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BME 120T.01: Electricity I

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THE UNIVERSITY OF MONTANA
MISSOULA
COLLEGE OF TECHNOLOGY
INDUSTRIAL TECHNOLOGY DEPARTMENT

COURSE SYLLABUS

COURSE NUMBER AND TITLE: BME 120T Electricity I

DATE REVISED: February 2004

SEMESTER CREDITS: 3

CONTACT HOURS PER SEMESTER: 75

Lecture hours per week: 4

Lab hours per week: 6

Shop hours per week: 0

PREREQUISITES: None

INSTRUCTOR: Ed King

PHONE: (406) 243-7645

OFFICE LOCATION: T&T II, West Campus

OFFICE HOURS: To be announced

RELATIONSHIP TO PROGRAM:

This course gives the Building Maintenance Engineers the basic knowledge to maintain building electrical systems and to supervise electrical professionals that are doing contract work on the building.

COURSE DESCRIPTION:

The electrical laws and principles pertaining to DC and AC circuits. Includes current, voltage, resistance, power, inductance, capacitance, and transformers. Introduction to wiring methods and materials in conformance with the National Electric Code (NEC). Includes installation and replacement of light fixtures, heaters, GFCI's, switches, receptacles, and electrical thermostats.

STUDENT PERFORMANCE OUTCOMES:

Occupational Performance Objectives

Life-Long Learning Skill Codes*
[Include Code and Number]

Upon completion of this course, the student will be able to:

1. Understand the basic concepts of electricity.
2. Test electrical systems with an electrical meter.
3. Do basic calculations to determine amperage and power use.
4. Understand the application of various electrical equipment in building systems.

STUDENT PERFORMANCE ASSESSMENT METHODS AND GRADING PROCEDURES:Grading Scale:

| | | |
|---------------|---|---|
| 93% - 100% | = | A |
| 84% - 92% | = | B |
| 70% - 83% | = | C |
| 60% - 69% | = | D |
| less than 60% | = | F |

Grade Breakdown:

| | |
|-------------|-----|
| Tests | 50% |
| Lab Project | 50% |

Notes:

1. Tests will be as required.
2. Safety glasses are required when in the lab.

HOW VARIOUS ASSESSMENT METHODS WILL BE USED TO IMPROVE THE COURSE:

1. Student course evaluations
2. Peer feedback
3. Advisory committee feedback

REQUIRED TEXT: Physics for Career Education by Ewen, Nelson, Schurter

OPTIONAL REFERENCE MATERIALS: Principles of Electric Circuits by Floyd

COURSE OUTLINE:

- I. General Principles of Electricity
 - A. Conventional Theory
 - B. Electron Theory
- II. Static Electricity
 - A. Charges
 - B. Induction
 - C. Coulomb's Law
 - D. Fields
- III. Direct Current
 - A. Circuits
 - B. Ohm's Law
 - C. Series Circuits
 - D. Parallel Circuits
 - E. Instruments

IV. DC Sources

- A. Dry Cells
- B. Battery Chemistry
- C. Electrical Power

V. Magnetism

- A. Current Effects
- B. Induced
- C. Electromagnets
- D. Generators
- E. Motors

VI. Alternating Current

- A. Effective Values
- B. Power
- C. Transformers
- D. Inductance
- E. Capacitance

VII. Symbols and Formulae

VIII. Wiring Diagrams

IX. Safety

| *Life-Long Learning Skills Codes and Numbers | |
|---|---|
| FOUNDATIONAL SKILLS: | COMPETENCIES: |
| <p>BASIC SKILLS [BSKL]</p> <ol style="list-style-type: none"> 1. Reading 2. Writing 3. Arithmetic/Mathematics 4. Listening 5. Speaking <p>THINKING SKILLS [THINK]</p> <ol style="list-style-type: none"> 1. Creative Thinking 2. Decision Making 3. Problem Solving 4. Mental Visualization 5. Knowing How to Learn 6. Reasoning <p>PERSONAL QUALITIES [PQ]</p> <ol style="list-style-type: none"> 1. Responsibility 2. Self-esteem 3. Sociability 4. Self-management 5. Integrity/Honesty | <p>RESOURCES [RSRC]</p> <ol style="list-style-type: none"> 1. Manages Time 2. Manages Money 3. Manages Materials and Facility Resources 4. Manages Human Resources <p>INTERPERSONAL SKILLS [IPS]</p> <p>Participates as Member of a Team</p> <ol style="list-style-type: none"> 1. Teaches Others 2. Serves Clients and Customers 3. Exercises Leadership 4. Negotiates to Arrive at a Decision 5. Works with Diversity <p>INFORMATION [INFO]</p> <ol style="list-style-type: none"> 1. Acquires and Evaluates Information 2. Organizes and Maintains Information 3. Interprets and Communicates Information 4. Uses Computers to Process Information <p>SYSTEMS [SYS]</p> <ol style="list-style-type: none"> 1. Understands Systems 2. Monitors and Corrects Performance 3. Improves and Designs Systems <p>TECHNOLOGY [TECH]</p> <ol style="list-style-type: none"> 1. Selects Technology 2. Applies Technology 3. Maintains and Troubleshoots Technology |