



Course Outline

Course Name: Fundamentals of Power Distribution and Circuit Analysis (ELEC 252)

Academic Period: 2023 - 2024

Faculty:

Faculty Availability:

Associate Dean:

Shaun Ghafari
shaun.ghafari@humber.ca

Schedule Type Code:



Land Acknowledgement

Humber College is located within the traditional and treaty lands of the Mississaugas of the Credit. Known as Adoobiigok [A-doe-bee-goke], the "Place of the Alders" in Michi Saagiig [Mi-Chee Saw-Geeg] language, the region is uniquely situated along Humber River Watershed, which historically provided an integral connection for Anishinaabe [Ah-nish-nah-bay], Haudenosaunee [Hoeden-no-shownee], and Wendat [Wine-Dot] peoples between the Ontario Lakeshore and the Lake Simcoe/Georgian Bay regions. Now home to people of numerous nations, Adoobiigok continues to provide a vital source of interconnection for all.

Equity, Diversity and Inclusion Statement

Humber College and the University of Guelph-Humber (Humber) are leaders in providing a learning, working and living environment that recognizes and values equity, diversity and inclusion in all its programs and services. Humber commits to reflect the diversity of the communities the College serves. Students, faculty, support and administrative staff feel a sense of belonging and have opportunities to be their authentic selves.

Faculty or Department	Faculty of Applied Sciences & Technology
Course Name:	Fundamentals of Power Distribution and Circuit Analysis (ELEC 252)
Pre-Requisites	CALC 103 & (ELEC 211 OR ELEC 407)
Co-Requisites	none
Equates	none
Restrictions	none
Credit Value	3
Total Course Hours	42

Developed By:**Prepared By:****Approved by:**

Shaun Ghafari



Humber Learning Outcomes (HLOs) in this course.

The HLOs are a cross-institutional learning outcomes strategy aimed at equipping Humber graduates with the employability skills, mindsets, and values they need to succeed in the future of work. To explore all the HLOs, please consult the [Humber Learning Outcomes framework](#).



Critical Thinking



Professionalism

Course Description

This course is an introduction to the fundamental theory of medium and low voltage power distribution and circuit analyses techniques. The concept of electric transient phenomena in electrical systems is introduced. Mesh and nodal voltage analysis methods together with ac complex wave form simulation are discussed in this course.

Course Rationale

This course aims to develop student knowledge and understanding of power distribution systems and major circuit analysis methods. Students would apply their mathematical skills and knowledge of polyphase circuits to analyze transient and steady state behavior of electrical networks. The course will prepare students for studying protection and control of power distribution systems.

Course Learning Method(s)

- Lecture

Learning Outcomes

- Define the electrical systems which are susceptible to electrical transients by demonstrating the system's ability to enter a transient state or return back to its normal or steady state condition.
- Define the AC complex waveforms in graphical and analytical form in terms of AC throughresistance, inductance and capacitance and their power requirements
- Perform voltage drop calculations for DC and AC medium and low voltage, two- wire, three-wiresingle phase and three-wire / four – wire three-phase power distribution systems
- Define the concept of medium and low voltage networks by means of substations and their components
- Demonstrate an acceptable level of professionalism by being on time for all classes, submitting all class activities (individual and group) and assignments by the due dates in the prescribed manner

Assessment Weighting

Assessment	Weight
In-class Activity	
Lab Test 1	10%
Lab Test 2	10%

Assessment	Weight
Lab Test 3	10%
Final Exam	
Final Exam	35%
Midterm Exam	
Mid-term Exam	35%
Total	100%

Modules of Study

Module	Course Learning Outcomes	Resources	Assessments
ELECTRICAL TRANSIENTS AND SIMULATION	<ul style="list-style-type: none"> Define the electrical systems which are susceptible to electrical transients by demonstrating the system's ability to enter a transient state or return back to its normal or steady state condition. Demonstrate an acceptable level of professionalism by being on time for all classes, submitting all class activities (individual and group) and assignments by the due dates in the prescribed manner 	Blackboard and Class Notes	<ul style="list-style-type: none"> Mid-term Exam Lab Test 1
AC COMPLEX WAVE FORMS SIMULATION	<ul style="list-style-type: none"> Define the AC complex waveforms in graphical and analytical form in terms of AC through resistance, inductance and capacitance and their power requirements Demonstrate an acceptable level of professionalism by being on time for all classes, submitting all class activities (individual and group) and assignments by the due dates in the prescribed manner 	Blackboard and Class Notes	<ul style="list-style-type: none"> Mid-term Exam Lab Test 2
FUNDAMENTALS OF POWER DISTRIBUTION	<ul style="list-style-type: none"> Perform voltage drop calculations for DC and AC medium and low voltage, two-wire, three-wire single phase and three-wire / four-wire three-phase power distribution systems Demonstrate an acceptable level of professionalism by being on time for all classes, submitting all class activities (individual and group) and assignments by the due dates in the prescribed manner 	Blackboard and Class Notes	<ul style="list-style-type: none"> Final Exam Lab Test 1 Lab Test 2

