

Bay College
Course Cover Sheet



M-CAM Training Area:

CNC/Machining **Multi-Skilled/Mechatronics** Production Operation Welding/Fabrications

Program(s): Mechatronics, Certificate

Mechatronics and Robotics Systems, AAS

Course: ELEC 130 Circuit Fundamentals I

Course Description: This course is designed as an introduction to electrical and electronic concepts. Course topics included are: DC and AC circuit concepts: voltage, charge, current, energy, and power; fundamental circuit laws; characteristics of resistance, capacitance and inductance; basic magnetic concepts and circuits; basic transformer principles. Electrical safety and test equipment usage are taught and practiced.

Date Modified: Dec 2014

Faculty Developer(s)/Instructional Designers(s): Mark Highum

Employer/Industry Partner: Engineered Machine Products (EMP), Stewart Manufacturing, Cal Grinding

College Contact: Mark Highum

Phone: 906.217.4083

Email: highumm@baycollege.edu

Additional Information/Comments:

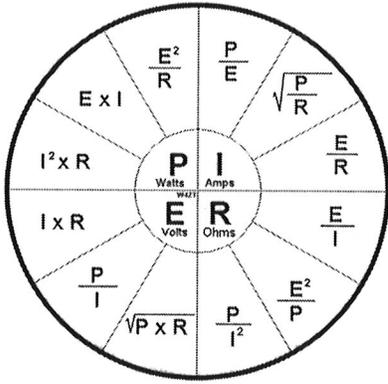
Course was developed using Open Source Textbook with PHET interactive simulations provided by the University of Colorado. Additional practice problems incorporated with the Basic Circuit Challenge software available from ETCAI Products.

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

The eight community colleges and M-CAM is an equal opportunity employer/program provider. Auxiliary aids and services are available upon request to individuals with disabilities. TTY users please call 1-877-878-8464 or visit W.michigan.gov/mdcr.

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COURSE SYLLABUS **Fall 2016**

ELEC 130 Circuit Fundamentals I

Mechatronics

BAY COLLEGE

LEAD INSTRUCTOR: MARK HIGHUM

I. COURSE INFORMATION:

Title:..... *Circuit Fundamentals I*
Number:..... ELEC 130 01 90
Credit/contact hours:.....4/4
Prerequisites:.....None
Class Website:..... **Bay College Blackboard site**
<https://online.baycollege.edu/>

II. INSTRUCTOR INFORMATION:

Name:.....Mark Highum
Office location:..... 402D
Office Hours:..... Tuesdays/Thursdays 11 AM – 12 PM, 2 – 4 PM
E-Mail:..... highumm@baycollege.edu
Office Phone:.....906-217-4083

III. COURSE MATERIALS:

Required Text: OER text Lessons in Electric Circuits, Volume I – DC
 By Tony R. Kuphaldt

IV. CATALOG DESCRIPTION

This course is designed as an introduction to electrical and electronic concepts. Course topics included are: DC and AC circuit concepts: voltage, charge, current, energy, and power; fundamental circuit laws; characteristics of resistance, capacitance and inductance; basic magnetic concepts and circuits; basic transformer principles. Electrical safety and test equipment usage are taught and practiced.

V. STUDENT LEARNING OUTCOMES

| Course Outcomes | Assessment Method |
|---|---|
| <p>Apply basic math functions to Electronics, including scientific notation.</p> <p>Describe the relationship between matter, elements, and atoms.</p> <p>Discuss current flow, including the difference between electron flow and conventional flow.</p> <p>Contrast Alternating (AC) and Direct (DC) Current.</p> <p>Define terms voltage, current, and resistance and perform Ohm's Law calculations.</p> <p>Describe the properties of magnetism, including magnetic induction of current.</p> <p>Describe and utilize units of measurement on AC waveforms, including phase angle, wavelength, peak values, and root mean square (RMS).</p> <p>Analyze series, parallel, and complex circuits.</p> | <p>Homework, Exams, and Hands-on Activities</p> |

VI. HOW TO BE A SUCCESSFUL STUDENT ONLINE

- A. Give yourself extra time for an online course to read all the content, develop thoughtful responses to discussion board topics, submit assignments on time and read all directions.
- B. Explore all the course links to become familiar with where all the course content is located.
- C. Find the course syllabus and schedule and know, what is due, where it's due and when it's due.
- D. Introduce yourself to other students and make contact with the instructor right away via the discussion board, email or whatever communication tools their using.
- E. Build community with other students in the course and create online or face-to-face study groups.

