-based research with Ph. D. faculty
- b) Local science-based community outreach
- c) Leadership opportunities in physics club activities
- d) Multifaceted physics and mathematics-based competitions
- e) In-depth content curriculum review through paper grading and leading study sessions
- f) Publish research or other significant work in the Eastern Oregon Science Journal

Key Programmatic Curricular Assessment Features

The aforementioned outcomes are supported by the physics curriculum. A matrix displays the correspondence of assessment devices with the intended outcomes of the program. Each of the following major assessments are significant:

<i>Assessment Device</i>	<i>Outcome Measured</i>
Exit Examination	1, 2
<u>Student Projects</u>	
Phys 345 – Experimental Techniques	3
Phys 441 – Theoretical Physics	2,4,6
Phys 442 – Theoretical Physics	2,4,6
Phys 443 – Theoretical Physics	2,4,6
Phys 490/491 – History and Philosophy of Physics (Senior Capstone)	2,5,6
Physics Capstone Examination	7

- The physics capstone is taken at the end of the physics graduate's career. At the end of the capstone course, an exit examination is given. It primarily tests student's analytical problem-solving abilities and their understanding of fundamental physics content curriculum. The exit examination consists of 102 questions involving the following 10 physics disciplines: Physics sense, classical mechanics, optics, electromagnetism, applied mathematics, electricity and electronics, quantum mechanics, relativity, thermodynamics, and high-energy physics. Each of these disciplines is separated into two levels. Level I questions are simpler and more fundamental than the more advanced Level II questions.
- In addition to usual homework problems, five physics courses have substantial projects. They are Phys 345 – Experimental Techniques, Phys 441 – Theoretical Physics, Phys 442 – Theoretical Physics, Phys 443 – Theoretical Physics, and Phys 490/491 – History and Philosophy of Physics (Senior capstone project is initiated in Phys 490 and completed in Phys 491). Students demonstrate their understanding and ability to design laboratory instrumentation (Outcome #3) through their Phys 345 project in which the student is required to use a microcontroller. The project also involves building their device from bare materials using machine-shop skills they learn in class. The three projects completed by students in Theoretical Physics all involved mathematical modeling of physical phenomena (Outcome #2), and simulation of the results (Outcome #4). In addition to synthesizing the content curriculum in these respective courses, the students are required to write a manuscript summarizing their results (Outcome #6). The student's ability to conduct research (Outcome

#5) is assessed in the Phys 490/491 (capstone) course. Students work on a stated problem, develop specific methodology to explore, conduct a study, collect data, analyze data, and report findings. The students give a formal oral presentation of their results (Outcome #6). The level of accomplishment is determined by the percentage of students delivering a formal presentation at the Spring Symposium or other professional conference, or publishing a paper in the *Eastern Oregon Science Journal* or external peer-reviewed scientific journals. The physics program is currently in the process of writing a standardized rubric for grading these projects.

- An examination during the capstone is used to assess the student's knowledge of the history of physics (Outcome #7).

- Five of the outcomes are assessed from student projects. The student project relevant outcomes assessed are

- Outcome 2: Students are required to be proficient in the mathematical problem-solving approaches used by physicists.

- Outcome 3: Students are required to understand laboratory instrumentation, and be able to design specialized instrumentation as needed.

- Outcome 4: Students are required to perform computer simulations of physical phenomena.

- Outcome 5: Students are able to communicate the knowledge and applications of physics to both peers and the general public, orally and in writing.

- Outcome 6: Student are able to design and conduct physical research.

Courses Evaluated:

Course	<i>Outcome Assessed</i>
Phys 345 – Experimental Techniques	3
Phys 441 – Theoretical Physics Phys 442 – Theoretical Physics Phys 443 – Theoretical Physics	2,4,6
Phys 490/491 – History and Philosophy of Physics (Senior Capstone)	2,5,6

Rubric for evaluating projects in courses.

