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## Department of Architecture, Engineering, & Technology

## West Campus Building 9 room 140 – 407.582.1902

# EGS 2004C –Electrical Networks Spring 2024

**Textbooks: *Electric Circuits,*** 9th/10th Ed., by J.W. Nilsson and S.A. Riedel, Pearson

**Instructor:** Prof. M. Kar

**Office:** West Campus, Bldg. 11 – Room 259

**Phones:** (Office) 407.582.1182 (please use email or canvas as we are not allowed to campus)

**Fax:** 407 582 1900

**Email:** mkar@valenciaccollege.edu (prefer email via Canvas)

**Class location**: Building 11, room 263, Wednesday 10 to 12:30 PM

**Office Hours:** Mon / Thurs: 10:00 to 1:00 PM (on-line)

 Tues: 1:00PM to 2:00PM (Room 11-259)

 Wed: 12:30 to 2:00 PM (room 11-259)

 Friday: 9 AM to 11:00 AM (on-line)

**Prerequisite:** PHY 2049C**,** MAC 2313– With a grade of C or better.

**Co-requisite:** MAP 2302

**Catalog Course Description:** (Credit: 3 hours)

An introductory course in analysis and design of linear circuits, transients, DC and AC circuit analysis, power calculation, three-phase circuits, and Laplace Transforms.

**Grading Policy:**

 **Labs** 5% **A** 90 -100 %

 **Recitation** 5% **B** 80 – 89 %

 **Quizzes**1 10% **C** 70 – 79 %

 **Two Tests**1 50% **D** 60 – 69 %

 **Final Exam2**  30% **F** < 59 %

 1 *No make-up*, quizzes or tests will be given.

2 **Final Exam** will be ***comprehensive*.**

**Notes:**

* Even though most of the course material is from the textbook, the lectures may or may not necessarily follow the text word-by-word. Therefore, it is the student’s responsibility to be in class and take notes. Test/Exams will cover all material covered ***in class*** and **homework**.

**Topics Covered:**

* Circuit variables, circuit elements, Kirchhoff’s Law – Chapter 1, 2
* Resistive Circuit Analysis – Chapter 3
* Techniques of Circuit Analysis (Node Analysis, Mesh Analysis, Source Transformation, Superposition, Thevenin and Norton theorems, Maximum Power transfer) – Chapter 4
* Inductors and Capacitors – Chapter 6
* Response of First Order RL and RC circuits – Chapter 7
* Response of Second Order RLC Circuits – Chapter 8
* AC Analysis, AC Power calculations – Chapter 9, 10

**Course Outcome:**

The student will be able to:

* calculate the power for each element in a simple circuit and determine whether or not the power balances for the whole circuit.
* use Kirchhoff's current and voltage laws to analyze simple circuits.
* recognize resistors connected in series and in parallel and use the rules for combining series-connected resistors and parallel-connected resistors to yield equivalent resistance.
* design simple voltage-divider and current divider circuits. Be able to use voltage and current divisions appropriately to solve simple circuits.
* to use the mesh-current method to solve a circuit.
* to use the node-voltage method to solve a circuit.
* decide whether the node-voltage method or the mesh-current method is preferred approach to solve a circuit.
* Use source transformation to solve a circuit.
* Understand the concept of the Thevenin and Norton equivalent circuits and be able to construct a Thevenin or Norton equivalent for a circuit.
* Learn the condition for maximum power transfer to a resistive load and be able to calculate the value of the load resistor that satisfies the condition.
* use the equations for voltage, current, power and energy in an inductor; understand how an inductor behaves in presence of constant current.
* use the equations for voltage, current, power and energy in a capacitor; understand how a capacitor behaves in presence of constant voltage.
* determine the natural response of both RL and RC circuits.
* determine the forced (or step) response of both RL and RC circuits.
* determine the natural response and step response of both series and parallel RLC circuits
* transform a circuit with a sinusoidal source into the frequency domain using phasor concepts.
* use the circuit analysis techniques to solve a circuit in the frequency domain.
* Determine the powers of each element in frequency domain.
* Learn the condition for maximum power transfer to a general load.

