Theory

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Feel free to email me if you have questions!

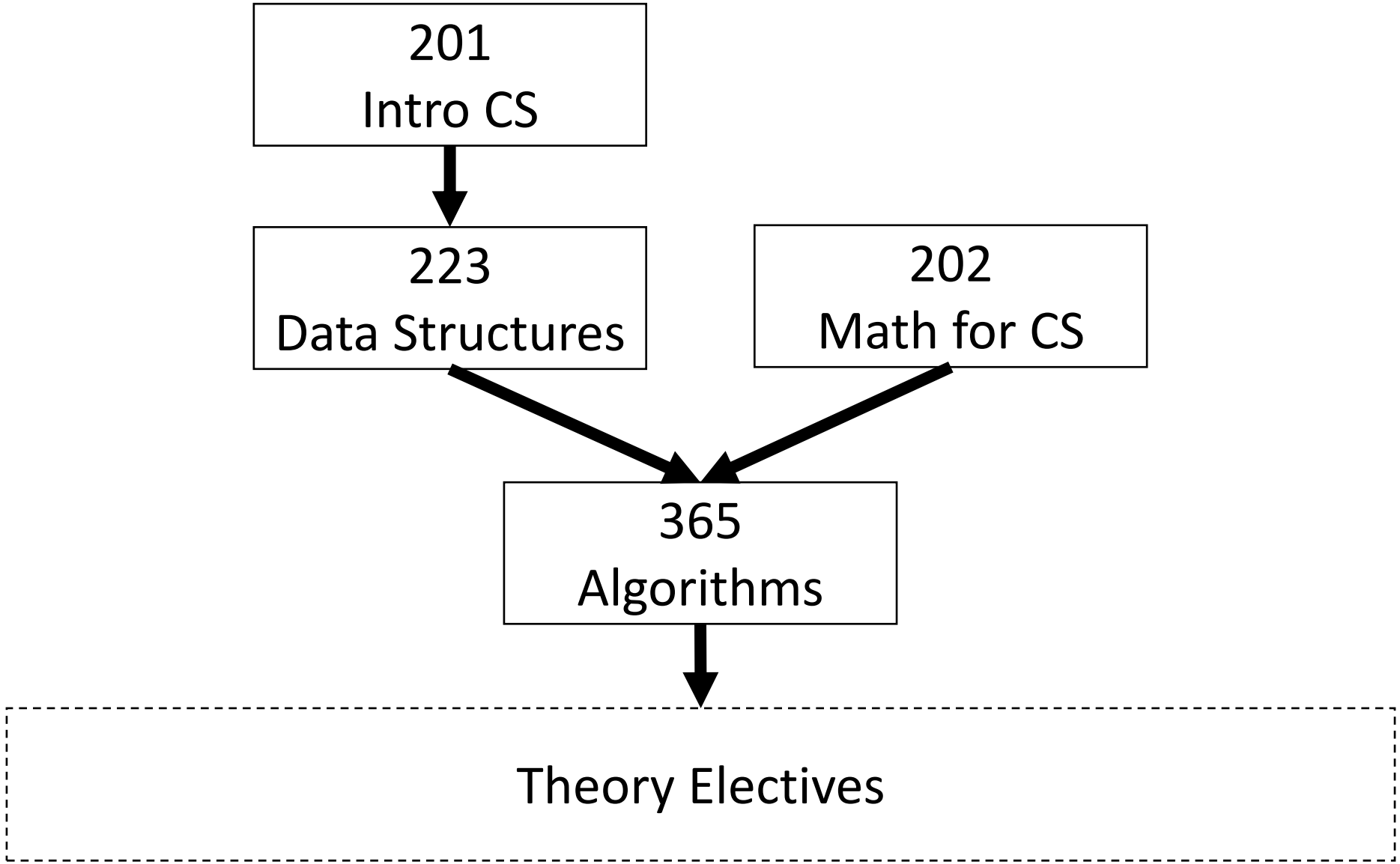
Core Courses

“Theory Adjacent”

- 201 – Introduction to Computer Science
- 223 – Data Structures and Programming Techniques

“Pure Theory”

- 202 – Mathematical Tools for Computer Science
- 365 – Algorithms
- 366 – Intensive Algorithms


201
Intro CS
223
Data Structures
202
Math for CS
365
Algorithms
Theory Electives

Theory Electives: **Spring 2024**

463: Algorithms via Continuous Optimization

469: Randomized Algorithms

612: Topics in Algorithmic Game Theory

640: Topics in Numerical Computation

768: Scalable and Private Graph Algorithms

466: Introduction to Blockchains (Security)

467: Cryptography and Security (Security)

486: Probabilistic Machine Learning (AI/ML)

Other Theory Electives

442: Theory of Computation
443: Optimal Transport: Theory and Applications to Data Science
455: Economics and Computation
464: Algorithm with Their Societal Implications
465: Theory of Distributed Systems
468: Complexity Theory

441: Zero-Knowledge Proofs (Security)
659: Advanced Topics in Cryptography (Security)

Other Theory Electives – Organized by Semester Most Recently Offered

Fall 2023

442: Theory of Computation

443: Optimal Transport: Theory and Applications to Data Science

455: Economics and Computation

464: Algorithm with Their Societal Implications

465: Theory of Distributed Systems

441: Zero-Knowledge Proofs

659: Advanced Topics in Cryptography

Fall 2022

468: Complexity Theory

Other Theory Electives

New Theory faculty teaching special topics!

In general, look for special topics courses from Theory, Cryptography, and Learning faculty

Math courses in Combinatorics, Probability, Number Theory, Algebra, Logic, etc.

Even some philosophy classes! (PHIL 427 Computability and Logic)

FAQs: “Why do I need Theory classes?”

Practice thinking and reasoning abstractly!

Learn tools important in other courses

Learn common language of computer science

Technical interviews

FAQs: “Should I take 366?”

You should take 366 instead of 365 if you…

- Are already interested in pursuing upper-level theory electives, or
- Feel motivated by Algorithms and proofs and want to be challenged