

# Curriculum Development for Secure Blockchain Technologies

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Module	Lectures	Total Lecture Duration	Lab Assignments
Blockchain Primitives: Hash Functions, Mechanics, Signatures, Keys, Transactions	2	38m07s	Yes
Incentives and Attacks	1	24m32s	No
Mechanics and Data Structures	1	23m00s	No
Bitcoin Network	2	46m15s	No
Ethereum and Smart Contracts	2	51m30s	No
Vulnerability Detection in Smart Contracts (Research)	2	1h5m10s	Yes (2)
Smart Contract Development	3	2h45m	Yes

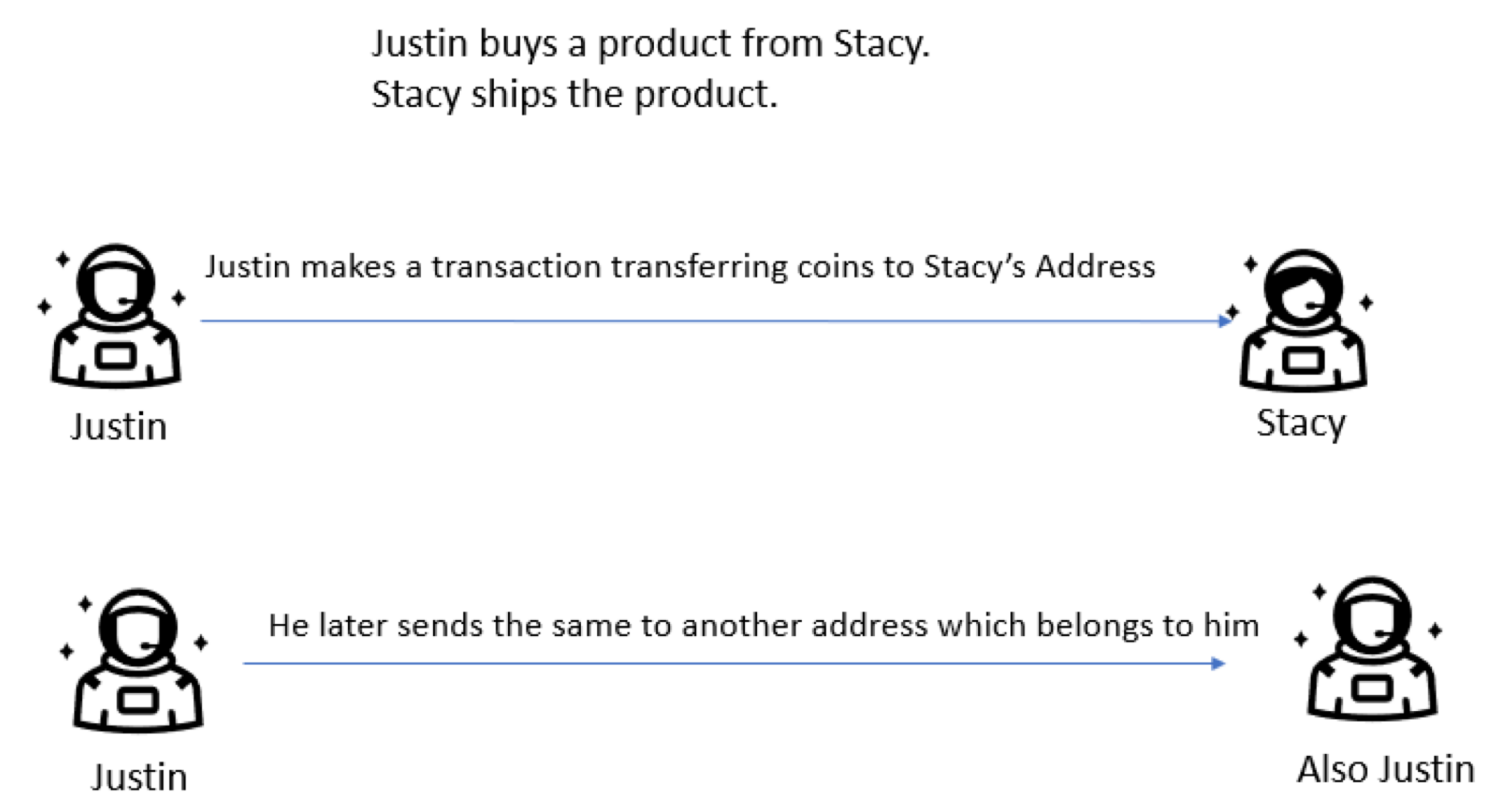
## Challenge:

- Blockchain is an emerging technology, fast evolving
- Standards are not concrete
- Recognizing what is a relevant long-term skill and what is
- Identifying “core” topics that should go into a standard Blockchain course across universities, analogous to classic topics in Database Design such as ER Diagrams, Normalization

