



INDT 1100 Concepts of Electronics I

Josef Philippi
CENTRAL COMMUNITY COLLEGE

INSTRUCTOR

Josef Philippi

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Office Hours: 6pm - 9pm

COURSE INFORMATION

Part one of a survey course covering the electronics field. The student will gain an understanding of foundational electrical principles, perform basic analyses and calculations with direct current, and understand safe practices using a VOM meter. 0

Contact Hours: Class- 30 Practical Lab- 45 Clinical- 0 Internship- 0

Homework Expectations:

For each hour of classroom time, typically you can expect two hours of homework per week.

Credits: 3

Total Hours: 75

CLASS INFORMATION

Term: Fall Year: 2021 Start Date: 8/12/2021 End Date: 12/10/2021

TEXTBOOKS

Textbook information may be found in **WebCentral** through My Services, Services for Students, Academic Planning, Student Planning, Go to Plan & Schedule, Timeline tab or use this quick link:

[Student Planning Timeline Tab](#) > Sign In, if applicable > Navigate to Term > Click on Course Name > Scroll to the bottom of the **Section Details** popup window > Click the link to **Bookstore Information**

SUPPLIES

- Handheld personal calculator. Required.

GRADING INFORMATION

97-100	A+
93-96	A
89-92	B+

85-88	B
81-84	C+
77-80	C
73-76	D+
69-72	D
≤68	F

Student will be graded on daily work and tests.

COURSE COMPETENCIES

1. Evaluate physical relationships between atomic structure and electronic function.

Criteria

Performance will meet expectations when the student:

- relates the properties of an atom to the function of current in a circuit.
- relates atomic structure to the Law of charges.
- explains the properties and uses of insulators, conductors and semi-conductors.

Learning Objectives

- Identify atomic particles by name and their respective charges.
- Describe the "Law of Charges."
- Discuss the properties and uses of insulators, conductors and semi-conductors.

2. Apply engineering notation to electronic calculations.

Criteria

Performance will meet expectations when the student:

- utilizes the math functions involving converting engineering notation into proper metric prefix form.
- uses the rules that apply to using common metric units.
- demonstrates the function of the calculator to solve conversion data problems.

Learning Objectives

- Convert engineering notation into proper metric prefix form.
- Select proper metric prefix choices for common use.
- Solve data problems using the handheld calculator.

3. Apply common electrical terms and labels such as amps, ohms, volts and watts.

Criteria

Performance will meet expectations when the student:

- defines volts, ampere, ohms and watts.
- uses labels when solving for electrical circuit values.

Learning Objectives

- recognize the different properties of voltage , ampere, ohms and watts.
- Select the proper labels when solving for electrical circuit values.

4. Compute electrical problems using Ohm's Law.

Criteria

Performance will meet expectations when the student:

- defines ohms law.
- selects the proper ohm's law formula from a chart.

Learning Objectives

- Define Ohm's Law using the knowledge of volts, ohms, amps, and watts.
- Select the proper Ohm's Law formula from a chart.
- Compute Ohm's Law problems including volts, amperes, ohms or watts.

5. Examine resistors for suitability in electronic applications.

Criteria

Performance will meet expectations when the student:

- identifies resistor types based on their construction.
- identifies resistor values using the standard color code system and power ratings.

Learning Objectives

- Identify resistors types based on their construction.
- recognize resistor values using the standard color code system.
- Predict resistor suitability based on its power ratings.

6. Demonstrate the proper use of the VOM meter.

Criteria

Performance will meet expectations when the student:

- captures meter measurements that are within tolerance and support the lab expectations.
- builds a circuit.

Learning Objectives

- Apply general safety precautions when using a meter.
- Select the correct function and range to measure voltage.
- Select the correct function and range to measure current.
- Select the correct function and range to measure resistance and continuity.

7. Demonstrate the ability to use series rules to calculate electronic values.

Criteria

Performance will meet expectations when the student:

- explains a series circuit.
- solves unknown series quantities using Ohms Law.
- explains the difference between a short circuit and an open circuit.

Learning Objectives

- List the rules for series circuits.
- Recognize components used in real series applications.
- Calculate total voltage, current, resistance and power values in series circuits.
- Apply Ohm's Law formulas to solve unknown series quantities.

- Recognize the presence of an open condition in series circuits.
- Recognize the presence of a short condition in series circuits.

8. Demonstrate the ability to use parallel rules to calculate electronic values.

Criteria

Performance will meet expectations when the student:

- explains a parallel circuit by understanding the parallel circuit laws.
- solves unknown parallel quantities using Ohms Law.
- explains the difference between a short circuit and a open circuit in a parallel circuit.

