

Rebecca E Gasper, Ph.D

Curriculum Vitae

1. Professional Address

College of Arts and Sciences
Department of Mathematics
Creighton University
2500 California Plaza
Omaha, NE, 68178-0610 USA

Office: 534 Hixson-Lied Science Building
Email: RebeccaGasper@creighton.edu
Phone: (402) 280-3268

2. Current Appointment

Assistant Professor, Department of Mathematics and Faculty in Data Science Program
Starting Date: August 1, 2014 with no previous experience granted toward tenure
Years of Academic Service: 6

3. Proposed Action

Conferral of Tenure

4. Research Interests

Mathematical Biology, Audiology, Differential Equations, Assessment Practices in Math and Data Science Education, Mathematical Ecology, Parameter Fitting and Estimation

5. Teaching Interests

Inquiry-Based Learning, Standards Based Grading (and other Mastery Grading), Applications of Mathematics

6. Education

The University of Iowa

Ph.D., August 2014 [Terminal Degree]
Certificate in College Teaching, May 2014
M.S., Mathematics, May 2010

Field: Applied Mathematical and Computational Sciences

Thesis: "Action Potentials in the Peripheral Auditory Nervous System: a Novel PDE Distribution Model"

Advisor: Colleen Mitchell, Department of Applied Mathematical and Computational Sciences

Co-advisor: Paul Abbas, Department of Speech and Hearing Sciences

Comprehensive Exam (Thesis Proposal) Completed February 2011

Qualifying Exams Completed August 2009

Attendance: August 2008-August 2014

The University of Minnesota-Twin Cities

B.S, May 2008

Magna Cum Laude, with honors

Major: Mathematics

Senior Thesis / REU Project: "An Introduction to Minimizing Energy Functions"

Thesis Advisor: Maria Carme Calderer

Minors: Russian Studies and Spanish Studies

Attendance: August 2004-May 2008

Math in Moscow

Study Abroad Program at *Independent University of Moscow*

Graduate Courses in Mathematics and Russian Language

Attendance: August-December 2007

IES Madrid

Study Abroad Program at *Universidad Complutense de Madrid*

Spanish Language and Culture Program

Attendance: May-July 2005

7. Professional Experience

Current Appointment

August 1, 2014-present

Creighton University

Assistant Professor, Mathematics

Faculty, Data Science Program

Previous Experience

The University of Iowa

2008-2014 Graduate Teaching Assistant

Instructor, Discussion Leader, Teaching Practicum Student, REU

Mentor, Math Lab Tutor, Grader

Coe College

2013 Teaching Practicum Student

Student Teacher

The University of Minnesota

2006 Undergraduate Teaching Assistant

Discussion Leader

Minnesota Center for Industrial Mathematics

2006-2007 Consultant to Wand Corporation

Analyst

8. Organizations

Professional Memberships, Current

- **Leadership Team:** Inquiry Based Learning-Greater Iowa Nebraska Community of Practice (IBLINC)
- American Mathematical Society (AMS, AMS Central Section)
- Mathematical Association of America (MAA, MAA Nebraska-SE South Dakota Section)
- Phi Beta Kappa (PBK)
- Iowa Section-NExT (alumna member)

9. Funding and Recognition

Funding Since Joining the Creighton Faculty

2020-2021	PI: Inquiry-Based Learning Community of Practice Minigrant <i>Increasing participation and collaboration with a virtual book club, \$250, funded.</i>
2020	PI, with Dr. Aimee Schwab-McCoy and Dr. Catie Baker: Dr. George F. Haddix President's Faculty Research Fund Award (competitive intramural grant), Interdisciplinary <i>New Activities Database for Data Science Instructors. \$15,000, rejected.</i>
2020-2021	Co-PI, with Dr. Aimee Schwab-McCoy and Dr. Catie Baker: NSF grant HDR-I-DIRSE-FW <i>MAPping Data Science: Establishing an Institute for Meaningful Assessment Practices in Data Science. \$434,917, rejected.</i>
2018-2019	PI: CURAS Faculty Research Fund, (competitive intramural grant), Supply <i>Using MATLAB to Perform Bifurcation and Sensitivity Analysis in Two Student Projects. \$1050, funded.</i>
2016-2017	PI: Mathematics Research Communities Collaboration Grant <i>2016 Physiology in Medicine (AMS follow-up funding), \$2250, funded.</i>
2016-2017	Co-PI, with Dr. John F. Shea: Dr. George F. Haddix President's Faculty Research Fund Award (competitive intramural grant), Interdisciplinary <i>Furthering Creighton's Mission with Interdisciplinary Studies of Host-Parasite Populations. \$15,000, rejected.</i>
2015-2016	PI: CURAS Faculty Research Fund, (competitive intramural grant), New Investigator <i>A Scaffolded "Laboratory" in Mathematics to Discover and Uncover a Robust Mathematical Biology Population Model. \$2000, funded.</i>
2015	Co-PI, with Dr. John F. Shea: Dr. George F. Haddix President's Faculty Research Fund Award (competitive intramural grant), Interdisciplinary

