

# Frances E. Dean

Frances.e.dean2019@gmail.com • US Citizen

## EDUCATION

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**University of Washington** • Seattle, WA  
Graduate Non-Matriculated Student

Present

**Williams College** • Williamstown, MA  
BA in Mathematics • *Cum laude*

Class of 2019

## RELEVANT COURSEWORK

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### WILLIAMS COLLEGE:

*Science:* Biology 101: The Cell, Biology 102: The Organism, Neuroscience, Introduction to Psychology, Social Psychology, Introduction to Mechanics and Waves, Philosophy and Modern Physics, Principles of Modern Chemistry, Introduction to Computer Science, Data Structures & Advanced Programming

*Mathematics:* Multivariable Calculus, Linear Algebra, Abstract Algebra, Protecting Information: Applications of Abstract Algebra and Quantum Physics, Algebraic Number Theory, Applied Real Analysis, Introduction to Statistical Modeling, Introduction to Python Programming, Galois Theory, Differential Equations, Dance of the Primes, Topology, Probability, Algebraic Combinatorics

### UNIVERSITY OF WASHINGTON:

*Applied Mathematics:* Applied Biostatistics I and II, Mathematical Modeling of Cancer, Physical Applications of Group Theory

*Global Health:* Measuring the Global Burden of Disease of TB and HIV/AIDS

## WORK EXPERIENCE

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**Institute for Health Metrics and Evaluation**, Post Bachelor Fellow

Fall 2019 – Present

Contribute to the landmark Global Burden of Disease study modeling the morbidity and mortality of neoplasms  
Assist in data formatting and processing and utilize and write statistical software to create estimates  
Design methods to improve estimation of mortality to incidence ratios, survival curves, and model new diseases

**Williams College Mathematics**, Teaching Assistant

Fall 2017 – Spring 2019

Hosted weekly sessions answering student questions and tutoring undergraduates in Linear Algebra, Abstract Algebra  
Managed the entering of student grades, updated homework solutions, and graded problem sets with a team of T.A.'s

**SMALL REU in Mathematics**, Undergraduate Researcher

June 2018 - August 2018

Investigated and created tools for computing the gonality of combinatorial graphs as defined via tropical algebraic curves

## ACTIVITIES

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**Math Matters Seattle**, Test Prep Instructor

September 2020 - Present

Tutor and mentor students from low-income backgrounds in the Seattle area weekly to set them up for collegiate success

**Student Advisory Board of Math & Statistics**, Vice President

August 2018 – May 2019

Facilitated informational, mentorship, and social events and encouraged engagement by producing department stickers  
Assisted in the hiring of new mathematics and statistics faculty at Williams College

**Williams College Varsity Swim Team**, Member

November 2015 – March 2019

Qualified for NCAA Division III Championship: 2016  
CSCAA Scholar All-American: 2016, Honorable Mention: 2017  
NESCAC All-Academic Honoree: 2016, 2017, 2018, 2019

**Lehman Community Engagement**, President

June 2016 – May 2019

Organized, participated, and oversaw service trips and outings to engage the members of the greater Williams community  
As President (2018-19): led weekly board meetings, oversaw communications, and facilitated group projects and structure  
As Secretary (2017): took meeting minutes and sent out engaging weekly emails promoting events

## PRESENTATIONS

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Cancer Survival Estimation in the GBD Study, <i>IHME Science Seminar Series</i>	September 9, 2020
Graphs of Gonality Three, <i>Joint Mathematics Meetings</i>	January 19, 2019
Chip Firing Games & Gonality, <i>Williams College</i>	October 1, 2018
Computing Graph Gonality with Brambles, <i>MAA MathFest</i>	August 2, 2018

## PUBLICATIONS

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Global Burden of Disease Study 2019 The Lancet, Vol 396 (10258), DOI: 10.1016/S0140-6736(20)30925-9	October 2020
Treewidth and gonality of glued grid graphs, I. Aidun et. al Discrete Applied Mathematics, Vol 279, DOI: 10.1016/j.dam.2019.10.024	May 2020
Tired: A Reflection on Asceticism and the Value of Quantitative Assessment Journal of Humanistic Mathematics, DOI: 10.5642/jhummath.202001.19	January 2020
Graphs of gonality 3, I. Aidun et. al Journal of Algebraic Combinatorics, Vol 2 (2019), DOI: 10.5802/alco.80	December 2019
Gonality sequences of graphs, I. Aidun et. al In review, arXiv:2002.07753v1	2019

## ADDITIONAL SKILLS & CERTIFICATES

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### Computer

Proficient in R, LaTeX, Beamer, Python, Mathematica, Stata, SQL

### Teaching

*Instruction Support Program Training in Teaching, IHME* September 2020

## SCHOLARSHIPS & AWARDS

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<b>Williams College Department of Mathematics Beaver Award</b> Given to a senior to recognize their contributions to the mathematical community	Awarded: May 2019
<b>Lola G. Duff and William H. Duff, II Scholarship</b> A merit scholarship for full-time pursuit of a bachelor's degree to students of Allegheny County of Protestant faith	Awarded: September 2015 – May 2019
<b>Brown Book Award</b> , <i>Thinking the Twentieth Century</i> by Tony Judt and Timothy Snyder Awarded to high school students who demonstrates excellent communication skills by the Brown Alumni Association	Awarded: May 2014

## PERSONAL

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I enjoy competitive swimming, sailing, yoga, biking, running, hiking, tennis, and golf.