Criteria	Exemplary (4 – 5)	Good (2 – 3)	Needs Improvement (0 – 1)
Outcome 2: “Math Skills”			
Mathematical Competency	Uses mathematics appropriately and accurately.	Some errors in mathematics and mathematical reasoning.	Consistent errors in mathematics and mathematical reasoning.
Mathematical Modeling	Relates mathematical model(s) to theoretical foundations.	Relationship between model(s) and theoretical	Does not understand the relationship between model(s) and

		foundations has logical or mathematical errors.	theoretical foundations.
Mathematical Results	Understands relationship between mathematical results and physical world, especially model's limitations.	Relates mathematical result only to specific problem of interest.	Does not relate mathematical results to the physical world. Confused about application of results.
Mathematical Rigor/Ambition	Project involves advanced mathematics.	Project involves moderately difficult mathematics.	Project involves little or no mathematics.
Outcome 3: “Lab Skills”			
Laboratory Competency	Demonstrates excellent laboratory technique.	Demonstrates adequate or good laboratory technique.	Demonstrates poor laboratory technique.
Laboratory Process	Demonstrates iterative nature of laboratory project design.	Demonstrates understanding but not does not implement iterative nature of laboratory project design.	Completes laboratory project near deadline.
Laboratory Results	Understands strengths and weaknesses of laboratory results. Can apply results to the design of unrelated experiments.	Is aware of many of the strengths and weaknesses of laboratory results. Can apply results to design related experiments.	Confused about the strengths and weaknesses of laboratory results. Cannot apply results to design any other experiments.
Laboratory Rigor/Ambition	Project involves advanced laboratory skills.	Project involves moderately difficult laboratory skills.	Project involves little or no laboratory skills.
Criteria	Exemplary (4 – 5)	Good (2 – 3)	Needs Improvement (0 – 1)
Outcome 4: “Computer Skills”			
Computational Competency	Uses computation appropriately and accurately.	Some errors in computation.	Consistent errors in computation.
Computational Process	Uses excellent methodology including modularity and use of numerical controls.	Uses good methodology including modularity and use of numerical controls.	Uses poor methodology. Code is nonmodular and/or lacks numerical controls.
Computational Results	Understands strengths and weaknesses of computational results.	Is aware of strengths and weaknesses of computational results.	Confused about strengths and weaknesses of

	Can apply results to the design of unrelated numerical experiments.	Can apply results to the design of related numerical experiments.	computational results. Cannot apply results to the design of any other numerical experiments.
Computational Rigor/Ambition	Project involves advanced computer skills.	Project involves moderately difficult computer skills.	Project involves little or no computer skills.
Outcome 5: “Communication”			
Communication Competency	Uses excellent mechanics and supporting material.	Uses good mechanics and supporting material.	Uses poor mechanics and incomplete supporting material.
Communication Process	Shows excellent organization. Demonstrates coherent plan and logical point.	Shows good organization. Demonstrates plan and arguments.	Shows poor organization. No plan and/or uses poor arguments.
Communication Rigor/Ambition	Tries to persuade and is successful. In laboratory notebooks, student uses complete sentences and shows the process in a narrative, in addition to the usual equations.	Tries to persuade and is moderately successful. Laboratory notebook is readable.	Does not try to persuade or is unsuccessful. Laboratory notebook lacks a clear narrative and lacks coherence.
Criteria	Exemplary (4 – 5)	Good (2 – 3)	Needs Improvement (0 – 1)
Outcome 6: “Perform Research”			
Use of analytic tools	Consistently uses new procedures and tools successfully, and can describe rationale for them. Runs appropriate control and replicate experiments.	Uses new methods and tools, but may not always be successful. May not accurately explain rationale. Control and replicate experiments run.	Errors made in analytical methods, but sources of error aren't found. Appropriate control or replicate experiments not run.
Interpretation of data	Able to describe results and conclusions clearly and concisely. Relates results to hypothesis and to currently accepted theory.	Draws correct conclusions from results, but may not relate them well to original hypothesis or current theory.	States conclusions without justification. Does not consider internal consistency of results. Cannot compare control or replicate results.
Analyzing alternative interpretations and	Can account for unexplained results. Re-	Recognizes results that don't fit hypo-	Does not recognize that results do not

solutions	cognizes limitations of current hypothesis and proposes alternative interpretations.	thesis but may not readily come up with alternative interpretations.	conform to original hypothesis. Cannot suggest alternative interpretation.
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Student Accomplishments

The physics program can point to three avenues of evaluating student accomplishments:

- (1) Required course projects. These have been outlined earlier in this document. However, the courses in which project are required (PHYS 345, PHYS 441, 442, 443, and the Capstone) have been slated for elimination.

