

COURSE OUTLINE
CET 231 Building Automation Networking and BACnet
2 Credit Hours

Course Description

This course builds on CET 131 and introduces students to the features and benefits of open protocols that are commonly used in building automation systems, including critical environments. Special emphasis will be given to the BACnet protocol, which is commonly used to integrate control devices into a common building automation networks. Students will learn about the BACnet Standard Object model, token passing and internetworking, alarming, scheduling and trending.

Prerequisite(s)

CRT 165 Modern Information Technology Networks

Purpose of Course

The purpose of this course is to prepare students interested in Building Automation Systems to communicate with IT experts, to connect controllers and devices, and to troubleshoot communication problems. It also offers introductory controls information for students in IT fields who are interested in how IT is used in building automation systems.

Required Materials

ATP Staff (2009). Building Automation System Integration with Open Protocols. Orland Park, IL: American Technical Publishers, INC. ISBN 978-0-8269-2012-6.

Learning Outcomes and Competencies

The intention is for the student to be able to:

1. Discuss the advantages of building automation interoperability.
 - a. Discuss differences between proprietary and open protocols.
 - b. List the leading open protocols for building automation.
 - c. Discuss the advantages of control system interoperability.
 - d. Discuss common strategies for integrating building systems within a control system.
2. Discuss various control strategies commonly used in building automation systems.
 - a. Describe how building automation systems can be used to help accomplish building management goals.
 - b. Compare various control strategies used to optimize building system equipment.
 - c. Explain the differences between open-loop and closed-loop control.
 - d. Describe variables important in calibrating a PID controller.
 - e. Explain how supervisory controllers are used in conjunction with application controllers to optimize building systems.
3. Discuss how data is transferred among devices on a network.
 - a. Discuss the roles of protocols in data communication.
 - b. Discuss the seven layers of the OSI Model.

- c. Compare the functions of different network devices.
- 4. Discuss the standardization and flexibility of BACnet in building automation systems.
 - a. Evaluate features and limitations of BACnet.
 - b. Describe what is meant by an object-oriented information model.
 - c. Describe typical physical and network infrastructures used for BACnet.

Learning Units

- I. Interoperability
- II. BAS Control Strategies Overview
- III. Data Communication
- IV. BACnet

Method of Delivery/Instruction

☒ Face-to-face ☒ Blended ☐ Online

Learning activities will be assigned within and outside the classroom to assist the student to achieve the intended learning outcomes through lecture, Instructor-led class discussion, guest speakers, group activities, lab, drills/skill practice, and others at the discretion of the instructor.

Method of Grading and Evaluation

The student will be graded on learning activities and assessment tasks. Grade determinants may include the following: daily work, quizzes, chapter or unit tests, comprehensive examinations, student projects, student presentations, class participation, and other methods of evaluation employed at the discretion of the instructor.