Syllabus for
**EGR 101—Introduction to Engineering**
2 Credit Hours
Fall 2008

## I. COURSE DESCRIPTION

An introduction to the profession of engineering. Topics include problem solving, engineering design of simple electrical and mechanical systems, introduction to computer programming using MATLAB and introduction to economics and ethics of engineering practice.
Course fee: $35.

## II. COURSE GOALS

This course will enable the student to synthesize optimal engineering solutions during mechanical and electrical design competitions. This course not only serves to inform the student about the "art" of engineering, but also deals with the process of personal development needed to ensure that the student's behavior and attitudes support their goal of becoming a professional engineer.

## III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

### A. Terminal Objectives

As a result of successfully completing this course, the student will be able to discuss the following:

1. Different disciplines of engineering.
2. Elements of creative problem solving.
3. How to develop engineering skills.
4. Engineering as a career.
5. Engineering economies, management, and ethics.
6. Engineering design process.
7. The use of computers in engineering.

### B. Unit Objectives

As a result of successfully completing these units, the student will be able to discuss the following:

1. Unit 1: Engineering Disciplines: Introduction to the engineering profession and strategies for student success.
2. Unit 2: Creativity: Personal development and creative problem solving.
3. Unit 3: Mechanical Design Project: Aeronautics, glider development, wind tunnel testing.
4. Unit 4: Electrical Design Projects: Digital and audio systems development.
5. Unit 5: Computers: Introduction to computers and their role in solving engineering problems.
6. Unit 7: The Business of Engineering: Patents, entrepreneurialism, management, economics and ethics.

## IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

Required Materials

Textbooks

Chappell, Dorothy F. and Cook, E. David. Not Just Science : Questions Where Christian Faith and Natural Science Intersect. Grand Rapids, Michigan: Zondervan, 2005.

Landis, George. Studying Engineering–A Road Map to a Rewarding Career. Los Angeles: Discovery Press, 2000.

## V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.
2. Students taking a late exam because of an unauthorized absence will be charged a late exam fee.
3. Students and faculty at Oral Roberts University adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, video, multimedia, or computer software. By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronics verification or by other means.
4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.
5. Students are to be in compliance with University, school, and departmental policies regarding ePortfolio requirements. Students should consult the ePortfolio handbook for requirements regarding general education and the students' majors.
    a. The penalty for not submitting electronically or for incorrectly submitting an ePortfolio artifact is a zero for that assignment.
    b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.

B. Course Policies and Procedures

1. Evaluation Procedures
    a. Work conducted during each of the six units will contribute equally to the final grade.
    b. Instructors determine the evaluation procedure for their unit. Participation in discussions and projects are strongly encouraged.
    c. Homework and computer programs are due as announced. No late assignments are accepted.
    d. Required ePortfolio artifacts are to be promptly submitted by the student for assessment purposes. Failure to do so will result in a 5% reduction in the student's final grade.
2. ePortfolio Requirements – as assigned

VI. COURSE CALENDAR

| WEEK | DATE | PROFESSOR | TOPIC |
|---|---|---|---|
| 1 | 8/16 | Halsmer | Course Introduction |
| 2 | 8/21, 8/23 | Halsmer | Introduction to the Engineering Profession |
| 3 | 8/28, 8/30 | Halsmer | Personal Development & Creativity |
| 4 | 9/4, 9/6 | Leland | Mechanical Design Project |
| 5 | 9/11, 9/13 | Leland | Fundamentals of Aeronautics |
| 6 | 9/18, 9/20 | Leland/Zhang | Aircraft Design/Electrical Engineering |
| | **Glider Contest Wed 9/19 – 4:30-pm during Engineering Seminar at AC** | | |
| 7 | 9/25, 9/27 | Zhang | Digital Systems |
| 8 | 10/2, 10/4 | Zhang | Digital Systems Lab |
| 9 | 10/9, 10/11 | Liu | Electronic Circuit Design |
| 10 | **Fall Break (no class)** | | Starts Oct 12, 5:30 pm<br>Ends Oct 22, 7:50 am |
| 11 | 10/23, 10/25 | Liu | Electronic Circuit Lab |
| 12 | 10/30, 11/1 | Liu/Ma | Video Surveillance/Computer Engineering |
| 13 | 11/6, 11/8 | Ma | Communication Networks |
| 14 | 11/13, 11/15 | Ma | Design in Electrical Engineering |
| 15 | 11/20 | Matsson | Experimentation in Fluids |
| | **Thanksgiving Break (No Thursday class)** | | |
| 16 | 11/27, 11/29 | Matsson | Introduction to Computers |
| 17 | 12/4, 12/6 | Matsson | Introduction to MATLAB |

**Course Inventory for ORU's Student Learning Outcomes**

**EGR 101 – Introduction to Engineering**
**Fall 2008**

This course contributes to the ORU student learning outcomes as indicated below:
***Significant Contribution*** – Addresses the outcome directly and includes targeted assessment.
***Moderate Contribution*** – Addresses the outcome directly or indirectly and includes some assessment.
***Minimal Contribution*** – Addresses the outcome indirectly and includes little or no assessment.
***No Contribution*** – Does not address the outcome.

The Student Learning Glossary at http://ir.oru.edu/doc/glossary.pdf defines each outcome and each of the proficiencies/capacities.

| **OUTCOMES & Proficiencies/Capacities** | Significant Contribution | Moderate Contribution | Minimal Contribution | No Contribution |
|---|---|---|---|---|
| **1** | **Outcome #1 – Spiritually Alive** Proficiencies/Capacities | | | | |
| 1A | Biblical knowledge | | | | √ |
| 1B | Sensitivity to the Holy Spirit | | | | √ |
| 1C | Evangelistic capability | | | | √ |
| 1D | Ethical behavior | | √ | | |
| **2** | **Outcome #2 – Intellectually Alert** Proficiencies/Capacities | | | | |
| 2A | Critical thinking | √ | | | |
| 2B | Information literacy | | √ | | |
| 2C | Global & historical perspectives | | | √ | |
| 2D | Aesthetic appreciation | | | | √ |
| 2E | Intellectual creativity | √ | | | |
| **3** | **Outcome #3 – Physically Disciplined** Proficiencies/Capacities | | | | |
| 3A | Healthy lifestyle | | | | √ |
| 3B | Physically disciplined lifestyle | | | √ | |
| **4** | **Outcome #4 – Socially Adept** Proficiencies/Capacities | | | | |
| 4A | Communication skills | | √ | | |
| 4B | Interpersonal skills | | | √ | |
| 4C | Appreciation of cultural & linguistic differences | | | √ | |
| 4D | Responsible citizenship | | √ | | |
| 4E | Leadership capacity | | | √ | |

*(Revised 1/15/04)*