VII. COURSE SCHEDULE and Due Dates

| Due DATE | SUBJECT/TOPIC | Assignment |
|------------------------------|---|---|
| 2400 Sunday Sep 4 | Introduction Assignments | Assignment, Introduction Quiz, and Discussion |
| 2400 Sunday Sep 11 | Basic Concepts of Electricity | Assignment, Discussion Board |
| 2400 Sunday Sep 25 | Ohm's Law and Safety | Assignment, Discussion Board, Exam One |
| 2400 Sunday Oct 9 | Scientific Notation and Metric Prefixes | Assignment, Discussion Board |
| 2400 Sunday Oct 23 | Series and Parallel Circuits | Assignment, Discussion Board, Exam Two |
| 2400 Sunday Nov 6 | Divider Circuits and Kirchhoff's Laws | Assignment, Discussion Board, |
| 2400 Sunday Nov 20 | Series – Parallel Combination Circuits | Assignment, Discussion Board, Exam Three |
| 2400 Sunday Dec 4 | Magnetism and Electromagnetism | Assignment, Discussion Board |
| 2400 Wednesday Dec 14 | Introduction to Alternating Current | Assignment, Discussion Board, Exam Four |
| 2400 Wednesday Dec 14 | Final Exam - cumulative | Final Exam |

VIII. COLLEGE POLICIES

SEXUAL HARASSMENT AND DISCRIMINATION STATEMENT

Bay College takes its responsibilities under Title IX of the Education Amendments of 1972 seriously. Bay College is committed to providing an educational environment free from discrimination or harassment based on race, color, national origin, religion, sex, gender identity, age, disability, or other protected status. Bay College Board Policy 1060 prohibits discrimination or harassment based on the above-named categories. Prohibited acts include but are not limited to sexual assault, sexual harassment, domestic violence, dating violence, and stalking.

Students who experience or observe an incident of sex- or gender-based discrimination are encouraged to report it to a College employee or a member of the College's Title IX team. Faculty and staff are considered "responsible employees" and are required to report any such incident they observe or of which they are made aware. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a College-approved research project. Students also have options to discuss issues confidentially.

Questions concerning discrimination or harassment on the basis of gender may be directed as well to either the Title IX Coordinator or a Deputy Title IX Coordinator:

Kevin Carlson
Title IX Coordinator
Office: CB 201J (Escanaba Campus)
Office: WC 215 (Iron Mountain Campus)
kevin.carlson@baycollege.edu
906-217-4023

Dave Laur
Deputy Title IX Coordinator
Office: SC 512 (Escanaba Campus)
dave.laur@baycollege.edu
906-217-4031

Bridget DeGroot
Deputy Title IX Coordinator
Office: SC 523B (Escanaba Campus)
bridget.degroot@baycollege.edu
906-217-4049

SEXUAL HARASSMENT AND DISCRIMINATION STATEMENT (Cont.)

A complaint may also be filed by going to the College website www.baycollege.edu, selecting the “Campus Safety” link, and selecting the “Incident Report” link <https://publicdocs.maxient.com/incidentreport.php?BayCollege>. This report allows individuals to identify themselves or to submit an anonymous report.

Student Academic Assistance

Academic Testing Services provides proctored testing for both online and traditional courses. If you have a class on campus or online that requires you to take exams in testing services and have questions, please stop by room 876 in the HUB at the Escanaba Campus or call (906) 217-4035.

The **Bay College West Student Success Center** provides **tutoring** to students in all courses, as well as **Supplemental Instruction (SI)** in select courses. The Student Success Center is located in room 221 on the upper level next to the Student Services Desk, (906) 302-3035.