**Important Dates:**

**Jan 16th Drop/Refund deadline**

**Jan. 15th, Feb. 9th  College is closed**

**March 15th Withdrawal deadline for “W” Grade**

**March 18-24th Spring break**

**April 22th – 28th Final Exams**

 **April 30th  Grades are due**

**Quiz:**

All quizzes will be online on a specific date. The online quiz will be available from 6 AM to mid night.

**Recitation Activity:**

The Recitation activities will be graded based on the student’s effort not based on the correct answer; therefore, I recommend submitting your own work so that I can correct your mistakes.

**Labs:**

There will be no physical lab as we are fully online. All labs will be done by using simulation. We will use a free circuit simulation software called “PSpice”. Can also use another software called ‘MultiSIM’.

**Rules and Comments**

* Hybrid class usually requires **more preparation time and more discipline** compare to face-to-face classes. Please stay with the class schedule don’t fall behind.
* All Quiz/tests work must be properly and adequately shown and organized to **earn credit**. Simply written down answers will not be given any credits and receive a grade of “0” (zero).
* No make-up tests are permitted unless ***prior arrangement*** with the instructor has been made and ***approved***.
* There is **no** “dropped” test score. Lowest quiz grade and Class activity will be dropped.
* There will be **NO CURVE** for any test or Final. **No extra credit opportunity** in this class
* Final exam is comprehensive. **Failing to take the final exam will result in a grade of “F”**.
* After each F2F Meeting there will be some Recitation activity to complete and **submit via canvas**. Submission of Recitation activities worth 5% of total grade. The Recitation activities will be graded based on the student’s effort not based on the correct answer, therefore I recommend to submit your own work so that I can correct your mistakes.
* Homework will **not** be **collected** or graded, solutions will be posted in canvas.
* Lectures will be recorded and posted in canvas along with the power points. There will be no lectures during the F2F meetings only problem solving. Students should watch the lectures before the F2F meeting and should come prepare to solve problems.
* **You are encouraged to ask relevant questions during the class meeting.**
* Each student is responsible for his or her own work. All quiz/tests and graded assignments are to be exclusively your own work, unless you receive instructions to collaborate. Using any human, written, electronic, or other resource in any manner not explicitly authorized by the instructor will result in a grade of zero on the exam(s) or assignment(s) involved.

More than ***three unexcused*** absences could result in a withdrawal from the course.

* You are responsible for any information and/or assignments given in lectures, whether you are present or not.
* **It is the responsibility of the student to withdraw themselves before the withdrawal deadline and to be aware of the date of the withdrawal deadline.**
* It is the student’s responsibility to keep track of their status and performance (i.e., quizzes, and exam grades) in class. Student should be able to average their grades based upon the grading policy stated in this syllabus.
* Your attitude will greatly affect your ability to succeed in this course.  It will also affect your classmates’ attitudes should you choose to participate in class discussions.  Always consider this fact carefully before you speak or act.  If your comments or actions in class are deemed by the instructor to adversely affect other students’ attitudes, they are considered disruptive.
* ***Grades will not be disclosed over the telephone or via e-mail, except through your Atlas account***.
* This course is not about your ability to use a calculator! It is about to excel and improve your abilities to correctly and properly think, analyze, process, and solve real problems as a future engineer.
* **Cheating or *any act of academic dishonesty* is prohibited**. Any student caught cheating, the instructor has the right to withdraw the student from the class or result in a failing grade.
* Any recording of the lectures or class actives by video or audio is not allowed without prior written approval from the instructor.
* In order to academically maintain financial aid, students must meet all of the following requirements:

Complete 67% of all classes attempted, and

Maintain a Valencia GPA of 2.0 or higher, and

Maintain an overall GPA of 2.0 or higher, and

Complete degree within the 150% timeframe

**DISCLAIMER:** Any Changes in the policy and/or schedule of this syllabus may be made at anytime during the semester at the discretion of the instructor.

