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Spring 1-1-2020

ECET 303-104: Circuit Measurements I

Jinsoo Park

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Park, Jinsoo, "ECET 303-104: Circuit Measurements I" (2020). *School of Applied Engineering and Technology Syllabi*. 102.
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NEWARK COLLEGE OF ENGINEERING

*TENTATIVE SYLLABUS AND COURSE INFORMATION, SPRING 2020***

Course Name: Circuit Measurements

Course Number: ECET 303

Course Structure: 1-3-2 (lecture hr/wk – lab hr/wk – course credits)

Course Description: Lecture and laboratory sessions are designed to develop techniques for the measurement of various circuit parameters as well as the theoretical prediction of these parameters. Extensive use of computer simulation software.

Prerequisites: (ECET 205 or ECE 271) and (Math 238 or Math 112)

Co-requisites: None

Required, Elective or Selected Elective: Required

Required Materials: **Text:** Name: Fundamentals of Electric Circuits (ECET 303)
Author: Various (Custom Book) (McGraw-Hill Create) Year: 2015
ISBN: 978-1-308-53459-9
Full version ISBN: 978-0-07-338057-5

Course Learning Outcomes:

By the end of the course students are able to:

1. Identify the best circuit theory to apply to various resistive circuits to solve for voltage and current measurements, and utilize these theories to solve these circuit problems.
2. Simulate a circuit with the use of Multisim to obtain a prior understanding of a circuit's behavior, and incorporate these results in a laboratory report.
3. Demonstrate the use of Excel to perform data analysis and graphing on laboratory results.
4. List the differences between time and frequency analysis of a circuit. Theoretically and experimentally generate a Bode plot, as well as simulate these results with Multisim.
5. Write an effective laboratory report, including a detailed Results and Conclusion section.
6. Present orally technical information in a professional and concise manner.
7. Effectively interact with other team members to analyze circuits and complete assignments.
8. Download and upload files with Canvas, as well as utilize other aspects of this learning management application Kirchhoff's Laws Voltage and Current Division

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Class Topics:

Mesh and Nodal Analysis Thevenin and Norton Equivalent Circuits
Maximum Power Transfer Superposition
Source Transforms First Order Response
AC Steady State Analysis Frequency Analysis
Bode Plots Average and RMS Calculations Power Factor

Student Outcomes:

The Course Learning Outcomes support achievement of the following Student Outcomes from the ETAC of ABET Criterion 3 requirements.

Student Outcome a: An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly defined engineering technology activities.
Related Course Outcome: 2

Student Outcome c: An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes. **Related Course Learning Outcomes:** 6

Student Outcome e: An ability to function effectively as a member or leader on a technical team.
Related Course Learning Outcomes: 8

Student Outcome g: An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature. **Related Course Learning Outcomes:** 6 & 7

Academic Integrity:

NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. Please visit the Dean of Students website at http://www.njit.edu/doss for a list of student policies relating to academic integrity and student conduct.

Modification to Course:

The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course Outline.

Prepared By: Daniel Brateris
Course Coordinator: Daniel Brateris

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COURSE MEETS	LECTURE	05:45 pm – 07:40 pm	Tuesday	FMH 404
	LAB	07:45 pm – 09:45 pm	Tuesday	FMH 318

COURSE BY **Name**: Mohammad Rabie
Office: GITC 2108
Email: mrabie@njit.edu
Phone: 973 – 596 – 5775

OFFICE HOURS Wednesday 01:30 pm – 04:00 pm.

LECTURE SCHEDULE

WEEK	DATE	TOPICS	ASSIGNMENT
1.	01/21	Review of Circuits, Basic laws (ohm's, Kirchhoff) for passive networks, voltage and current division	TBD on Canvas
2.	01/28	Mesh Analysis	TBD on Canvas
3.	02/04	Independent and Dependent Sources	TBD on Canvas
4.	02/11	Nodal Analysis	TBD on Canvas
5.	**02/18**	**Test #1**	
6.	02/25	Thevenin & Norton - Max Power Transfer	TBD on Canvas
7.	03/03	Source transformation and dependent sources	TBD on Canvas
8.	03/10	Superposition and source transform	TBD on Canvas
9.	**03/17**	**Spring Recess (03/15 – 03/22) - No Classes**	
10.	**03/24**	**Test #2**	
11.	04/31	First Order Response and Intro to RLC	TBD on Canvas
12.	04/07	AC Steady State Analysis and Freq. Analysis, Part 1	TBD on Canvas
13.	04/14	Frequency Analysis – Part 2	TBD on Canvas
14.	**04/21**	**Test 3**	
15	04/28	Review	
	05/05	**FRIDAY CLASSES MEET, LAST DAY OF CLASSES**	

Notes Regarding Laboratory Work:

1. All calculations are to be done outside the lab and before the experiment is implemented.
2. Only one report is required per group but a work distribution sheet must be handed in with the report with a different member of the team writing each part.
3. All lab reports are due at the beginning of the lecture class one week after the lab session.
4. Ten percentage points will be deducted for each week the report is late. Lab reports will not be graded if late for more than 2 weeks.
5. All Lab reports items must be typed in any handwritten portion of you Lab report will be penalized.

Note Regarding Homework Canvas Submission:

- Don't return homework by email; I don't have automated way to organize files received by email.
- Please do not send individual images of page scans. It is tedious for you and I to make sure that they are all included/printed.
- The edge of your paper must aligned to the edge of your scan.
- To submit your homework online, scan your homework and upload the scanned document (as a single pdf file) using the homework link on the course Canvas site.
- Convert your homework documents to PDF, which you should be able to create directly from your word processor or editor. *No other format is acceptable for turning in homework.*
- Homework must have your name, homework number, date and page number PRINTED CLEARLY on the front page. Your name and homework page number must appear on subsequent pages.
  Ragged paper scans and/or ragged edges scan will not be accepted.

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GRADING POLICY

Note:

Grading Policy may be modified by Instructor for each Section in the Course)

Professionalism	05 %
Homework and Class Participation	10 %
Tests	30 %
Laboratory	25 %
Final Exam	30 %

Note:

- Cannot pass course if you having failing grades on tests and final exam
- There are three tests during the semester. The lowest grade will be dropped. However, if you achieve an A for all three tests, you will not be excused from the final. Students achieving an A on all three tests will receive 5 bonus points that will count for the final grade, so there is an incentive to take all three tests.
- There will be no makeup tests – if you miss one test, then that is the test you will drop.

STUDENT BEHAVIOR

- No eating or drinking is allowed at the lectures, recitations, workshops, and laboratories.
- Cellular phones must be turned off during the class hours – if you are expecting an emergency call, leave it on vibrate.
- No headphones can be worn in class.
- Unless the professor allows the use during lecture, laptops should be closed during lecture.
- During laboratory, if you are finished earlier, you must show the professor your work before you leave class
- Class time should be participative. You should try to be part of a discussion

**** The instructor reserves the right to amend this schedule depending on the dynamics of the class and the progress throughout the semester.**