

**STUDENT LEARNING ASSESSMENT PROGRAM
SUMMARY FORM AY 2004-2005**

**Degree and
Program Name:**

B. S. in Engineering

Submitted By:

Dr. Leonard E. Storm

Please complete a separate worksheet for each academic program (major, minor) at each level (undergraduate, graduate) in your department. Worksheets are due to CASA this year by **June 1**. Worksheets should be sent electronically to cskjs@eiu.edu and should also be submitted to your college dean. For information about assessment or help with your assessment plans, visit the Assessment webpage at <http://www.eiu.edu/~assess/> or contact Karla Sanders in CASA at 581-6056.

PART ONE

What are the learning objectives?	How, where, and when are they assessed?	What are the expectations?	What are the results?	Committee/ person responsible? How are results shared?
1. Demonstrate a working knowledge of the basic laws of physics in the areas of mechanics, electromagnetism, thermodynamics, modern physics, and optics.	Indirect measures: 1a. Course evaluation questionnaire given by instructors at the end of each course in the major.	1a. On the scale 2=strongly agree to -2=strongly disagree, the expectation is that the average would be greater than zero.	1a. The questionnaires were first given Spring 2005. “This course has increased my ability to assess and solve real physics problems.” Response average = 0.75 based upon 76 students. “This course has given me a solid, working knowledge of the areas of physics covered in this course.” Response average = 0.61 based upon 76 students.	The Assessment Committee is responsible for analyzing and updating assessment tools and for analyzing data and reporting the results to the Physics Department and to the Curriculum Committee for possible revision of the curriculum. Instructors are responsible for collecting course evaluation questionnaires from each of their courses in the major. The Pre-Engineering Studies Chair will be responsible for collecting success rate data from UIUC.

<p>1. continued.</p>	<p>1b. Exit interview questionnaire. Responsible person: Chair of Pre-Engineering.</p> <p>1c. Program completion rate of pre-engineering students at UIUC. During the first two years, Pre-Engineering students take the same Chemistry, Mathematics, and Physics as our Physics majors. This coursework then provides the basis for further study in engineering. So this should be a good indirect measure of demonstrating a working knowledge of Physics.</p> <p>Direct measures: 1d. Exam given to B.S. in Engineering students near the end of PHY 1000 during their last semester at EIU.</p>	<p>1b. On the scale 2=strongly agree to -2=strongly disagree, the expectation is that the average would be greater than zero.</p> <p>1c. Greater than 80% of EIU students transferring into UIUC's various engineering programs should complete the degree.</p> <p>1d. No data collected yet.</p>	<p>1b. Question: The Physics program at EIU has given me an appropriate background in:</p> <p>Mechanics 10 Responses, Ave=1.0</p> <p>E&M 10 Responses, Ave=0.80</p> <p>Thermodynamics 10 Responses, Ave=0.70</p> <p>Quantum Mechanics 10 Responses, Ave=0.70</p> <p>1c. Of the 70 students in pre-engineering that transferred to UIUC from EIU since 1998, 90% have graduated or are in good standing in the program.</p> <p>1d. No data collected yet.</p>	<p>The Physics Seminar instructor will be responsible for performing a primary trait analysis of student talks and administering the GRE or ETS Major Field Exam.</p> <p>The Advanced Lab instructor will be responsible for performing a primary trait analysis of student lab reports.</p> <p>The Chair of Pre-Engineering will be responsible for the exit interview.</p>
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	1e. Primary trait analysis of a Physics 1362 lab.	1e. Development of a rubric is in progress.	1e. No data yet.	
2. Students will be able to perform physics experiments using modern equipment and analyze them using appropriate mathematical techniques.	<p>Indirect measures: 2a. Course evaluation questionnaire given at the end of each laboratory course in the major.</p> <p>2b. Exit interview questionnaire. Responsible person: Chair of Pre-Engineering.</p> <p>Direct measures: 2c. Primary trait analysis of a PHY 1362 lab.</p>	<p>2a. On the scale 2=strongly agree to -2=strongly disagree, the expectation is that the average would be greater than zero.</p> <p>2b. On the scale 2=strongly agree to -2=strongly disagree, the expectation is that the average would be greater than zero.</p> <p>2c. Development of a rubric is in progress.</p>	<p>2a. The questionnaires were first given Spring 2005.</p> <p>“This course increased my ability to use basic experimental apparatus to study physical phenomena.” Response average =1.21 based upon 28 students.</p> <p>“This course helped me to understand how to use error analysis techniques.” Average response = 1.09 based upon 33 responses.</p> <p>2b. Question: The Physics program at EIU has given me the ability to: calculate the experimental error in real physical situations. Responses=10. Ave.=1.00</p> <p>Use basic experimental apparatus for studying physical phenomena. Responses=10. Ave.=1.00</p> <p>2c. No data yet.</p>	See under 1.

<p>3. Demonstrate a proficiency in applying mathematics up to and including:</p> <p>Calculus I for the Radiation Physics option,</p> <p>Differential Equations for the Physics Major and Applied Physics option.</p>	<p>Indirect measures:</p> <p>3a. Course evaluation questionnaire given at the end of each course in the major.</p> <p>3b. Exit interview questionnaire. Responsible person: Chair of Pre-Engineering.</p> <p>3c. Program completion rate of Pre-Engineering students at UIUC. Advanced engineering courses require the ability to use mathematics up to the level of differential equations.</p> <p>Direct measures:</p> <p>3d. Analysis of Final Exams in Statics, Dynamics, and Circuit Analysis.</p>	<p>3a. On the scale 2=strongly agree to -2=strongly disagree, the expectation is that the average would be greater than zero.</p> <p>3b. On the scale 2=strongly agree to -2=strongly disagree, the expectation is that the average would be greater than zero.</p> <p>3c. Greater than 80% of EIU students transferring into UIUC's various engineering programs should complete the degree.</p> <p>3d. No data collected yet.</p>	<p>3a. The questionnaires were first given Spring 2005.</p> <p>“This course has increased my ability to use mathematics to solve physical problems.” 76 responses with an average rating of 0.68.</p> <p>3b. Question: The Physics program at EIU has given me the ability to:</p> <p>use mathematics in the solution of real physics problems. Responses=10. Ave.=1.20</p> <p>3c. Of the 70 students in pre-engineering that transferred to UIUC from EIU since 1998, 90% have graduated or are in good standing in the program.</p> <p>3d No data collected yet.</p>	<p>See under 1.</p>
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<p>4. Students will demonstrate the ability to communicate technical material effectively in lab writing.</p>	<p>Indirect measures: 4a. Course evaluation questionnaire given at the end of each laboratory course in the major.</p> <p>4b. Exit interview questionnaire. Responsible person: Chair of Pre-Engineering Studies.</p> <p>Direct measures: 4c. Primary trait analysis of a lab report from PHY 1362.</p>	<p>4a. On the scale 2=strongly agree to -2=strongly disagree, the expectation is that the average would be greater than zero.</p> <p>4b. On the scale 2=strongly agree to -2=strongly disagree, the expectation is that the average would be greater than zero.</p> <p>4c. Rubric in progress.</p>	<p>4a. The questionnaires were first given Spring 2005.</p> <p>“This course increased my ability to produce clearly written lab reports.” 29 responses with an average score of 0.86.</p> <p>4b. Question: The Physics program at EIU has given me the ability to communicate effectively, both verbally and in writing. Responses=10. Ave.=0.80.</p> <p>4c. Rubric in progress.</p>	<p>See under 1.</p>
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PART TWO

Describe what your program’s assessment accomplishments since your last report was submitted. Discuss ways in which you have responded to the CASA Director’s comments on last year’s report or simply describe what assessment work was initiated, continued, or completed.

Since the last report, the Physics assessment committee was enlarged from 1 person to 3. Course evaluation questionnaires and Exit Interview questionnaires were developed and data collected to obtain indirect measures of student learning at intermediate points in the program. Sample GRE Physics exams were given to students in the Physics Seminar Course to obtain a direct measure of student learning. Rubrics are being developed for the lab and seminar courses. The assessment committee met with the CASA Director for the purpose of evaluating the Department’s proposed assessment tools.

PART THREE

Summarize changes and improvements in **curriculum, instruction, and learning** that have resulted from the implementation of your assessment program. How have you used the data? What have you learned? In light of what you have learned through your assessment efforts this year and in past years, what are your plans for the future?

The following questions were included in the course evaluations:

Course evaluation question: “Three hours of lecture per week were sufficient to cover all of the topics required by the course syllabus.” On a scale of 2=strongly agree to -2=strongly disagree, the average from each course in the major during spring 2005 was {0.17, 0.66, 0.14, 1.00, 1.50, -0.15, 0.00} resulting in an average of 0.45.

Course evaluation question: “The amount of time spent discussing homework each week was adequate.” On a scale of 2=strongly agree to -2=strongly disagree, the average from each course in the major during spring 2005 was {-0.33, 0.39, -0.43, 1.25, 1.50, -0.58, 2.00} resulting in an average of 0.18.

Instructors who received a negative average will be notified. The department will also be taking into consideration the recommendations of a CUR external review of the program. Based upon these results, the assessment committee will look into restructuring lecture, homework, and lab hours for certain courses.

Some responses to the questionnaires indicate that some questions need to be revised to reduce confusion. Exit interview questions should be more tailored to the individual program options. Course evaluation questions may need to be course specific.

Rubrics are being designed for the Advanced Lab and Seminar courses.

One student made the following comment about her advanced lab experience on the exit interview form: “Some of the lab equipment, while still in working order, was showing some wear. [There was] not a lot of space to carry out experiments because rooms were used as storage also.” Loss of space has been a concern in the Physics department as rooms have been lost to other departments and the budget has not always kept up with equipment needs.

Results from Exit Interview Form:

2=strongly agree, 1=agree, 0=neutral, -1=disagree, -2=strongly disagree

	2 to -2	Average	Responses
I can recommend EIU to another student.		1.09	11.00
In general, the quality of instruction at EIU is high.		0.91	11.00
In concept, the EIU general education curriculum is a good idea.		0.82	11.00
EIU as a whole provides a stimulating atmosphere for undergraduate study.		0.91	11.00
I can recommend my physics degree program to another student.		1.00	10.00
In general, I am pleased with the curriculum in my physics degree program.		0.80	10.00
The quality of instruction in the physics department is high.		0.91	11.00
Class sizes in the physics classes are appropriate.		1.64	11.00
Undergraduate research opportunities were available to me.		0.80	10.00
I had a rewarding undergraduate research experience.		0.88	8.00
Faculty members in the physics department provide a stimulating atmosphere.		1.00	11.00
Faculty members in the physics department are constructively involved in education.		1.09	11.00
Faculty members in the physics department are accessible and helpful.		1.18	11.00
My academic advisor in the physics department was accessible and helpful.		1.09	11.00
Fellow students were intellectually stimulating.		0.91	11.00
The physics department staff was accessible and helpful.		1.27	11.00
The physics lab facilities and equipment were appropriate for undergraduate instruction.		1.00	11.00
The program should require coursework in advanced computer skills.		0.82	11.00
Research should be required of all students in my major.		0.80	10.00
The physics program at EIU has prepared me for the next step in my professional career.		0.80	10.00
The physics program at EIU has given me an appropriate background in mechanics.		1.00	10.00
The physics program at EIU has given me an appropriate background in electricity and magnetism.		0.80	10.00
The physics program at EIU has given me an appropriate background in thermodynamics.		0.70	10.00
The physics program at EIU has given me an appropriate background in quantum mechanics.		0.70	10.00
The physics program at EIU has developed in me the ability to use mathematics in the solution of real physics problems.		1.20	10.00
The physics program at EIU has given me the ability to calculate the experimental error in real physical situations.		1.00	10.00
The physics program at EIU has given me the ability to communicate effectively, both verbally and in writing.		0.80	10.00
The physics program at EIU has given me the ability to use basic experimental apparatus for studying physical phenomena.		1.00	10.00