## Solutions:

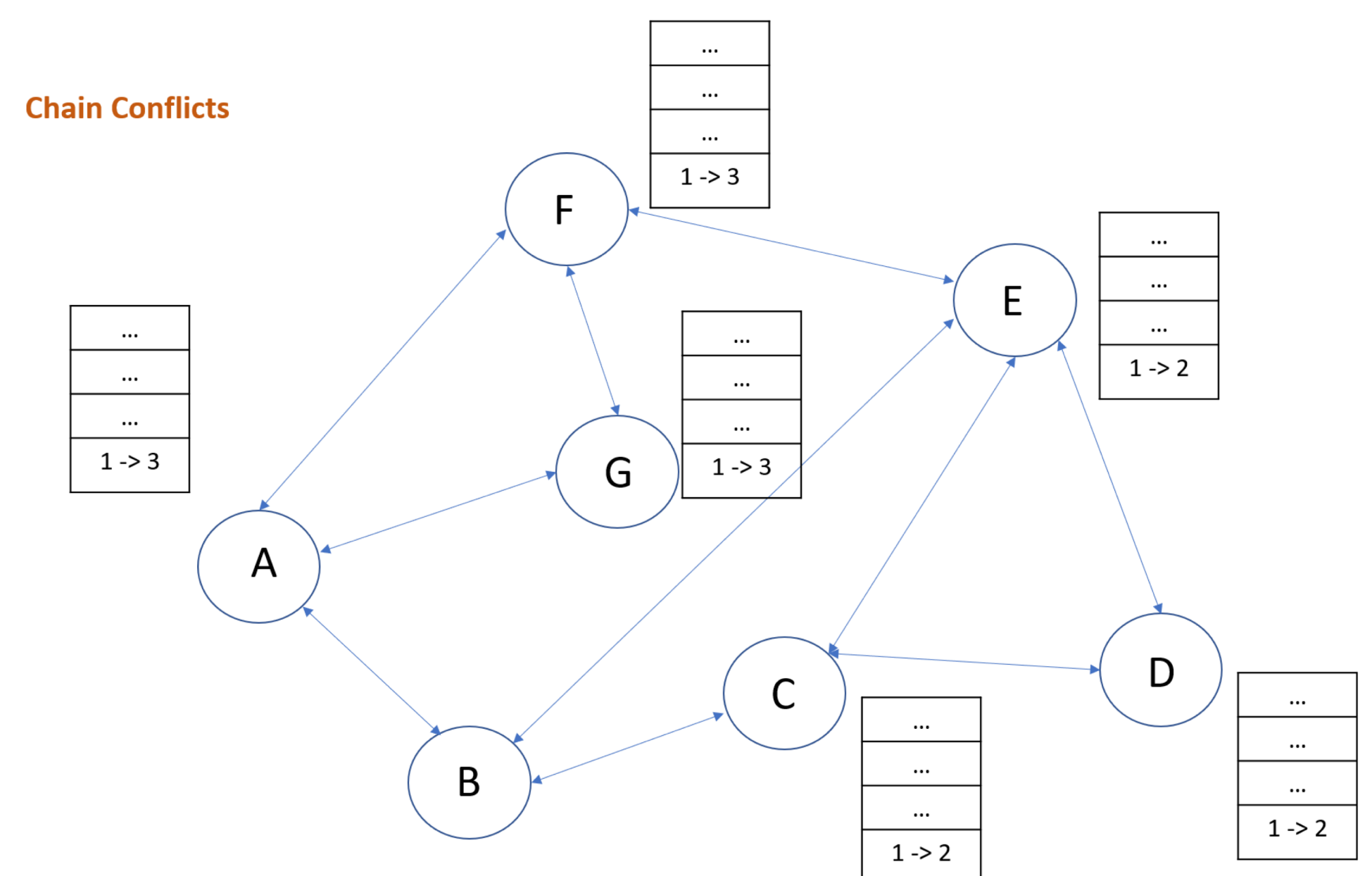
- Identifying “fundamental” concepts
- Emphasis on theoretical understanding as well as practical, hands-on development
- Observing industry trends closely

## Double Spending



## Scientific Impact:

- Increased interest in blockchain technology will help bring scientific advances in the field, which benefits both science as well as the products which will take advantage of the scientific advances
- Standardized education in the subject area will make scientists in the field uniformly prepared to tackle challenges.



## Broader Impact (On Society)

We plan to reach out to people from various parts of society in the summer of 2022:

- Workshops** for high school students where they get hands-on exposure to blockchain technologies
- Seminars** with industry experts where students can also participate and attend.

## Broader Impact (Education and outreach)

The material being developed will be made available to a wide audience, and students will gain knowledge on important issues related to blockchain fundamentals and the relevant security implications

## Broader Impact and Participation

- Tutorials** being offered at notable conferences such as IEEE IDS, linked below: [https://drive.google.com/file/d/1uCpv\\_pziwUPvAh9knUEKLlry5f2Xpj5MC/view](https://drive.google.com/file/d/1uCpv_pziwUPvAh9knUEKLlry5f2Xpj5MC/view)
- Publications** at venues such as IEEE ICBC.