Interdisciplinary Collaboration to Serve Creighton's Mission with Biological Field Research-Learning and Mathematical Modeling. \$15,000, funded.

Recognition

2018	IGGY Award, for outstanding mentorship of Freshman students (intramural award from office of retention)
2015	IGGY Award, for outstanding mentorship of Freshman students (intramural award from office of retention)

10. Publications

Summary of Scholarly Publications

Six years ago, I published my Ph.D. dissertation. In the last five years, one paper has been published and two are submitted and pending review or second review. Preprints are available due to copyright issues; an author's copy of the pdf is available upon request.

Also listed are current projects that have preprints available or are in a late data analysis stage, to show a tentative trajectory of publications over the next 1-2 years (dependent on the state of public health).

In mathematics, *citations* take longer to appear and may appear even decades after first publication. The most important consideration is to choose a journal with a narrow scope.

In applied mathematics, *coauthorship from two to five authors is more normative than a work of solo authorship*, as long as the authors are from different disciplines and perspectives, but author ordering is not universal. For each entry I've listed each *author contribution*.

Peer Reviewed Journal Articles and Submitted Works

Since joining the Creighton Faculty

- Brady N, with **Faculty Sponsor: Gasper RE**, *Gambiense Human African Trypanosomiasis in the Democratic Republic of the Congo: An Update Model for Sleeping Sickness with Parameter Identifiability*. **Submitted**, SIAM Undergraduate Research Online, July 2020. (Work by undergraduate student)
 - Impact Factor: --
*SIURO is the premier undergraduate research journal focusing on applied mathematics. It is sponsored by SIAM, the Society for Industrial and Applied Mathematics, and all papers undergo a peer-review process. **Faculty are not allowed to coauthor in this journal, but receive acknowledgement on the first page and index.** Undergraduate journals in mathematics are not ranked;*

however, only a few (3-5) exist that are not an academic publisher tied to a department.

An undergraduate journal was chosen to emphasize that this is the first in an evolution of this line of modeling; further analysis may allow partial republication in a journal of biomathematics. The early publication of this model helped the student in professional school admissions.

- This article updates parameters for sleeping sickness in the DRC with new studies and models the transmission using vertical transmission. Previous studies had found the reservoir transmission to be unimportant, and we expand that to rank identifiable parameters by sensitivity, suggesting control measures that will alter the course of the disease. This is timely with multimillion-dollar efforts to eradicate sleeping sickness.
 - NB formulated the question, computed and analyzed the patterns, and contributed 80% of the paper authorship. I created a short curriculum and program to solve the problem and supplied some required computing files; I edited the paper.
 - This preprint is the version submitted by NB for publication.
- Schwab-McCoy A and Baker C and Gasper RE, *Data Science in 2020: Computing, Curricula, and Challenges for the Next 10 Years*. **Submitted**, Journal of Statistics Education, May 2020.
 - Impact Factor: 1.00; 3-year Impact Factor: 0.98.
The Journal of Statistics Education was an American Statistical Association journal until 2015, when it switched to Taylor and Francis. It is well-known and one of the only journals in statistics education with no page fees. Its Impact Factor has risen 68% in the last year. This will appear in a special issue dedicated to "Computing in the Statistics and Data Science Curriculum."
 - We describe the findings of our university data science educator survey in the context of the predictions made 10 years ago for the future of "applied statistics". Faculty reported teaching a variety of computing skills in introductory data science (albeit fewer computing topics than statistics topics), and that one of the biggest challenges they face is teaching computing to a diverse audience with varying preparation.
 - ASM is the lead contributor; CB and I are equal next contributors. ASM, CB, and I all contributed to survey design, survey distribution, data analysis, and writing.
 - The preprint is not the published version. It is in the second round of reviews with only minor changes.
- Ciocanel V, Docken SS, **Gasper RE**, Dean C, Carlson BE, and Olufsen MS, *Cardiovascular Regulation in Response to Multiple Hemorrhages: Analysis and Parameter Estimation*. Biological Cybernetics. **Published Online** September 2018. DOI: <https://doi.org/10.1007/s00422-018-0781-y> **Published** Vol 113: p 105, 2019.
 - Impact Factor: 1.440; 5-year Impact Factor: 1.941
Biological Cybernetics is a top computational biology journal. This appeared in a special issue on "Control Theory in Biology and Medicine."
 - This paper is one of the first to explore cardiovascular response to multiple hemorrhages through data and modeling. We determine which parameters are

structurally unidentifiable and which can be experimentally determined, and backsolve to determine what happens in variables that are hidden, eg, to vascular resistance which is not measured by experimental catheterization.

- I was part of an equal working group of junior researchers: V Ciocanel, SS Docken, RE Gasper, who chose to accept an *alphabetical* listing of junior faculty. C Dean performed experiments; BE Carlson and MS Olufsen were PIs. MS Olufsen contributed the model, training, research question and some software code; SSD, VC, and I computed the optimization and analyzed the model. VC, SSD, MO, BEC and I wrote the paper.
- This is not the version that appears online or in print; this preprint is the version submitted by the authors for publication.

Works in Progress (not yet submitted)

- Tanaka ST and **Gasper RE**, *Effects of Obesity on Essential Cardiac Action Potentials: Modeling and Bifurcation*. To be submitted to Minnesota Journal of Undergraduate Mathematics in Summer 2020; preprint available. (Work with an undergraduate student)
 - Impact Factor: --
The student completed this work as part of a senior honors project. Given the limited time allotted to do this, it is appropriate to publish it in an undergraduate math journal; if more analysis is performed it can be partially published in a journal of biomathematics. Undergraduate math journals are not ranked.
 - This paper investigates the robustness of the DiFrancesco and Noble, and the Noble and Noble models for electrocardiology. Can we modify existing Purkinje Fiber and Sinoatrial Node models to reflect the physiology of a person who is obese? The answer is split. Using studies on obesity we alter channel density and function, and even the capacitance of the membrane due to fatty molecules nearby. 1D and 2D bifurcations are performed.
 - I contributed the research question, program for analysis, and training; ST and I contributed to software coding and computing, analysis, and authorship.
 - A courtesy preprint is available; it has not been submitted for publication as/of July 2020.
- Lewis D, **Gasper RE**, et al, *Effects of Grading Structures on Student Anxiety* (working title). Targeted submission to PRIMUS: Problems, Resources, and Issues in Mathematics Undergraduate Studies, Fall 2020.
 - *PRIMUS is the most popular mathematics secondary education journal. The data has large scope (with Pandemic data) to merit a second publication with a new line of analysis.*
 - This is work by a group of ten SoTL researchers from mathematics, statistics, and nursing, led by Drew Lewis of University of South Alabama. The main goal is to research whether types of mastery grading (Mastery Testing, Specifications Grading, Standards-Based Grading) increase or decrease learner stress and anxiety in mathematics courses. The first survey spanned Spring 2020, implying a rapid publication due to topical pandemic educational structures captured.

- The survey was designed, approved by several IRBs, distributed, and collected by my co-investigators. I serve as the impartial chief data analyst, since none of my students are subjects. I will author this and subsequent papers.
- **Gasper RE** and Schwab-McCoy A, *Establishing student clarity under standards-based and specifications-based grading* (working title).
 - This is a collaborative work in mathematics education. The research has been approved by the IRB and a survey is being collected for analysis.
 - This has already led to the instigation of an NSF proposal in data science education.
- **Gasper RE**, *Post-stimulus firing time and action potential properties at a single node of Ranvier with stochastic ion channel opening* (working title).
 - A planned continuation of work at a prior institution, it will include data from Rob Shepherd's lab on deafened cats for comparison to the theoretical framework. This data, thought lost, was used by another researcher and distributed to me recently. Analysis to include model parameter optimization, sensitivity and covariance analysis.