The Bay College **Library** provides services that are designed to meet classroom-related and general information needs of students, faculty, staff and the community. The Library’s primary goal is to provide resources that will enhance and expand an individual’s learning experience. Call (906) 217-4055 or stop by JHUC 952.

The **Office of Accessibility** assists students with a variety of services for classroom success and is located in room 811 of the Student Success Center in the HUB at the Escanaba Campus, (906) 217-4017. Services include (*but are not limited to*) specialized testing, classroom note taker, reader and/or scribe, alternative textbooks, use of a recorder for academic needs, interpreter for the deaf, and temporary use of a motorized scooter. These services are also provided to students at Bay College West Campus in room 211, (906) 302-3004.

Online Learning Support is available to students. For assistance stop by Online Learning Support in the HUB at the Escanaba campus Monday-Friday 8:30 am-5 pm or call (906) 217-4276 or email onlinehelp@baycollege.edu.

Placement test preparation is available to students seeking to place well initially or re-test to improve their placement in English, reading, or math. Students can schedule an appointment to receive preparation resources and strategies on how to prepare to take the placement test. Please call (906) 217-4301 or stop by the reception desk for the Student Success Center in the HUB at the Escanaba campus. Placement test preparation is available at West Campus during the fall and winter semesters. Call (906) 302-3035 or stop by room 221.

Supplemental Instruction (SI) is an internationally recognized academic support program that targets traditionally difficult courses. Students come together in regularly-scheduled study sessions to compare notes, discuss course materials, develop study tools, practice problem solving, and prepare for exams. These sessions are facilitated by trained SI leaders that attend the course with students and prepare study materials for use during SI sessions. SI staff can be found in the Student Success Center (rooms 827-833 at the Escanaba Campus or room 221 at West Campus) or can be reached via phone at (906) 217-4175.

The **TRiO Student Support Services** program provides many services to students, including academic planning, career exploration, transfer assistance, personal financial training and support, FAFSA assistance, cultural & college trips, leadership opportunities, grant aid, and tutoring in math, writing and General Education courses. The TRiO reception offices are located in room 815 of the Student Success Center in the HUB at the Escanaba Campus, (906) 217-4133 and in the Student Success Center at West Campus, (906)-302-3035.

Tutoring has become very popular at Bay College and is offered for all courses. Tutoring requests can be made through the front reception desk of the Student Success Center in the HUB at the Escanaba Campus. Feel free to stop in or call (906) 217-4230.

Please refer to the college catalog for specific details about services available to students.

Bay College ADA Statement

Disability-related accommodations and services for all Bay College students are provided through the Office of Accessibility (OOA) located on the Escanaba campus, room 811 of the Student Success Center in the HUB, or call (906) 217-4017, or email OOA@baycollege.edu.

If you are a student with a disability and think you may require disability-related accommodations or services, please contact the Office of Accessibility. Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation in accordance with federal, state, and Bay de Noc Community College guidelines.

Our online accessibility policy can be viewed at

<http://www.baycollege.edu/Academics/Online-Learning/Accessibility-Policy.aspx>.

Bay College Web Accessibility Policy

Please find the Bay College accessibility policy here:

<http://www.baycollege.edu/Academics/Online-Learning/Accessibility-Policy.aspx>

IX. COMMUNICATING WITH THE INSTRUCTOR

The course is presented via the Blackboard.

All homework should be submitted using the Blackboard system.

Homework will be graded within one day after the DUE DATE. You can submit work early, but this work may not be graded within one day of submission.

If you need to contact the instructor, the best way is via the email listed above. Every attempt will be made to reply within 24 hours.

X. NETIQUETTE

Remember the Golden Rule

"Do unto others as you would have others do unto you". This Rule underwrites all the other guidelines contained in this Guide.

Take a few moments to proofread before you send something

Frequent typographical errors or misspellings will distract your readers, and may leave a bad impression.

