Electrical Circuits

Dr. Raziq Yaqub
dr.raziq@gmail.com

Chapter—00
Introduction to Logistics and Mutual Expectations

1. Course

Course Name and Number

- **Course Title:**
  - Electrical Circuits (Laboratory)
- **Course No.**
  - ENG-214
- **Course Scope**
  - A practical laboratory experience
  - Designing,
  - Simulating,
  - Bread boarding,
  - Testing electrical circuits to complement the theory

Course Schedule

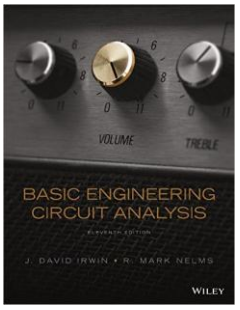
- **Course Dates:-**
  - August 28 , 2015 to December 01, 2015 (To be confirmed)
- **Time:-**
  - Every Monday and Friday
  - 02:00 to 04:30 PM
- **Place (Classroom/Lab):-**
  - To be announced
- **TA**
  - None
- **GA**
  - None

Course Schedule

- **Examinations**
  - None
  - Evaluation would be based on TR (Technical Reports)
  - Oral Presentations (PPT) at end of semester on one of the TR of your choice
  - Penetrations would be in groups of two or three students

Course Material

- **Text Books:**
  - Basic Engineering circuit analysis,
    - by J. David Irwin, and R. Mark Nelms
    - ISBN : 978-1-118-53929-3
  - Some other Books would also be used
    - Instructor deems suitable for better learning
  - Some News Articles (Optional)
    - Instructor deems suitable for Research



- **Purchased Required?**
  - Students' discretion (Not imposed by the instructor)
  - As required by Theory Instructor

Course Description

- **The course plans to cover the following topics**
- **Lecture-1:**
  - Introduction and review of laboratory equipment and Safety
- **Lecture-2:**
  - Lab 1 Basic Electrical Measurements and Modeling
- **Lecture-3:**
  - Lab 2 Dc Circuit Analysis with Spice
- **Lecture-4:**
  - Lab 3 Electrical Measurements Using the Oscilloscope (RMS and Transformers)
- **Lecture-5:**
  - Lab 3 Continued
- **Lecture-6**
  - Lab 3 Continued

Course Description

- **Lecture-7**
  - Lab 4 – RC and Opamp Transient Circuit Analysis
- **Lecture-8:**
  - Lab 4 Continued
- **Lecture-9:**
  - Lab 5 - Low pass filter networks and Impedance
- **Lecture-10:**
  - Lab 5 Continued
- **Lecture-11**
  - Lab 6 – Filter Design Project
- **Lecture-12**
  - Lab 6 Continued
- **Lecture-13:**
  - Oral Presentations

Course Format

- **Lectures/Lab Work**
  - Explaining Theory
  - Conducting Experiments
  - Mandatory
- **Technical Reports**
  - Writing and submitting Technical Reports (TR) is mandatory
  - TR is due to the instructor ONE week after the lab is completed.
  - TR will be an individual Report for each lab
  - Each TR will be graded
  - Each TR will describe in detail the technical investigations assigned in class
  - Keep the complete record of lab work in the form of TR

TR Requirements

- **COVER SHEET**
  - Student Name
  - Experiment No. and Title
  - Experiment Date
- **ABSTRACT**
  - One paragraph (summarizing what the lab is about)
- **LIST OF INSTRUMENTS USED**
  - Indicate serial numbers when available
- **THEORETICAL BASIS**
  - Includes Theoretical basis
  - Equations
  - Circuit diagrams/Figures (with descriptive caption and figure number)
  - References

TR Requirements

- **EXPERIMENTAL MEASUREMENTS**
  - Outline clearly the actual step by step procedure performed
  - Any derivations from the procedure in the lab handout should be documented
  - Present data clearly using graphs and/or tables (using Excel, etc.)
  - Use correct units and calculate percent error where appropriate
- **CONCLUSION/ANALYSIS**
  - Summary of the findings of the study
  - Include a description of any unusual or unexpected results
- **Attachments**
  - A copy of the original data taken during the lab (can be scanned)
  - Data should never be erased. If in error, draw a line through incorrect data and record new data below. Data sheets should be signed and dated by the laboratory instructor

TR Requirements

- **SIMULATIONS**
  - You will also be required to use modern tools such as
    - SPICE (PSPICE or LTSPICE), and Math-Lab
- **TIP**
  - Run the simulation using theoretical (nominal) component values prior to doing the experimental measurements
  - It is much easier to simulate different component values and voltages, and then changing them with real parts and settings.
  - Rerun the simulation using measured component values when necessary and compare with your lab measured results.
  - Knowing the simulation results will give you a clearer understanding of what to look for during the experiment possibly saving wasted time for repeated measurements

Course Objectives

- **To develop the student's ability to**
  - Design and conduct experiments
  - Collect, analyze, and interpret laboratory data
  - Identify, formulate and solve engineering problems
- **To give students the ability to**
  - Identify, formulate and solve electric circuit problems
  - Use the techniques, skills and modern engineering tools
- **To teach students**
  - The basic principles of electric circuit analysis.
- **To introduce students**
  - Elements of circuit design in a laboratory environment
  - DC, steady state AC, and transient excitation.