- (2) Student participation in the COMAP (Consortium for Mathematics and Its Applications) Mathematical Modeling Contest. In this national contest, students work in teams of three, and are allowed 3.5 days to work on a difficult problem requiring mathematical modeling and often applied physics. They must solve the problem and write a well-organized paper presenting their solution. Dr. Tovar has long been involved in coaching and preparing teams for this contest. Our teams generally do quite well, often obtaining “Meritorious” standing, and once our team attained “Outstanding” status. (Universities whose teams recently obtained Outstanding status include Harvard, Harvey Mudd, and Duke. Only 3 to 5 per year accomplish this.) Students find this contest exciting and often comment that it rekindles their interest in science.

- (3) Student accomplishments after graduation. We are proud of the career paths our students take after graduation. At this time (2008) two of our graduates are finishing doctorates; one in Astronomy and one in Computational Physics. Another is in the middle of Ph.D thesis work at Washington State University. Students who do not go on to graduate work often work for companies such as Microchip, Hewlett-Packard, Intel, and Tektronix. Three of our graduates work at Battelle Northwest Laboratories. One of these has his Ph.D in chemistry (laser-based analytical chemistry, of course!)

While it existed, the 3/2 Physics/Engineering route was taken by about 1/3 of our graduates. Another option, taken by several, was to complete the physics degree and then obtain a Masters' degree in either electrical or mechanical engineering. All of these are now working as engineers.

A physics degree is not narrow --- the problem-solving skills learned are applicable in a wide range of careers. At least one of our graduates works as a system administrator. A current student intends to become a patent lawyer.

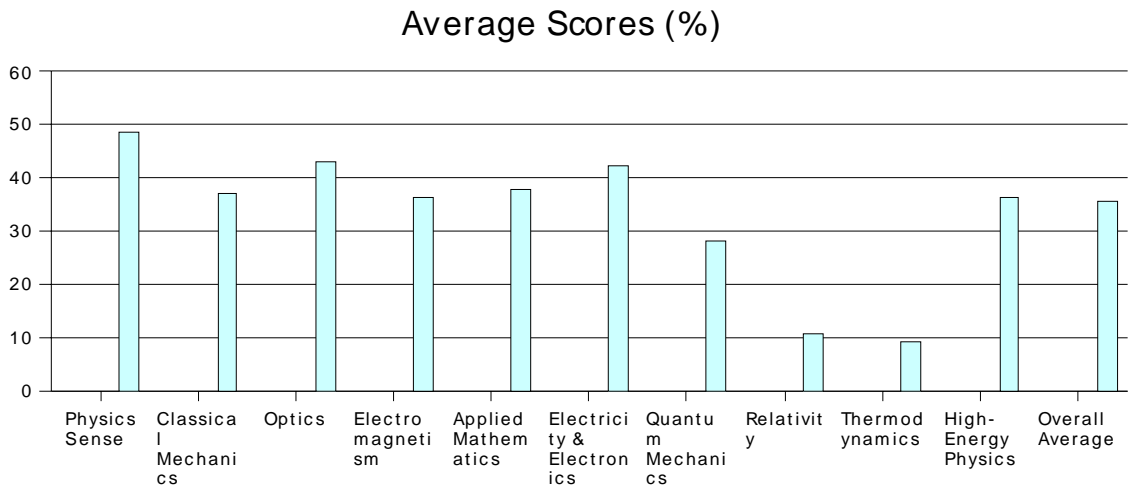
Current Programmatic Assessment Reflections/Recommendations of Curriculum and Instruction

I. Notes from a 2008 self-study made before the suspension of the physics degree. Reflections made after the suspension will follow.

• **Exit Examination**

As noted above, our exit exam assessment tool is in place and will be an ongoing part of program assessment. For programs which graduate few students in a difficult field, the other most accessible assessment tool is to track the success of graduates and get feedback from them on program strengths and weaknesses. We have done some of this informally and plan to formalize the process. For now, this is overshadowed by our efforts to keep the program alive in the face of reduced support.

