

**COLLEGE OF ENGINEERING**  
**GENERAL ENGINEERING**  
**ELEC212 / Electric Circuits II**  
**Fall 20xx**

**Instructor Information**

Name:  
Academic Title:  
Office:  
Phone:  
E-mail:  
Office Hours:

If you need to see me outside of the posted office hours, please set up an appointment with me, either by speaking to me before or after class, or by sending me an e-mail message.

**TA Information**

Name:  
Office:  
Phone:  
E-mail:  
Office Hours:

**Class/Laboratory Schedule**

**Class:**

**Coordinator Information**

Name:  
Office:  
Tel:  
E-mail:

**Course Information**

Catalog Description:

Phasor relationships for circuit elements. Series/parallel, Nodal and Mesh Analysis, and Theorems for AC circuits; Instantaneous and average AC power; Maximum average power transfer, RMS value, Complex AC power, and power factor correction; Three-phase circuits analysis, power in balanced three-phase system; Mutual inductance and electric circuits with mutual inductances; resonant electric circuits; steady state response of electric circuits with non-sinusoidal sources.

Credits:

3

Contact Hours:

3 contact hours (3 hours theory, 0 lab)

Prerequisites:

ELEC 201 or (ELEC210 and ELEC211 and MATH231)

Textbook(s):

Alexander and Sadiku “Fundamentals of Electric Circuits” Seventh Edition McGraw Hill.

References:

Nilsson and Riedel “Electric Circuits” Seventh edition Prentice Hall.

Course Objectives:

The objective of this course is to continue with electric circuits analysis. This course is mainly intended to develop an understanding of sinusoidal steady state (AC) circuit analysis. The course introduces phasors, sinusoidal steady state analysis, AC power, rms values, three-phase systems, and RC, RL and RLC circuits. The last part of this course is devoted to advanced topics. It provides students with solid introduction to Fourier analysis.

Course Learning Outcomes (CLOs):

At the end of this course, the students are expected to be able to:

1. Solve AC circuits using different techniques.
2. Analyze the real, reactive and apparent power in AC circuits.
3. Solve electric circuits with mutual inductances.
4. Analyze balanced and unbalanced three-phase AC circuits.
5. Apply Fourier technique for circuits’ analysis.
6. Analyze resonant electric circuits.
7. Use computer software to analyze electric circuits.

Relationship of Course Learning Outcomes (CLOs) to Student Outcomes (SOs):

| Course Learning Outcomes (CLOs) | Related Student Outcomes (SOs) |   |   |   |   |   |   |
|---------------------------------|--------------------------------|---|---|---|---|---|---|
|                                 | 1                              | 2 | 3 | 4 | 5 | 6 | 7 |
| 1                               | ✓                              |   |   |   |   |   |   |
| 2                               | ✓                              |   |   |   |   |   |   |
| 3                               | ✓                              |   |   |   |   |   |   |
| 4                               | ✓                              |   |   |   |   |   |   |
| 5                               | ✓                              |   |   |   |   |   |   |
| 6                               | ✓                              |   |   |   |   |   |   |
| 7                               | ✓                              | ✓ |   |   |   |   |   |

*Student Outcomes (SOs)*

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Topics Covered:

| Topics   | Chapter | Weeks     |
|--|---------|-----------|
| Phasor relationships for circuit elements                | 9       | 1         |
| KCL and KVL in phasor domain                             | 9       | 1         |
| Nodal and Mesh Analysis for AC circuits                  | 10      | 1         |
| Methods of analysis and network theorems for AC circuits | 10      | 1         |
| AC power calculations                                    | 11      | 2         |
| Three phase circuits analysis                            | 12      | 2         |
| Magnetically coupled circuits and transformers           | 13      | 2         |
| Resonant electric circuits                               | 14      | 2         |
| Fourier circuit analysis                                 | 17      | 2         |
| <b>Total</b>   |         | <b>14</b> |

\*Optional

### Method of Instruction

Lectures (a combination of PowerPoint and whiteboard delivery will be used), class tutorial.

### Assessment Methods and Grading Policy

*The following grading policy cannot be altered without the approval of the department board and head of department authorization.*

|                                 |     |
|---------------------------------|-----|
| Homework <b>and/or</b> project: | 10% |
| Quizzes:                        | 20% |
| Midterm Exam(s):                | 30% |
| Final Exam:                     | 40% |

### ABET Contribution of Course to Professional Component

|                                     |       |
|-------------------------------------|-------|
| Subject Area (Credit Hours)         |       |
| College-Level Math & Basic Science: | 5%    |
| Engineering                         | : 90% |
| Engineering Design                  | : 5%  |
| Broad Education                     | : 0%  |

### Computer/Software Usage

Word, PowerPoint, Multisim used for some problems solution.