Avoid Acronyms

Do not use acronyms like IMHO (In My Humble Opinion), WAYTA (What Are You Talking About?), or FWIW (For What It's Worth). Not everyone will be familiar with this 'Net shorthand, and your acronym may confuse or slow down others' ability to understand your posting. If you encounter an unfamiliar acronym online, ask the writer for clarification.

Avoid Potentially Offensive Terminology

Unless you are consciously trying to annoy people, you should avoid using words that could be considered sexist, racist, ageist, and any other perspective that reflects insensitivity, prejudice, and bias based on ignorant disrespect. Don't curse or swear online, either: in most venues, using swear words is considered highly rude. People will pay attention to your words, rather than to the idea you're trying to communicate so forcefully.

DON'T CAPITALIZE EVERY WORD, AND BE JUDICIOUS WHEN USING EXCLAMATION POINTS!!!!!!

Capitalizing every word in a statement is the online equivalent of yelling. No one likes to be yelled at, so avoid capitalizing every letter in a posting. Likewise, there's really no reason to type in a dozen or more exclamation points.

From "A Guide to Netiquette", taken from the Educational Technology Center at Northeastern University, 2007

XI. STUDENT EVALUATION/GRADING

The class is evaluated by completion of the following:
Area Homework/Activities – various points as indicated
Area Discussion Boards – 10 points each
Area Exams – 40 points per test
Final Exam – 50 points

The final grade is a straight percentage of these elements, and can be checked at any time through the online gradebook.

XII. GRADE SCALE

| | | |
|--------|---|---|
| ≥90% | = | A |
| 80-90% | = | B |
| 70-80% | = | C |
| 60-70% | = | D |
| <60% | = | F |

XII. TECHNOLOGY REQUIREMENTS

Students need to have access to a properly functioning computer throughout the semester.

Student computers need to be capable of running the latest versions of plug-ins, recent software and have the necessary tools to be kept free of viruses and spyware. The computer needs to run the following software. Also, some courses require special software that students may have to purchase.

- Adobe Acrobat Reader
- Apple iTunes Player
- Apple QuickTime Player
- Most recent version of Java
- Adobe Flash Player
- Adobe Shockwave Player
- Mozilla Firefox Browser - recommended
- Microsoft Windows or Mac OS
- Microsoft Office
- Windows Media Player
- Real Player

XIV. TECHNICAL SUPPORT FOR ONLINE LEARNING

Students can receive live support for technical issues they encounter related to online learning.

Hours: 8:30 a.m. to 4:30 p.m. EST, Mon-Fri

Phone: 1.906.217.4276

Email: onlinehelp@baycollege.edu

XV. INTERNET SERVICE

Students are responsible to have internet service. High speed Internet access is recommended, as dial-up may be slow and limited in downloading information and completing online tests. Some courses may contain streaming audio and/or video content.

XVI. USE OF PUBLIC COMPUTERS

If using a public library, or other public access computer, students should check to ensure they will have access for the length of time required to complete their tasks and tests.

XVII. STUDENT ASSESSMENT

All Bay College students will be expected to participate in assessment activities during their course of study at the college. These activities will include participating in assessment of General Education Outcomes, classroom assessment for specific course lessons, or assessment of skills needed for a specific program. These assessments will help instructors and the college make decisions to improve instruction and student learning.

XVIII. POLICY STATEMENT ON ACADEMIC INTEGRITY

It shall be the policy of Bay de Noc Community College Board of Trustees that the college provides opportunities for students to gain the knowledge, skills, judgment and wisdom they need to function in society as responsible citizens. Plagiarism, falsifying data, and other forms of academic dishonesty are inconsistent with the college's goals and mission; Students are expected to pursue their education at Bay College with honor and integrity. In line with this college policy, any student found cheating, copying, or otherwise misrepresenting his/her performance, or any way gaining an unfair advantage over other students will be subject to disciplinary actions according to the Bay College Academic Integrity Procedures.