Currently a sample size of 11 data points, which is too small a sample exists to garner definitive conclusions. However, some preliminary conclusions may be drawn. The overall average raw score is 35.5%. Interestingly, the overall average for Level I questions is 35.7% and 35.3% for the Level II questions. This could possibly indicate a need for a reinforcement of the fundamentals or “big picture”. The scores in the disciplines in indicated in the following bar graph:



Two areas of weakness are relativity and thermodynamics. Since no course in the current curriculum is dedicated to relativity, this indicates a need to add those topics to other courses, or dedicate an entire course to it. After visiting with the thermodynamics professor, it became clear that the questions were too abstruse.

Student Projects:

Tracking of students projects has been on an ad hoc basis. The general quality has been high however in Phys 345, Phys 441, Phys 442, and Phys 443. However, the quality of the research has been generally low in Phys 490/491. A programmatic change has recently been made to address this issue. Previously, the entire senior capstone was performed in a single quarter, and the students chose their own projects. Now, the students are given two quarters to complete their work and an oral presentation updating their progress is required after the first term. In addition, if the student has not chosen a project after 3 weeks, a project is chosen for them. The data since is changes are very small, but the preliminary results of these changes are encouraging. A systematic rubric for evaluating these projects is under development.

Physics Capstone Examination:

Recently an examination was created to determine a student's knowledge and understanding of the history of physics. However, the data are too small to make any determination at this time.

Programmatic Assessment: Synthesis and Recommendations

Currently, the physics program uses two means to assess the program: Student Projects and Capstone Course. Overall quality of student projects for theoretical physics and experimental techniques is high, and students demonstrate great personal growth in performing them. However, an area of concern has been the quality of capstone projects, due to choosing project topics late in spring quarter. To solve this problem, students now present their project proposals including project schedules during the winter quarter, which has already led to a definite increase in overall project quality.

In addition, the program has developed a senior exit exam and is in the third year of refining it. The results of this tool will be interesting this year, because we have a large cohort (nine students) poised to graduate.

Current Strengths and Weaknesses

Strengths:

- Higher graduation rates than national average for discipline.
- High Faculty/Student ratio
- Allowing a non-physicist to teach physics courses makes efficient use of faculty time.
- Excellent facilities.
- Actively involved in COMAP modeling contest.

Weaknesses

The primary weaknesses of the program are those related to being a small, highly rigorous program at a small school in a rural area:

- Limited course offerings.
- Limited number of faculty.
- Faculty required to do it all - maintain and organize laboratory equipment, computer laboratories, and lab sections.
- No engineering science minor or pre-engineering program of any kind.

Commendations / Recommendations:

The recovery of the pre-engineering program is vital to the recruitment efforts of the Physics program and would improve overall University recruitment and retention efforts. To this end, EOU must re-instate the four engineering courses (a total of 11 credits) which would allow the continuance of the Engineering Science minor for those who wish to stay in the region and still obtain some engineering experience; continue the inter-institutional 3/2 program with Oregon State University; and continue of the pre-engineering program.

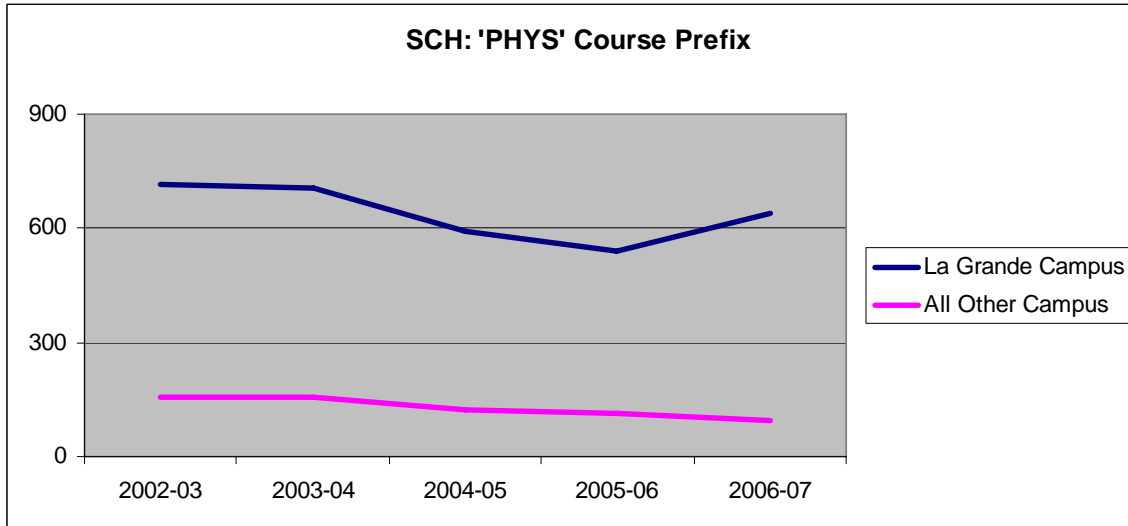
Hiring a full-time physical geologist would provide load relief for the Physics program during the alternate years when Experimental Techniques is given and allow the Geology program to satisfy student demand for more lower-division geology courses and enable the University to offer an

