# COURSE SYLLABUS

<table>
<thead>
<tr>
<th>Course Title:</th>
<th>Electronic Circuits and Devices</th>
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<tr>
<td>Department:</td>
<td>Advanced Manufacturing Technology</td>
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<tr>
<td>Curriculum:</td>
<td>Technology Studies</td>
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| Date submitted: | May 2019 (19-25) |

### Course Code:
- **MFG*142**

### Course Type:
- **X**

### Prerequisites:
- Math for Electricity & Electronics (MFG*133), Circuit Theory I (MFG*137), Digital Fundamentals (MFG*138), Circuit Theory II (MFG*139), and Robotics (MFG*140) or consent of the instructor

### Elective Type:
- **G**

### Credit Hours:
- **3**

### Developmental: (yes/no)
- **No**

### Lecture:
- **1.5**

### Clinical:
- **0**

### Lab:
- **1.5**

### Studio:
- **0**

### Other:
- **0**

### TOTAL:
- **3**

### Contact Hours:
- **3**

### Class Maximum:
- **24**

### Semesters Offered:
- **Fall, Spring**

### Catalog Course Description:
Electronic Circuits & Devices provides an introduction to electronic materials, components, circuits, devices and their applications. The course will provide an overview of semiconductors, diodes, transistors (bi-polar, field-effect and unijunction), applications of SCR and Triac to circuits, and application of components to rectifiers, amplifiers, and relays.

### Topical Outline:
1. Semiconductors
2. Power Rating and Heat Sinking Components
3. The P-N Junction; The Light Emitting Diode
4. Single Phase Rectifiers; The Polyphase Rectifier
5. Filters
6. The Transistor; The Transistor Switch; The Transistor Amplifier; The Darlington Amplifier
7. Field Effect Transistors
Upon successful completion of this course, the student will be able to do the following:

1. Demonstrate an understanding of the construction of semiconductor devices and the material from which they are constructed.

2. Demonstrate an understanding of the significance of heat to semiconductors and the devices and materials used to address this issue.

3. Demonstrate an understanding of basic diode operation and testing.

4. Demonstrate the use of the diode in a variety of rectifier applications.

5. Apply the filtering process to a variety of rectifiers.

6. Select and apply bi-polar transistors to amplifier applications.

7. Select and apply Field Effect Transistors to amplifier applications.

8. Apply unijunction transistor to timing applications.

9. Utilize the silicon-controlled rectifier (SCR) in AC and DC circuits.

10. Apply phase shifting circuitry to the SCR.

11. Select and apply the Triac to AC circuits including phase shifting.

12. Select and apply solid state relays.

13. Explore oscillator applications.

14. Utilize off-delay and on-delay solid state timers.

15. Select and utilize various operational amplifiers.
## GENERAL EDUCATION:
(Numbering reflects General Education Outcomes as they appear in the college catalog)

No General Education outcomes.

## Evaluation:
List how the above outcomes will be assessed.

Assessment will be based on the following criteria:
1. Tests and quizzes

## Instructional Resources:
List library (e.g. books, journals, online resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.

<table>
<thead>
<tr>
<th>Required</th>
<th>Desired</th>
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<tr>
<td>Full electronics lab</td>
<td>None</td>
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## Textbook(s)