

**IUPUI**  
**Dept. of Computer and Information Science**  
**CSCI-43300 Introduction to Internet of Things (3 credit hours)**

**Spring 2023**

**COURSE SYLLABUS**

**Instructor:** Dr. Yao Liang  
Dept. of Computer and Information Science

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**Brief Description:** This course describes the basic concepts of Internet of things, and wireless networks of smart objects. It provides principles, knowledge and information of the latest technologies about the various aspects of the subject. Topics include the concept and architecture of Internet of things, communication mechanisms, lightweight IP stack, protocols, operating systems, devices, and various applications. It covers fundamental principles of Internet of Things.

**Pre-requisites:** This course builds on the background and knowledge developed in a standard computer science undergraduate program, including basic understanding of the fundamentals of network architectures and protocols, languages, and operating systems. The course requires the prerequisite courses CSCI 36200 Data Structures and CSCI 40300 Operating Systems, or permission from instructor.

**Lectures:** Tuesdays and Thursdays, 12:00 – 1:15 PM (LD020)

I expect you to attend the lectures, and you are responsible for all materials discussed and any announcements made in the lectures. Students are responsible for getting their work done on time, working independently, attending class, and checking Canvas and their email for new announcements and assignments. They are responsible not only for the reading material from the textbook, but also all the material covered in lectures including any specified additional reading.

**Office Hours:** Tuesdays, 8:30 - 9:30 PM (online via Zoom);  
Thursdays, 11:00 AM-12:00 PM (Hardware Lab SL253)

**Textbooks (optional):**

1. Jean-Philippe Vasseur, Adam Dunkels, Interconnecting Smart Objects with IP, Morgan Kaufmann, 2010.

**Homework:** 3-4 Homework assignments. Homework is due by the beginning of the class on the due date. Late homework will not be accepted. In exceptional circumstances (e.g., illness, company business, religious observances) extensions may be granted. However, all extensions must be approved by instructor before the due date. All work submitted should be finished by your own, although discussion with your classmates is permitted.

**Project:** There will be 2-3 projects. The projects will require some hardware interface related work and programming. We usually have a two-person team to work on assigned projects with a set of hardware device checked out from our Lab. At the end of semester, each team returns its device kit to the Lab. You can also purchase your own device kit, either Raspberry Pi Kits or Arduino Kits, based on your choice. The cost of the device kit ranges from \$40 to \$90, depending on either Arduino or Raspberry Pi Kit you choose. When you order your device kit, please make sure WiFi module is included in your kit. Here are some websites for your reference.

<https://www.canakit.com/raspberry-pi-4-ultimate-kit.html>

[https://usa.banggood.com/Geekcreit-Mega-2560-The-Most-Complete-Ultimate-Starter-Kits-No-Battery-Version-Geekcreit-for-Arduino-products-that-work-with-official-Arduino-boards-p-1409970.html?gmcCountry=US&currency=USD&createTmp=1&utm\\_source=googleshopping&utm\\_medium=cpc\\_bgcs&utm\\_content=frank&utm\\_campaign=frank-ssc-usg-all-0306&ad\\_id=423759569880&gclid=CjwKCAjw4pT1BRBUEiwAm5QuR5x-waB8oWdT2pimq87xLlqpQzjiFpiWLHpmPK0sDZW4tRiOio3x\\_xoCQVMQAvD\\_BwE&cur\\_warehouse=CN](https://usa.banggood.com/Geekcreit-Mega-2560-The-Most-Complete-Ultimate-Starter-Kits-No-Battery-Version-Geekcreit-for-Arduino-products-that-work-with-official-Arduino-boards-p-1409970.html?gmcCountry=US&currency=USD&createTmp=1&utm_source=googleshopping&utm_medium=cpc_bgcs&utm_content=frank&utm_campaign=frank-ssc-usg-all-0306&ad_id=423759569880&gclid=CjwKCAjw4pT1BRBUEiwAm5QuR5x-waB8oWdT2pimq87xLlqpQzjiFpiWLHpmPK0sDZW4tRiOio3x_xoCQVMQAvD_BwE&cur_warehouse=CN)

**Exams:** There will be a midterm and a final project.

**Class materials** (subject to adjustment):

Introduction	15%
IoT application layer	25%
Lightweight IP stack	10%
Wireless sensor networks	15%
Programming languages	10%
Devices and operating systems	15%
Applications	10%
	<hr/> 100%

**Grading:** Your grade will consist of 4 components: homework, projects, midterm and final exams. The breakdown of the grades is as follows:

- Homework and quiz 15%
- Projects 30%

- Midterm 30%
- Final Project 25%

If you feel that an error is made in grading a problem set or an exam, you must present a written appeal within two weeks after the assignment or exam is returned to you. Grades will not be changed after the two-week period. Your appeal should be specific. Appeals should be submitted to the instructor.

**Academic Integrity:** Students are encouraged to discuss the concepts and principles amongst themselves. Such discussions may help in a better understanding of the topics taught in the class. *However, the student discussion should not result in identical or near identical answers/report/code/documentation for projects, homeworks, term reports, etc.*

- All classwork and material submitted for grading must be your own effort, unless specified otherwise by the Instructor.
- Proper credit (in the form of correct citations and references) should be given wherever applicable and direct cutting-and-pasting must be avoided, unless indicated as verbatim (e.g., putting the text in quotation marks).
- ACM's Code of Ethics can be found here: <http://www.acm.org/about/code-of-ethics>.

#### **Policy on Academic Dishonesty in the Department of Computer and Information Science at IUPUI:**

The faculty in the Department of Computer and Information Science (henceforth, referred to as the department) values academic honesty to be absolutely essential and expects all students to conform to it. Any violation of academic integrity is considered a serious offense and will result in severe consequences.

The policy against violations of academic integrity will be enforced at the departmental level across all courses.

If a student does not abide by this policy then, for the first violation, he/she will receive zero points for the component of the course on which academic misconduct occurred and will be reported to the Department Chairperson. If the violation is not related to a specific assignment or exam, the course instructor reserves the right to impose the zero-point penalty to any component of the course.

For a second violation of academic integrity (occurring anywhere in the graduate or undergraduate curriculum, in the same or a different semester, in the same or a different course), the student will receive a failing grade for the course where the second violation occurred, as enforced by the Department Chair and the School of Science Dean's Office, and, in addition, an official reporting process will be initiated by the Department Chair as per IUPUI's Student Conduct Policies: <http://studentaffairs.iupui.edu/student-rights/student-code/>.

For a third violation, the department will initiate dismissal request from the program in which the student is enrolled.

In all cases of academic integrity violation, the involved student will be notified in writing at the time the offense is observed and acknowledge the receipt of such notice in writing.

This is the minimal policy and the department reserves the right to impose more severe penalties for the first and/or second offense of academic misconduct.

The student will have opportunities to file appeals at the department, the school, and the university levels, to contest the academic dishonesty finding and/or the imposed penalty.

At the department level, any appeal will be made to the department's graduate or undergraduate committees respectively, depending on whether the student is a graduate or an undergraduate student. The graduate or undergraduate committee chair will substitute any committee members involved in the penalty imposition process with other faculty members with no conflicts of interest before processing the appeal. If desired, a student can pursue a further appeal to the School of Science Appeals Committee. Finally, the student can also submit an appeal to the IUPUI Appeals Committee.

**Special Needs and Circumstances:** Any student with special needs or circumstances should feel free to contact the instructor so that appropriate arrangements can be made to accommodate these needs.