印刷 閉じる

北海道大学シラバス

| 科目名 | | | | | |
|---|---|---|---|---|---|
| Blockchain | | | | | |
| 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 )<br>Ren Ping Liu ( ｼﾄﾞﾆｰ工科大学 )<br>Ying He ( ｼﾄﾞﾆｰ工科大学 )<br>Beeshanga Abewardana Jayawickrama ( ｼﾄﾞﾆｰ工科大学 ) | | | | | |
| 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 | 1 学期 | 時間割番号 | 215607 |
| 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 | | | | | |
| 実務経験のある教員等による授業科目 | | | | | |
| | | | | | |

## キーワード

Internet, Cybersecurity, Blockchain, IoT, Ethereum, DApps, Smart contracts

## 授業の目標

The new technology of Blockchain will be introduced. It has been developed over internet with cybersecurity. In order to keep high secure communications, this technology has been designed. A blockchain is a growing list of records, called blocks, which are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. With a blockchain, many people can write entries into a record of information, and a community of users can control how the record of information is amended and updated. All entries are not the product of a single publisher. No one person controls the information.
This techniques are widely spread recently and useful for electronic commerce. Thought this lecture, a student can study new technology in the field of ICT and know current real applications.

## 到達目標

This course aims at students' understanding of several network architectures of wide area network, local area network, personal area network with cybersecurity. It is expected for the students to obtain basic knowledge for creating novel applications, systems, and services over new cybersecurity systems.

## 授業計画

Lecture 1: Introduction to IoT and Blockchain technologies
Lecture 2: Fundamentals of Blockchains
Lecture 3: Introduction to cryptography & crypto currencies
Lecture 4: Introduction to Ethereum
Lecture 5: Blockchain protocols
Lecture 6: Anonymity, traceability and privacy
Lecture 7: Smart contracts, DAO and programming tools
Lecture 8: IoT and Blockchain applications

## 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.

## 有する実務経験と授業への活用

## 他学部履修の条件

## 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

This course will be provided as part of the Hokkaido Summer Institute.
For more information (invited lecturers, course details, etc.), please visit the website below:
https://hokkaidosummerinstitute.oia.hokudai.ac.jp/courses/CourseDetail=G110

## 研究室のホームページ

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

## 備考

Related Course (HSI)
Mandatory Course (Course required to be taken together with this course): Software Defined Networks
Recommended Course (Course highly recommended to be taken together with this course): Cyber Security

## 更新日時

2019/02/04 10:46:37

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| Hokkaido University Syllabus | | | | | |
|---|---|---|---|---|---|
| Course Title | | | | | |
| Blockchain | | | | | |
| Subtitle | | | | | |
| | | | | | |
| Instructor (Institution) | | | | | |
| Yoshikazu MIYANAGA ( Faculty of Information Science and Technology ) | | | | | |
| Other Instructors (Institution) | | | | | |
| Yoshikazu MIYANAGA ( Faculty of Information Science and Technology )<br>Ren Ping Liu<br>Ying He<br>Abewardana BEESHANGA | | | | | |
| Course Type | | | | Open To Other Faculties / Schools | OK |
| Year | 2019 | Semester | 1st Semester | Course Number | 215607 |
| 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. | | | | | |
| Course list by the instructor with practical experiences | | | | | |
| | | | | | |

## Key Words

Internet, Cybersecurity, Blockchain, IoT, Ethereum, DApps, Smart contracts

## Course Objectives

The new technology of Blockchain will be introduced. It has been developed over internet with cybersecurity. In order to keep high secure communications, this technology has been designed. A blockchain is a growing list of records, called blocks, which are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. With a blockchain, many people can write entries into a record of information, and a community of users can control how the record of information is amended and updated. All entries are not the product of a single publisher. No one person controls the information.
This techniques are widely spread recently and useful for electronic commerce. Thought this lecture, a student can study new technology in the field of ICT and know current real applications.

## Course Goals

This course aims at students' understanding of several network architectures of wide area network, local area network, personal area network with cybersecurity. It is expected for the students to obtain basic knowledge for creating novel applications, systems, and services over new cybersecurity systems.

## Course Schedule

Lecture 1: Introduction to IoT and Blockchain technologies
Lecture 2: Fundamentals of Blockchains
Lecture 3: Introduction to cryptography & crypto currencies
Lecture 4: Introduction to Ethereum
Lecture 5: Blockchain protocols
Lecture 6: Anonymity, traceability and privacy
Lecture 7: Smart contracts, DAO and programming tools
Lecture 8: IoT and Blockchain applications

## 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.

## Practical experience and utilization for classes

## Condition of tasking the subject

## Textbooks

References will be introduced in the lecture.

## Reading List

## Websites

This course will be provided as part of the Hokkaido Summer Institute.
For more information (invited lecturers, course details, etc.), please visit the website below:
https://hokkaidosummerinstitute.oia.hokudai.ac.jp/courses/CourseDetail=G110

## Website of Laboratory

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

## Additional Information

Related Course (HSI)
Mandatory Course (Course required to be taken together with this course): Software Defined Networks
Recommended Course (Course highly recommended to be taken together with this course): Cyber Security

## Update

2019/02/04 10:46:38