Hokkaido University Syllabus					
■■ Course Title					
Introduction to Wireless Sensor Networks and IoT					
■■ Subtitle					
■■ Instructor (Institution)					
Yoshikazu MIYANAGA (Faculty of Information Science and Technology)					
■■ Other Instructors (Institution)					
Yoshikazu MIYANAGA (Faculty of Information Science and Technology) Eryk Dutkiewicz Negin Shariati Moghadam					
■■ Course Type			■■ Open To Other Faculties / Schools		OK
■■ Year	2019	■■ Semester	2nd Semester	■■ Course Number	215602
■■ Type of Class	Lecture	■■ Number of Credits	1	■■ Year of Eligible Students	∼
■■ Eligible Department / Class				■■ Other Information	
■■ Numbering Code					
■■ Major Category Code	■■ Major Category Title				
■■ Level Code	■■ Level				
5	Specialized Subjects (basics) in graduate level (Master's Course and Professional Course), Inter-Graduate School Classes				
■■ Middle Category Code	■■ Middle Category Title				
■■ Small Category Code	■■ Small Category Title				
■■ Language Type					
Classes are in English.					

■■ Key Words

Wireless Sensor Network, IoT, Internet, Security

■■ Course Objectives

Wireless sensor networks are distributed systems, in which autonomous devices, sometimes called Motes, collect environmental data (such as location, speed, temperature, humidity and sound level) or, more recently, medical data (such as heart rate, blood oxygen level and pulse rate). The data is collected across the network, aggregated and fed into business applications. Sensor networks and IoT devices are an enabler for very different applications, including environmental monitoring, agricultural monitoring, medical monitoring, habitat monitoring and military surveillance.

■■ Course Goals

By the end of this course you will be able to
1. know the basic structure of wireless sensor network and IoT.
2. explain many applications by using wireless sensor network and IoT.
3. present the behavior of wireless sensor network and IoT clearly.

Course Schedule

Lecture 1: a Overview of the subject, b Introduction and background on WSN and IoT, c Applications of WSN/IoT
Lecture 2: a WSN characteristics, b WSN architecture and topologies
Lecture 3: a Sensors and actuators, b Sensing, actuation and signal processing
Lecture 4: a Routing in WSN (1) Flat-Based Routing
Lecture 5: a Routing in WSN (2) Hieratical-Based Routing and Location-Based Routing
Lecture 6: a Security in WSN and IoT (1), b WSN/ IoT Attacks at Different Layers
Lecture 7: a Security in WSN and IoT (2), b Possible strategies against WSN/IoT Attacks
Lecture 8: a Resource (energy) management in WSN/IoT , b Energy Harvesting for IoT devices，c Demonstration of real measurements of embedded sensors at UTS, FEIT building, d Industrial applications of WSN/ IoT technologies-Smart Cities, e Suggestions for future career in IoT area as an engineer or researcher

Homework

It is required for students to make enough preparation and review before and after each lecture. For each lecture, 90 min preparation and 90 min review are required.
Lecture materials are available on the e-Leaning of Hokkaido University.

Grading System

Students whose attendance rate is less than 70% cannot get any evaluation. Evaluation is based on the term report (90%) and the lecture participation (10%). By the term report, students' deep understanding of a specific technology and presentation skills are evaluated. The evaluation is based on 5 grades. The ratio of S is not greater than 15% of registered students. The ratio of S and A is not greater 50% of registered students.

Textbooks

References will be introduced in the lecture.

Reading List

Websites

Website of Laboratory

https://csw.ist.hokudai.ac.jp/

Additional Information

Recommended Course (Course highly recommended to be taken together with this course):
1. Cyber Security Fundamentals
2. ABC of Information Science and Technology: Introduction to Artificial Intelligence, Big Data, and Cybersecurity for Graduate Students

Update

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