EEE 310.2 – Circuit Theory II

COURSE PARTICULARS

Course Code: EEE 310.2

Course Title: Electric Circuit Theory II

No of Units: 3

Course Duration:

Status: Compulsory

Prerequisite: EEE 322.1, ENG 210

COURSE LECTURERS

Engr. A. A. Enughwure
Dept. of Electrical Engineering
Nigeria Maritime University, Okerenkoko, Nigeria
akpofure.enughwure@nmu.edu.ng

Engr. Salihu
Dept. of Electrical Engineering
Nigeria Maritime University, Okerenkoko, Nigeria
sasyalwa05@yahoo.com

Engr. Umar Sabo
Dept. of Electrical Engineering
Nigeria Maritime University, Okerenkoko, Nigeria
umar.sabo@gmail.com

COURSE DESCRIPTION

This course is an exploratory, second advance course in circuit theory primarily designed for students in electrical and electronics engineering discipline. The focus of the course is to impart useful skills on the students in order to enhance their circuit synthesis capability since no electrical/electronics engineering graduate will be versatile in the field without a good knowledge of modern circuit analysis and synthesis methods. Hence, this course is design to provide fundamental knowledge on circuit analysis and network synthesis. Topics to be covered include: **Advanced Circuit Analysis, Non Linear Circuit Analysis, Filter** – design and operation and **Active Network Synthesis using Foster and Cauer's forms.**

COURSE OBJECTIVES

The objectives of this course are to:

- introduce students to different methods involves in realising network system from transfer functions;
- provide students with basic information involves on how to work with Fourier transforms, and using them to analyze circuits in frequency domain; and
- provide students with required knowledge on how to apply inverse Laplace transforms to obtain time-domain expressions from frequency domain.

COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:
(Knowledge based)
- synthesis network system from their transfer functions;
- analysis network systems using both initial-value and final-value theorems;
- design and develop basic filter networks

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Practical	10%
Assignments	10%
Test(s)	20%
Final Examination	60%
TOTAL	**100%**

SUPPORTING MATERIALS

We need to recommend at least four textbooks to the students.

Week	Topic	Lecturer	Remarks
1	Introduction and Course General Overview	Engr. A. A. Enughwure	During the first class, the expectation of the students from the course will also be documented
2 -5	Advanced Circuit Analysis Introduction, Definition, Properties and Inverse of Fourier Transform. Application of Circuit Analysis	Engr, A. A. Enughwure	When learning about application of Fourier transform to circuit analysis, student will be taught on how to use partial fractions expansion to deduce inverse Fourier transforms
6	Non-linear Circuit Analysis	Engr. A. A. Enughwure	
7-10	Filter: Understanding basic types of filters sections such as low pass, high pass, band-pass and band-stop filters Learning how to design filters Understanding characteristic impedance and attenuation of filter. Butterworth, Chebychev filters	Engr. Salihu	Practical exercise will involve different filters design and realisation using components and MATLAB
11-13	Network Synthesis: Learning how to synthesis LC Network using	Engr. Sabo Umar	

	Foster Forms (Foster Form I and Foster Form II) and Cauer Forms (Foster Form I and Foster Form II) Learning how to synthesis RC and RL Networks using Foster Forms (Foster Form I and Foster Form II) and Cauer Forms (Foster Form I and Foster Form II)		
14	Revision	Engr. A. A. Enughwure	This is the week preceding the final examination. At this time, evaluation will be done to assess how far the students' expectations for the course have been met.