COURSE SYLLABUS

EGR 101, ENGINEERING FOUNDATIONS
(Lecture/Lab-Based)

*This information is to be completed by the instructor for the course.

I. *INSTRUCTOR INFORMATION

A. Name:
B. Office:
C. Office Phone Number:
D. E-mail Address:
E. Office Hours:

II. COURSE INFORMATION

A. Course name, number, and credit hours:
   EGR 101, Engineering Foundations, 3 Semester Credit Hours.
B. *Section number and reference/synonym number:
C. *Class meeting time (days, time location):
D. Prerequisite/Course Description:
   **COREQUISITE:** MTH 113 *(Precalculus Trigonometry)* or MTH 115 *(Precalculus Algebra and Trigonometry)*.
   This course introduces students to engineering as a profession, basic engineering skills, and the design process. The course includes components to develop teaming and oral and written communication skills. The course also provides an introduction to computer tools used by engineers (e.g., spreadsheet, word processing, presentation software, and Internet).

E. Course Objectives:
   The student will be required to demonstrate attainment of each competency by performing the following objectives:
   a. The student will demonstrate an understanding of the purpose of the Engineering curriculum by
1. Accessing university catalogs and web pages to list the courses required to complete a bachelor's degree in their chosen field of Engineering.
2. Compiling a list of courses to be taken at Calhoun Community College and after transfer.

b. The student will demonstrate that he/she has learned the main Branches and Fields of Engineering by
   1. Passing a test over reading assignments that describe the different Branches of Engineering.

c. The student will demonstrate that he/she has become acquainted with The Canon of Ethics for Engineers by
   1. Passing a test over reading assignments that discuss The Canon of Ethics.
   2. Participating in class discussions of real examples of situations that involved the ethical decisions by engineers.

d. The student will demonstrate an understanding of the Engineering Design Process by
   1. Working as part of a group to complete an Engineering Design Project.
   2. Using techniques such as “brainstorming” to complete the project.

e. The student will demonstrate a knowledge of how to prepare and present a technical discussion by
   1. Preparing and presenting a PowerPoint presentation of the design project.
   2. Preparing a written report of an engineering ethics project.

f. The student will demonstrate the ability to use the computer as an Engineering tool by
   1. Completing assignments using EXCEL.
   2. Making a PowerPoint presentation.
   3. Using a word processing program to prepare a written report of Engineering ethics project.

III. TEXTBOOK AND COURSE SUPPORT MATERIALS

A. Textbook:
   Engineering Fundamentals: An Introduction to Engineering, 4th edition, by Saeed Moaveni, Thomson (Cengage Learning), 2011. (Parts 1, 2, 3, and 4; see Topic Outline for sections covered.)

B. *Laboratory manual(s) and/or additional notes/materials/supplies:

C. Library and LRC resources and services are accessible on-line at http://lib.calhoun.edu/lib
IV. INSTRUCTIONAL METHODS (Methods of Teaching)

Instructional methods may include, but not be limited to, lectures, class discussions, student presentations, CD/DVD lecture presentations, and computer-generated material.

V. *GRADING PLAN

Include information on the number and type of evaluation methods (exams, quizzes, labs, homework, papers, etc.) with point or percentage values for each.

VI. GRADE SCALE

The following letter symbols are used to indicate the student’s level of achievement in courses taken:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Excellent</td>
<td>(90 – 100)</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td>(80 – 89)</td>
</tr>
<tr>
<td>C</td>
<td>Average</td>
<td>(70 – 79)</td>
</tr>
<tr>
<td>D</td>
<td>Poor</td>
<td>(60 – 69)</td>
</tr>
<tr>
<td>F</td>
<td>Failure</td>
<td>(Below 60)</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>Withdrawal</td>
<td></td>
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</tbody>
</table>

VII. TOPIC OUTLINE (Include Tentative Dates and Topics)

PART ONE: ENGINEERING—AN EXCITING PROFESSION

1. Introduction to the Engineering Profession
   1.1 Engineering Work Is All Around You
   1.2 Engineering as a Profession and Common Traits of Good Engineers
   1.3 Common Traits of Good Engineers
   1.4 Engineering Disciplines
   1.5 Accreditation Board for Engineering and Technology (ABET)

2. Preparing for an Engineering Career
   2.1 Making the Transition from High School to College
   2.2 Budgeting Your Time
   2.3 Daily Studying and Preparation
   2.4 Getting Involved with an Engineering Organization
   2.5 Your Graduation Plan
   2.6 Other Considerations

3. Introduction to Engineering Design (Material may be substituted)
   3.1 Engineering Design Process
   3.2 Sustainability in Design
   3.3 Engineering Economics
   3.4 Material Selection
   3.5 Teamwork
   3.6 Common Traits of Good Teams
   3.7 Conflict Resolution
3.8 Project Scheduling and Task Chart
3.9 Evaluating Alternatives
3.10 Patent, Trademark, and Copyright
3.11 Engineering Standards and Codes
3.12 Examples of Standards and Codes Organizations in the United States
3.13 Examples of International Standards and Codes
3.14 Drinking Water Standards in the United States
3.15 Outdoor Air Quality Standards in the United States
3.16 Indoor Air Quality Standards in the United States

