

ECE569A: Selected Topics in Computer Engineering: Internet of Things: Analytics and Security

Territory Acknowledgement

We acknowledge and respect the Lək'wəŋən (Songhees and Esquimalt) Peoples on whose territory the university stands, and the Lək'wəŋən and W̱SÁNEĆ Peoples whose historical relationships with the land continue to this day.

Course Dates

CRN(s):	Section A01 CRN: 11039 Section A02 CRN: 11040
Term:	2024
Course Start:	2024-09-04
Course End:	2024-12-20
Withdrawal with 100% reduction of tuition fees:	2024-09-17
Withdrawal with 50% reduction of tuition fees:	2024-10-08
Last day for withdrawal (no fees returned):	2024-10-31

Scheduled Meeting Times (M=Mon, T=Tue, W=Wed, R=Thu, F=Fri)

Section:	Location:	Classes Start:	Classes End:	Days of week:	Hours of day:	Instructor:
A01		2024-09-04	2024-12-04	R	18:30-21:20	Li, Wei
A02		2024-09-04	2024-12-04	R	18:30-21:20	Li, Wei

Instructor(s) Li, Wei [weili at engr dot uvic dot ca](mailto:weili@engr.uvic.ca)

TA Information

- Wu Guolong guolongwu@uvic.ca
- Abdalla Walaeldin Walaeldina@uvic.ca

Course Objectives

This course will introduce the fundamental concepts and architecture of Internet of Things (IoT), including the hardware and software which support the IoT structure and devices. Essential standards, IoT data transmission protocols will also be explained. IoT data processing and analytics strategy will be studied under the unique IoT requirements, such as device identity, dynamic data volume, and real-time processing. IoT device and system security, privacy vulnerabilities, and mitigation technologies will be covered. Practical IoT application examples, IoT business and market insights will also be discussed.

Learning Outcomes

- **Understand** the fundamental concepts of IoT, supporting technologies and standards.
- **Analyze** and formulate a given problem, and select the appropriate technique(s) to solve it.
- **Apply** different IoT techniques to solve real-world practical problems.
- **Evaluate** the performance of IoT techniques using standard metrics and benchmark datasets.
- **Enhance** their design and computing skills by the use of programming and design tools.

Syllabus

The course topics will be covered as follows. Instructor may modify the content as required to ensure proper coverage.

No 1	Week	CONTENT	ASSIGNMENTS/Project/Activities
1	09/05	Introduction to IoT concept, supporting technologies, and standards.	
2	09/12		Establish Project Group: Due Oct 6 (5%)
3	09/19	IoT computing and Analytics, device identity, dynamic data volume, real-time processing and Edge/Cloud Computing, project.	Assignment 1 Due Oct 13 (10%)
4	09/26		Project Topics
5	10/03	IoT Applications and Eco-System, Industrial and Academic opportunities, project. Midterm Review.	In Class Practice (2%)
6	10/10		In Class Practice (2%)
7	10/17	MIDTERM EXAM Assignment	30%
8	10/24	IoT device and system security, privacy vulnerabilities, and mitigation technologies. Midterm Review, tutorial.	Assignment 2 Due Nov 24 (10%)
9	10/31		
10	11/07	IoT security applications, Project Review, project report and presentation requirements.	In Class Practice (2%)
11	11/14		In Class Practice (2%)
12	11/21	Practical IoT application examples, IoT business and market insights, Course Review.	In Class Practice (2%)
13	11/28		Project Report + Presentation PPT Due 12/01 (35%)

Textbook & Course Materials

1. Title: Internet of Things (IoT), Technologies, Applications, Challenges and Solutions Author: BK Tripathy, J Anuradha Publisher: CRC Press Year: 2020
2. Title: Internet-of-Things (IoT) Systems Architectures, Algorithms, Methodologies Author: Serpanos, Dimitrios, Wolf, Marilyn Claire Publisher: Springer Press Year: 2018
3. Title: Security and Privacy in Internet of Things (IoTs) Models, Algorithms, and Implementations Author: Fei Hu Publisher: CRC Press Year: 2020

Course Delivery

Fully online via Zoom. Please see the following Zoom Classroom information. Students are required to login Zoom with UVIC access, guest access will not be allowed.

