

Summary of Teaching Experience

Consider my candidacy for a teaching assistantship. I summarize what has prepared me to teach.

Tutoring & Grading I tutored calculus students one-on-one and graded physics coursework. I guided small groups through problems in elementary electromagnetism. I heard out my peers in introductory topology and posed constructive questions. As a Heritage Scholar at The College of Idaho, I led discussions in colloquium. In seminar, I organized half-hour workshops on the logistic equation and the heat equation. I also delivered an hour presentation on epidemiological modeling.

Time Away from School Over the last year, I volunteered on a ranch outside of Stuttgart and worked at a refugee resettlement office in Houston. These experiences refined my teaching ability. For example, while I learned \LaTeX for mathematical exposition, with it, I have created bus guides and applications for indigent health-care. As a second example, while I was exposed to guided problem solving (G. Polya) and inquiry based learning (R. L. Moore) in college, I have applied these pedagogies across language barriers. I plan ahead, relax, and invite questions.

Undergraduate Syllabi

While I am a quick study, I want to front up my established strengths. Here I list my undergraduate course-work, declare my grade, cite the textbook and abstract the course's content. My strength in analysis and topology suggests that I would be an excellent assistant for calculus sequence courses. However, perhaps working as an assistant for introductory linear algebra or ordinary differential equations would be a fruitful learning experience for myself and others.

2015–2016

MAT-441 Topology

3 credit(s). Taught by Dave Rosoff, with final grade **A**.

- Dave Rosoff. *Course Notes on Elementary Topology*. Personally distributed, 2016. adapted from notes by Michael Starbird
- An introduction to the techniques and theorems of point-set topology. Approached in a modified Moore method, with emphasis on writing, revising and presenting proofs. Topics included cardinality, separation axioms, compactness, connectedness, continuity, as well as novel proofs for the Heine-Borel theorem and the fundamental theorem of algebra.

MAT-494 Galois Theory for Diff Eqs

2 credit(s). Advised by Jonny Comes, with final grade **A**.

- Michio Kuga. *Galois' Dream: Group Theory and Differential Equations: Group Theory and Differential Equations*. Birkhäuser Boston, 1993

- An independent study. Explored the correspondence between the fundamental group of the plane with n points removed and its covering surface. Used Galois theory to prune the ring of continuous functions (defined out of the covering surface) down to exactly those functions that were solutions to Fuchsian type differential equations.

PHY-330 Electricity & Magnetism

3 credit(s). Taught by James Dull, with final grade **A**.

- David Jeffery Griffiths. *Introduction to Electrodynamics*. Prentice Hall, third edition, 1999
- A survey of classical electro-magnetic theory including electrostatic and magnetostatic fields and potentials, Gauss's flux theorem, Laplace's equation, dielectrics, vector potentials, magnetization and Maxwell's equations. Focused on spoken delivery. Concluded in an oral exam.

MAT-370 Geometry

3 credit(s). Taught by Jonny Comes, with final grade **A**.

- Michael P. Hitchman. *Geometry with an Introduction to Cosmic Topology*. Jones and Bartlett Publishers, 2009
- A preparation for Felix Klein's *Erlangen* program. Developed geometry in terms of a space and a group of transformations of that space. Emphasis on congruence relations. Unpacked the theory of complex functions in relation to hyperbolic geometry.

MAT-451 Real Analysis

3 credit(s). Taught by Jonny Comes, with final grade **A-**.

- Stephen Abbott. *Understanding Analysis*. Undergraduate Texts in Mathematics. Springer New York, 2015
- Proceeded from the Axiom of Completeness to rigorously prove results about the convergence of sequences and series. Defined continuity (Lipschitz and uniform), the derivative and nowhere differentiable functions. Used suprema and infima to define the Riemann integral.

MAT-498 Upper Division Seminar

1 credit(s). Taught by Dave Rosoff, with final grade **A**.

- Douglas R. Shier and K.T. Wallenius. *Applied Mathematical Modeling: A Multidisciplinary Approach*. Discrete Mathematics and Its Applications. CRC Press, 1999
- A student-led seminar concerned with computational methods for mathematical modeling. Emphasized the importance of audience understanding. With the early outbreak of HIV in Houston as a case study, I presented a introduction to epidemiological modeling.

PHY-313 Thermal Physics

3 credit(s). Taught by James Dull, with final grade **A**.

- Daniel V. Schroeder. *An Introduction to Thermal Physics*. Addison Wesley, 2000
- Physical basis and applications of thermodynamics and statistical mechanics including temperature, heat engines, entropy and free energy. Included an introduction to Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics and their application to the solution of thermal, mechanical and electrical problems in fluids and solids.