4. Engineering Communication
   4.1 Communication Skill and Presentation of Engineering Work
   4.2 Basic Steps Involved in the Solution of Engineering Problems
   4.3 Homework Presentation
   4.4 Progress Report, Executive Summary, and Short Memos
   4.5 Detailed Technical Report
   4.6 Oral Communication and Presentation
   4.7 Engineering Graphical Communication

5. Engineering Ethics
   5.1 Engineering Ethics
   5.2 The Code of Ethics of the National Society of Professional Engineers
   5.3 Code of Ethics for Engineers
   5.4 Engineer's Creed

PART TWO: ENGINEERING FUNDAMENTALS—CONCEPTS EVERY ENGINEER SHOULD KNOW

6. Fundamental Dimensions and Units
   6.1 Engineering Problems and Fundamental Dimensions
   6.2 Systems of Units
   6.3 Unit of Conversion
   6.4 Dimensional Homogeneity
   6.5 Numerical versus Symbolic Solutions
   6.6 Significant Digits (Figures)
   6.7 Engineering Components and Systems
   6.8 Physical Laws and Observations in Engineering
   6.9 Learning Engineering Fundamental Concepts and Design

7. Length and Length-Related Parameters
   7.1 Length as a Fundamental Dimension
   7.2 Measurement of Length
   7.3 Nominal Sizes versus Actual Sizes
   7.4 Radian as a Ratio of Two Lengths
   7.5 (Omit)
   7.6 (Omit)
   7.7 (Omit)
   7.8 (Omit)
8. Time and Time-Related Parameters
   8.1 Time as a Fundamental Dimension
   8.2 Measurement of Time
   8.3 Periods and Frequencies
   8.4 (Omit)
   8.5 (Omit)
   8.6 (Omit)

9. Mass and Mass-Related Parameters
   9.1 Mass as a Fundamental Dimension
   9.2 Measurement of Mass
   9.3 Density, Specific Volume, and Specific Gravity
   9.4 Mass Flow Rate
   9.5 (Omit)
   9.6 (Omit)
   9.7 (Omit)

10. Force and Force-Related Parameters
    10.1 What We Mean By Force
    10.2 Newton’s Laws in Mechanics
    10.3 Moment, Torque—Force Acting at a Distance
    10.4 Work—Force Acting Over a Distance
    10.5 Pressure and Stress—Force Acting Over an Area
    10.6 Modulus of Elasticity, Modulus of Rigidity, and Bulk Modulus of Compressibility
    10.7 Linear Impulse—Force Acting Over Time

11. Temperature and Temperature-Related Parameters
    11.1 Temperature as a Fundamental Dimension
    11.2 Measurement of Temperature and Its Units
    11.3 Temperature Difference and Heat Transfer
    11.4 Thermal Comfort, Metabolic Rate, and Clothing Insulation
    11.5 Some Temperature-Related Material Properties
    11.6 Heating Values of Fuels
    11.7 Degree-Days and Energy Estimation

12. Electric Current and Related Parameters
    12.1 Electric current as a Fundamental Dimension
    12.2 Voltage
    12.3 Direct Current and Alternating Current
    12.4 Electric circuits and Components
    12.5 Electric Motors
    12.6 Lighting Systems

13. Energy and Power
    13.1 Work, Mechanical Energy, Thermal Energy
    13.2 Conservation of Energy—First Law of Thermodynamics
    13.3 Understanding What We Mean by Power
    13.4 Watts and Horsepower
13.5 Efficiency
13.6 Energy Sources, Generation, Consumption

PART THREE COMPUTATIONAL ENGINEERING TOOLS—USING AVAILABLE SOFTWARE TO SOLVE ENGINEERING PROBLEMS
14. Electronic Spreadsheets
   14.1 Microsoft Excel—Basic Ideas
   14.2 Cells and Their Addresses
   14.3 Creating Formulas in Excel
   14.4 Using Excel Functions
   14.5 Using Excel Logical Functions
   14.6 Plotting with Excel
   14.7 (Omit)
   14.8 Curve Fitting with Excel

PART FOUR ENGINEERING GRAPHICAL COMMUNICATION CONVEYING INFORMATION TO OTHER ENGINEERS, MACHINISTS, TECHNICIANS, AND MANAGERS
16. Engineering Drawings and Symbols
   16.1 Importance of Engineering Drawing
   16.2 Orthographic Views
   16.3 Dimensioning and Tolerancing
   16.4 Isometric View
   16.5 Sectional Views
   16.6 Civil, Electrical, and Electronic Drawings
   16.7 Solid Modeling
   16.8 Why Do We Need Engineering Symbols?
   16.9 Examples of Common symbols in Civil, Electrical, and Mechanical Engineering

VIII. ASSIGNMENTS [Weekly or Daily List of Assignments]

(Include required submission of course requirements as shown in the Grading Plan.)

