STARK STATE COLLEGE OF TECHNOLOGY
ELECTRICAL/ELECTRONIC ENGINEERING TECHNOLOGY
COURSE SYLLABUS

EET230 ELECTRONIC CIRCUITS I

Hours: Class 3; Lab 2; Credits 4
Pre-requisite: EET123

COURSE DESCRIPTION:

A study of semiconductors, field effect transistors, h-parameters, device equivalent circuits, small signal analysis, multistage amplification, decibels, frequency analysis, large signal amplifiers, thyristors, power amplifier design, differential amplifiers, operational amplifiers, feedback and oscillator circuits, electronically regulated power supplies, and applications of circuits with these devices

TECHNICAL OBJECTIVES:

Upon completion of the course, the student should have an understanding of different types of biasing arrangements, be able to identify BJT and FET amplifier circuits, calculate gain, input and output impedance of an amplifier circuit, determine transistor model parameters from characteristic curves, and describe the frequency characteristics of BJT and FET amplifiers. The student should have an understanding of power amplifier design, test and measurement of differential and operational amplifier circuits, the application of BIFET, BIMOS and CMOS circuits, the different types of oscillator circuits, thyristors, electronically regulated power supplies and applications.

CRITICAL THINKING/COMPUTATIONAL SKILLS:

Technical skills are demonstrated by the student's ability to test and measure various types of amplifier circuits for transistorized, FET, BJT and IC circuits using the electronic kits provided for this course to build the circuits and perform testing and measurement.

COMPUTER APPLICATION SKILLS:

The students are instructed to use Multisims software to draw schematic diagrams, select the various types of amplifier circuits and perform testing and measurement.

COMMUNICATION/INTERPERSONAL SKILLS:

Students are instructed to work in groups in the lab, interacting with each other by solving problems, writing reports, completing homework assignments and preparing for exams

TEXTBOOK:

Electronic Devices and Circuit Theory, Boylestad & Nashelsky, Prentice-Hall

Course Objectives and Plan of Work:

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EET230 Electronic Circuits I Lecture Outline

Lecture Hour	**Topics**	Textbook Sections	Homework	OET005 Topic
1	**Semiconductor Properties, PN Junction Theory, Diodes, Applications & Circuits**	1.1-1.18, 2.1 - 2.14	Ch2. 29,30,31,32,37,43,44	1,2,3
2	**BJT Theory**	3.1-3.13	CH3 20,24,30	4
3	**BJT biasing**	4 5.1-5.7	CH4 1,6,12 Ch5 5,14,22	4,5
4	**BJT stability amplifier circuits multistage amplifier design**	5.8-5.14,	Ch5 26,30,32,36,40,42,44	6,7
5	**BJT amplifier circuits multistage amplifier design**	5.15-5.29	Ch5 46,54,60,62,70,72,74,75	6,7
6		Exam. 1		
7	**JFET and Field effect transistors (FETs)**	6.1-6.8	2,3,11	9
8	**JFET and MOSFET biasing circuits**	6.9-6.15	22,33,36	10
9		Exam. 2		
10	**JFET and FET amplifier circuits**	7.1-7.8	2,3,6,12	11
11	**JFET and FET amplifier circuits**	7.9-7.15	18,21,26,30	11
12		Exam. 3		
13	**JFET and MOSFET amplifier circuits**	8.1-8.6	1,6,10,18,20,24	11

Lecture Hour	**Topics**	Textbook Sections	Homework	OET005 Topic
14	**JFET and MOSFET amplifier circuits Multi-Stage Amplifier Design**	8.7-8.18	27,32,33,38,43,46,5054	11
15	**Frequency analysis**	9.1-9.6	4,9	12
16	**Frequency analysis**	9.7-9.13	12,15,19	12
17	**Frequency analysis**	9.5-9.12	22,2628,31	12
18	**Op-Amps and circuits**	10.1-10.6	1, 2, 3, 4, 5, 6, 10, 12,13	16
19	**Op-Amps and circuits**	10.7-10.10	16, 17, 19, 22, 23	16
20	**Op-Amps applications Filters: Low pass, High pass, Band pass & applications**	11.1-11.4	1, 3, 5, 6, 9, 11, 13,15, 17, 19, 21	16
21	**Op-Amps applications Multi-Stage Amplifier Design**	11.3-11.6	15,16,17,20,21	16
22		Exam 4		
23	**Power amplifiers**	12.1-12.5	1,3,5,7, 9, 12, 15, 17, 19,23, 25	8
24	**Op-Amps applications**	13.1-13.8	2, 3,5, 10, 13, 15, 19, 23, 25,	16
25		Exam 5		
26	**Negative and positive feedback concepts**	14.1-14.4	1, 3, 5	14
27	**Oscillators & Multi-stage Amplifier Design**	14.5-14.9	6, 7, 8, 10, 11, 12, 13	15
28	**Thyristors, Triacs and applications**	17.12	Problems from supplemental material	13
29	**Electronically regulated power supplies**	15.6 and Review for final Exam	Problems from online design software	17

EET230 Electronic Circuits I Lab Outline

Lab	Exercise
1	Experiment 11- Design of BJT Bias Circuits
2	Experiment 13- JFET bias circuits
3	Experiment 14 Design of JFET bias circuits
4	Experiment -15 Compound configurations
5	Experiment 18- Common Base and Emitter Follower
6	Experiment 20- Common source transistor amplifiers
7	Experiment -21 Multistage amplifiers: RC coupling
8	Experiment -22 CMOS circuits
9	Experiment 23- Darlington and cascade amplifier circuits
10	Experiment 24- Current source and current mirror circuits
11	Experiment 26 – Class A and Class B Power Amplifiers
12	Experiment 27 – Differential Amplifier Circuits
13	Experiment 29 – Active Filter Circuits with Op amps
14	Experiment 30 - Comparator Circuits Operation
15	Experiment 31 – Oscillator Circuits
16	Experiment 555 Timer Astable multivibrator

Description of Assessment

Grading Policy

Course Grade

The course grade will be determined by a weighted average of the following:

Category	Weight
Quizzes	15%
Exams	30%
Lab Exercises	25%
Final Exam	25%
Homework	5%

Homework

Homework will be checked at the beginning of the class period on the date it is due.

Exams

A missed exam may be made-up within 4 school days of the exam, but will have a 10% per school day penalty and not be subject to any curve. A make-up exam will differ from the regularly scheduled exam.

Lab

Students are expected to work on the assigned lab period. The lab grade will be calculated by averaging the grades received on all lab reports. Lab reports are due at the beginning of the lab

All labs and lab reports must be completed to the satisfaction of the lab instructor in order to receive a passing grade for the course.

Final Exam

The final exam will be comprehensive, but there will be a greater emphasis on the material covered after the second exam.

Quizzes

Quizzes will be given weekly.