**Class schedule:**

*The following is a tentative schedule based upon class needs. The Instructor reserves the right to make any schedule changes necessary*.

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Read | Homework to be finished | Quiz / Test |
| Week 11/10  | Chapter 1 | Assignment 1 |  |
| Chapter 2, Resistor color code | Assignment 2 |  Recitation 1  Lab 1  |
| Week 21/17 | Chapter 3 | Assignment 3.1 | Lab 2, Quiz 1 |
| Breadboard | Assignment 3.1 | Recitation 2 |
| Week 31/24 | Chapter 3 | Assignment 3.2 |  Quiz 2 – Ch 3 |
|  Mesh current/ MultiSIM | Assignment 4.1 | Recitation 3 |
| Week 41/31 | Mesh Current | Assignment 4.1 | Quiz 3 - Mesh |
| Node Voltage | Assignment 4.2 | Recitation 4, Lab 3 |
| Week 52/07 | Node Voltage | Assignment 4.2 | Quiz 4 - Node |
| Review |  | Recitation 5 |
| Week 62/14 | 02/14/23 | 10 AM to 11:30AM | Test #1 |
| PSpice  | 11:15 to 12:30PM | Lab 4  |
| Week 72/21 | Source Transformation | Assignment 4.3 |  |
| Thevenin/Norton | Assignment 4.4 | Recitation 6 |
| Week 82/28 | Thevenin/Norton | Assignment 4.4 | Quiz 5 - Thevenin |
| Max. Power | Assignment 4.4 | Recitation 7 |
| Week 93/06 | Max power/Chapter 6 | Assignment 6.1 | Quiz 6 – Max power |
| Chapter 6 | Assignment 6.1 | Recitation 8A |
| Week 103/13 | Chapter 6 | Assignment 6.2 | Quiz 7 -Ch6 |
| Review |  | Recitation 8B |
| Week 113/13- 3/19 | Collage is closed | Spring Break |  |
| Week 123/27 | 03/27/23 | 10 AM to 11:30AM | Test # 2 |
| PSpice/Lab |  | Lab 5 |
| Week 134/03 | Chapter 7 | Assignment 7.1 | Recitation 9 |
| Chapter 7 | Assignment 7.2 | Recitation 10 |
| Week 14 4/10 | Chapter 9 |  Recommended Ch 9 | Quiz 8 – Ch 7 |
| Chapter 9 & 10 | Recommended Ch 9 | Lab 6, Recitation 10, 11 & 12 |
| Week 15 4/17  | Chapter 9 & 10 | Recommended Ch 9 | Lab 6, Quiz 9 - AC |
| Chapter 9 & 10 | Recommended Ch 10 | Recitation 13 |
| 4/24/23 | Final Exam 10 AM to 12 PM |

**Illness Statement:**

*If you are unable to participate in the course due to illness, family emergency, etc., please communicate with me as soon as possible in order to create a plan to complete any missed assignments so that your learning can progress in your course. In the case of a prolonged online absence, please communicate with me as soon as possible in order to create a plan for the best course of action*.

**Academic Resources**

 We want you to stay connected to the latest academic resources we have available for you during this transitional time.

**West Campus Bookstore:**

Campus Store will be open Monday – Friday, 8 a.m. – 6 p.m.
Campus store window pick-up will be available Monday – Saturday, 8 a.m. – 6 p.m.

**Downtown Campus**
The Campus Store at the Downtown Campus is owned and operated by Barnes & Noble and will continue to operate online for the Fall 2021 term. Visit the [Campus Store website for the Downtown Campus](https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fvalenciacollege.edu%2Flocations%2Fdowntown%2Fcampus-store.php&data=04%7C01%7Cmkar%40valenciacollege.edu%7Cc9bef0b886654c06c99308d963959878%7C0e8866953d1741a88544135b0a92a47c%7C1%7C0%7C637650316442184617%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=eVF7aL43KFrBqiEpuEmNn%2B%2B%2BVfjHeYI54txioKICN8c%3D&reserved=0) for more information and to [order online](https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fucf-vc.bncollege.com%2Fshop%2Fucf-valencia%2Fhome&data=04%7C01%7Cmkar%40valenciacollege.edu%7Cc9bef0b886654c06c99308d963959878%7C0e8866953d1741a88544135b0a92a47c%7C1%7C0%7C637650316442184617%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=hTJKhtKYoCdqPlrEN4lu0pz41TlACABM9QE9xrhxFeY%3D&reserved=0)**.**

