Course Title	**Basics of Electronic Devices**
Course Code	**EE3404**
No. of Credit Hrs (Lecture + Tutorial + Lab)	**4 (3+0+1)**
No. of Contact Hrs (Lecture + Tutorial + Lab)	**5 (3+0+2)**
Level-Year	**5-3**
Prerequisite (if any)	**PHYS 2411**

1) Course Objectives:

To introduce students to the basic physics and operation of semiconductor devices as well as some simple applications. Students will gain good background for more advanced courses. Also practically highlighting the topics and concepts taught in Electronic Devices lab.

2) Expected Learning Outcomes:

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

1. Apply principles of semiconductor physics to analyze the characteristics and behavior of diodes, BJTs, and FETs. PLO1 [1]
2. Design and construct rectifier, biasing, and amplifier circuits using diodes, BJTs, and FETs. PLO2 [2]
3. Investigate and interpret experimental results to validate theoretical behavior of diode and transistor-based circuits. PLO3 [6]
4. Communicate and defend the performance and design aspects of analog circuits during technical presentations or discussions. PLO8 [3]
5. Collaborate effectively in a team environment to build and test semiconductor circuits. PLO7 [5]

3) Course Contents:

1. Intrinsic and Doped Semiconductors
2. Drift and Diffusion Currents.
3. PN Junction Diode.
4. Bipolar Junction Transistor (BJT).
5. Field-Effect Transistors (FET).
6. Introduction to JFET

4) Electronic Devices Lab Contents:

1. Experiment 1: V-I Characteristics of Silicon Diode
2. Experiment 2: Voltage Stabilization with Zener Diode
3. Experiment 3: Half Wave Rectifier (With and Without Capacitor Filter)
4. Experiment 4: Center-Tapped Full Wave Rectifier (With and Without Capacitor Filter)
5. Experiment 5: Bridge Rectifier (With and Without Capacitor Filter)
6. Experiment 6: Diode Clippers
7. Experiment 7: Diode Clampers
8. Experiment 8: Current controlled characteristics curve of a transistor
9. Experiment 9: Output characteristics curve of a transistor
10. Experiment 10: Common Emitter Amplifier

5) Teaching Methods:

- Lectures and Discussion

- Videos
- Self-learning
- Laboratory demonstrations

6) Mode of Evaluation:

Course Assessment Methods

- Quizzes , Assignment, Homeworks, Reports, Presentations etc.
- Lab Work
- Mid Exam
- Final Exam

Evaluation

No	Assessment Activities *	Percentage
1.	Assignments/Quizzes/HomeWorks/Mini-Projects/Presentations/Reports+Quizzes	15%
2.	Mid Exam	25%
3.	Lab/Tutorial (Lab Exam)	10%
4.	Lab/Tutorial (Lab Reports)	10%
5.	Final Exam	40%

7) Textbook(s):

- Microelectronics, authored by Behzad Razavi, 2nd edition, international student version, Willey
- Lab Manual

8) References:

- S. Sedra and K. C. Smith, “Microelectronic Circuits: Theory and Applications”, Oxford University Press, 2014.
- J. Millman and A. Grabel,"Digital and analog circuits and systems," Wiley Eastern, 1987