### Laboratory Projects

NA

### Course Ground Rules

- **Taking Notes:** Students are responsible for taking notes during the lecture. Exams will include some of the materials discussed in class in addition to those given in the textbook and class notes.
- **Attendance:** According to QU policies, attendance is mandatory; more than 25% absence will not qualify you for the course credit.
- **Late arrival:** Coming to class after 05 minutes, will result in absence.
- **Homework:** Homework should be submitted through Blackboard before the due date. Deadlines for assignments are strict; 50% will be deducted for each day after the deadline (you get zero marks if two days pass the deadline). Students should review their marks on the blackboard, and if any inquiry should contact the TA by email within 48 hours after the grade has been posted; thereafter, there should be no discussion on the grades.
- **Blackboard:** Check the course website frequently on Blackboard for updates (e.g., announcements, lecture notes, etc.).
- **Communications:** Students must use the assigned university e-mail address rather than a personal e-mail address. Writing emails in a proper format is required (communication skills are part of the course)
- **Cheating and/or Plagiarism:** Strict rules will apply in accordance with Qatar University regulations and policies in case of any cheating and/or plagiarism. Check the undergraduate students' handbook for further details on University policies.
- **Mobiles/Smart Devices:** Switch off/silent mobiles during lecture time. Mobile phones/smart devices are not permitted in the classroom during exams.

### University Code of Conduct

- In accordance with Article 6 of the Student Code of Conduct at Qatar University, academic violations include a range of actions, one of which pertains to submitting work that is not the individual's own production. This includes using creative artificial intelligence tools such as ChatGPT to produce content, images, videos, or programming code and presenting it as original work.
- Therefore, students are cautioned that using artificial intelligence tools such as ChatGPT or any similar tools to produce academic content and present it as their own work is considered plagiarism, exposing the student to disciplinary penalties as stipulated in Qatar University's Student Code of Conduct. In light of this, we urge all students to adhere to ethical standards in all assignments and academic work and to seek guidance from the course instructor when unsure about the proper and ethical use of artificial intelligence sources in completing assignments, duties, and academic tasks.
- As such, a student is expected not to engage in behaviors that compromise their integrity, as well as the integrity of QU. Further information regarding the University Code of Conduct may be found on the web at <http://www.qu.edu.qa/students/code-of-conduct>

### Support for Students with Special Needs

It is Qatar University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their Instructor to ensure that their individual needs are met. The University, through its Inclusion and Special Needs Support Center, will exert all efforts to accommodate individuals' needs.

#### Contact Information for Inclusion and Special Needs Support Center:

Tel-Female: (00974) 4403 7972  
Tel-Male: (00974) 4403 7946  
Location: Student Activities Building  
Email: [specialneeds@qu.edu.qa](mailto:specialneeds@qu.edu.qa)

### Academic Support and Learning Resources

The University Student Learning Support Center (SLSC) provides academic support services to male and female students at QU. The SLSC is a supportive environment where students can seek assistance with academic coursework, writing assignments, transitioning to college academic life, and other academic issues. SLSC programs include: Peer Tutoring, the Writing Lab, Writing Workshops, and Academic Success Workshops. Students may also seek confidential academic counseling from the professional staff at the Center.

#### Contact Information for Students Support and Learning Resources:

Tel: (00974) 4403 3870  
Fax: (00974) 4403 3871  
Location: Female Student Activities Building  
E-mail: [learningcenter@qu.edu.qa](mailto:learningcenter@qu.edu.qa)

### College of Engineering Learning Support

#### Contact Information for College of Engineering Learning Support:

Females  
Tel: (+974) 4403 6380  
Email: [CENG.SuccessOasis.F@qu.edu.qa](mailto:CENG.SuccessOasis.F@qu.edu.qa)  
Males  
Tel: (+974) 4403 6388  
Email: [CENG.SuccessOasis.M@qu.edu.qa](mailto:CENG.SuccessOasis.M@qu.edu.qa)

#### Sessions' Booking

Females

1- One-to-one sessions' registration via Simplybook:

<https://crulearningfemales.simplybook.me>

2- Weekly sessions via email invitation from Engineering Success Oasis (ESO)

Males

1- One-to-one sessions' registration via Simplybook:

<https://crulearningmales.simplybook.me>

2- Weekly sessions via email invitation from Engineering Success Oasis (ESO)

### **Student Complaints Policy**

Students at Qatar University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the student handbook.

### **Declaration**

This syllabus and contents are subject to changes in the event of extenuating circumstances. The instructor (with the approval of the Head of Department) reserves the right to make changes as necessary. If changes are necessitated during the term of the course, the students will be notified by email communication and posting the notification on the online teaching tool Blackboard. It is the student's responsibility to check on announcements made while they were absent.

Faculty Name:  
Last Modified:  
Date: