

# Craig Tennenhouse

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## Professional Appointments

<b>Associate Professor</b> Mathematical Sciences, University of New England, Biddeford, ME	2016-Present
<b>Assistant Professor</b> Mathematical Sciences, University of New England, Biddeford, ME	2010-2016
<b>Teaching Assistant</b> University of CO Denver	2007-2010
<b>Assistant Professor</b> Mathematics, Simpson University, Redding, CA	2003-2007
<b>Assistant Professor</b> Mathematics, Jamestown College, Jamestown, ND	2002-2003
<b>Teaching Assistant</b> University of Colorado, Boulder, CO	1999-2002

## Education

<b>Ph.D. Applied Mathematics</b>	University of Colorado Denver
<i>Some extensions of graph saturation to edge-colored, oriented, and subdivided graphs</i>	
Advisor: Michael S. Jacobson	
<b>M.A. Mathematics</b>	University of Colorado, Boulder
<b>A.B. Mathematics, with honors</b>	University of Chicago
<b>Junior Year Abroad</b>	University of Edinburgh, Scotland, UK

## Awards, Grants & Honors

2019 - CETL Teaching Scholars Program, *Inquiry-Based Learning*, \$5500  
2017 - VPRS Faculty Mini-Grant, *Collaborative Research in Impartial Combinatorial Games*, \$3252  
2016 - Excellence in Academic Advising (awarded by students annually)  
2013 - NSF S-STEM SUCCESS Grant, \$620,788 *Co-PI*  
2012 - Debra J. Summers Memorial Award for Teaching Excellence (awarded by students annually)  
2008-2010 - NSF GK-12 Fellowship  
2007-2008 - Bateman Teaching Assistantship  
1999-2002 - UCB Teaching Assistantship

## Teaching methodology experience

I have experience in developing and teaching using flipped classrooms, Inquiry-Based Learning, Question Formulation Theory, and teaching through game play. I am currently working on a qualitative research project on the use of IBL in an upper-level mathematics setting, and am in the early stages of a collaborative textbook project using inquiry and Combinatorial Game Theory to guide students through Discrete Mathematics.

## Industry knowledge and experience

I am experienced with Python, in particular within the context of Jupyter Notebooks and Sagemath/CoCalc. I also recently worked on a contracted Data Science project using historical data on weather, soil composition, and crop yields from a dozen farms over a decade and employed a number of regression and classification methods (linear, tree-based, and neural nets) to predict future yield. I utilized the packages NumPy, Pandas, GeoPandas, GDAL, Matplotlib, Pillow, and Scikit-Learn.

## Research Interests

Graph and digraph saturation, structural properties of graphs, coloring, Combinatorial Game Theory

Major Academic Service	Courses taught
<p><b>Core Curriculum Assessment Coordinator</b> Coordination of all assessment efforts in general education among faculty in the college. 2 years.</p> <p><b>Curriculum development</b> Development and implementation of university-wide mathematics proficiency exam, development of new courses and curricula</p> <p><b>Core Area Coordinator</b> for Mathematics Coordination of <b>assessment</b> for the Core in CAS</p> <p><b>Referee</b> for multiple peer-reviewed academic journals</p> <p><b>Host &amp; organizer</b> for multiple mathematics meetings</p>	<p>Mathematics for Liberal Arts College Algebra Math Applications for Management Precalculus Calculus I, II, III Discrete Mathematics, Intro to Proofs Graph Theory Geometry (Euclidean and non-Euclidean) Modern Algebra Topology Real Analysis Complex Analysis Network ecology (team-taught) Mathematics research seminar Mathematics of Games and Puzzles</p>

Undergraduate research advising	
<p>12. <i>Crab and Gulls: A variant of Queens</i></p> <p>11. <i>The game of Locking Nim</i></p> <p>10. <i>Analysis of a new all-small game</i></p> <p>9. <i>InfiniTiles: Undecidability using Wang Tiles</i></p> <p>8. <i>Node Hackenbush disguised as a Chomp variant</i></p> <p>7. <i>Protect the King: A placement chess variant</i></p> <p>6. <i>The game of Plankton</i></p>	<p>5. <i>Also Kanye: Examining patterns in a strip game variant</i></p> <p>4. <i>Penultimate Nim and conjoined games</i></p> <p>3. <i>Computational potential of protein interactions</i></p> <p>2. <i>Combinatorial games and Rotisserie Nim</i></p> <p>1. <i>Modified firefighter problem for simplified metastatic model</i></p>

