(Universal Algebra and) Category Theory in Foundations of Computer Science

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This course: http://www.mimuw.edu.pl/~tarlecki/teaching/ct/

Universal algebra and category theory: basic ideas, notions and some results

- Algebras, homomorphisms, equations: basic definitions and results

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- Functors and natural transformations
- Adjunctions

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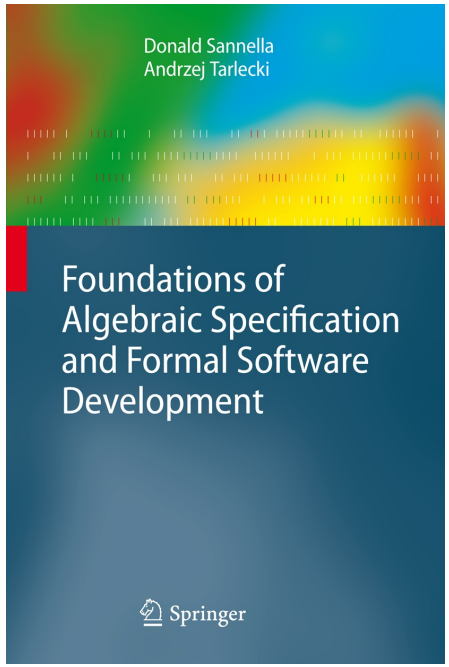
BUT: *Tell me what you want to learn!*

Literature

Plenty of standard textbooks

But this will be roughly based on:

- D.T. Sannella, A. Tarlecki.
  Foundations of Algebraic Specifications and Formal Program Development.
  Springer, 2012.
  - Chap. 1: *Universal algebra*
  - Chap. 2: *Simple equational specifications*
  - Chap. 3: *Category theory*



One motivation

Software systems (modules, programs, databases. . .):

sets of data with operations on them

- Disregarding: code, efficiency, robustness, reliability, . . .
- Focusing on: CORRECTNESS

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Universal algebra from rough analogy

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Category theory

A language to further abstract away from the standard notions of universal algebra, to deal with their numerous variants needed in foundations of computer science.