Join Zoom Meeting <https://uvic.zoom.us/j/88431214958?pwd=K2JlSGZKZ01SeldPNWl1Zi9QMmhSZz09>

Meeting ID: 884 3121 4958 Password: 230097 One tap mobile +16475580588,,88431214958# Canada +17789072071,,88431214958# Canada

Dial by your location +1 647 558 0588 Canada +1 778 907 2071 Canada Meeting ID: 884 3121 4958

Learning & Teaching Technologies

- Desktop or Laptop Computer with webcam/microphone/speakers/headsets for online lecture & tutorials (worst case a smartphone will do)
- Scanner (desktop or phone-based)
- Printer (useful but not mandatory)
- Internet Access
- Software installed on your computer: Zoom, MS office, PDF viewer
- General programming tools such as C/C++, Python or Java.

Please make yourself familiar with Zoom, which we will use for live interaction in tutorial, office hours, etc. Students are required to login with university access to Zoom to join the classes. No guest access allowed.

<https://www.uvic.ca/systems/services/avmultimedia/zoomvideoconferencing/index.php>

Assessment

Assessment	Weight
1. Assignments	20%
2. Mid-term Assignment	30%
3. Project	40%
4. In Class Participation	10%

Notes

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current [Graduate Calendar](#).

Coursework Mark Appeals: All marks must be appealed within 7 days of the mark being posted.

Important: All deadlines and schedules for this course will reference Pacific Daylight Time.

General Information

Note to students: Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the [Chair of the Department](#) by email, or the [Chair's Assistant](#) to set up an appointment.

Course Lecture Notes: Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.

Equality: This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the [Centre for Accessible Learning](#). The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

Academic Integrity requires commitment to the values of honesty, trust, fairness, respect, and responsibility. It is expected that students, faculty members and staff at the University of Victoria, as members of an intellectual community, will adhere to these ethical values in all activities related to learning, teaching, research and service. Any action that contravenes this standard, including misrepresentation, falsification or deception, undermines the intention and worth of scholarly work and violates the fundamental academic rights of members of our community. This policy is designed to ensure that the university's standards are upheld in a fair and transparent fashion.

Attendance: Students are expected to attend all classes in which they are enrolled. An academic unit may require a student to withdraw from a course if the student is registered in another course that occurs at the same time.

An Instructor may refuse a student admission to a lecture, laboratory, online course discussion or learning activity, tutorial or other learning activity set out in the course outline because of lateness, misconduct, inattention or failure to meet the responsibilities of the course set out in the course outline. Students who neglect their academic work may be assigned a final grade of N or debarred from final examinations.

Students who do not attend classes must not assume that they have been dropped from the course by an academic unit or an instructor. Courses that are not formally dropped will be given a failing grade, students may be required to withdraw and will be required to pay the tuition fee for the course.

Resources for Students:

- [UVic Learn Anywhere](#)
- [Library resources](#)

- [Indigenous Student Services \(ISS\)](#)
- [Centre for Academic Communication \(CAC\)](#)
- [Math & Stats Assistance Centre](#)
- [Learning Assistance Program \(LSP\)](#)
- [Community-Engaged Learning \(CEL\)](#)
- [Academic Concessions](#)
- [Academic Concessions & Accommodations](#)
- [Centre for Accessible Learning \(CAL\)](#)
- [Academic Accommodation & Access for students with disabilities - Policy AC1205](#)
- [Student Groups & Resources](#)
- [Student Wellness](#)
- [Office of the Ombudsperson](#)

University Statements & Policies

- [Information for all students](#)
- [Attendance](#)
- [Creating a respectful, inclusive and productive learning environment \(general policies\)](#)
- [Accommodation of Religious Observance](#)
- [Student Conduct](#)
- [Academic Integrity](#)
- [Non-academic Student Misconduct](#)
- [Standards of Professional Behaviour \(Faculty of Engineering and Computer Science\)](#)
- [Academic Accommodations and Accessibility](#)
- [Accessibility](#)
- [Diversity & Inclusion Supports \(Faculty of Engineering and Computer Science\)](#)
- [Diversity / EDI \(VPAC's Commitment\)](#)
- [Equity statement](#)
- [Sexualized Violence Prevention and Response](#)
- [Discrimination and Harassment Policy](#)
- [Graduate Supervision Policy](#)

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