I. INTRODUCTION

A. Introduction to engineering as a profession with emphasis on technical communication and team-based engineering design. Includes instruction in the applications of mathematical and scientific principles to the solution of practical problems for the benefit of society. ENGR 1201 is a two semester hour course.

B. This course satisfies the introduction to engineering course for students considering engineering as a profession. Please check with your chosen schools of engineering to verify transferability.

C. This course is occupationally related and serves as preparation for careers in engineering.

D. Prerequisites: A grade of C or higher in MATH 1414 or equivalent

II. Learning Outcomes

Upon successful completion of this course, the student will be able to:

A. Describe the engineering profession and engineering ethics, including professional practice and licensure. (F2, F8)
B. Use technical communication skills to explain the analysis and results of introductory laboratory exercises in engineering and computer science. (F1, F2, F12)
C. Explain the engineering analysis and design process. (F10, F11)
D. Analyze data collected during laboratory exercises designed to expose students to the different engineering disciplines. (F4, F7)
E. Describe the impact engineering has had on the modern world. (F13, F15, F17)
F. As part of a team, design a simple engineering device, write a design report, and present the design. (F2, F5, F6, F15, F16)
G. Demonstrate computer literacy. (F11)
H. Discuss the history of engineering. (F1)
I. Define engineering. (F13, F16)
J. Discuss engineering fields of specialization. (F16)
K. Discuss the nature of engineering design. (F10, F11)
L. Discuss the engineering method. (F7, F9, F12)
M. Discuss and apply engineering calculations. (F3, F4, F9)
N. Discuss and work problems illustrating problems from the branches of mathematics related to engineering. (F1, F3, F4, F9, F12)

III. INSTRUCTIONAL MATERIALS
A. http://www.ctcd.edu/im/im_main.asp.

IV. COURSE REQUIREMENTS
A. Assignments will be made daily. All assignments are to be completed by the following class meeting. Assignments may be collected and examined at any time.
B. Students are expected to attend every class and to arrive at each class on time and remain in class for the entire class period. Students who are absent from class 12.5% of the number of class meetings for any reason will be dropped from the class with a grade of "F". Instructors may choose to lower a student's grades because of tardiness.
C. The instructor will post office hours after the semester commences. Consult the instructor during office hours. If your visit may tend to be lengthy, make an appointment with the instructor so that he may set aside some time for you.

V. EXAMINATIONS
A. Examinations will be given to assess knowledge and understanding of each unit. A final exam will be given and students must take the final exam in order to pass the course. The final exam date is announced about two weeks prior to the examination week.
B. Students who miss an exam should discuss with the instructor the circumstances surrounding the absence. The instructor will determine whether a make-up exam is to be given. Make-up examinations are given by appointment only.

VI. SEMESTER GRADE COMPUTATIONS
A. Your point total is determined by adding the points earned on each unit examination. Your letter grade for the course is then determined by the following formula:

\[
\text{Your Point Total} \div \text{Total Points Possible} \times 100
\]

If the result is between 90 and 100 your grade is a(n) A
**NOTE: Grade Computation is determined by instructor. Please see your instructor for how your grade will be determined. This is just an example.**

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM COURSE INSTRUCTOR

A. **Withdrawal from Course:** It is the student's responsibility to officially drop a class if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file an Application for Withdrawal or an Application for Refund. The withdrawal form must be signed by the student.

Application for Withdrawal will be accepted at any time prior to Friday of the 12th week of classes during the 16 week fall and spring semesters. The deadline for sessions of other lengths is as follows.

- Friday of 3rd week for 5-week courses
- Friday of 4th week for 6-week courses
- Friday of 6th week for 8-week courses
- Friday of 7th week for 10-week courses
- Friday of 9th week for 12-week courses
- Friday of 12th week for 16-week courses

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

Students who officially withdraw will be awarded the grade of "W", provided the student's attendance and academic performance are satisfactory at the time of official withdrawal. Students must file a withdrawal application with the college before they may be considered for withdrawal.

A student may not withdraw from a class for which the instructor has previously issued the student a grade of "F" or "FN" for nonattendance.

B. **An Administrative Withdrawal:** An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on the Administrative Withdrawal Form for submission to the registrar.

