北海道大学シラバス		

■ 科目名

Introduction to Wireless Sensor Networks and IoT

■ 講義題目

■ 責任教員（所属）

宮永　喜一 (大学院情報科学研究院)

■ 担当教員（所属）

宮永　喜一 (大学院情報科学研究院)
Eryk Dutkiewicz (シドニー工科大学)
Negin Shariati Moghadam (シドニー工科大学)

■ 科目種別	情報科学院専門科目			■ 他学部履修等の可否	可
■ 開講年度	2019	■ 期間	２学期	■ 時間割番号	215602
■ 授業形態	講義	■ 単位数	1	■ 対象年次	～
■ 対象学科・クラス				■ 補足事項	

■ ナンバリングコード	
■ 大分類コード	■ 大分類名称
■ レベルコード	■ レベル
5	大学院（修士・専門職）専門科目（基礎的な内容の科目）、大学院共通授業科目
■ 中分類コード	■ 中分類名称
■ 小分類コード	■ 小分類名称

■ 言語
英語で行う授業

■ キーワード

Wireless Sensor Network, IoT, Internet, Security

■ 授業の目標

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.

■ 到達目標

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.

■ 授業計画

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

■ 準備学習(予習・復習)等の内容と分量

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.

■ 成績評価の基準と方法

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.

■ テキスト・教科書

References will be introduced in the lecture.

■ 講義指定図書

■ 参照ホームページ

■ 研究室のホームページ

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

■ 備考

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

■ 更新日時

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