# NORTHEASTERN TECHNICAL COLLEGE
## COURSE OUTLINE

<table>
<thead>
<tr>
<th>COURSE:</th>
<th>PREFIX NO.</th>
<th>EFFECTIVE DATE</th>
<th>NEXT REVIEW DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEM 202</td>
<td>January 2014</td>
<td>January 2016</td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>TITLE:</th>
<th>CREDITS</th>
<th>CONTACTS</th>
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<tbody>
<tr>
<td>ELECTRONIC DEVICES II</td>
<td>3.0</td>
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| PREREQUISITES: | EEM 201 |

**DESCRIPTION:** This course is a continuation of the study of electronic devices and circuits. Components and circuit configurations are analyzed to achieve a more comprehensive coverage of electronic devices and circuits.

**TEXTBOOK(S) OR ALTERNATIVE:** ELECTRONIC CIRCUITS by Heathkit and Electronic Circuits Lab Manual by Heathkit. Pdfs and handouts for textbook will given.

**MATERIALS (specifying those to be purchased by student):** Materials provided are course outline and lab equipment. Students will provide book, lab manual, paper, pencils, and a scientific calculator.

**COLLATERAL READING:** None

**CLASS MANAGEMENT ACTIVITIES (Attendance, tardies, testing, etc.):**

**Academic dishonesty:** Students are expected to do their own work. Please refer to the NETC Student Code and Grievance Procedure for definition of academic dishonesty and an outline of disciplinary action that may result therefrom.

**Attendance:** Students are expected to attend all scheduled classes, however, up to 10 hours of absence are allowed for unavoidable hardships such as illness or car trouble. A student missing more than 10 hours of class for any reason will be dropped from the course for excessive absences. A grade of "W" will be assigned if a student drops, or is dropped from a class prior to mid-term. After mid-term, a grade of "WF" is assigned unless there are extenuating circumstances and the student is passing the course at the time of withdrawal.

**Tardies:** A student is considered tardy if he or she arrives for class after the roll has been taken. Three tardies constitute 1 hour of absence.

**Assigned Work:** If a student is absent the day an assignment (test and/or homework) is due; he/she is required to complete the work on the first day back in class.

**Classroom Etiquette:** An integral part of an education is developing a sense of integrity and responsibility not only toward ourselves but also toward others. In the classroom, as on the job or in your home, exhibiting appropriate behavior reflects on your maturity. Arriving on time to class, being prepared, and
considerate of others as they are talking has a positive effect on others. Please be considerate.

**Student ID:** It is mandatory that every student wear his or her student ID at all times. During the first week of classes, the instructor will issue a reminder to wear the ID. This reminder is a warning.

Then instructors are required to dismiss students without ID from class. The student may get his/her ID (or a new one from Student Services for $3.00) and return to class before the midpoint of the class. If the student cannot get his/her ID and return to class by the midpoint, the instructor will record the absence.

**Disabilities Statement:** Students with disabilities are encouraged to contact the Dean of Student Services to discuss needs or concerns as they pursue an academic program and participate in campus life. The Dean of Student Services will provide guidance regarding official documentation of disabilities and/or accommodation of needs. (See College Catalog).

**RESOURCES (A-V, persons, tools/equipment):**
Heathkit Trainer ET3100 and parts kit EB6104-31

**COURSE TOPICAL OUTLINE** (List topics and sub-topics of course) and Calendar or approximate length of time devoted to topic.

**UNIT 1** BASIC AMPLIFIERS
a. Importance of Amplifiers
b. Amplifier Configurations
c. Amplifier Biasing
d. Labs 1 and 2

**UNIT 2** TYPICAL AMPLIFIERS
a. DC Amplifiers
b. Audio Amplifiers
c. Special Amplifiers
d. Labs 3 and 4

**UNIT 3** OPERATIONAL AMPLIFIERS
a. Differential Amplifiers
b. Op Amp Characteristics
c. Closed-Loop Operation
d. Labs 5, 6, 7, and 8

**UNIT 4** POWER SUPPLIES
a. Rectifier Circuits
b. Filter Circuits
c. Voltage Multipliers
d. Regulation
e. Labs 9, 10, and 11
UNIT 5   OSCILLATORS
   a. Fundamentals
   b. Sinusoidal Oscillators
   c. Nonsinusoidal Oscillators
   d. Labs 12, 13, and 14

UNIT 6   PULSE CIRCUITS
   a. Waveshaping
   b. Clippers
   c. Multivibrators
   d. Ramp Generators
   e. Labs 16, 17, and 18

UNIT 7   MODULATION
   a. Amplitude Modulation
   b. Frequency Modulation

STUDENT LEARNING OUTCOMES: Upon successful completion, the student will be able to complete the following task:

1. Identify basic transistor amplifier circuits, describe their operation and list the characteristics of each.

2. Discuss direct current amplifiers, audio amplifiers, and special amplifiers and their application in practical electronic systems.

3. Explain the operation of differential amplifiers, comparators, summing and difference amplifiers, and active filter circuits.

4. Identify and explain the operation of power supply rectifiers, filters, and regulation circuits.

5. Discuss the basic principles of oscillation, identify and describe the operation of commonly used LC, RC, and crystal oscillators.

INSTRUCTIONAL METHODS TO COMPLETE OUTCOMES: Classroom lectures, demonstrations, textbook assignments and lab experiments.

EVALUATIVE METHODS TO APPRAISE OUTCOMES: Approximately seven unit tests will be given. The unit average will constitute 80% of the course grade with 20% assigned to labs. A final exam may be given if time permits.

GRADING SCALE:
   90 - 100 = A
   80 -  89 = B
   70 -  79 = C
   60 -  69 = D
   Below 60 = F