

Apurva Nakade

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Experience	Postdoctoral Lecturer, Northwestern University	2021-
	Postdoctoral Fellow, University of Western Ontario	2019-21
	Ph.D. in Mathematics, Johns Hopkins University	2019
	Academic Coordinator, Canada/USA Mathcamp	2018
	Mentor, Canada/USA Mathcamp	2017-20
	M.Sc. in Mathematics, Chennai Mathematical Institute	2013
	Exotic Derivatives Trader, Nomura Capital India Pvt Ltd	2010
	B.Tech. in Computer Science & Engineering, IIT Kanpur	2010
Publications	<i>String structures, 2-group bundles, and a categorification of the Freed-Quinn line bundle</i> arXiv:2110.07571, joint with D. Berwick-Evans, E. Cliff, L. Murray, and E. Phillips	2021
	<i>Manifold Calculus and the h-principle</i> The Journal of Homotopy and Related Structures	2019
	<i>Effect of increasing the energy gap between the two lowest energy states on the mixing time of the Metropolis algorithm</i> (with Somenath Biswas) Information Processing Letters, IPL4801 (2012.08.012)	2012
Grants & Awards	<i>Open Educational Resources Faculty Grant</i> (joint with Aaron Greicius), NU \$10000 to develop, use, and publish OER for a Northwestern undergraduate course	2022
	<i>William Kelso Morrill Award for Excellence in Mathematics</i> , JHU Awarded each year to the math graduate student who best displays love of teaching, love of mathematics, and concern for students	2019
	<i>Finalist for the KSAS Excellence in Teaching Awards</i> , JHU The award honors the best graduate TAs in the School of Arts and Sciences for the care and concern they take with their subject and their students.	2019
	<i>Prof. Joel Dean Award for Excellence in Teaching in Mathematics</i> , JHU Annual award to recognize math graduate students who have exhibited extraordinary performance in teaching undergraduates	2016
	<i>AMS Graduate Student Travel Grant</i> \$250 travel grant for giving a talk at AMS Sectional Meetings	2019
Mentoring	<i>Supplementary Instructor for the Causeway Postbaccalaureate Program</i> , NU Yearlong experience in mathematics that seeks to increase the number of graduate students in the mathematical sciences from historically underrepresented groups	2022
	<i>Directed Reading Program</i> , UWO, JHU • Started DRP at UWO in Fall 2019 • Organizer and mentor for DRP at JHU and UWO	2017-21

Professional Development	MAA Project NExT Fellow, Brown'20 cohort	2020
	Professional development program for new or recent Ph.D.s in the mathematical sciences.	
	<i>Teaching Academy Certification, JHU</i>	2019
	Program to help prepare for academic careers and to provide assistance in acquiring a foundation for the teaching responsibilities	
	Participated in several workshops by the <i>Center of Teaching & Learning</i> at UWO	2019-20
	Participated in the MSRI <i>Critical Issues in Mathematics Education Workshop</i>	2022
Teaching Experience	Participated in the MAA <i>Modeling Inspiration for Differential Equations Workshop</i>	2022
	Participated in online <i>Mastery Grading Workshop</i>	2019
	Attended the <i>Science of Learning Symposium, JHU</i>	2014-18
	<i>Instructor, Northwestern</i>	2021-
	<ul style="list-style-type: none"> • MENU Linear Algebra and Multivariable Calculus, (Coordinator) 2022-23 • Introduction to Optimization, Winter, Spring 2022 • Single Variable Calculus, Fall 2021 • MENU Linear Algebra and Multivariable Calculus, 2021-22 • Foundations of Mathematics, Winter 2023 • Elementary Differential Equations, Spring 2023 	
	<i>Instructor, UWO</i>	2019-21
	<ul style="list-style-type: none"> • Algebraic Topology (graduate level), Winter 2021 • Topology Bootcamp, Fall 2020 • Discrete Structures for Engineering, Fall 2020 • Calculus II for Mathematical and Physical Sciences, Winter 2020 • Calculus I for Mathematical and Physical Sciences, Fall 2020 • Topics in Category Theory, Fall 2020 	
	<i>Instructor, JHU</i>	2014-18
	<ul style="list-style-type: none"> • Honors Single Variable Calculus, Fall 2018, 2017 • Symmetries & Polynomials, Intersession 2018 • Hitchhikers Guide to Algebraic Topology, Intersession 2017 • Differential Equations with Applications, Summer 2017, 2015 • Online Linear Algebra, Summer 2014 	
	<i>Academic Co-coordinator, Canada/USA Mathcamp</i>	2018
	<ul style="list-style-type: none"> • Planned the five week academic schedule • Part of the mentor hiring committee • Invited visiting speakers 	
	<i>Mentor/Staff, Canada/USA Mathcamp</i>	2017-20
	<ul style="list-style-type: none"> • Designed and taught a variety of undergraduate-level courses • Was residential and academic advisor at camp • Part of the mentor hiring committee 	

Projects	Formalizing Math in <i>Lean Theorem Prover</i>	2019-
	<ul style="list-style-type: none"> • Taught a course at Mathcamp 2020 • Contributed to Lean's surreal numbers math library • Contributed to Lean's convex optimization math library 	
	<i>Open Educational Resources Textbook for Linear Algebra</i>	2022
	<ul style="list-style-type: none"> • Added WeBWorK problems to a Linear Algebra <i>PreTeXt</i> OER textbook 	
	Course Design: <i>Introduction to Optimization</i> , UWO	2022
	<ul style="list-style-type: none"> • Restructured the course to include applications and modeling • Created <i>course notes</i> in <i>RMarkdown</i> • Created Excel worksheet assignments for modeling scenarios 	
	Course Design: <i>Discrete Structures for Engineering</i> , UWO	2020
	<ul style="list-style-type: none"> • Adapted the course for online asynchronous delivery • Helped code (in a team) hundreds of problems on WeBWork • Made short weekly video lectures to support the course text • Maintained an active discussion forum on Piazza • Gave a talk about the course design at a conference on E-Assessment in Mathematical Sciences 	
	Course Design: <i>Honors Single Variable Course (IBL)</i> , JHU	2017-18
	<ul style="list-style-type: none"> • Designed and taught a semester long course structured in a flipped classroom format for two semesters 	
	Course Design: <i>Intersession courses</i> , JHU	2017-18
	<ul style="list-style-type: none"> • Designed and taught a 2-week course titled <i>Symmetries & Polynomials</i> introducing Galois theory to non-math majors • Designed and taught a 2-week course <i>Hitchhiker's Guide to Algebraic Topology</i> introducing algebraic topology to non-math majors 	
Pre-College	Course Design: <i>Canada/USA Mathcamp courses</i>	2017
	<ul style="list-style-type: none"> • Designed and taught several week-long math courses to advanced high-school students • Course topics: Theorem proving in Lean, Visualizing 3-manifolds, Riemann surfaces, Crash Course on Linear Algebra, Covering Spaces, Cohomology etc. 	
	<i>IMO bronze medal</i> , Slovenia, highest scorer from India	2006
	273 rank in the Indian Institute of Technology Joint Entrance Exam	
	Cleared national astronomy and regional physics and chemistry olympiads	