Publications Prior to Joining the Creighton Faculty

- **Gasper RE**, *Action Potentials in the peripheral auditory nervous system: a novel PDE distribution model*. Ph.D. Dissertation, The University of Iowa. 2014.
 - 352 downloads and an additional 157 abstract views
 - The first work to attach population modeling methods to auditory neurons. Auditory neurons were particularly suited to this advection-diffusion approach (and approximating stochastic differential equations) because of the small diameter of the neuron. In essence, I look at the input required for a cochlear implant to work, based on the properties of the neuron, from a first principles modeling framework.
 - The final work is included as a large pdf.

11. Presentations

Since Joining the Creighton Faculty

- **(Invited)** SIAM Special Session on Mathematical Physiology, Mathematical modeling and simulation of complex biological systems, Joint Math Meetings, Denver CO, January 16, 2020
 - *Can you hear me now? A PDE Model for Stochastic Properties of the Auditory Neuron.*
- Micro-Conference on Parameter Estimation of Physiological Models after SIAM LS, Minneapolis MN, August 9, 2018
 - *Undergraduate Versions of 'This': Propagating Sensitivity, Parameter Selection, and more to New Math Learners.*

- Math Biosciences Institute Emphasis Workshop 3: Control of Disease: Personalized Medicine Across Heterogeneous Populations, Columbus OH, October 30, 2017
 - *Effects of Obesity on Cardiac Action Potentials at the Sino-Atrial Node* (Poster)
- AMS Special Session, Joint Mathematics Meetings, Seattle WA, January 9, 2016
 - *Stochastic Gating in a Peripheral Auditory Neuron: Effects on Post Stimulus Time and Firing Efficiency of Action Potentials.*
- Midwest Auditory Research Conference (MARC-MANS), Omaha NE, July 24, 2015
 - *New Results in Population Models in Auditory Neurology* (Poster).
- Neuroscience Journal Club, Creighton University, January 27, 2015
 - *Mathematical models of action potentials in the auditory nerve fiber.*

Prior to joining the Creighton Faculty

- Joint Mathematics Meetings, Baltimore MD, January 16, 2014.
 - *Action potentials in peripheral auditory nervous system: A novel PDE distribution model.*
- Math and Computer Science Colloquium, Goucher College (MD), November 20, 2013
 - *All my circuits.*
- Math Colloquium, Truman State University (MO), April 17, 2013.
 - *Can you hear me now?, or, A mathematician's journey to get people in other disciplines to listen.*
- Joint Mathematics Meetings, San Diego CA, January 10, 2013.
 - *Action potentials in peripheral auditory nervous system: A novel PDE distribution model.*
- Math Colloquium, University of Wisconsin-La Crosse (WI), November 9, 2012
 - *Mathematical biology.*
- Math Biology Lunch, University of Iowa, April 6, 2012.
 - *Auditory midbrain implant: A review* (H.H. Lim, M. Menarz, T. Menarz).
- Comprehensive Exam, Panel: (Mathematics) Colleen Mitchell, Bruce Ayati, Tong Li, Rodica Curtu, (Biology) Alan Kay, (Hearing Science) Paul Abbas, University of Iowa, February 24, 2011.
 - *Excitation in the auditory system: A novel PDE model.*
- Math Biology Seminar, University of Iowa, February 21, 2011.
 - *Excitation in the auditory system: A novel PDE model.*
- Math Biology Lunch, University of Iowa, November 5, 2010.
 - *A stochastic model of the electrically stimulated auditory nerve: single-pulse response* (Ian C. Bruce et al).
- Math Seminar, Grinnell College (IA), March 12, 2010.
 - *The auditory brain stem and the Poisson distribution.*
- Graduate and Undergraduate Student Seminar (GAUSS), University of Iowa, March 9, 2010.
 - *Poisson Processes in the auditory brain stem.*

SOTL and Professional Development Talks

- **(Invited)** Panelist: Data Collection, LMSs, and Gradebooks. Mastery Grading Conference, Virtual Conference (600 registered), June 6, 2020.

