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See what the student sees...

Course Master: Approved

Resources: Approved

Program Standards: Approved



Course Outline

1.0 IDENTIFICATION

COURSE INFORMATION

Subject Code	ELEC
Course Name	Electricity 1
Course Code	10099
Offering Term	Winter 2014
Classification	Foundational
Program Code and Name	360 - Energy Systems Eng Technology
Total Course Hours	70
Credit Value / Grade Type	5
Academic Year	2013/2014
Approving Associate Dean	Tom Low
Revision Date	May 25, 2012

2.0 LEARNING OVERVIEW

SUBSECTION

Course Description This course introduces students to electrical units, voltage, current, resistance and power. DC circuit analysis is studied including Ohms Law, Kirchoffs voltage and current laws, Series and Parallel circuits, Network Theorems and Magnetism.

Resources	Code or ISBN	Name or Title	Author / Publisher	Version or Edition	Type	Status
Status REQ = Required REC = Recommended					Supply	REQ

REF = Reference		Course materials as advised by instructor in first class.				
Type						
Online						
Supply						
Text Book						
Custom Courseware						

Pre-requisite(s)	N/A			
Equivalent(s)		Subject Code	Course Code	Course Name
		ELEC	EE147	Electricity
And		ELEC	EE148	Electricity Lab

3.0 COURSE CONTENT

MAJOR MODULES, THEMES, OR TOPICS

Electrical Charge, Current and Voltage
Resistance
Ohm's Law, Power and Energy
Resistive Circuits
DC Resistive Circuit Analysis
Magnetism and Magnetic Circuits

4.0 REFERENCE TO STANDARDS

VS CODE	RELEVANT VOCATIONAL LEARNING OUTCOME
	N/A
EE CODE	RELEVANT ESSENTIAL EMPLOYABILITY SKILLS OUTCOME
EE01-A	Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
EE01-B	Respond to written, spoken, or visual messages in a manner that ensures effective communication.
EE02	Execute mathematical operations accurately.
EE03-A	Apply a systematic approach to solve problems.
EE03-B	Use a variety of thinking skills to anticipate and solve problems.
EE04-A	Locate, select, organize, and document information using appropriate technology and information systems.
EE04-B	Analyze, evaluate, and apply relevant information from a variety of sources.

EE05-A	Show respect for the diverse opinions, values, belief systems, and contributions of others.
EE05-B	Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
EE06-A	Manage the use of time and other resources to complete projects.
EE06-B	Take responsibility for one's own actions, decisions, and consequences.
GE CODE	RELEVANT GENERAL EDUCATION THEME
	N/A
ES CODE	OTHER EXTERNAL STANDARD
	N/A

5.0 COURSE LEARNING OUTCOMES

Upon successful completion of the course learning outcomes, the student will reliably demonstrate the ability to:

LO01 Apply important considerations in basic electrical safety and basic electrical parameters.

LEARNING ELEMENTS

Demonstrate the basic precautions in working with electricity.

Read an analogue multimeter displaying any one of a number of scales.

Manipulate electrical quantities in SI units and in engineering notation.

Solve for the following electrical parameters; charge, potential difference (voltage), current (electron and conventional flow), resistance and conductance

Given suitable physical parameters calculate the following; voltage, current, resistance and conductance

Distinguish between various dc voltage sources and how they may or may not be connected to each other.

Distinguish between direct current (dc) and alternating current (ac).

Distinguish between different types of resistive elements

Draw and label a basic circuit schematic.

Differentiate between open and closed circuit in terms of current flow.

Show the correct placement of a voltmeter, ammeter and ohmmeter in a circuit in order to measure the specified parameter.

LINKING TO STANDARDS

Vocational Standard

N/A

Essential Employability Skills

N/A

External Standard

N/A

LO02 Analyse for specified currents, voltages and power in dc resistive circuits using circuit analysis theorems.

LEARNING ELEMENTS

Relate the gage number, wire diameter and resistance in the American Wire Gage (AWG) code.

Solve for the resistance of a conductor at 20°C given the conductor's length, cross-sectional dimensions and resistivity.

Differentiate between an open and short circuit and how to find each in a circuit using an ohmmeter.

Describe the purpose, operation and symbol of fuses and circuit breakers and how to select and test each type.

