

**Oklahoma State University Institute of Technology**  
**Course Syllabus**  
**Fall 2017**

**ETDE-1363 Electronic Devices & Standards**

Students learn to identify, specify, and troubleshoot electronic devices used in power supplies, amplifiers, oscillators, sensor circuits, electro-optical and industrial control circuits. Students learn how to research and use manufacturer specification sheets. Device measurements are made with Multimeter, oscilloscopes, frequency counters and other test equipment. Students are introduced to standards development for measurements and devices. An overview of professional organizations such as American National Standards Institute, International Standards Organization, and National Institute of Standards and Technology is included. Students may complete a course project integrating devices into a working system. Technical reports and presentations are vital components of the course.

**Course Purpose:**

Purpose of this course is to introduce the concepts of semiconductor devices and their application in the field of instrumentation technology.

**Type of course:** Theory/Lab.

**Credit Hours:** 3;

Total hours of theory per semester: 30;

Total hours of lab for the semester: 45;

**Class length -** Full Semester

**Class days and times:** MWF 9:30- 11:55 AM

**Prerequisites:** ETDE 1263

**Instructor Name:** Asif Hoque

**Instructor Phone:** (918) 293-5375

**Office:** ETDE Building -Room 15J

**Instructor email:** [asif.hoque@okstate.edu](mailto:asif.hoque@okstate.edu)

**Instructor's Office Hours:** Monday, Wednesday, Friday: 3.00 pm to 4.00 pm

Tuesday, Thursday: 10.30 pm to 11.30 pm

**Division Name:** Engineering Technologies    **Division Phone:** (918) 293-5150

**REQUIRED TEXT, REFERENCES, AND MATERIALS**

**Texts:** Electronics Fundamentals, A Systems Approach by Floyd & Buchla, Pearson, ISBN-13: 978-0-13-314363-8  
Experiments in Electronics Fundamentals and Electric Circuits Fundamentals (8th Edition) by Buchla, Prentice Hall, ISBN-13: 978-0-13-506327-9

**References:** N/A

**Materials:** Notebook, graph-ruled Composition book, Pens & Pencils, Scientific/Engineering calculator, 16+GB Flash drive

**Tools:** Digital Multi-meter, Klein Tools MM2000 or equivalent

Electrical/Electronics Tool Kit  
 Electronics Parts Kit  
 NI myDAQ with Labview and Multisim Software & NI MyProtoBoard

**Estimated Cost for Textbooks:** \$258.00  
**Estimated Cost for Materials:** \$100.00  
**Estimated Cost for Tools:** \$780.00

**Optional Resources:** Windows 10 OS Laptop Computer with the following minimum requirements: 8GB RAM (16GB preferred), 1TB Hard drive, Intel i5 CPU (i7 preferred), dedicated graphics card, 1600x900 screen resolution or better, Wi-Fi connectivity, DVD player. (Apple Mac computers are highly discouraged due to software compatibility issues)

**Upon completion of this course, students should demonstrate the ability to:**

Course Outcomes	Assessment Method
1. Interpret the Data Sheets of Semiconductor Devices such as Diodes, BJTs, FETs and Op Amps	Test, Lab, Homework, Quiz
2. Implement and Troubleshoot circuits with semiconductor devices such as diodes and transistors	Test, Lab, Homework, Quiz
3. Implement amplifier and oscillator circuits using BJTs & FETs and interpret their performance	Test, Lab, Homework, Quiz
4. Interpret the difference in the Theoretical Values calculated and the results measured from the circuits implemented	Test, Lab, Homework, Quiz
5. Construct and Analyze basic Op-Amp circuits	Test, Lab, Homework, Quiz
6. Construct and Analyze linear and non-linear Op-Amp circuits such as amplifiers, comparators, summers, differentiators & integrators	Test, Lab, Homework, Quiz
7. Interpret schematics with Diodes, BJTs, FETs and Op Amps in them, troubleshoot and repair these circuits successfully if they are not in proper working condition	Test, Lab, Homework, Quiz

**COURSE ACTIVITIES**

In this course students will:

- *Participate in class discussions and activities.*
- *View videos that depict the various concepts.*
- *Contribute to a course Service Learning project.*
- *Participate in group and individual presentations.*
- *Compile a portfolio of work produced.*
- *Take examinations.*
- *Complete reading assignments.*
- *May be required to do quizzes.*

**EVALUATION - GRADES WILL BE BASED ON THE QUALITY AND COMPLETION OF THESE TASKS:**

The final course grade will be calculated with the following weights:

2 Unit test	30%
Labs	25%
Homework	15%
Pop Quizzes	10%
Final Test *	20%

<b>OSUIT Grading Scale</b>
A = 90%-100%
B = 80%-89%
C = 70%-79%
D = 60%-69%
F = 59% & below

\*The student’s grade for this assignment will be used in student learning. A 70% competency or higher receives a Pass rating. This Pass/Fail rating is independent of the student’s course grade.

Daily and/or weekly quizzes, small weekly assignments and similar type projects: Normal return time to student by next class meeting or no later than one (1) week.

Extensive assignments, large lab projects, extensive quizzes, exams and similar type projects: Normal return time to students in one (1) to two (2) weeks.

