Hitman7128's Math and CIS Resource Collection

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This is a collection of various resources for the math and computer science courses at UPenn. I'm more than open to suggestions! If a link breaks on any of these, I will fix it upon being notified of them.

Contents

§1 MATH 1400 (Single Variable Calculus)

I did not take MATH 1400 myself, so my knowledge on this class is limited. However, the cheat sheets do cover what you would normally see in a single variable calculus class.

- Single Variable Calculus Cheat Sheet (cherry pick whatever you need from here, some of this is beyond what you're expected to know)
- Sum Convergence/Divergence Cheat Sheet
- Past exams (generally considered the best way to practice for the final, even if there is variance in the material between professors)

§2 MATH 1410 (Multivariable Calculus)

- Ivan Li's Plug and Chug Series (when he made those videos, the course was called MATH 114)
- Past exams (like 1400, past exams are the best way to practice for the final)
- Professor Ghrist's Calculus Blue series:
  - Vol 1: Vectors and Matrices
  - Vol 2: Derivatives
  - Vol 3: Integrals
  - Vol 4: Fields

§3 MATH 2400 (Linear Algebra)

- Ivan Li's Plug and Chug Series (when he made those videos, the course was called MATH 240)
- 3Blue1Brown's Essence of Linear Algebra (he teaches linear algebra from a geometric perspective rather than algebraic, which for many, makes the topics much easier to grasp)
- ODEs (particularly the First and Second Order sections) (at the end of the course, ODEs are covered; these explain the procedure to solving them. Ignore the sections that are beyond what you need to know)
- Past exams

Warning 3.1. All the required math classes after 2400 require you that you know how to read and write proofs. 3140 is probably the easiest entry point into a proof based math class.

There are considerably less resources I have listed for these classes because the professors rotate these classes so often that there is much more variance with the material in these classes. I will still list textbook(s), though they most likely will be different.

§4 MATH 3140 (Advanced Linear Algebra)

- Textbook: Hoffman and Kuze

§5 MATH 3600 (Real Analysis I)

- Textbook: Lebl, Volume I

§6 MATH 3610 (Real Analysis II)

- Textbook: Lebl, Volume II

§7 MATH 3700 (Abstract Algebra I)

- Textbook: Artin

§8 MATH 3710 (Abstract Algebra II)

- Textbook: Artin

§9 MATH 4100 (Complex Analysis)

- Textbook: Bak and Newman

§10 MATH 4250 (PDEs)

- Textbook: Strauss

§11 CIS 1600 (Discrete Math)

- Cheat Sheet by papickee (list of the topics, theorems, etc. from Rajiv's edition)
- Survivor's Manual for CIS 1600 by me (this can help early on with some of the tricky concepts but is more suited for the spring iteration than the fall iteration)
- Lectures Notes by Rajiv (Wayback Machine) (unfortunately, the material in the spring is not publicly available)
- Recitation Problems/Slides (Wayback Machine)
- Ishaan Lal's Videos (should help for the harder topics, particularly Combinatorial Proofs and Induction)

§12 CIS 1200 (Programming Languages and Techniques)

- Lecture Notes
- OCaml Documentation (first part of the course uses OCaml)
- Java Documentation (second part of the courses uses Java)

§13 CIS 1210 (Data Structures and Algorithms)

- Textbook: CLRS
- Lecture Notes
- Survivor's Manual for CIS 1210 by me

§14 CIS 2400 (Computer Architecture)

- Textbook: Patt and Patel, 2nd Edition
- Fall 2022 Lecture Slides
- C Library (the last third of the course uses C, which has syntax similar to Java, but does not hold your hand at all)

§15 CIS 2620 (Automata, Computability, and Complexity)

- Recommended Book: Introduction To Automata Theory, Languages, and Computation, 3rd Edition

§16 CIS 3200 (Algorithms)

- Textbook: CLRS
- Survivor's Manual for CIS 3200 by me