EETH 1110 Electric Circuits
4 Credits
4 Class Hours
An introductory course for all Electrical Engineering Technology concentrations. Topics include voltage, current, resistance, and power in DC and AC circuits, series, parallel and more complex circuits using Kirchhoff’s laws and selected network theorems, capacitance and inductance, resonance, transformers, and polyphase concepts.

Instructor Information:
Name:
Email:
Office Phone:
Office Location:
Office Hours:

Textbook and Other Materials:
Textbook:  Volume I and Volume II are available free on-line at: Lessons in Electric Circuits
w/CD, 0131730444, 9780131730441,
  Basic Electricity and Electronics, video tapes (in library),
  Basic AC Circuits, video tapes (in library)
Supplies: Prototype Board

Course Outcomes:
Upon successful completion of this course, students should be able to:
  • apply Ohm’s law to solving basic circuit questions
  • apply KCL, KVL, Thevenin in solving circuits problems.
  • understand the distinction between DC & AC circuits, and how the circuit theory applies to them.
  • transfer the knowledge and the understanding to practical applications.

Course Competencies:
The following are detailed course competencies intended to support the course outcomes
  • define properly the fundamental electrical properties of resistance, current, voltage, energy, power, efficiency, capacitance, and inductance.
• define and correctly apply Ohm’s Law and Kirchhoff’s Current and Voltage Laws.

• demonstrate the ability to correctly apply the Voltage Divider and Current Divider rules.

• demonstrate the ability to combine several voltage or current sources into a single source.

• solve any circuit containing no more than three loops for all voltages, currents, and powers using Mesh Analysis.

• solve any multisources circuit for voltages, currents, and powers using the Superposition Principle.

• convert any multisource circuit containing no more than three loops into its Thevenin and Norton equivalent.

• demonstrate the ability to convert from Thevenin to Norton equivalent and vice versa.

• calculate the equivalent capacitance of any series and/or parallel combination of capacitors.

• calculate the voltage and charge of typical series and/or parallel combinations of capacitors.

• calculate the voltage and current of typical series and/or parallel combinations of inductors.

• define time constant and apply the proper equations for determining voltage and current in typical RC circuits (DC source).

• define and illustrate the fundamental A.C. parameters of cycle, period, frequency, instantaneous value, effective and average values.

• illustrate the phase relationships between waves of the same frequency using time domain.

• define and apply correctly the relationships between peak, peak to peak, average and effective (RMS) values of voltages or current.

• define and use properly the fundamental relationships between voltage and current in individual units of R, L or C, when used with AC.

• define reactance and impedance and use properly the mathematical equations defining the same.

• convert voltages and currents from polar to rectangular form and vice versa.

• calculate the impedance and/or admittance of basic series, parallel and series-parallel circuit involving R, L, and C using A, X_L, X_C and notation.

• demonstrate the ability to convert a wye network to its equivalent delta and vice versa.

• determine the Maximum Power Theorem and be able to apply it.
• define true, apparent and reactive power and show how they are related in the power triangle.

• define resonance and state the general differences between series and parallel resonance.

• define quality, bandwidth, and cut-off frequencies in resonant circuits.

• determine band pass and band stop characteristics of elementary tuned filters.

• express voltage and current relationships in both delta and wye 3-phase balanced systems.

• describe the iron-core transformer and be able to express the voltage, current, power and turns ratio.

• use the turns ratio to determine/select the reflected impedance.

Course Assessments:
The following performance assessments will be used to demonstrate students’ understanding, knowledge and skills:
Students will be able to demonstrate their understanding, knowledge and skills during tests, and quizzes.

Grading Policy
Report 10%
Presentation 30%
Quizzes 30%
Final 30%
Total 100%

Grading Scale:
A (90-100%), B (80-89%), C (70-79%), D (60-69%), F (less than 60%)
### Topics to Be Covered:

#### Tentative Scheduled Sequence

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<th>Topics</th>
<th>Reading Assignments</th>
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<td>TBA</td>
<td>Instructor handout / Power Point presentation Volume I Chapter 3 &amp; 4</td>
<td>Electrical Safety, Review Units and conversion between systems,</td>
<td>Volume I Chapter 3 (ALL) Chapter 4 (ALL)</td>
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<tr>
<td>1</td>
<td>TBA</td>
<td>Volume I Chapter 1</td>
<td>Current, &amp; Voltage, Conductors and Insulators</td>
<td>Volume I Chapter 1 Basic Concepts of Electricity (All)</td>
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<td>1</td>
<td>TBA</td>
<td>Instructor handout / Power Point presentation</td>
<td>Color Coding of Resistors</td>
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<td>Ohm’s Law</td>
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<td>Volume I Chapter 5</td>
<td>Series Circuits</td>
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<td>4</td>
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<td>KCL, KVL, and CDR, Open / Short Circuits</td>
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<td>TBA</td>
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<td>Series-Parallel Circuits</td>
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<td>DC Network Analysis</td>
<td>Volume I Chapter 10, Mesh, Nodal, Super Positioning, Thevenin’s</td>
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<td>Online text or Handout</td>
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<td>10</td>
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<td>Volume II Chapter 1 &amp; 2</td>
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<td>Inductive Circuits</td>
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<td>Volume II Chapter 5 &amp; 11 Handouts / Power Point Presentations</td>
<td>R, L and C Circuits Network Theorems and Power Factor</td>
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<td>Volume II Chapter 9 &amp; 10</td>
<td>Transformers and Polyphase AC Circuits</td>
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<td>Final Exam (Mandatory)</td>
<td>TBA</td>
<td>All</td>
<td>Mandatory Final Exam 2 Hours Open Book, open notes, open lab work, open computer, NO OPEN NEIGHBOR!</td>
<td>All</td>
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**Attendance Policy**

