NORTHEASTERN TECHNICAL COLLEGE
COURSE OUTLINE

<table>
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<tr>
<th>COURSE:</th>
<th>PREFIX NO.</th>
<th>EFFECTIVE DATE</th>
<th>NEXT REVIEW DATE</th>
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<tbody>
<tr>
<td>EEM</td>
<td>201</td>
<td>January 2014</td>
<td>January 2016</td>
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<table>
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<tr>
<th>TITLE:</th>
<th>CREDITS</th>
<th>CONTACTS</th>
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<td>ELECTRONIC DEVICES I</td>
<td>3.0</td>
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PREREQUISITES: EEM 105 OR EEM 115

DESCRIPTION: This course is a study of the fundamental principles of common electronic devices and circuits. Emphasis is placed on solid-state principles and applications.

TEXTBOOK(S) OR ALTERNATIVE: Semiconductor Devices by Heathkit and Semiconductor Devices Lab Manual. 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 paper, pencils, a scientific calculator, and a lab manual.

COLLATERAL READING:

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 or 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)


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

UNIT 1 SEMICONDUCTOR FUNDAMENTALS
   a. Importance of Semiconductors
   b. Semiconductor Materials
   c. Operation
   d. Lab 1
   e. Video #1 "Introduction to Semiconductors"

UNIT 2 SEMICONDUCTOR DIODES
   a. PN Junction
   b. Diode Biasing
   c. Characteristics
   d. Labs 2, 3, and 4
   e. Video #2 "Semiconductor Diodes"

UNIT 3 THE ZENER DIODES
   a. Characteristics
   b. Voltage Regulation
   c. Lab 5
   d. Video #3 "The Zener Diode"
COURSE TOPICAL OUTLINE: (Continued)

UNIT 4  SEMICONDUCTOR DIODES FOR SPECIAL APPLICATIONS  
(Optional)
   a. Tunnel Diode  
   b. Varactor Diode  
   c. High Frequency Diodes

UNIT 5  BIPOLAR TRANSISTOR OPERATION
   a. Transistor Construction  
   b. Transistor Action  
   c. Amplification  
   d. Amplifier Circuits  
   e. Labs 6, 7, and 8  
   f. Video #5 "Bipolar Transistor Operations"  
      #6 "Bipolar Transistor Circuits and Testing"

UNIT 6  BIPOLAR TRANSISTOR CHARACTERISTICS
   a. Common-base Circuits  
   b. Common-emitter Circuits  
   c. Common-collector Circuits  
   d. Maximum Transistor Ratings  
   e. Labs 9, 10, and 11  
   f. Video #7 "Bipolar Transistor Characteristics"  
      #8 "Bipolar Testing"

UNIT 7  FIELD EFFECT TRANSISTORS
   a. Junction FET  
   b. Insulated Gate FET  
   c. Labs 12 and 13  
   d. Video #9 "Field Effect Transistors" and  
      #10 "Insulated Gate FET's"

UNIT 8  THYRISTORS
   a. Silicon Controlled Rectifiers  
   b. Bidirectional Thyristors  
   c. Unijunction Transistors  
   d. Labs 14 and 15  
   e. Video #11 "Thyristors-SCR and TRAIC" and  
      #12 "Thyristors-DIAC and UJT"
COURSE TOPICAL OUTLINE: (Continued)

UNIT 10 OPTOELECTRONIC DEVICES

a. Principles of Light
b. Light Sensitive Devices
c. Light Emitting Devices
d. Labs 18 and 19
e. Video #15 "Optoelectronis Devices-Part I" and
   #16 "Optoelectronic Devices-Part II"

STUDENT LEARNING OUTCOMES:
1. Demonstrate understanding of semiconductor physics.
2. Explain operation of bipolar and unijunction transistors.
3. Analyze semiconductor biasing, configuration, and class of
   operation.
4. State characteristics and operation of semiconductor devices, to
   include diodes, bipolar transistors, FET's, SCR's, UJT's, DIAC's,
   and TRIAC's.
5. To apply test equipment to determine performance of semiconductor
   devices.

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

EVALUATIVE METHODS TO APPRAISE OUTCOMES: Several chapter tests will
   be given. The chapter tests average will constitute 80% of the
   course grade with 20% assigned to labs.

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