

A - New Course Proposal V. 7.2022 : Entry # 3426**DEAN Decision**

Approved

Date

02/04/2025

Is this course intracollegiate or intercollegiate?

Intracollegiate

DEAN Comments

The course is only available to students in a program taught by the Computer Science Department or undertaking a Computer Science minor.

ACADEMIC PROGRAM Decision

Approved

SCHOOL EPC Decision

Approved

Date

03/07/2025

SCHOOL EPC Comments

Approved by Webb School of Engineering EPC committee on 3/7/2025--submitted by chair, Claire McCullough

Begin Form**Today's Date**

01/20/2025

Your Name:

Lloyd Williams

Your Email:lwilla5@highpoint.edu**Are you a Department Chair?**

No

Department Chair Name

Michael Oudshoorn

Email address of your Department Chair

A - New Course Proposal V. 7.2022 : Entry # 3426moudshoo@highpoint.edu

By checking below, I certify that my department chair has seen and approved the new course that I am proposing.

Yes

Please select the appropriate school overseeing this proposal:

Engineering

When should this proposal take effect?

Fall 2026

Information for the Registrar

Choose the department designator from the list below.

CSC

Proposed Course Number?

3710

Is this course cross listed?

No

Does this course replace a current course?

No

What is the title of the new course?

Internet of Things

Write the catalog description of your proposed course:

The Internet of Things (IoT) represents a transformative shift in computing—connecting everyday objects and devices to collect, share, and process data in real time. This course offers a comprehensive foundation in IoT technologies, with a focus on device programming (e.g., Arduino, Raspberry Pi), communication protocols (MQTT, Zigbee, etc.), and networking infrastructures. Students will explore the end-to-end architecture of IoT systems, from sensor-level data collection to cloud-based data integration and analytics. Through hands-on projects, participants will gain practical experience in designing, deploying, and securing scalable IoT solutions.

How many credit hours will this course be?

4

How will the course be graded?

Letter grade

Please select the course repeat option for this course:

Repeatable for credit once

A - New Course Proposal V. 7.2022 : Entry # 3426**What is the offering cycle for this course?**

Fall semester

Does your course have any prerequisites?

Yes

Please list all prerequisites this course requires:

CSC 2710

Gen Ed and Academic Programs**Is this course part of Gen Ed?**

- No

Does this course count towards a major or a minor?

Yes

Please list the Major / Minor and if it is Required or Elective

Computer Science Major/Minor - Elective

Is this course part of an academic program?

- This course does not fulfill academic program requirements

Does this course include any community engagement?

No

Does this course participate in the GoGlobal Program?

No

Information for Curriculum Review**Rationale and evidence for new course's consistency with departmental mission:****1. Expanding Career Opportunities in a High-Demand Field**

The Internet of Things (IoT) is a rapidly growing industry, projected to reach over \$1.5 trillion by 2025, with applications in smart cities, healthcare, agriculture, automotive, and industrial automation. Adding an IoT course to the curriculum equips students with in-demand skills, preparing them for careers in embedded systems, cybersecurity, software development, and data analytics.

2. Bridging the Gap Between Software and Hardware

Unlike traditional CS courses focused solely on software development, IoT requires knowledge of embedded systems, sensor networks, communication protocols, and real-time data processing. An IoT course provides hands-on experience integrating hardware with software, making students more versatile engineers.

3. Aligning with Industry Trends and Emerging Technologies

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With the rise of AI-driven IoT, edge computing, and 5G networks, IoT is at the core of technological advancements. Many industries now require expertise in machine learning on embedded devices, cybersecurity for connected systems, and real-time data analytics, making an IoT course essential for a future-ready CS curriculum.

4. Enhancing Hands-on Learning and Interdisciplinary Knowledge

An IoT course can provide practical, project-based learning experiences where students build real-world applications like:

Smart home automation systems

Wearable health monitors

Industrial IoT solutions

Environmental monitoring sensors

By integrating topics from computer networks, cybersecurity, AI, and cloud computing, an IoT class fosters interdisciplinary learning and provides students with practical, real-world problem-solving skills.

5. Addressing Cybersecurity Challenges in IoT

As billions of devices connect to the internet, IoT security has become a critical issue. A dedicated IoT course would teach students about secure coding practices, encryption methods, authentication protocols, and risk assessment, preparing them to develop secure and resilient IoT systems.

6. Supporting Research and Innovation

Many universities focus on AI, robotics, and smart systems research, where IoT plays a crucial role. An IoT course would support undergraduate research, capstone projects, and entrepreneurial initiatives in smart healthcare, autonomous systems, and intelligent transportation.

7. Meeting Accreditation and Academic Standards

ABET and other accreditation bodies emphasize practical, applied learning in CS programs. An IoT course aligns with ABET criteria by enhancing student outcomes in problem-solving, system design, teamwork, and emerging technology proficiency.

Conclusion

Adding an IoT course to the CS curriculum ensures that students gain critical technical skills, stay competitive in the job market, and contribute to emerging innovations. With IoT continuing to transform industries, it is essential that CS students receive formal training in this field to be prepared for the future of computing and technology.

List all student learning outcomes for this course.

By the end of this course, students will be able to:

1. Analyze the architecture, components, and applications of IoT systems to understand their role in modern technology ecosystems.
2. Develop and program IoT devices using industry-standard tools and implement various communication protocols such as MQTT and Zigbee.
3. Integrate IoT data with cloud platforms, leveraging appropriate infrastructure for scalability and efficiency.
4. Evaluate and implement robust security and privacy measures to mitigate risks in IoT applications.

List any units or content areas that will be required for all sections of this course.

N/A

List any assignments, tests, or other assessments that will be required for all sections of this course.

N/A

List any readings or other materials that will be required for all sections of this course.

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N/A

List any course policies that will be required for all sections of this course.

N/A

If you would like to specify how requirements for contact hours must be met for all sections of this course, please indicate below. (e.g., if any experiential learning activities will replace seat time)

N/A

Sample Syllabus

- [CSC-3710-Internet-of-Things.pdf](#)