This course will introduce you to the forefront of blockchain and distributed ledger technology, introducing both foundations, tools, and platforms in this rapidly evolving field. The lectures will cover the underlying topics of distributed systems, cryptography, game theory, communication protocols, data storage, algorithms and data structures, languages for expressing protocols (contracts) and programs (smart contracts).

WHAT YOU WILL LEARN
You will gain basic blockchain programming skills and an understanding of strengths, trade-offs, risks and legal aspects of blockchain systems. More specifically, after this course you will be able to:

- Explain the fundamental building blocks of blockchain/DLT systems and the architectures of existing popular blockchain/DLT systems
- Understand inherent trade-offs preventing the development of a single blockchain system that is best for all uses
- Identify risks of and attacks on smart contracts in popular blockchain/DLT systems
- Evaluate contractual and regulatory aspects of setting up and operating a blockchain-based project with smart contracts
- Perform group-based smart contract programming in Ethereum (the most widely used public blockchain systems) on distilled, representative problems, such as the issuance of new cryptocurrencies (tokens, coins), crowdfunding (initial coin offerings), financial contracts and resource tracking.

COURSE CONTENT
The course is structured as follows:

Day 1: Introduction to distributed systems, cryptographic techniques, decentralized consensus protocols and contracts (including smart contracts) for blockchain/DLT systems, including fundamental trade-off theorems; up-to-date review of blockchain applications
Day 2: Introduction to organizational, contractual, and regulatory aspects of blockchain systems and ICOs; introduction to programming in Ethereum
Day 3 and Day 4: Group-based smart contract programming project, based on given or participant-provided user cases
Day 5: Presentation and review of programming projects; guest lecture by international blockchain analyst (TBD) on the future of blockchain technology

Blockchain is listed as one of the 10 biggest technological trends by the OECD (2016)

PARTICIPANTS
The course is intended for professionals who need an interdisciplinary overview of the different aspects of blockchain technology as well as implementing blockchain applications. Therefore, participants could be:

- Software developers experienced in building classical centralized information systems, but not distributed or peer-to-peer systems, and who are interested in getting first-hand blockchain development experience.
- Business developers and business engineers interested in constructing (programming) smart contracts first-hand for technology assessment and application.
- Managers, lawyers, regulators, etc. interested in blockchain technology for strategic, legal, and regulatory purposes and in getting first-hand experience of programming blockchain applications.

COURSE DIRECTORS
Fritz Henglein, Professor of Programming Languages and Systems, Department of Computer Science, University of Copenhagen
Boris Düdder, Assistant Professor of Software Engineering, Department of Computer Science, University of Copenhagen
Omri Ross, Assistant Professor of Data-driven Finance, Department of Computer Science, University of Copenhagen

OTHER COURSE TEACHERS
Martin von Haller Grønbæk, Partner, Bird & Bird

There will be lectures by other guest speakers during the week.

COURSE FEE
EUR 2,680/DKK 19,900 excl. Danish VAT. Fee includes teaching, course materials, and all meals during the course.

Blockchain is listed at the peak of the hype cycle by Gartner Group (2016 and 2017)

All participants are expected to have some documented experience with programming. However, no prior knowledge of blockchain technology or computer science is needed.

COURSE DATES
5 days, August 20-24, 2018, 9:00 – 16:30 at the University of Copenhagen, South Campus.

FOR MORE INFORMATION AND REGISTRATION: copenhagensummeruniversity.ku.dk