

FIP 160
FIRE PROTECTION/ELECTRICAL

COURSE DESCRIPTION:

Prerequisites: MAT 115

Corequisites: None

This course covers the methods and means of electrical installations and their uses as related to fire. Topics include basic electrical theories, wiring methods, electrical components and circuitry, and an introduction to the National Electrical Code. Upon completion, students should be able to demonstrate a basic knowledge of electricity, including its uses, characteristics, and hazards. This course also assists students in understanding how electrical fires may develop and in conducting electrical fire examinations in the context of NFPA 921, Guide for Fire and Explosion Investigations. Course Hours Per Week: Class, 2. Semester Hours Credit, 2.

COURSE OBJECTIVES:

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

- a. Explain basic electrical theories
- b. Explain basic wiring methods
- c. Explain electrical components and circuitry
- d. Utilize the national electrical code
- e. Determine fire in code-complying electrical installation
- f. Determine the place of origin in electrical fires
- g. Explain electrical conductors following a fire
- h. Discuss electrical wiring in building fires
- i. Explain copper metallurgy as a diagnostic tool for analysis of the origin of building fires
- j. Explain arcing phenomenon as related to fire investigation

OUTLINE OF INSTRUCTION:

- I. Nonpower-limited fire alarm and power-limited fire alarm
 - A. Overcurrent protection
 - B. Circuit power source requirement
 - C. Circuit wiring methods
- II. National electrical code
 - A. General requirements
 - B. Wiring and protection
 - C. Wiring methods and materials
 - D. Equipment for general use

- E. Special occupancies
- F. Special equipment
- III. Origin of fire - electrical
 - A. Beginning the investigation
 - B. Effects of fire, short circuit, and overload on conductors
- IV. Examination of electrical conductors following a fire
 - A. Short circuit
 - B. Arcing
- V. Electrical wiring in building fires
 - A. Copper
 - B. Fire melting
 - C. Overcurrent
 - D. Short circuit or ground fault
 - E. Aluminum wiring
 - F. Metallography
- VI. Copper metallurgy as a diagnostic tool for analysis of the origin of building fires
 - A. Micro-structures
 - B. Macro-structures
- VII. Arc marks and gouges in wires and heating at gouges
 - A. Fire examples
 - B. Arc marks

REQUIRED TEXTBOOK AND MATERIALS:

NFPA. Fire and Electricity. NFPA.

STATEMENT FOR STUDENTS WITH DISABILITIES:

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 686-3652 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1309.