
Course Name

Code No.**I. COURSE DESCRIPTION:**

This course is a detailed study BJT's, JFET's, MOSFET's and OPAMP's as well as applications of these devices including transistor amplification, switching, timing circuits and OPAMP applications. This course will focus on operational analysis and troubleshooting of circuits employing these devices. Hands on skills will be reinforced in the laboratory component of this course, which includes device testing, circuit assembly, testing and troubleshooting.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Analyze, assemble, test and troubleshoot various BJT biasing configurations and applications

Potential Elements of the Performance:

- Identify and analyze common transistor biasing circuits.
 - Correctly use common test equipment in the analysis and troubleshooting of transistor circuits.
 - Identify and compare various Amplifier classes
 - Analyze, test and troubleshoot transistor switching applications including timing circuits.
 - Identify and understand the operation of other transistor configurations including Darlington
2. Understand the characteristics, operation, biasing, and testing of JFET's and MOSFET's.

Potential Elements of the Performance

- Identify the two types of JFET's and describe the construction and operation of each.
- Describe and analyse the different types of JFET biasing circuits.
- Compare FET characteristics, advantages and disadvantages with BJT's
- Identify the two types of MOSFET's and describe the construction and operation of each.
- Describe and analyse the different types of MOSFET biasing circuits
- Assemble, test and troubleshoot different MOSFET circuits.

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3. Understand the operation, characteristics and applications of Operational Amplifiers (OPAMPS)

Potential Elements of the Performance:

- Describe the operational amplifier.
 - Explain IC identification of an OPAMP.
 - Explain the term differential amplifier.
 - Describe the operation of a discrete differential amplifier.
 - Using a specification sheet, list and understand the operating and electrical characteristics of OPAMPS.
 - Describe and analyse the operation of common OPAMP circuits including Inverting, Non-Inverting, Follower, Comparator, Schmitt Trigger.
 - Assemble, test and troubleshoot common OPAMP circuits.
4. Understand and Analyze other common switching circuits and applications

Potential Elements of the Performance:

- Describe and analyse the operation of the basic BJT, JFET AND MOSFET switches.
- Describe and analyse 555 timer astable and monostable multivibrators.
- Understand the operation of relays (DC, AC, Reed).
- Understand the operation of different optoelectronic devices used in switching circuits including Opto-Isolators.
- Describe and analyse the operation of a constant current generator.
- Assemble, test and troubleshoot common switching circuits.

III. TOPICS:

1. Bipolar Junction Transistors
2. JFETs, MOSFETs and their applications
3. Operational amplifiers and their applications
4. Switching circuits and their applications

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IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Introductory Electronic Devices and Circuits (Conventional Flow Version)
 Seventh Edition – Robert T. Paynter – Prentice Hall.
 1st Year Parts Package / DMM
 Assorted handouts as required.

V. EVALUATION PROCESS/GRADING SYSTEM:

The final grade will be derived as follows:

- Theory - Tests (3 or 4) and Quizzes = 50%
- Lab - Practical tests and reports = 40%
- Attendance and work ethics = 10%
- TOTAL = 100%

- **See Special Notes Section VI for further details affecting final grade.**

The following semester grades will be assigned to students in other than postsecondary courses:

Grade	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

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Code No.**VI. SPECIAL NOTES:**

- Attendance to lab activities is compulsory, unless discussed with the instructor in advance of the absence and the absence is for a medical or family emergency. A **deduction of 2% per Lab missed**, will be imposed on the final lab mark.
- Your attendance to all classes, and your final grade are directly related. A **deduction of 1% per theory hour missed**, will be imposed.
- Any student that is absent for a test, will be required to provide a doctors' note immediately upon returning. Failing to do so will result in a grade of 0% being assigned to the missed test.
- Tests, quizzes and other activities, will not be scheduled on an individual basis, unless it is for a medical or family emergency.
- Disruptions to theory classes, such as lateness, are not acceptable and will be dealt with on an individual basis.

Laboratory Reports shall be subject to the handout and or criteria given at the start of the semester by the instructor.

All Lab Reports are due at the start of the following weeks Lab Class unless otherwise stipulated by the instructor. A **penalty of 10% per day** will be assessed for late submissions (Weekends included).

All Lab Reports must be submitted in a Duo-Tang cover unless otherwise noted.

All other required submissions will be assessed a late penalty of **5% per day** (Weekends included).

Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

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Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean’s secretary. Students will be required to provide a transcript and course outline related to the course in question.