

TECHNOLOGY 276: Electronics I

2007-08 Catalog Data: TECH 276 Electronics I (3 Credits)

Catalog Description: First semester of a two-semester sequence covering basic semiconductor theory and operations of various types of diodes, bipolar transistors, and field-effect transistors. Topics include transistors biasing, incremental models, stability, and single/multistage amplifiers.

Prerequisites: TECH 270

Co-requisites: MATH 229 and TECH 276A

Textbooks

- T. F. Bogart and J. W. Brown, Experiments in Electronic Devices and Circuits, 6th Edition, Prentice Hall 2004.

Instructor: Said Oucheriah, Ph.D., P.E., Associate Professor

Learning Objectives	Relational ABET Learning Outcomes
<p>Learn about basic semiconductor concepts.</p> <p>Learn about the diode characteristics and its ac and dc resistance.</p> <p>Learn about zener diode and its characteristics.</p> <p>Learn about the theory and characteristics of bipolar junction transistors (BJT).</p> <p>Learn about the theory of junction field-effect transistors (JFET) and their characteristics.</p> <p>Learn about the theory of metal-oxide-semiconductor FET (MOSFET) and its characteristics.</p>	<p>A. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines.</p> <p>B. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology.</p>
<p>Learn how to analyze circuits containing diodes and draw load lines.</p> <p>Learn about half-wave and full-wave rectifiers.</p> <p>Learn about power supplies and voltage-regulation</p>	<p>A. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines.</p> <p>B. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology</p> <p>D. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives.</p> <p>F. An ability to identify, analyze and solve technical problems.</p>

<p>circuits.</p> <p>Learn how to bias transistor circuits.</p> <p>Learn about the use of a BJT as a switch.</p> <p>Learn about general amplifier concepts, cascade of amplifier stages and input/output loading effects.</p> <p>Learn about small-signal BJT amplifiers: common-emitter, common-collector and common- base amplifiers.</p> <p>Learn about multistage amplifiers.</p> <p>Learn about biasing techniques in JFET circuits.</p> <p>Learn about small-signal JFET amplifiers: common-source, common-drain and common- gate amplifiers.</p> <p>Learn about MOSFET bias circuits and small-signal MOSFET amplifiers</p>	<p>A. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines.</p> <p>B. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology</p> <p>D. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives.</p> <p>F. An ability to identify, analyze and solve technical problems.</p>
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Topics Covered:

- Diodes
- Diode as a Circuit Element
- Bipolar Junction Transistors (BJT)
- Small-Signal BJT Amplifiers
- Field-Effect Transistors (FETs)

Laboratory: See Syllabus for TECH 276A