**Other Campuses**
Valencia Campus Stores will be closed during the Fall 2021 term. Visit the[Valencia Campus Store website](https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fvalenciacollege.edu%2Fstudents%2Fcampus-store%2F&data=04%7C01%7Cmkar%40valenciacollege.edu%7Cc9bef0b886654c06c99308d963959878%7C0e8866953d1741a88544135b0a92a47c%7C1%7C0%7C637650316442194612%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=h72dxYZ%2FkHvfMcxrqJ5Ef2bBY6O%2F3rjpUPGDQPfEUvY%3D&reserved=0)for more information and online ordering.

**Customer Service**
**Monday – Friday 8 a.m. – 6 p.m.**
**407-299-5000, extension 5310**
onlineorder@valenciacollege.edu

**Learning Support Services** provides students with academic support through distance tutoring, face to face tutoring at the campuses, writing consultations, library services, and resources. Tutoring is offered in most academic disciplines including math, science, foreign languages, English for academic purposes (EAP), computer programming and writing assistance for any course.  Assistance with library research can be accessed online through Atlas or the tutoring LibGuide.  For more information on how to access tutoring and library research assistance, please visit the college-wide Learning Support Services LibGuide at: [www.valenciacollege.edu/tutoring](https://nam10.safelinks.protection.outlook.com/?url=http%3A%2F%2Fwww.valenciacollege.edu%2Ftutoring&data=04%7C01%7Cmkar%40valenciacollege.edu%7Cc9bef0b886654c06c99308d963959878%7C0e8866953d1741a88544135b0a92a47c%7C1%7C0%7C637650316442194612%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=k43D4en7XIKrKI35ysN5EH3NwSuWOqMMznHYcm9ninc%3D&reserved=0)

**Please note**: Brainfuse is our new  24/7 online tutoring and learning hub, which is available to all of Valencia’s students.  This service is best used as a back-up to Valencia’s Distance Tutoring service, not as a replacement.  Brainfuse is accessible through Canvas or by visiting [www.valenciacollege.edu/tutoring](https://nam10.safelinks.protection.outlook.com/?url=http%3A%2F%2Fwww.valenciacollege.edu%2Ftutoring&data=04%7C01%7Cmkar%40valenciacollege.edu%7Cc9bef0b886654c06c99308d963959878%7C0e8866953d1741a88544135b0a92a47c%7C1%7C0%7C637650316442204600%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=OEg6cg19bwHN%2FtjM6ZMIYCPGSyxM9CEXRVoT8nw2c3k%3D&reserved=0)

**Academic Advising:**

* Call: 407-582-1507
* Email: advising@valenciacollege.edu
* Visit [https://valenciacollege.edu/students/student-services/support.php](https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fvalenciacollege.edu%2Fstudents%2Fstudent-services%2Fsupport.php&data=04%7C01%7Cmkar%40valenciacollege.edu%7Cc9bef0b886654c06c99308d963959878%7C0e8866953d1741a88544135b0a92a47c%7C1%7C0%7C637650316442204600%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=O0YDeXIAi10evy%2BIn7MIPoWVCQpajfxx3mAXVGeZ4ro%3D&reserved=0) for links and information on how to get connected to each of the following:
	+ **Virtual Answer Center or Virtual Advising Center** (online Zoom access): Monday-Thursday 10a-7p, Fridays 9a-5p; Virtual Answer Center only – Saturdays 9a-1p
	+ **Make an appointment** (in person): Monday-Thursday 8a-5p, Fridays 9a-5p (East, West, and OSC only), Fridays - virtual only (DTC, LNC, WP, PNC).

