Engineering – Spring 2009

EGR Courses: 111, 112, 215, 250, 321, 343

Program Learning Outcomes (Undergraduate Program):

1. The student will demonstrate proficiency in the basic and applied fields of engineering.
2. The student will apply physical principles to novel situations, both in the classroom and in research settings.
3. The student will develop good experimental technique, including proper setup and care of equipment, conducting experiments and analyzing results in order to observe physical phenomena, assess experimental uncertainty, and make meaningful comparisons between experiment and theory.
4. The student will develop effective written and oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner.
5. The student will be able to work effectively in groups or teams.
6. The student will appreciate the importance and practice of ethics in science.

Methods of Assessment:

A. Embedded questions
B. Laboratory Rubric
C. Major Field Assessment Test (MFAT)
    a. Ties to professional recommendation
    b. Possibly refund fee if student scores above national average
D. Teamwork Rubric
E. Independent Study Rubric
F. Seminar Rubric
G. Ethics Survey

Learning Objective -Assessment Method Matrix

Objective	Method	When	Who
1	A C	Periodically through each course Senior Year	Course Instructor Instructor of PHY470
2	B E	Laboratory rubric in the labs Independent Study Evaluation Rubric at conclusion of 475/476	Course Instructor Course Instructor
3	B E	Laboratory rubric in the labs Independent Study Evaluation Rubric at conclusion of 475/476	Course Instructor Course Instructor
4	B F	Independent Study Evaluation Rubric at conclusion of 475/476 Seminars delivered using Seminar Rubric	Course Instructor Faculty in attendance
5	D D	Teamwork rubric in 475/476 Teamwork rubric in 108, 250, 320	Course Instructor Course Instructor
6	G A	Senior Year At least every other year in core courses	Instructor of PHY470 Course Instructor

Assesment Method-Learning Objective Matrix

Method	Objective	When	Who
A	1 6	Periodically through each course At least every other year in core courses	Course Instructor Course Instructor
B	2 3 4	Laboratory rubric in the labs Laboratory rubric in the labs Independent Study Evaluation Rubric at conclusion of 475/476	Course Instructor Course Instructor Course Instructor
C	1	Senior Year	Instructor of PHY470
D	5 5	Teamwork rubric in 108, 250, 320 Teamwork rubric in 475/476	Course Instructor Course Instructor
E	2 3	Independent Study Evaluation Rubric at conclusion of 475/476 Independent Study Evaluation Rubric at conclusion of 475/476	Course Instructor Course Instructor
F	4	Seminars delivered using Seminar Rubric	Faculty in attendance
G	6	Senior Year	Instructor of PHY470

EGR 111 – Foundations of Engineering I

By the end of the course, a successful student will be able to:

Student Learning Outcomes	Outcome
Understand the requirements to be a professional engineer	1
Demonstrate engineering teamwork skills	5
Identify good engineering ethics	6
Differentiate the most popular engineering disciplines	1
Understand the fundamentals of engineering drafting	4

EGR 112 – Foundations of Engineering II

By the end of the course, a successful student will be able to:

Student Learning Outcomes	Outcome
Recognize the fundamentals of thermodynamics	1
Construct two simple heat engines	3
Demonstrate engineering teamwork skills	5
Apply basic conservations principles when solving engineering problems	2
Identify the fundamentals of engineering statics and dynamics	1

EGR 215 – Principles of Electrical Engineering

By the end of the course, a successful student will be able to:

Student Learning Outcomes	Outcome
Demonstrate a clear understanding of the theory and function of basic circuit components such as resistors, capacitors, inductors, diodes, transistors, transformers, and semiconductor devices.	1, 3
Design and construct DC transient and AC filter circuits.	3, 5
Build digital logic circuits using integrated circuit gates and interpret their operation.	3, 4

EGR 250 – Engineering Statics

By the end of the course, a successful student will be able to:

Student Learning Outcomes	Outcome
Demonstrate an advanced level knowledge and understanding of Newton's First Law and its application to engineering.	1
Show quantitative and analytical skills necessary to solving physics/engineering problems.	1
Exhibit effective written and oral communication skills in presentations of physics/engineering problems to one's peers.	4
Work effectively as a member of a group.	5

EGR 321 – Engineering Dynamics

By the end of the course, a successful student will be able to:

Student Learning Outcomes	Outcome
Demonstrate an advanced level knowledge and understanding of the laws of classical mechanics to include representing these laws in mathematical expressions with appropriate units for physical quantities.	1
Show quantitative and analytical skills necessary to solving physics/engineering problems.	1
Exhibit effective written and oral communication skills in presentations of physics/engineering problems to one's peers.	4
Work effectively as a member of a group.	5

PHY 343 - Electronics

By the end of the course, a successful student will be able to:

Student Learning Outcomes	Outcome
Design and construct digital logic circuits using integrated circuit gates, decoders, counters, and flip-flops.	1, 2, 3, 5
Employ Karnaugh Maps and the Quine-McClusky method to solve complex logic problems.	2
Develop code for Programmable Integrated Circuits (PIC Chips) and install these programs on chips.	2, 3