

Syllabus for *Pervasive Computing*

CIS 373

Winter 2024

Generated January 4, 2024

This course introduces students to mobile, ubiquitous, pervasive, and Internet-of-Things (IoT) computing systems and services. Students will develop design skills for pervasive software development using different device platforms. It also provides an overview of future trends and ongoing research in these fast growing areas.

Contact Information:

Instructor: Dr. Erik Fredericks
E-mail: frederer@gvsu.edu
Office: D-2-210 MAK
Office Hours: MWF, 10am – 11am, (MF) In-Office, (W) Zoom (remote)
Course Page: Blackboard
Format: Synchronous
Discord: <https://discord.gg/pNaTDKH>
Class room: Mackinac Hall D2233
Class time: R, 6:00pm – 8:50pm
Midterm: (Thursday) February 22, 1:00pm – 2:15pm
Final exam: (Thursday) April 25, 6:00pm – 8:50pm

Course Objectives:

After successful completion of the course, the students will be able to:

- Identify aspects of mobile, ubiquitous and pervasive computing systems.
- Analyze the current problems in pervasive systems and the need for using the IoT as a solution vehicle.
- Develop research skills to stay current with the rapidly changing nature of data acquisition and technologies in the IoT sensor based systems.
- Build Internet of Things (IoT) solutions.
- Apply defensive security techniques to protect IoT infrastructure

Prerequisites:

- CIS162 and CIS230

Course Materials:

Primary: Instructor's Lecture Notes and Handouts (via Blackboard)

Secondary: Internet of Things, Principles and Paradigms. Rajkumar Buyya and Amir Vahid Dastjerdi(Eds.), Publisher: Elsevier. 2016 (Recommended)

Secondary: Ubiquitous Computing: Smart Devices, Environments, and Interactions. Stefan Poslad. Publisher: Wiley. 2009 (Recommended)

Course Delivery - In Person:

This course will be delivered **in person**, following proper social distancing protocols. If it becomes necessary to change delivery formats, we will change to an *online synchronous* format.

Grading Proportions:

The last day to drop a course with a grade of “W” is **March 22, 2024**.

The CR/NC date is **February 2, 2024**.

Your grade is based on your performance in your homework assignments, term project, exams, and participation.

Graded Item	Points Available
Participation:	15%
Coursework:	30%
Term Project	25%
Midterm Exam:	15%
Final Exam:	15%
Total	100%

A	$\geq 93\%$	B-	$\geq 80\%$	D+	$\geq 67\%$
A-	$\geq 90\%$	C+	$\geq 77\%$	D	$\geq 60\%$
B+	$\geq 87\%$	C	$\geq 73\%$	F	$< 60\%$
B	$\geq 83\%$	C-	$\geq 70\%$		

Late Policy: Work submitted after the due date will incur 10% late penalty per day, with a minimum penalty of 10%. No assignment will be accepted more than 3 days late.

If you are struggling with meeting deadlines while working remotely, please contact me as soon as possible!

Coursework:

Coursework in this class consists of in-class assignments (participation), homework assignments, and a half-semester term project. Assignments are graded for correctness *and* communication. Pay attention to factors including content, organization, clarity/style, and mechanics.

1. Homework assignments must be completed individually (unless otherwise noted). However, it is expected that several of the finished and graded homework assignments will be used to support the creation of the term project report.
2. The term project is a half-semester long effort *centered around pervasive computing*. Grades will reflect the quality of the software created. Groups of **1–3** people will be accepted, where requests for groups of a larger size will be handled on a case-by-case basis.

Course Policies and General Information:

- (1) The Fred Meijer Center for Writing, with locations at the Allendale and Pew/Downtown Grand Rapids campuses, is available to assist you with writing for any of your classes. Writing consultants, who are fellow GVSU students, are trained to help you with all stages of your writing process, from brainstorming to organizing to editing your papers. Simply bring a draft of your paper, the assignment sheet, and your questions/concerns to any of the Center's locations. Also, through your Gmail account, you have access to online consultations through Google Docs. The Center's services are free and you can drop in and work with a consultant or make an appointment, either through our website or by calling the Center (331-2922). For more information about our services and locations, please visit our website: <http://www.gvsu.edu/wc/>
- (2) **Cooperation and cheating:** Be aware of the SCIS policy on academic honesty. Visit the department website (<http://www.cis.gvsu.edu/academic-honesty/>) for the full statement on academic honesty. Academic dishonesty will not be tolerated. Violations will result in *at least* failure of the assignment. However, violations may also include failure of the entire course and referral to the university resulting in additional consequences, including possible expulsion. You are welcome to discuss assignments with each other or myself, however do not copy answers or plagiarize. If you are unsure of what plagiarism means, please either ask me or visit the department website mentioned above.
- (3) Participation is *not* equivalent to attendance. Please ensure you keep up with the in-class assignments to ensure that you are staying current with the class (and receive the credit for it).
- (4) Special Needs: If there is any student in this class who has special needs because of a disability, please contact Disability Support Resources at <http://www.gvsu.edu/dsr/> (DSR) at 616-331-2490.
- (5) This course is subject to the GVSU policies listed at <http://www.gvsu.edu/coursepolicies/>.
- (6) In Case of Emergency Fire: Immediately proceed to the nearest exit during a fire alarm.

Do not use elevators. More information is available on the University's Emergency website located at <http://www.gvsu.edu/emergency>.

- (7) This syllabus is deprecated in favor of any syllabus uploaded to the course Blackboard page with a *more recent* "generated" date. This version of the syllabus was generated on January 4, 2024.

Course Schedule:

A course schedule of topics project deadlines are included in the table below. This schedule may be adjusted throughout the semester as needed. Note, the week that topics are covered or even the order they are covered is tentative and may be adjusted throughout the semester.

Tentative Order	Lecture/Discussion Topic
January 15th, 2024, Martin Luther King Jr. Day	No classes!
March 3rd – 10th, 2024, Spring break	No classes!
1.	Introduction to IoT
2.	System architectures
3.	Wireless sensor networks
4.	Introduction to research (tentative)
5.	Vehicular ad hoc networks (VANETs)
6.	Wearable computing
7.	Edge computing
8.	Arduino Experiments
9.	Security and Privacy
10.	Remaining material and term project wrapup/ student presentations
Midterm exam	Thursday, February 22, 6:00pm – 8:00pm
Final exam	Thursday, April 25, 6:00pm – 8:50pm