**Enrollment Services:**

         (phone access): Monday-Thursday 8a-6p and Fridays 9a-5p (407-582-1507)

**Financial Aid:**

Contact FinAidOffice@valenciacollege.edu for their financial aid questions, as well as for potential assistance with financial support

As a reminder, you can [review the full list of student services hours of operation](https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fdrive.google.com%2Ffile%2Fd%2F1ZafZ7jOMwKLrWHSischZiSyF_oA7W6oz%2Fview&data=04%7C01%7Cmkar%40valenciacollege.edu%7Cc9bef0b886654c06c99308d963959878%7C0e8866953d1741a88544135b0a92a47c%7C1%7C0%7C637650316442204600%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=ZdHaGbYAvSuB%2Fg2NQD4zeDj0j8iG7dajofPwzMxjbz0%3D&reserved=0), which was provided in a past [Grove Article](https://nam10.safelinks.protection.outlook.com/?url=http%3A%2F%2Fthegrove.valenciacollege.edu%2Froadmap-for-reopening-phase-4-hours-of-operation%2F&data=04%7C01%7Cmkar%40valenciacollege.edu%7Cc9bef0b886654c06c99308d963959878%7C0e8866953d1741a88544135b0a92a47c%7C1%7C0%7C637650316442214606%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=RM5JH7sQ512CJAGRDKvAfqdtPtBnKr%2FqCeng4e12IMI%3D&reserved=0) for the Roadmap to Reopening.

**Withdrawal Policy**

Per Valencia Policy 4-07 (Academic Progress, Course Attendance and Grades, and Withdrawals), a student who withdraws from class before the withdrawal deadline of (*insert appropriate date)* will receive a grade of “W.” A student is not permitted to withdraw after the withdrawal deadline. If you remain in the class after the withdrawal deadline, you can only receive a grade of A, B, C, D, F or I. An I grade will only be assigned under extraordinary circumstances that occur near the end of the semester. If you receive an I, the work missed must be made up during the first week of the following semester, at which time you will get an A, B,C,D or F. Failure to make up the work during the following semester will result in you getting a grade of F in the course. Any student who withdraws or is withdrawn from a class during a third or subsequent attempt in the same course will be assigned a grade of “F.” For a complete policy and procedure overview on Valencia Policy 4-07 please go to: <http://valenciacc.edu/generalcounsel/policydetail.cfm?RecordID=75>

**Student Core Competencies**

The faculty of Valencia College has identified four core competencies that define the learning outcomes for a successful Valencia graduate. These competencies are at the heart of the Valencia experience and provide the context for learning and assessment at Valencia College. You will be given opportunities to develop and practice these competencies in this class. The four competencies are:

1. **Think** - think clearly, and creatively, analyze, synthesize, integrate and evaluate in the many domains of human inquiry
2. **Value** - make reasoned judgments and responsible commitments
3. **Communicate** - communicate with different audiences using varied means
4. **Act** - act purposefully, effectively and responsibly.

**Expected Student Conduct**

Valencia Community College is dedicated not only to the advancement of knowledge and learning but is concerned with the development of responsible personal and social conduct. By enrolling at Valencia Community College, a student assumes the responsibility for becoming familiar with and abiding by the general rules of conduct. The primary responsibility for managing the classroom environment rests with the faculty. Students who engage in any prohibited or unlawful acts that result in the disruption of a class may be directed by the faculty member to leave the class. Violation of any classroom or Valencia’s rules may lead to disciplinary action up to and including expulsion from Valencia. Disciplinary action could include being withdrawn from class, disciplinary warning, probation, suspension, expulsion, or other appropriate and authorized actions. You will find the Student Code of Conduct in the current Valencia Student Handbook.

<http://catalog.valenciacollege.edu/academicpoliciesprocedures/studentcodeofconduct/>

**Students with disabilities** who qualify for academic accommodations must provide a letter from the Office for Students with Disabilities (OSD) and discuss specific needs with the professor, preferably during the first two weeks of class. The Office for Students with Disabilities determines accommodations based on appropriate documentation of disabilities (West Campus SSB 102, ext. 1523).