Calculate current, voltage and resistance given any two of these three values including conventional current direction and voltage polarity

Determine the value of a fixed resistor by measuring the resistor voltage and current and applying Ohm's Law.

Calculate the energy consumed by a domestic load and the cost of operating this load given the cost of electric power.

Given any two values of current, voltage and resistance calculate the power consumed by a resistive load.

Relate current flow, surface area and power rating as they relate to the selection of devices.

Calculate the maximum allowable current or voltage that can be applied to a resistor given its power rating.

Calculate the required ampere-hour rating of a battery given the desired load and operating time.

Calculate the efficiency of a device given its input and output power.

Apply Ohm's Law and Kirchoff's Laws to a dc resistive circuits in order to calculate specified parameters.

Apply current and voltage divider rules to solve for specified circuit currents and voltages.

Manipulate a multimeter in order to measure specified resistor currents and voltages in dc circuits.

Express voltages using the double subscript notation and the ground reference notation.

Measure and analyse the effect of using a potentiometer in a dc circuit either as a potentiometer or as a rheostat.

Determine internal voltage supply resistance.

Determine the effects on dc circuits under the influence of internal short circuits and open circuits.

Use the Superposition Theorem to determine specified currents and voltages in a dc resistive circuit.

Determine the value of a fixed resistor using the resistor colour code and by measuring the resistance with an Ohmmeter.

LINKING TO STANDARDS

Vocational Standard	Essential Employability Skills	External Standard
N/A	N/A	N/A

L003 Determine the value of any number of magnetic parameters given the necessary variables.

LEARNING ELEMENTS

Sketch the magnetic fields associated with permanent and electromagnets, taking the right hand rule into account

Determine total magnetic flux, flux density and cross-sectional geometry of a magnetic circuit given any two of these parameters.

Determine magnetomotive force, flux density and reluctance of a magnetic circuit given any two of these parameters

Determine flux density, magnetizing force and permeability of a magnetic circuit given any two of these parameters

LINKING TO STANDARDS

Vocational Standard	Essential Employability Skills	External Standard
N/A	N/A	N/A

6.0 ASSESSMENT

Individual assignment and grading details to be provided by Instructor.

Assessment Method	Weight	Associated Outcomes
Test(s)	45%	LO01 , LO02 , LO03
Final Exam	25%	LO01 , LO02 , LO03
Quiz(zes)	5%	LO01 , LO02 , LO03
Report(s)	25%	LO01 , LO02 , LO03
TOTAL	100%	

7.0 STUDENT SUCCESS - POLICIES AND PROCEDURES

Mohawk College has developed several policies and procedures designed to protect students and provide an enriching and rewarding learning experience in which the rights of individuals are respected. This may include the use of digital assessments such as [turn it in](#). For the most up to date information on the following policies and procedures, consult Mohawk College's [Policies and Procedures](#) website.

In addition, students enrolled in Mohawk/McMaster collaborative programs are protected under McMaster University's policies and procedures outlined in [General Academic Regulations, McMaster Undergraduate Calendar](#), and in McMaster's [Academic Integrity Policy](#).

Please be advised that all policies and procedures are subject to change.

EFFECTIVE FALL 2009 - Policy: AC700 - Program Promotion and Graduation Requirements: A minimum grade of 50% is required as a course pass at Mohawk College. Please be aware, however, that a higher passing grade (minimum 60% or 70%) may be required if this course is taken as part of certain diploma or certificate programs. Please consult your Academic Department for details.

Additionally, if you are taking this course as part of a diploma or certificate program, be aware that you need an overall weighted grade point average (WGPA) of at least 60% to graduate. Graduation requirements are higher for some programs. Please check requirements with your department.

Note:

Faculty are required to review Emergency Lockdown procedures and Emergency Evacuation Procedures, including Evacuation Procedures for students with disabilities, at the first class of every course they are teaching each semester. This information is available in the College Emergency Safety and Security Procedures Booklet distributed to all staff in hard copy, or online in MoCoMotion within the HR Staff Services Tab in the Occupational

Health and Safety Channel (Occupational Health and Safety web site).

Course information correct as of: **May 25, 2012**

Last updated by: **Kayla Ciccone**