**RECOMMENDED STUDENT COMPETENCIES/SKILLS**

N/A

**AUTHORIZED TOOLS**

**Instructors Policy to Submit Work**

To provide students with improved feedback, technical documents shall be submitted electronically via D2L unless approval is received for other methods. To ensure students learn to submit documents electronically, students are required to submit work in Microsoft Word format and follow a pre-define template and format. Students will be asked to meet a goal in data recording and analysis by submitted data plots in Microsoft Word format (after creating in a Microsoft Excel or other professional software format) with the aid of team members and instructor advisement. All individual submissions must be submitted as one Microsoft Word or PDF document unless instructed otherwise. Documents that are not legible will be given a grade of zero. NO EXCEPTIONS!

**LATE WORK**

**Labs/Project:** Submitting your complete and properly-executed work early is always acceptable. Lab report must be submitted in D2L. Lab report should include signed off (Instructor Sign) page. Late work will get 25% penalty.

**Unit exam and Final Exam:** If you miss an exam, it cannot be made up unless your absence meets the requirements for an approved absence. Make-up exams may be different from the exam given in class and may be more difficult. Unit Exams and Final Exam CANNOT be made

up without strict approval and penalty! If you know in advance that you will miss an exam, special arrangements to re-schedule the exam may be possible for hardship circumstances.

### **TESTING**

The following guidelines will be enforced during proctored exams:

- All materials not required for the exam must be placed off the desk
- Scientific/Engineering Calculators are allowed unless otherwise noted
- Once testing has started you are not allowed to leave the room until you have completed the test. Doing so will immediately end the test for you.
- All material associated with the exam must be submitted upon completion.
- All tests will have a defined time for completion.
- Exceptions may be made to these rules at the instructor's discretion.
- Tests will be proctored by the LASSO center on the OSUIT campus.

### **OTHER LAB AND CLASSROOM POLICIES**

The college environment is one in which various ideas, philosophies, and sensitive topics are explored. The open and respectful pursuit of knowledge will require that each person be allowed to share opinions that may not be popular or accepted by all. Language or gestures that are non-inclusive, derogatory, or disrespectful of diverse backgrounds, cultures, ethnicities, religions, genders, and/or sexual orientations will not be tolerated.

- The use of tobacco in any form is not permitted in the building.
- Cell phones must be turned off unless there is a medical need.
- Audio equipment is not permitted.
- Food and beverage is permitted but not around the equipment. Only liquids with screw type closures are allowed.
- Lab computers are to be used for teaching/learning only. Do not use for entertainment or casual internet surfing or chatting. This is especially true during class.
- Students are expected to maintain a respectful manner during class-sleeping or otherwise assuming a laid down position will not be tolerated.
- Tests will not be given early.
- The lab is considered an industrial environment, therefore you must adhere to proper safety and operations protocols. Do not endanger yourself or others.

### **Dress Code**

- 1. Shoes must cover entire foot.**
- 2. Shorts/Dresses must cover the knees.**
- 3. Tank tops/muscle shirts are not to be worn.**
- 4. Clothing with obscene logos are not to be worn.**
- 5. Clothing that is distracting may not be worn in the classroom setting.**
- 6. Clothing that is baggy should not be worn for safety reasons. Jewelry should be removed in the lab setting.**
- 7. Safety glasses must be worn when appropriate.**

### **E-Mail Communication Standards**

Students are encouraged to use e-mail when communicating personal issues with their instructor. E-mail corruption is a significant problem and unidentified e-mails are simply purged. Therefore a strict standard is necessary to identify a legitimate student communication. The “message line” of student e-mails must contain in order – Subject, Name, Course, and Trimester. Example: **Missing Assignment, John Smith, ETDE 3513, Spring 2017.**

### **SYLLABUS ATTACHMENT**

View the Syllabus Attachment, which contains other important information, by visiting [http://osuit.edu/center/student\\_syllabus\\_information](http://osuit.edu/center/student_syllabus_information)

<b>Course Schedule</b>			
<b>Course Outline Schedule</b>	<b>Topic</b>	<b>Assignment</b>	<b>Due Date</b>
<i>Week 1</i>	Diodes and Applications		
<i>Week 2</i>	Diodes and Applications	Homework 1	09/15/17
<i>Week 3</i>	Diodes and Applications	Lab 1	09/22/17
<i>Week 4</i>	Transistors and applications	Homework 2	09/29/17
<i>Week 5</i>	Transistors and applications	Lab 2	10/06/17
<i>Week 6</i>	Transistors and applications	Test 2,	10/13/17
<i>Week 7</i>	The Operational Amplifier	Homework 3	10/20/17
<i>Week 8</i>	The Operational Amplifier	Lab 3	10/27/17
<i>Week 9</i>	The Operational Amplifier	Homework 4	11/03/17
<i>Week 10</i>	Basic OP-AMP Circuits	Lab 4	11/10/17
<i>Week 11</i>	Basic OP-AMP Circuits	Test 2	11/17/17
<i>Week 12</i>	Basic OP-AMP Circuits	Homework 5	11/27/17
<i>Week 13</i>	Basic OP-AMP Circuits	Lab 5	12/01/17
<i>Week 14</i>	Special-Purpose OP-AMP circuits		12/13/17
<i>Week 15</i>	Review	Final Exam	

\*Schedule is subject to change at instructor discretion.