- Application of XP: Based on an idea by Mariah Birgen. Cool Stuff Session, Mastery Grading Conference, Virtual Conference (600 registered), June 5, 2020.
- Do Students Get it? At 3 Levels of the Curriculum. MAA Themed Contributed Paper Session, MAA MathFest, Denver CO, August 4, 2018.
- Changing tracks: More Applied Courses Make a Med-Ready Major. MAA Themed Contributed Paper Session, Joint Mathematics Meetings, Atlanta GA, January 6, 2017.
- The new diversity. Iowa Section-NExT, Wartburg College (IA) October 18, 2013.
- Creating a course site on Facebook. Math Biology Lunch, University of Iowa, February 17, 2012.
- A love-hate relationship with Wolfram Alpha. Math Biology Lunch, University of Iowa, September 23, 2011.
- Creating a mathematical multimedia slideshow in Beamer. Math Biology Lunch, University of Iowa, February 18, 2011.

12. Undergraduate Research Projects

Summary of Undergraduate Student Research

Undergraduate Students engaged in research since 2014: 17
 (22 when enumerating distinct projects for a single student)
 Undergraduate Students engaged in funded summer research: 5
 Undergraduate Presentations and Authorships:
 Poster Presentations: 18
 Oral Presentations: 11
 Proposals for Summer Undergraduate Research Fellowships: 5 (3 funded)
 Articles and Reports: 5 (0 published, 1 submitted)

Undergraduate Student Research Details

- Mitchell Tran, Fall 2018-Present, and Ally Larsen, Fall 2019-Present, Optimizing cardiac output for Pulmonary Atresia with Intact Ventricular Septum.
 - (MT) Spring 2019: Proposal, *Modeling the Heart of Patients Affected by Pulmonary Atresia with Intact Ventricular Septum*, \$6000, rejected
 - (MT) Spring 2020: Proposal, *Modeling the Heart of Patients with Pulmonary Atresia with Intact Ventricular Septum (Revised)*, \$6000, rejected
 - (MT) Spring 2020: Presentation, Department Seminar.
- Shari Tanaka, Spring 2018-Present, Modeling Effects of Obesity on the SinoAtrial Node with Bifurcation Analysis.
 - Spring 2018: Proposal, *Modeling Effects of Obesity on the Sinoatrial Node with Bifurcation Analysis*, \$5000, funded
 - CURAS Dean's Summer Undergraduate Research Fellowship awarded for this research.
 - Fall 2018: Poster, *Effects of Obesity on Essential Cardiac Action Potentials: Modeling and Bifurcation*, NIMBioS URC National Conference

- Spring 2019: Poster, *Effects of Obesity on Essential Cardiac Action Potentials: Modeling and Bifurcation*, NCUWM Regional Conference
- Spring 2019: Poster, *Effects of Obesity on Essential Cardiac Action Potentials: Modeling and Bifurcation*, St. Albert's Day university showcase
- Spring-Summer 2018: Paper, see *Publications*
- Noah Brady, Spring 2018-Present, African Sleeping Sickness in the Democratic Republic of Congo.
 - Spring 2018: Proposal, *Modeling African Sleeping Sickness in the Democratic Republic of Congo*, \$5000, funded
 - Dr. and Mrs. Randolph Ferlic Summer Undergraduate Research Fellowship awarded for this research.
 - Summer 2018: Oral Presentation, *Modeling African Trypanosomiasis: Performing Bifurcation Analysis and Finding R_0 for gHAT*, MAA Mathfest National conference
 - Fall 2018: Poster, *Modeling African Sleeping Sickness in the Democratic Republic of the Congo*, Dr. Randolph and Teresa Kolars Ferlic Poster Symposium university showcase
 - Spring 2019: Poster, *Modeling gHAT in the DRC*, Honors Day university showcase
 - Spring 2019: Poster, *Modeling gHAT in the DRC*, St. Albert's Day university showcase
 - Spring-Summer 2019: Paper, see *Publications*
- Grace Rants, Fall 2016-Spring 2017, Effects of obesity on cardiac action potentials at the sino-atrial node.
 - Spring 2017: Poster, *Effects of Obesity on Cardiac Action Potentials at the SinoAtrial Node*, Honors Day University Showcase
 - Spring 2018: Poster, *Effects of Obesity on Cardiac Action Potentials at the SinoAtrial Node*, St. Albert's Day University Showcase
- A.K. Satpathy, Summer 2016, TS-19 Outbreak after Aggressive Intracranial Medical Therapy.
 - Summer 2016: Unpublished Report, *TS-19 Outbreak after Aggressive Intracranial Medical Therapy*.
- Mary Luckasen, Grace Rants, Nina Thakur, and Emma Harwood, Spring 2016, *Effects of Obesity on the Cardiac Action Potential*.
 - (EH, GR, ML, NT) Spring 2016: Oral Presentation, *Obesity Affects Function In the Heart's Pacemaker Cells*, St. Albert's Day university showcase
 - (NT and EH) Spring 2016: Oral Presentation, *Obesity affects function in the heart's pacemaker cells*, MUMS regional conference
- Monika Satkauskas, Emma Schlagenhauff, Sruti Prathivadhi-Bhayankaram, Chris Connor, Tommy Nemmers, and Robert James, with co-advising of an additional eight biology students, Summer 2015-Spring 2016, *A Host-Parasite-Commensal ecological model based on field studies in the Great Plains*.
 - (TN) Summer 2015: Unpublished Report, *Summary of Last Week*.