Introductory Astronomy course (see detailed program review on the importance of this hire).

Based on the program assessments, the data collected, and the analysis of student performance, what recommendations for change are made by the faculty? A bulleted action list may suffice here.

Enrollment Program Performance

5 Year Student Credit Hours Generated by 'PHYS' Course Prefix



	2002-03	2003-04	2004-05	2005-06	2006-07
La Grande Campus	714	706	592	540	641
All Other Campus	156	156	124	112	96

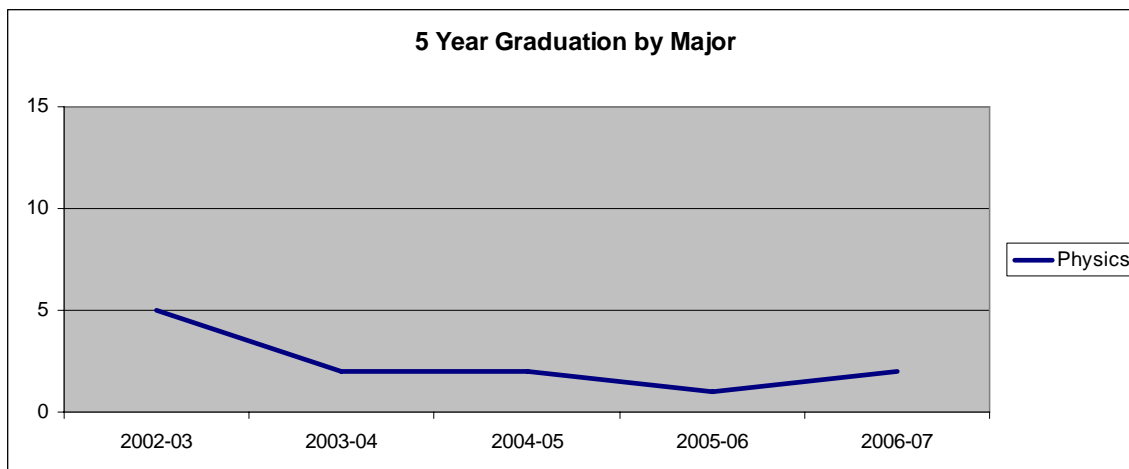
Total	870	862	716	652	737
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*SCH includes all terms effective end of term

The data are provided by the Provost's Office. These data are Banner polled based on prefix for SCH and by major for graduates

Commentary on Enrollment and Graduate Trends

5 Year Graduation by Major



	2002-03	2003-04	2004-05	2005-06	2006-07
Physics	5	2	2	1	2

II. Recent programmatic changes upon suspension of the Physics degree.

Suspension of the Physics major:

In the fall of 2007, the State Board directed the EOU administration to find programs to cut in an effort to make up a financial shortfall. The Physics program was suspended as a result. Part of the reason for this was low enrollment in this program. We have already described and analyzed the effect on enrollment of eliminating the pre-engineering option from the program. This led ultimately to the suspension of the degree.

The students who are now in the physics program will be supported until they obtain the BS or BA in Physics. That is, we will “teach out” the major until there are no more students in the program.

Retention of the Physics minor:

The physics minor will still be offered. The difference is that students must now take a prescribed set of courses, rather than taking a core sequence and choosing the balance from a variety of course offerings.