IX. FINAL EXAM

(Include Date, Time, and Location)

Final Examination Attendance
Attendance at final examinations is mandatory. Such examinations are administered in all academic subjects at the end of each semester in accordance with an examination schedule issued by the Dean or designee. Any student who must miss a final examination has the responsibility of notifying his/her instructor to make arrangements to take the final examination on an alternate date, if possible. Faculty members should not change the published class examination schedule without prior approval from the Dean or designee.
X. ATTENDANCE POLICY

FOR CLASSES OTHER THAN DISTANCE EDUCATION/HYBRID CLASSES:
Attendance is taken for each class meeting. Absences are counted beginning with the first class meeting after the student registers; however, students are responsible for all coursework and assignments made or due from the first day of class. In general, students should have no more than four absences for a 15-week term, no more than three absences for a 10-week term, no more than two absences for an 8-week term, and no more than one absence for a 5-week term. Each course syllabus will clearly state the number of absences considered as the acceptable maximum for the class as well as how late arrivals and early departures will be handled. Each course syllabus will also state policies regarding make-up work, if allowed. The policies stated in the course syllabus for a student’s specific class will be the policies for which the student will be held accountable. Communication with the instructor concerning absences is essential. If a student has excessive absences, he/she is encouraged to withdraw from the course after consulting with the instructor. Instructors will not withdraw students for any reason. If a student fails to officially withdraw from a course, this could result in a grade of F and adversely impact financial aid. Withdrawing from a course is the responsibility of the student.

Therefore, a grade of F will not be changed without written approval from the Vice President of Instruction and Student Services. Military personnel who are involuntarily called to active duty for unscheduled and/or emergency situations and those individuals called for jury duty will be excused with official documentation. College related events which the student is required to attend by the club sponsor and which have been approved by the appropriate Dean, will also be excused. Official documentation will be required. Make-up work will be accepted under these excused circumstances as outlined in the individual course syllabus.

NOTE TO INSTRUCTOR: For Distance Education/Hybrid classes, pick one or more of the choices below and state in your syllabus how you are tracking.

FOR DISTANCE EDUCATION/HYBRID CLASSES:
Attendance in a Distance Education or Hybrid course will be recorded within the FIRST WEEK of the course by one or more of the following:

- Student contact with the instructor through attendance at an on-site orientation session;
- Student participation in an online orientation session that is tracked through Blackboard’s “Student Tracking” feature, or through “Tegrity Reports,” or similar features in other course management systems;
- Student sending an e-mail to the instructor’s Calhoun address or through Blackboard e-mail;
- Student making phone call to the instructor’s Calhoun office or an in-person visit to the instructor;
- Student submission (online or in-person) of completed assessments, assignments, essays, or other course related work.
After the first week, the student’s "attendance record" will be based on the student's meeting course requirements such as submitting assignments or communicating with the instructor as outlined in the course syllabus. It is expected that a student will receive a weekly attendance record based on requirements stated in the course syllabus. If a student does not meet attendance requirements as stated in the course syllabus, the student is encouraged to officially withdraw from the course. **Failure to officially withdraw from the course could result in a grade of F and adversely impact financial aid.**

XI. **MAKE-UP POLICY**

(How to make-up missed homework assignments, exams, quizzes, etc.)

XII. **WITHDRAWAL POLICY**

A student who wishes to withdraw from a course(s) after the drop/add period may do so by having a withdrawal form completed by Admissions/Records Personnel or their designated representatives. A student may withdraw from a course(s) after drop/add period through the last class day (prior to final exams). A grade of W for withdrawal will be assigned for the course.

XIII. **DISABILITY STATEMENT**

If you have a disability that might require special materials, services, or assistance, please contact Calhoun’s Disability Services Office in the Chasteen Student Center, Second Floor, Room 220G (Decatur Campus) or call (256) 306-2630 or (256) 306-2635.

XIV. **COMMUNICATION**

Calhoun Community College will communicate campus-wide information via SPACE student e-mail. You have a SPACE e-mail account, which you can access from [www.calhoun.edu](http://www.calhoun.edu). Your user name is your first initial, last name, and last four digits of your student ID number (Example: jsmith1234). Your initial password is 'cal' and the last four digits of your student ID number. You will be prompted to change the password.

XV. **GENERAL COMMENTS BY INSTRUCTOR**

A. Children are not allowed to attend classes with students or faculty. No minors should be left unattended in any building of Calhoun Community College.

B. **Student Schedules/Grades:**

   Students may obtain schedule and grade information through the Calhoun Web Site at [www.calhoun.edu](http://www.calhoun.edu) and clicking on the Web Advisor link. A student user name and password is needed to access Web Advisor.

C. *
THIS SYLLABUS IS EFFECTIVE SPRING SEMESTER, 2011.

REVISED 12/10/10