Learning Objectives

- List the rules for parallel circuits.
- Recognize components used in real parallel applications.
- Calculate total voltage, current, resistance and power values in parallel circuits.
- Apply Ohm's Law formulas to solve unknown parallel quantities.
- Recognize the presence of an open condition in parallel circuits.
- Recognize the presence of a short condition in parallel circuits.

9. Demonstrate the ability to use series and parallel rules to calculate electronic values.

Criteria

Performance will meet expectations when the student:

- explains the difference between a short circuit and an open circuit in a series/parallel circuit.
- explains a series/parallel circuit by understanding the series and parallel circuit laws.
- solves unknown series/parallel quantities using Ohms Law.

Learning Objectives

- Calculate total voltage, current, resistance and power values in combination circuits by using simplification methods.
- Apply Ohm's Law formulas to solve unknown combination circuit quantities.
- Recognize the presence of an open condition in parallel circuits.
- Recognize the presence of a short condition in parallel circuits.

10. Use industry methods to properly size electrical conductors.

Criteria

Performance will meet expectations when the student:

- selects a conductor from the proper wire table.
- uses correction factors for ampacity rating adjustments.
- solves parallel conductor requirements and perform testing using proper testing equipment.

Learning Objectives

- Select a conductor from the proper wire table.
- Use correction factors to make ampacity rating adjustments.
- Select the proper wire size for loads located long distances from the power source.
- List the requirements for using parallel conductors.

- Describe the method of testing insulation using a MEGGER®.

11. Determine different types of batteries and alternative power sources.

Criteria

Performance will meet expectations when the student:

- describes the different types of battery properties.
- describes the operation of solar cells , thermocouples and piezoelectric devices.

Learning Objectives

- List differences between types of primary and secondary cells.
- Describe the charging cycle of a secondary battery and observe safety precautions.
- Discuss operation of solar cells and thermocouples.
- Describe the piezoelectric effect.

12. Apply circuit rules to battery applications.

Criteria

Performance will meet expectations when the student:

- solves series and parallel battery connections to achieve the correct voltage.
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- solves series and parallel battery connections to achieve the proper amperage rating.

Learning Objectives

- Demonstrate battery connection properties in series and parallel.
- Connect batteries in series and parallel to achieve desired voltage.
- Connect batteries in series and parallel to achieve desired ampere-hour ratings.

CCC-AMERICANS WITH DISABILITIES ACT

If you have a disability or want to know if you qualify for accommodations as defined by the Americans with Disabilities Act, you are invited to contact the campus Director of [Disability Support Services](#). You are not required to disclose or reveal information about your disability to anyone at any time, however, in order to receive accommodations in college, you must make those needs known and request services from the Disability Support Services office on one of the three CCC campuses. Inquiries concerning the application of the laws and regulations cited above may be directed to the Human Resources Office, Central Community College, P.O. Box 4903, Grand Island, NE 68802-4903; (308) 398-7325, or to the Director, Office of Civil Rights, U.S. Department of Education, Washington, DC 20201.

CCC-ARCHIVING OF STUDENT WORK

To protect the original work of students from plagiarism and to uphold the high academic standards and integrity of CCC, any written assignment in this course may be submitted to an internet based plagiarism detection service such as [Turnitin.com](#) by the student or the instructor. All submitted written assignments will be archived and may be referenced for the purpose of detecting plagiarism.

CCC-ATTENDANCE--ONLINE, FACE-TO-FACE, HYBRID

Central Community College faculty record attendance in courses- including online courses. Class attendance and participation contribute significantly to student academic success. Commonly, students who attend class get more out of

their college investment through increased learning, stronger relationships with instructors and classmates, earning higher grades, achieving increased passing rates in courses, which leads to completion of academic, and ultimately, career goals. Attendance in an online course may include timely participation in discussions, submitting assignments, activities, projects, etc. (i.e. completing assignments by their deadline). Students should regularly participate in weekly course activities as led by your instructor to ensure meeting attendance requirements. Failure to consistently attend class(es) - even online class(es) - may jeopardize your financial aid.

CCC-COURSE MEETING TIME AND LOCATION

Course meeting time and location may be found in **WebCentral** through My Services, Services for Students, Academic Planning, Student Planning, Go to Plan & Schedule, Timeline tab or use this quick link:

[Student Planning Timeline Tab](#) > Sign In, if applicable > Navigate to Term > Click on Course Name

CCC-EQUAL OPPORTUNITY/AFFIRMATIVE ACTION

Central Community College does not discriminate on the basis of race, religion, national origin, gender, age, disability, marital status, or military veteran status as is defined by law in employment, admission, scholarship and financial aid programs or operation of its educational programs and activities as prescribed by Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Executive Order 11246 as amended, sections 503 and 504 of the Rehabilitation Act of 1973, the Vietnam Era Veteran's Readjustment Assistance Act of 1974, the Age Discrimination Acts of 1974 and 1975, and other federal and state laws and regulations.