2014–2015

MAT-431 Complex Variables

0 credit(s). Taught by Dave Rosoff.

- No meaningful text.
- Due to a health concern in late spring, I **administratively withdrew** from all courses.

PHY-400 Quantum Physics

0 credit(s). Taught by Kathrine Devine.

- No meaningful text.
- Due to a health concern in late spring, I **administratively withdrew** from all courses.

MAT-372 History of Mathematics

3 credit(s). Taught by Dave Rosoff, with final grade **B**.

- Carl B. Boyer and Uta C. Merzbach. *A History of Mathematics*. Wiley, 2011
- A historical survey of the ideas, tools, and symbols of mathematics and the people who developed them. Contextualized sexagesimal computations, Diophantine equations and medieval number theory. Emphasis on notation and legible proofs.

MAT-461 Algebraic Structures

3 credit(s). Taught by Robin Cruz, with final grade **B+**.

- David M. Clark. Theory of groups. *Journal of Inquiry Based Learning in Mathematics*, (No. 3), April 2007
- An inquiry based course in abstract algebra focused primarily on groups. Addressed basic properties of groups, cyclic groups, LaGrange's Theorem, homomorphisms, isomorphisms, representation theorems, normal subgroups and quotient groups. Rich with examples.

MAT-498 Upper Division Seminar

1 credit(s). Taught by Dave Rosoff, with final grade **A**.

- Stanley J. Farlow. *Partial Differential Equations for Scientists and Engineers*. Dover books on advanced mathematics. Dover Publications, 1993
- A student-led seminar addressing partial differential equations in mathematical modeling. A prep for the COMAP contest. I presented the Fourier series solution to the heat equation.

PHY-301 Theoretical Mechanics

3 credit(s). Taught by Kathrine Devine, with final grade **B+**.

- John Robert Taylor. *Classical Mechanics*. University Science Books, 2005
- A survey of classical and modern topics in dynamics. Topics included orbital mechanics, non-inertial reference frames, rigid-body motion, Lagrangian and Hamiltonian methods, and elements of nonlinear mechanics and chaos. An introduction to Mathematica.

2013–2014

MAT-352 Differential Equations

3 credit(s). Taught by Dave Rosoff, with final grade C+.

- William E. Boyce and Richard C. DiPrima. *Elementary Differential Equations and Boundary Value Problems*. Wiley, ninth edition, 2008
- A study of the solution and applications of ordinary differential equations including systems of equations using matrix algebra. An introduction to SageMath.

MAT-361 Linear Algebra

3 credit(s). Taught by Robin Cruz, with final grade C.

- Robert A. Beezer. *A First Course in Linear Algebra*. Published Online, 2012
- A study of general vector spaces, linear transformations, eigenvalues and eigenvectors.

References

- [1] Dave Rosoff. *Course Notes on Elementary Topology*. Personally distributed, 2016. adapted from notes by Michael Starbird.
- [2] Michio Kuga. *Galois' Dream: Group Theory and Differential Equations: Group Theory and Differential Equations*. Birkhäuser Boston, 1993.
- [3] David Jeffery Griffiths. *Introduction to Electrodynamics*. Prentice Hall, third edition, 1999.
- [4] Michael P. Hitchman. *Geometry with an Introduction to Cosmic Topology*. Jones and Bartlett Publishers, 2009.
- [5] Stephen Abbott. *Understanding Analysis*. Undergraduate Texts in Mathematics. Springer New York, 2015.
- [6] Douglas R. Shier and K.T. Wallenius. *Applied Mathematical Modeling: A Multidisciplinary Approach*. Discrete Mathematics and Its Applications. CRC Press, 1999.
- [7] Daniel V. Schroeder. *An Introduction to Thermal Physics*. Addison Wesley, 2000.
- [8] Carl B. Boyer and Uta C. Merzbach. *A History of Mathematics*. Wiley, 2011.
- [9] David M. Clark. Theory of groups. *Journal of Inquiry Based Learning in Mathematics*, (No. 3), April 2007.
- [10] Stanley J. Farlow. *Partial Differential Equations for Scientists and Engineers*. Dover books on advanced mathematics. Dover Publications, 1993.
- [11] John Robert Taylor. *Classical Mechanics*. University Science Books, 2005.
- [12] William E. Boyce and Richard C. DiPrima. *Elementary Differential Equations and Boundary Value Problems*. Wiley, ninth edition, 2008.
- [13] Robert A. Beezer. *A First Course in Linear Algebra*. Published Online, 2012.