Course Objectives (Additional)

- **Make students capable of**
- **Contributing to the economic development**
  - Of the nation through the ethical practice of engineering
- **Becoming successful in their chosen career path, such as**
  - Practice of engineering
  - Advanced studies in engineering or science,
  - Achieving professional licensure
- **Assume leadership roles in industry or public service**
  - Through engineering ability,
  - Though using modern engineering tools

2. Instructor

Introduction

- **Name:**
  - Dr. Raziq Yaqub
- **Contact:**
  - dr.raziq@gmail.com
  - Skype: ryaqub
- **Phone:**
  - 908-454-7669 (H)
  - 908-319-8422 (M)
- **Office Hours:**
  - On appointment
  - Also available to reach out to students over phone, or through e-mail

My Teaching Philosophy

- **My Students must have a feeling of accomplishment**
  - I know that some need extra attention or assistance
  - It is my job to help students. So do not hesitate to ask question
  - I will keep explaining
    - Until it make sense, no matter how long it takes
    - Until Students have the feelings of accomplishment
  - I want to work with you
  - I want everyone get “A” Grade
  - I want everyone to do well in professional life

My Teaching Philosophy

- **Feedback**
  - I respect Student's feedback
  - Please feel free to provide your feedback/criticism. This would enable me to meet your needs, and help me learn how to become a good teacher.

3. Your Expectations from me and My expectations from you

Grade Reconsideration

Very Important

- Grades Re-consideration
  - If you think you did not get what you deserved in assignments, **Due To Any Reason, What So Ever**, please notify in two weeks from the date the assignment is graded.
  - **No action will be taken if you bring it up after this time period is elapsed**
  - **If you do not see your HA grades on the web, inform me imme diately via e-mail on the following address**
  - **dr.raziq@gmail.com**
- Grades on Course Material

Very Important

  - Depending on the chapter length and time spent on each lecture, there is a possibility that we may not cover all Chapters.
  - **You will be evaluated & graded for the chapters we cover in the class**

Cheating

- Cheating in any form will not be tolerated. This includes:
  - Copying HWs,
  - Cheating on exams
  - Cheating on CRQs
  - Presenting falsified data in a technical report in Lab works

Very Important

- You are allowed to discuss the HW questions with your friends, and me.
  - *However, you have to write up the homework on your own.*

Home Assignments

- **Home Assignment**

Submit your TR every Week

Honor Code violations are taken very seriously

Home Assignments

- Submit Home Assignments at

utc.homeassignments@gmail.com

Subject Line Must Contain
Course number-Assignment number-First name Last name
e.g.
CS-306-01-raziq yaqub

NOTE:
Assignments that do not observe submission rules may Skip the attention and may go ungraded
Grader (if any) and myself will have access to utc.homeassignments@gmail.com

EXAM

No Exam
Evaluation would be through weekly TR (Individual) and
Group (2 or 3 students) Presentation at the end of the semester

EXAM Format

No Exam
Evaluation would be through weekly TR (Individual) and
Group (2 or 3 students) Presentation at the end of the semester

Class Participation

- **Class Participation is Measured by**
  - Attention to Lecture

Attendance

- **Attendance**
  - The University's attendance policy will be applied
  - Each attendance will carry points
  - More than **two** absences will result in loss of points.
- **Makeup CRQ**
  - **NO MAKE-UP for CRQ (Except Really unusual circumstances)**
  - Two CRQs that carry least points will be dropped at the end of the semester because only 2 excusable absences allowed
  - More than two absences will result in loss of points

VOLUNTEER OPPORTUNITIY !!!

- **IF you would like to volunteer**
  - You may
- **Responsibilities**
  - Keep track:
    - Of material uploaded on the blackboard and Inform If anything missing
  - Inform me”
    - If uploaded material is accessible by the students
  - Perform task(s) (**IF ANY**) assigned by the instructor

Time for Your Introduction

- **Your Name**
- **Your Major**
- **Anything Else, For Example**
  - Your Feedback/Suggestions to make class more effective
  - OR Any Comments
- **Do you feel comfortable answering oral questions?**

YES

NO

Thank you!