Temporary resumption of the pre-engineering courses:

In the fall of 2007, we obtained funds from the Oregon Space Grant program to make core freshman and sophomore engineering courses available once again. The grant is for two years, with possibility of renewal for another two years. After that, the EOU administration will need to decide whether to continue offering these courses.

The resumption of pre-engineering courses has meant that the Engineering Science Minor is once more available. Previously, students completed a 21-hour core and then selected 9 more hours from a variety of courses. Now, the 9 hours are only available as PHYS 321 (Waves and Quantum Theory, 5 hours) and CHEM 440 (Thermodynamics, 4 hours).

Synopsis of course changes for 2007/8:

(1) Courses slated for elimination:

PHYS 441 (5 hours), 442 (5), 443 (5), the Theoretical Physics sequence, PHYS 322 (5), the second term of Waves and Quantum Theory, PHYS 345 (5), the final term of Experimental Techniques (5), and PHYS 490 (2), 491 (1), the Physics Capstone sequence.

(2) Courses retained for the minor:

PHYS 221 (5), 222 (5), 223 (5), General Physics (calculus-based) PHYS 321 (5) Waves and Quantum Theory with its lab, and PHYS 343 (5), 344 (5) Experimental Techniques, with the labs.

(3) Engineering courses temporarily restored:

ENGR 101 Engineering Orientation (2),
ENGR 211 Statics (3),
ENGR 202 Dynamics (3),
ENGR 203 Strength of Materials (3).

Other courses, unchanged:

(1) PHYS 201, 202, and 203, the algebra-based general physics course (4 hours each quarter, including lab), is retained as a service course, mainly for biology and biochemistry students.

(2) PHYS 201, 202, and 203 are also offered by Dr. Herrmann for distance delivery.

Program and Course Scheduling Requirements

(The following is in progress.)

Each program shall determine the minimum model necessary to support the success of students in completing the major and in support the needs of general education and service courses for other majors. Careful consideration must be given to smaller section sizes. If small (less than 15) then examine the possibilities of collapsing sections in such a way as they are offered once every two years.

General Education and Service Course Schedule

FALL YEAR 1			FALL YEAR 2		
Course	Load Hours	Mean Enroll	Course	Load Hours	Mean Enroll

WINTER YEAR 1

Course	Load Hours	Mean Enroll
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WINTER YEAR 2

Course	Load Hours	Mean Enroll
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SPRING YEAR 1

Course	Load Hours	Mean Enroll
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SPRING YEAR 2

Course	Load Hours	Mean Enroll
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TOTAL

TOTAL

Major Course Requirements

FALL YEAR 1

Course	Load Hours	Mean Enroll
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FALL YEAR 2

Course	Load Hours	Mean Enroll
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WINTER YEAR
1

Course	Load	Mean
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WINTER YEAR 2

Course	Load	Mean
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Hours Enroll

Hours Enroll

SPRING YEAR 1

Course	Load Hours	Mean Enroll
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SPRING YEAR 2

Course	Load Hours	Mean Enroll
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Compute the total SCH Required per academic year (General Education and service courses and major courses)

Staffing

Currently the program is staffed by two full time faculty: Dr. Tom Herrmann and Dr. Anthony Tovar. The former Resource Faculty Position or Geology/Physics Position has not been filled during the past three years.

Cost Ratios

Load/Faculty On Campus

The Provosts Office will help make these calculations for each major/minor. We will provide the raw data and computations for these areas. Prepares should make notes or –provide clarifications if the data are inadequate to communicate

the entire truth.

Based on the 2006/7 SCH, the ratio of SCH to faculty in ----- prefix courses is ---
- Student load hours/---- FTE = ----- load hours per faculty member.

Total SCH is -----

ON Campus SCH -----

ONLINE SCH -----

ON SITE SCH -----

SCH/Faculty ratios:

On campus (-----SCH/----- FTE) ----- SCH per faculty member

Summary Recommendations/Observations

This is an opportunity to discuss the short and long term aspirations of the program based on programmatic assessment, SCH and grad data, and any other information necessary.

Administrative Review of Program

Based on all of these data, the Dean and Provost will provide some direction for each program .