Central Community College offers career and technical education programs for all students regardless of race, color, national origin, age, religion, marital status, including those with limited English proficiency, sex or disability. For a complete list of programs, go to www.cccneb.edu/programs. Educational programs are offered at but not limited to the following locations: Columbus Campus, Grand Island Campus, Hastings Campus, Holdrege Center, Kearney Center, Lexington Center and Ord Learning Center.

CCC-EXPECTATIONS FOR ACADEMIC INTEGRITY

Central Community College believes successful students are independent critical thinkers who possess the work ethic and skills necessary to make a positive difference in their professions and communities. In order to maximize student and community success, CCC is devoted to maintaining an honest academic environment and upholding integrity as a core value. All individuals across all course modalities are expected to practice academic integrity, which encompasses the fundamental values of honesty, trust, respect, fairness, and responsibility. In the case of alleged violations of academic integrity, Central Community College strives for fair resolution.

Instances of Academic Dishonesty:

Behaviors that violate the fundamental values of academic integrity at Central Community College may include but are not limited to the following:

- Plagiarism - direct copying or paraphrasing without citation someone else's work (i.e. writing, images, video or audio)
- Cheating - engaging in any behavior intended to achieve an unfair advantage for self or another in any academic exercise (i.e. unauthorized collaboration or unauthorized use of resources or data in a study)

- Fabricating Information - inventing or falsifying information (i.e. making up resources and/or citations, falsifying academic records)
- Facilitating Academic Dishonesty - soliciting, furnishing, or offering to furnish unauthorized exams, quizzes, or academic materials; participating in academic sabotage

Read the [Expectations for Academic Integrity](#) in its entirety.

CCC-GENERAL INFORMATION

All college policies and procedures identified in the student handbook will be adhered to for the course. College policies and procedures include, but are not limited to, conditions for dropping or withdrawing from a class, student academic honesty, etc. A copy of the student handbook is available upon request from the Student Services office on each campus or you may utilize this link to the [Student Handbook](#).

CCC-TECHNOLOGY USAGE GUIDELINES

In order to support the activities for this course, Central Community College provides access to computers for students. The College established Technology Use Policy and Procedure documentation. This document can be found on the College web site. You may click this link to download a PDF document outlining the College's [Technology Use Guidelines](#).

CCC-TITLE IX POLICY

Members of the Central Community College community, guests and visitors have the right to be free from all forms of gender and sex-based discrimination, examples of which can include acts of sexual violence, sexual harassment, domestic violence, dating violence, and stalking. All members of the campus community are expected to conduct themselves in a manner that does not infringe upon the rights of others. Any member of the community, guest or visitor who believes that the policy on Equal Opportunity, Harassment and Nondiscrimination has been violated should contact the Title IX/Equity/AA Coordinator, Dr. Christopher Waddle, 308-398-7325 or TitleIXCoordinator@cccneb.edu. Students should understand that in cases of gender and sex based discrimination, no College employee, including members of the faculty, can guarantee confidentiality. For more information about CCC's policy please reference CCC's [Title IX Handbook](#). For counseling services which may remain confidential, CCC has contracted with the Family Resource Center for counseling services for CCC students at no cost. To schedule an appointment call 1- 888-381-7487, www.family-resources.net.

Pregnancy Rights and Responsibilities

Title IX makes it illegal to discriminate on the basis of pregnancy and related conditions. All pregnancy concerns and pregnancy related absences are coordinated by the Disability Services office. You may not anticipate any academic needs associated with your pregnancy, however, your needs may change as your pregnancy progresses. Disclosure of your condition early in the pregnancy will help in making the planning process more proactive. To disclose your pregnancy to ensure proper accommodations and support, please contact the [Disability Services Director](#) on your campus. For additional information related to pregnancy rights and responsibilities, please visit <https://www.cccneb.edu/pregnantandparenting> or contact you campus Disability Services Office or CCC's Title IX Coordinator at titleixcoordinator@cccneb.edu

COVID-19 REQUIREMENTS AND EXPECTATIONS

Students diagnosed with COVID-19 are expected to confidentially report this information to any Associate Dean of Student Success or by calling our Grand Island Office at 308-398-7426. Further, Central Community College instructors will support flexible attendance for students exhibiting symptoms or illness.

Specific instructional programs may require industry-specific personal protective equipment (PPE) that must be maintained.

Central Community College reserves the right to require face coverings and to change mode of delivery, instructor, or class schedule due to pandemic response at the college, at a location, or in the community.