XIX. COURSE WITHDRAWAL

It is the student's responsibility to withdraw/drop from the class if he or she chooses to do so. You may drop this class within the first two weeks (**Sept 9**) with reimbursement for the tuition. You may withdraw within the third through tenth week (**Nov 4**) and receive a WP (if passing at the time of the withdrawal request) or WF (if failing at the time of the withdrawal request). After the tenth week students are required to request an Administrative Appeal. All students who do not follow the drop/withdrawal procedure will receive an "F" for the class. Please refer to the college catalog for more specific details on this issue.

Incomplete: An incomplete grade is given only in extenuating circumstances, and only with prior arrangement with the instructor.



Subject Matter Expert (SME) Course Review Summary

College: Bay College

M-CAM Training Area: CNC/Machining Multi-Skilled/Mechatronics Production Operation Welding/Fabrication

Degree Program Name: Mechatronics

Title of Course: ELEC130 Circuit Fundamentals I

Subject Matter Expert (SME) Reviewer Information

Name: Casey Calouette

Title: Engineer

Phone: 9062413582

Email: ccalouette@calvalves.com

Organization/Affiliation: Cal Grinding, Inc.

Attach Resume or provide credentials (showing years of experience and work experience that is relevant to course content):

AAS : Electrical Engineering Technology – Bay College, 2003

BS : Electrical Engineering Technology – Michigan Technological University, 2005

Ross’s Manufacturing – Design Engineer, Frozen Custard Machine Electrical&Controls Design 2006

Cal Grinding, Inc. – Electrical & Manufacturing Engineer, Automation and Manufacturing Environment, 2006-Present

Synopsis of Findings:

Syllabus meets the requirements for what would be expected from a circuit fundamentals class. Proficiency is proven both with tests and also with the requirement for lab time. Of particular note is the initial safety class prior to any other activities.

Reviewers Signature _____

Date: 3/28/17

**Michigan Coalition for Advanced Manufacturing
Subject Matter Expert Course Review**

| 1. Course Overview and Objectives | Exceptional | Satisfactory | Ineffective |
|--|-------------|--------------|-------------|
| The goals and purpose of the course is clearly stated. | X | | |
| Prerequisites and/or any required competencies are clearly stated. | | X | |
| Learning objectives are specific and well-defined. | | X | |
| Learning objectives describe outcomes that are measurable. | | X | |
| Outcomes align to occupational focus (industry skills and standards). | X | | |
| Comments or recommendations: | | | |
| 2. Material and Resources | Exceptional | Satisfactory | Ineffective |
| The instructional materials contribute to the achievement of the course learning objectives. | X | | |
| The materials and resources meet/reflect current industry practices and standards. | X | | |
| The instructional materials provide options for a variety of learning styles. | X | | |
| Resources and materials are cited appropriately. If applicable, license information is provided. | X | | |
| Comments or recommendations: Text is well regarded and uses both visual and textual learning. | | | |
| 3. Learning Activities | Exceptional | Satisfactory | Ineffective |
| Provide opportunities for interaction and active learning. | X | | |
| Help understand fundamental concepts, and build skills useful outside of the learning object. | X | | |
| Activities are linked to current industry practices and standards. | X | | |
| Comments or recommendations: Many opportunities for hands on labs to better grasp the concepts. | | | |

**Michigan Coalition for Advanced Manufacturing
Subject Matter Expert Course Review**

| 4. Assessment Tools/Criteria for Evaluation | Exceptional | Satisfactory | Ineffective |
|---|--------------------|---------------------|--------------------|
| The course evaluation criteria/course grading policy is stated clearly on syllabus. | x | | |
| Measure stated learning objectives and link to industry standards. | | x | |
| Align with course activities and resources. | | x | |
| Include specific criteria for evaluation of student work and participation. | | x | |
| Comments and recommendations: | | | |
| 5. Equipment/Technology | Exceptional | Satisfactory | Ineffective |
| Meets industry standards and needs. | x | | |
| Supports the course learning objectives. | | x | |
| Provides students with easy access to the technologies required in the course/module. | | x | |
| Comments and recommendations: | | | |

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

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