A student is expected to attend all scheduled classes and laboratories. Each instructor will formulate an attendance policy and provide it on the course syllabus. Absences are counted from the first scheduled meeting of the class, and it is the responsibility of each student to know the attendance policy of each instructor in whose class he/she is enrolled. If a student is absent from a class, he/she should give an advanced explanation to the instructor. Absences in a course may affect a student’s final grade. The student is responsible for all assigned work in the
course regardless of excused or unexcused absences. Tardiness may also affect a student’s final grade.
Failure to attend class will result in a final course grade of “FA” or “FN” (see explanation below) depending on the individual instructor’s course policy.
FA= failure, attendance-related (unofficial withdrawal) Last recorded date of attendance required.
FN= failure, never attended class (unofficial withdrawal)

Student Communication Channels
It is the student’s responsibility to check D2L and MyNSCC email on a regular basis. These are the official communication channels between the college and students. Students are responsible for the information communicated through those channels. D2L contains specific course information and MyNSCC contains information important for other purposes.

Early Warning System
Nashville State Community College has implemented an Early Warning System to notify students via e-mail about academic problems such as poor classroom attendance, poor performance on assignments/tests, poor communication skills, late/missing assignments, and/or lack of classroom participation. Please note that Early Warning Alerts do not affect a student’s academic standing.

ADA Compliance Statement
Nashville State complies with the Americans with Disabilities Act. Please contact the Access Services Coordinators at 615-353-3721 or 615-353-3741 if you would like to arrange ADA accommodations.

Classroom Misconduct
Nashville State Community College has a zero tolerance policy for disruptive conduct in the classroom. Students whose behavior disrupts the classroom will be subject to disciplinary sanctions. Please consult your Student Handbook for more specific details.
The instructor has primary responsibility for control over classroom behavior and maintenance of academic integrity. He/she can order temporary removal or exclusion from the classroom of any student engaged in disruptive conduct or in conduct which violates the general rules and regulations of the College.
Disruptive behavior in the classroom may be defined as, but is not limited to, behavior that obstructs or disrupts the learning environment (e.g., offensive language, harassment of students and professors, repeated outbursts from a student which disrupt the flow of instruction or prevent concentration on the subject taught, failure to cooperate in maintaining classroom decorum, etc.), the continued use of any electronic or other noise or light emitting device which disturbs others (e.g., disturbing noises from beepers, cell phones, palm pilots, lap-top computers, games, etc.).
Please be aware that children are not allowed in class or unattended on campus.

Academic Dishonesty (Honor Code)
Any form of academic dishonesty, cheating, plagiarizing, or other academic misconduct is prohibited. “Plagiarism may result from: (1) failing to cite quotations and borrowed ideas, (2) failing to enclose borrowed language in quotation marks, and (3) failing to put summaries and
paraphrases in your own words (A Writer’s Reference 331). Academic dishonesty may be defined as, but is not limited to, intentionally trying to deceive by claiming credit for the work of another person, using information from a web page or source without citing the reference, fraudulently using someone else’s work on an exam, paper, or assignment, recycling your own work from another course, purchasing papers or materials from another source and presenting them as your own, attempting to obtain exams/materials/assignments in advance of the date of administration by the instructor, impersonating someone else in a testing situation, providing confidential test information to someone else, submitting the same assignment in two different classes without requesting both instructor’s permission, allowing someone else to copy or use your work, using someone else’s work to complete your own, altering documents, transcripts or grades, and forging a faculty/staff member’s signature.

In addition to other possible disciplinary sanctions that may be imposed through regular college procedures as a result of academic dishonesty the instructor has the authority to assign an “F” or a “Zero” for the exercise, paper, or examination or to assign an “F” for the course. Students may appeal through the appropriate college grade appeal procedures.

**Inclement Weather Policy**

In the event of an inclement weather event, check the Nashville State web site home page at www.nscc.edu for announcements on campus closures. Campus closures will also be announced on local television stations (channels 2, 4, 5, and 17).

When classes are cancelled, an online assignment will be posted in NS Online. Check your NS Online email for a message from your instructor regarding your online assignment requirements. Even though classes may be cancelled, some areas, i.e. Testing Center, may be open. However, you should check before commuting to campus.

The Vice President for Academic Affairs and the Director of Security are responsible for cancellation decisions during an inclement weather event for the Nashville State main campus and the Southeast campus. Cookeville, Waverly, and Dickson Campus Directors will make class cancellation decisions based on conditions in their respective areas. Decisions about class cancellations are based on actual conditions, not forecasts. The perspective used for making decisions is that of the college as an employer, not as a K-12 institution. Students should use their own best judgment in determining whether to report to campus during inclement weather when classes are not cancelled.

**NOTE:** This syllabus is meant simply as a guide and overview of the course. Some items are subject to change or may be revised at the instructor’s discretion. Each instructor will further clarify their criteria for grading, classroom procedures, attendance, exams and dates, etc. on his/her course syllabus.