Course description
Blockchain theory and usage

SDU

Blockchain theory and usage

Academic Study Board of the Faculty of Engineering

Teaching language: English
EKA: T520011102, T520011112
Censorship: Second examiner: External, Second examiner: None
Grading: 7-point grading scale, Pass/Fail
Offered in: Odense
Offered in: Autumn
Level: Master

Course ID: T520011101
ECTS value: 5

Date of Approval: 07-04-2021

Duration: 1 semester

Version: Archive

Course ID
T520011101

Course Title
Blockchain theory and usage

ECTS value
5

Internal Course Code
SM3-BLO

Responsible study board
Academic Study Board of the Faculty of Engineering

Date of Approval
07-04-2021

Course Responsible

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Teachers

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Programme Secretary

Name	Email	Department	City
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Offered in
Odense

Level
Master

Offered in
Autumn

Duration
1 semester

Recommended prerequisites
To follow this course in practice it is strongly recommended to have the following:

- Basic programming skills
- Knowledge of software engineering processes
- Fundamental understanding of mathematics and mathematical notation

Learning objectives - Knowledge
At the end of the course the student is expected to:

- Describe the features, and pros and cons, of blockchain technology
- Explain the theory of distributed ledgers
- Explain the theory of smart contracts
- Describe types of applications of distributed ledgers and smart contracts
- Explain cryptocurrencies, different categorizations and their use
- Explain byzantine agreement
- Explain the common methods for achieving consensus on the blockchain
- Describe the security risks and tradeoffs of smart contracts
- Explain authenticated agreement
- Explain distributed storage
- Explain symmetric and asymmetric cryptography

Learning objectives - Skills
Explain concepts behind and implementation of the following:

- Distributed ledgers
- Smart contracts
- Decentralization
- Cryptocurrencies
- Ciphers and encryption
- Distributed storage

Learning objectives - Competences

- Ability to design and implement an application based on blockchain technology
- Ability to analyse the application of blockchain technologies to specific problems
- Ability to rationalize and motivate over the use of blockchain database versus traditional databases and vice-versa for applications
- Ability to implement a prototype using blockchain technology

Content
The purpose of the course is to give an understanding of distributed ledgers, decentralization, and smart contracts. The course provides both a theoretical and practical perspective of blockchain and related technologies.

The following topics will be covered
- The theory behind distributed ledgers, decentralization, and smart contracts
- Cryptocurrencies
- Basics of Cryptography
- Tools and technologies for implementing blockchain, smart contracts, and cryptocurrencies

URL for Skemaplan
Odense
Show full time table

Teaching Method
Lectures, laboratory exercises, and project work.

Number of lessons
48 hours per semester

Teaching language
English

Examination regulations

Exam regulations

Name
Exam regulations

Examination is held
By the end of the semester

Tests

Exam

EKA
T520011102

Name
Exam

Description
The individual portfolio/project report will be included in the assessment.

Form of examination
Oral exam

Censorship
Second examiner: External

Grading
7-point grading scale

Identification
Student Identification Card - Date of birth

Language
English

ECTS value
5

Prerequisites

Type	Prerequisite name	Prerequisite course
Exam	T520011112, Examination conditions	T520011101, Blockchain theory and usage

Exam regulations

Name
Exam regulations

Examination is held
By the end of the semester

Tests

Examination conditions

EKA
T520011112

Name
Examination conditions

Description
Completion of the mandatory activities and the project in the module is a prerequisite for the exam. Criteria of fulfilment will be determined before the module starts and described in the module plan.

Form of examination
Compulsory assignment

Censorship
Second examiner: None

Grading
Pass/Fail

Identification
Student Identification Card - Date of birth

Language
English

ECTS value
0

Courses offered

Period	Offer type	Profile	Programme	Semester
Fall 2020	Optional	Software Engineering 2018-2019	Master of Science in Engineering (Software Engineering) | Odense	
Fall 2020	Optional	Software Engineering, MSc, 2020	Master of Science in Engineering (Software Engineering) | Odense	

Studieforløb

Profile	Programme	Semester	Period