North South University
ECE Department
Spring 2023

Dr. Mohammad Shorif Uddin-MHUd
Adjunct Professor, ECE
mohammad.uddin04@northsouth.edu

EEE111/ETE111 – Analog Electronics I, Section: 06

Course Objective:

This course introduces the characteristics and working of semiconductor devices like diode, BJT, and FET as well as the analysis methods of electronic circuits using these components. Basic and useful configurations of the electronic circuits of specific application will be introduced, and the behavior of the stated devices will be explained graphically and using appropriate equations.

The specific objectives of this course are:

1. to possess a solid understanding of semiconductor devices used in the design of analog electronics
2. to learn the required skill to use the electronic devices in designing practical circuits to solve practical problems.
3. to gain the ability of conduct, analyze, and interpret experiments, and apply experimental results to improve processes or circuit systems.

Learning Outcome:

The course will provide the students with sufficient knowledge for the advanced electronic aspects on analog circuit design. Upon completion, students should be able to construct, analyze, verify, and troubleshoot analog circuits using appropriate techniques, software, and test equipment.

References:

1. Electronic Devices and Circuit Theory by Boylestad & Nashelsky, 11th edition.
2. Microelectronic Circuits by Sedra and Smith, 6th edition.

Scheduled hours:

Theory	RA	NAC216	*10:20am – 11:20 pm*
Lab	A	SAC506	*03:00 pm – 05:10 pm*
Office Hour	RA	SAC1199	*12:30 am – 03:00 pm*

Marks Distribution:

Attendance	05%
Assignment	10%
Class Performance	05%
Quiz/Class Test	20%
Midterm Exam	25%
Final Exam	35%

Lecture Plan:

	Contents	Book Sections	Tentative # of Lectures
1	**Semiconductor Diodes:** Intrinsic, Extrinsic Materials, Junctions & Diodes, Diode Equivalent Circuit, i-v characteristics, Zener Diode, LED	***1.1-1.11, 1.15, 1.16***	5 (Quiz 1)
2	**Diode Applications:** Load Line Analysis, Series, Parallel Configuration, AND/OR Gates, HW & FW Rectification, Clippers & Clampers	***2.1-2.11***	6 (Quiz 2)
3	**BJT:** Construction & Operation, Amplifying Action, Configuration CB, CE, CC	***3.1-3.7***	4 (Quiz 3)
4	**DC Biasing:** Fixed, Emitter, Voltage divider, Collector FB Bias configuration etc.	***4.1-4.8, 4.16***	5
	MID TERM EXAM		
5	**AC Analysis:** r_e and hybrid Transistor Model, CE Fixed, Voltage Divider, CE Emitter, Emitter Follower, CB, Collector Feedback Configuration	***5.1-5.10, 5.19, 5.22***	5
6	**FET:** Construction & Transfer Characteristics, Depletion and Enhancement Type MOSFET, CMOS	***6.1-6.3, 6.6-6.8, 6.11***	5 (Quiz 4)
7	**FET Biasing:** Self and Voltage Divider Biasing Configuration, Biasing for Depletion and Enhancement Type MOSFET	***7.1-7.4, 7.7-7.8***	3 (Quiz 5)
8	**FET Amplifier:** E-MOSFET Drain Feedback and Voltage Divider Configuration	***8.8-8.11***	3

Instructions for students:

1. Talking (side-talk/cell-phone) is prohibited; if you have any question, please raise your hand and wait.
2. No **makeup** exam will be allowed.
3. I will cancel your **registration** for the course if caught using unfair means during each class activity.
4. All students must **bring textbook**/ebook and should follow it throughout the lectures.
5. PowerPoint slides, as well as whiteboard, will be used as the teaching tool.
6. All the slides will be posted in the classroom interaction page.