



BAKER COLLEGE

STUDENT LEARNING OUTCOMES

CS4410 IoT Devices
3 Semester Credit Hours

Student Learning Outcomes and Enabling Objectives

1. Interpret the Internet of Things (IoT):
 - a. Explain the components and stakeholders of the IoT ecosystem.
 - b. Explore characteristics and features of IoT.
2. Summarize data connectivity and computational infrastructure in IoT:
 - a. Identify key considerations for connectivity including data rate, power availability, range, and cost.
 - b. Compare fixed and wireless technologies for short-range, mid-range and long-range IoT connectivity.
 - c. Describe IoT edge architecture.
 - d. Implement an edge computing solution for a simple sensor application.
3. Explain data processing in IoT:
 - a. Explore interoperability between IoT data platforms including discovery, access control, and usage.
 - b. Explain the operations, architectures and languages used for stream processing of IoT data.
 - c. Investigate the application of machine vision and deep learning in IoT systems.
 - d. Explore the Semantic Web of Things (SWoT) and digital twins.
 - e. Interpret crowdsourcing and Human-in-the-Loop for IoT
4. Analyze security, trust, and privacy challenges associated with IoT:
 - a. Compare IT security and IoT security.
 - b. Explain initiatives and methodologies for addressing IoT security.
 - c. Summarize IoT data privacy requirements and approaches.
 - d. Explore blockchain and Distributed Ledger Technology (DLT) application in IoT.
5. Evaluate IoT applications in various fields and their benefits:

- a. Summarize IoT in healthcare settings, including system architecture, data collection, management, analysis, and privacy aspects.
- b. Explain energy and smart grid applications based on IoT and 5G.
- c. Explore transportation and air quality applications such as IoT-based Advanced Traffic Monitoring System.

Big Ideas and Essential Questions

Big Ideas

- Components and architecture of the Internet of Things
- Connectivity considerations, fixed and wireless technologies for IoT
- Stream processing of IoT data, machine vision, deep learning, and human-in-the-loop
- Security and privacy aspects of IoT
- IoT current and future applications

Essential Questions

1. What is the Internet of Things (IoT)?
2. What is the value of developing and using the IoT?
3. How is IoT data collected and processed?
4. What are specific aspects of security associated with the IoT and how are these handled?
5. How does IoT benefit fields such as healthcare, energy grid, and transportation?
6. What are future advances expected to take place in the evolution of IoT?

These SLOs are approved for experiential credit.

Effective: Spring 2022