Module	Course Learning Outcomes	Resources	Assessments
TYPES OF D. C. DISTRIBUTORS	<ul style="list-style-type: none"> Perform voltage drop calculations for DC and AC medium and low voltage, two- wire, three-wiresingle phase and three-wire / four – wire three-phase power distribution systems Demonstrate an acceptable level of professionalism by being on time for all classes, submitting all class activities (individual and group) and assignments by the due dates in the prescribed manner 	Blackboard and Class Notes	<ul style="list-style-type: none"> Final Exam Lab Test 1 Lab Test 2 Lab Test 3
SUBSTATION	<ul style="list-style-type: none"> Define the concept of medium and low voltage networks by means of substations and their components Demonstrate an acceptable level of professionalism by being on time for all classes, submitting all class activities (individual and group) and assignments by the due dates in the prescribed manner 	Blackboard and Class Notes	<ul style="list-style-type: none"> Final Exam Lab Test 1 Lab Test 2 Lab Test 3

Essential Skills

Section	Skills	Measurement	Details
Communication	<ul style="list-style-type: none"> Reading Listening Presenting 	Reinforce and measure	<ul style="list-style-type: none"> Respond to written, spoken, or visual messages in a manner that ensures effective communication. Tests, assignments, reports, and presentations.
Numeracy	<ul style="list-style-type: none"> Understanding and applying mathematical concepts and reasoning Analyzing and using numerical data 	Teach and measure	<ul style="list-style-type: none"> Execute mathematical operations accurately. Tests, assignments, reports, and presentations.
Critical Thinking and Problem-Solving	<ul style="list-style-type: none"> Synthesizing Decision-Making Creative and Innovative Thinking 	Reinforce and measure	<ul style="list-style-type: none"> Use a variety of thinking skills to anticipate and solve problems. Tests, assignments, reports, presentations
Information Management	<ul style="list-style-type: none"> Gathering and managing information Computer literacy Internet skills 	Reinforce and measure	<ul style="list-style-type: none"> Locate, select, organize, and document information using appropriate technology and information systems. Tests, assignments, reports, and presentations.

Section	Skills	Measurement	Details
Interpersonal Skills	<ul style="list-style-type: none"> Teamwork Conflict resolution Networking 	Reinforce and measure	<ul style="list-style-type: none"> Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals. Tests, assignments, reports, and presentations.
Personal Skills	<ul style="list-style-type: none"> Managing self Managing change and being flexible and adaptable 	Reinforce and measure	<ul style="list-style-type: none"> Manage the use of time and other resources to complete projects. Tests, assignments, reports, and presentations.

Prior Learning Assessment & Recognition (PLAR)

Prior Learning Assessment and Recognition (PLAR) is the formal evaluation and credit-granting process whereby candidates may obtain credits for prior learning. Prior learning includes the knowledge competencies and skills acquired, in both formal and informal ways, outside of post-secondary education. Candidates may have their knowledge, skills and competencies evaluated against the learning outcomes as defined in the course outline. Please review the [Assessment Methods Glossary](#) for more information on the Learning Portfolio assessment methods identified below.

The method(s) that are used to assess prior learning for this course may include:

- Challenge Exam (results recorded as a % grade and added to student's CGPA)
- Learning Portfolio (results reflected as SAT and not added to student's CGPA)
- Skills Test
- Interview

Please contact the Program Coordinator for more details.

Academic Regulations

It is the student's responsibility to be aware of the College Academic Regulations. The Academic Regulations apply to all applicants to Humber and all current students enrolled in any program or course offered by Humber, in any location. Information about academic appeals is found in the [Academic Regulations](#).

Anti-Discrimination Statement

At Humber College, all forms of discrimination and harassment are prohibited. Students and employees have the right to study, live and work in an environment that is free from discrimination and harassment. If you need assistance on concerns related to discrimination and harassment, please contact the [Centre for Human Rights, Equity and Inclusion](#) or the [Office of Student Conduct](#).

Accessible Learning Services

Humber strives to create a welcoming environment for all students where equity, diversity and inclusion are paramount. Accessible Learning Services facilitates equal access for students with disabilities by coordinating academic accommodations and services. Staff in Accessible Learning Services are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. If you require academic accommodations, contact:

[Accessible Learning Services](#)

North Campus: (416) 675-6622 X5090

Lakeshore Campus: (416) 675-6622 X3331

Academic Integrity

Academic integrity is essentially honesty in all academic endeavors. Academic integrity requires that students avoid all forms of academic misconduct or dishonesty, including plagiarism, cheating on tests or exams or any misrepresentation of academic accomplishment.

Disclaimer

While every effort is made by the professor/faculty to cover all material listed in the outline, the order, content, and/or evaluation may change in the event of special circumstances (e.g. time constraints due to inclement weather, sickness, college closure, technology/equipment problems or changes, etc.). In any such case, students will be given appropriate notification in writing, with approval from the Dean (or designate) of the School.

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