Peer-reviewed publications:	<i>By convention author order is alphabetical.</i>
<p>14. M. Huggan, <b>C. Tennenhouse</b>, “An investigation into the application of genetic programming to combinatorial game theory”, <i>submitted</i></p> <p>13. <b>C. Tennenhouse</b>, “Metric dimension of combinatorial game graphs”, <i>submitted</i></p> <p>12. K. Burke, M. Ferland, M. Fisher, V. Gledel, <b>C. Tennenhouse</b>, “The Game of Blocking Pebbles”, <i>submitted</i></p> <p>11. J. McDonald, G. J. Puleo, <b>C. Tennenhouse</b>, “Packing and covering directed triangles”, <i>Graphs &amp; Comb.</i>, (2020) 1-5.</p> <p>10. <b>C. Tennenhouse</b>, “Edge-critical <math>G, H</math> colorings”, <i>Ars Combinatoria</i>, Vol. <b>138</b>, (2018) 403-413.</p> <p>9. Hodgdon, C.T., <b>Tennenhouse, C.</b>, Koh, W., Fox, J., &amp; Sulikowski, J. “Shortnose Sturgeon of the Saco River Estuary: Assessment of a Unique Habitat”, <i>Journal of Applied Ichthyology</i>, (2018).</p> <p>8. <b>C. Tennenhouse</b>, “Impartial poker nim”, <i>Intern. J. of Game Th.</i>, Vol. <b>47:2</b>, (2016) 695-705.</p> <p>7. <b>C. Tennenhouse</b>, “Induced subgraph-saturated graphs”, <i>Th. and Appl. of Graphs</i>, Vol. <b>3:2</b>, (2016).</p> <p>6. C. J. Byron, <b>C. Tennenhouse</b>, “Commonality in structure among food web networks”, <i>Network Biology</i>, Vol. <b>5:4</b>, (2015) 146-162.</p> <p>5. J. Quinlan, <b>C. Tennenhouse</b>, “Perceived utility of typesetting homework in post-Calculus mathematics courses”, <i>PRIMUS</i>, Vol. <b>26:1</b>, (2015) 53-66.</p> <p>4. <b>C. Tennenhouse</b>, “A new parameter on resolving sets with a realizable triple”, <i>Australasian J. of Combin.</i>, Vol. <b>63:1</b>, (2015) 115-129.</p> <p>3. M. Ferrara, M. Jacobson, K. Milans, <b>C. Tennenhouse</b>, and P. Wenger, “Saturation numbers for families of graph subdivisions”, <i>J. Graph Theory</i>, Vol. <b>71:4</b>, (2012) 416-434.</p> <p>2. M.S. Jacobson, <b>C. Tennenhouse</b>, “Oriented graph saturation”, <i>JCMCC</i>, Vol. <b>80</b>, (2012) 157-169.</p> <p>1. B. Flesch, <b>C. Tennenhouse</b>, “Edge maximal non-interval graphs”, <i>JCMCC</i>, Vol. <b>77</b>, (2011) 33-44.</p>	

## Popular

**C. Tennenhouse**, C. Byron, “Mathematical Examinations of Marine Food Webs”, *Rising Tide, Research and Scholarship at the University of New England*, (2015) p17.

## Conferences hosted/organized

4. *Sprouts!* undergraduate combinatorial game theory conference – UNE, Biddeford, ME, April 2019.
3. *Disc Math Days of the NE* – UNE, Biddeford, ME, May, 2018.
2. *Sprouts!* undergraduate combinatorial game theory conference – PSU, Plymouth, NH, April, 2018.
1. *Sprouts!* undergraduate combinatorial game theory conference – UNE, Biddeford, ME, April 2017.

## Academic presentations

I have given 23 academic presentations, both contributed and invited, at conferences across the United States and in Canada, France, Portugal, and China. I have also given talks at Robert Gordon University in Aberdeen and at Stirling University in Scotland, UK.