C. **An Incomplete Grade:** The College catalog states, "An incomplete grade may be
given in those cases where the student has completed the majority of the course work but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course..." Prior approval from the instructor is required before the grade of "I" is recorded. A student who merely fails to show for the final examination will receive a zero for the final and an "F" for the course.

D. **Cellular Phones and Beeper:** Cellular phones and beepers will be turned off while the student is in the classroom or laboratory.

E. **Americans With Disabilities Act (ADA):** Disability Support Services provide services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Review the website at www.ctcd.edu/disability-support for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

F. ** Civility:** Individuals are expected to be cognizant of what a constructive educational experience is and respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion.

G. **Math Lab:** The Math Department operates an Advanced Mathematics Lab in Building 152, Room 145. All courses offered by the Math Department are supported in the lab with appropriate tutorial software. Calculators and Graphlink are available for student use in the lab. Students are encouraged to take advantage of these opportunities. See posted hours for the Math Lab.

H. **Office Hours:** Full-time instructors post office hours outside the door of the Mathematics Department (Building 152, Room 223). Part-time instructors may be available by appointment. If you have difficulty with the course work, please consult your instructor.

**VIII. COURSE OUTLINE**

A. **Unit One:** Discovering Engineering

1. **Learning Outcomes:** Upon successful completion of this unit, the student will be able to:
   
   a. Describe what engineers do.
   b. Describe the education and skills necessary for engineering.
   c. Describe the impact of engineering on society.
2. **Learning Activities:**
   
a. Listen to classroom lecture and discuss exercises.
b. Read pages of assigned chapter.
c. Complete assignments given by the instructor.

3. **Unit Outline:**
   
a. Nature of Engineering (Chapter 2)

B. **Unit Two:** Engineering Design and Communication.

1. **Unit Objectives:** Upon successful completion of this unit, the student will be able to:
   
a. Explain the relationship between engineering and societal needs.
b. Explain how engineering has influenced water systems in our lives.
c. Describe the impact of an engineering solution related to water from an ethical viewpoint.
d. Explain what a design process is.
e. Explain how engineering design differs from other design processes.
f. Explain the different steps in the engineering design process.
g. Apply each step of the engineering design process to design a product or process.
h. Describe how the implementation the design process affects the quality of the resulting design.

2. **Learning Activities:**
   
a. Listen to classroom lecture and discuss exercises.
b. Read pages of assigned chapter.
d. Complete assignments given by the instructor.

3. **Unit Outline:**
   
a. Engineering & Society (Chapter 3)
b. Introduction to Engineering Design (Chapter 4)

C. **Unit Three:** Mathematics, science and engineering
1. **Unit Objectives:** Upon successful completion of this unit, the student will be able to:
   
a. Explain the goals and the nature of the fields of science, mathematics, and engineering and the differences between them.
b. Explain generally how the fields of math and science and engineering benefit from one another as well as need one another.
c. Explain what engineers in different disciplines do and the math and science they use.
d. Explain the role of science and math in each step of the engineering design process.
e. Describe the types of science and math that might be used by engineers in the different engineering disciplines along with an example for the design of a product or a process.
f. Define Engineering Ethics.

2. **Learning Activities:**
   
a. Listen to classroom lecture and discuss exercises.
b. Read pages of assigned chapter.
e. Complete assignments given by the instructor.

3. **Unit Outline:**
   
a. Connecting Science and Mathematics to Engineering (Chapter 5)

E. **Unit Four:** History of engineering

F. 1. **Unit Objectives:** Upon successful completion of this unit, the student will be able to:
   
a. Give examples of how engineers have used creativity and judgment in the application of math, science, and technology to solve societal problems.
b. Explain why complex engineering problems are usually solved by teams working within broader social structures.
c. Explain how engineering progress provides new human capabilities, which in turn increases engineering capabilities.
d. Give examples of how engineering provides society with both intended and desirable consequences as well as unintended and undesirable consequences.
2. **Learning Activities:**
   a. Listen to classroom lecture and discuss exercises.
   b. Read pages of assigned chapter.
   c. Complete assignments given by the instructor.

3. **Unit Outline:**
   a. A Brief History of Engineering (Chapter 6)