- (MS, EH, TN) Fall 2015: Poster, *A Host-Parasite-Commensal Ecological Model Based on Field Studies in the Great Plains*, NIMBioS National Conference
 - (MS, EH, TN) Fall 2015: Poster, *A Host-Parasite-Commensal Ecological Model Based on Field Studies in the Great Plains*, CURAS Research Fair university showcase
 - (MS) Spring 2016: Poster, *A Host-Parasite-Commensal Ecological Model Based on Field Studies in the Great Plains*, JMM national conference
 - (MS) Spring 2016: Poster, *A Host-Parasite-Commensal Ecological Model Based on Field Studies in the Great Plains*, NCUWM regional conference
 - (MS and EH) Spring 2016: Oral Presentation, *A Host-Parasite-Commensal Ecological Model Based on Field Studies in the Great Plains*, MUMS regional conference
 - (MS) Spring 2016: Oral Presentation, *A Host-Parasite-Commensal Ecological Model Based on Field Studies in the Great Plains*, St. Albert's Day university showcase
 - (MS) Spring 2017: Poster, *Modelling Host, Parasite, and Commensal Interactions to Determine Pollution Levels*, JMM National conference
 - (MS) Spring 2017: Poster, *Modelling Host, Parasite, and Commensal Interactions to Determine Pollution Levels*, NCUWM Regional conference
- Nina Thakur and Emma Harwood, Fall 2015, *Neuron ODE Models*.
- Anh Vo, Spring 2015-Summer 2015, *Numerical Methods for Nonlinear Population Models*.
 - Spring 2015: Proposal, *Timing of Action Potential in Auditory Neuron System*, \$5000, funded
 - CURAS Dean's Scholarship awarded for this research.
 - Summer 2015: Oral Presentation, *Timing of Action Potential in Auditory Neuron System*, MAA Mathfest National Conference
Note: given in General Contributed Paper Session rather than as an undergraduate talk
 - Fall 2015: Poster, *Timing of Action Potential in Auditory Neuron System*, CURAS Research Fair university showcase
 - Fall 2015: Oral Presentation, *Numerical Methods for an Auditory PDE*, NIMBioS URC national conference
 - Fall 2015: Unpublished report, *Applying Finite Volume Method to Solve the Auditory Neuron System Equation*, as HRS 200 essay
 - Spring 2016: Poster, *Unknown*, St. Albert's Day university showcase
- Sarah Budney, Spring 2015, *Modeling Spread of HPV in College "Hook-up" Culture*.
 - Spring 2015: Poster, *MATHEMATICAL MODELING OF HUMAN PAPILLOMAVIRUS AND CERVICAL CANCER IN COLLEGE "HOOK-UP CULTURE"*, St. Albert's Day university showcase
- Monika Satkauskas, Fall 2014, *A Short Introduction: Group Theory and its Applications*.
 - Fall 2014: Oral Presentation, *A Short Introduction to Group Theory and its Applications*, Math Seminar

- Anh Vo, Fall 2014, *System of First Order Linear Differential Equations and Its Application in Study of Membrane*.
 - Fall 2014: Poster, *System of First Order Linear Differential Equations and Its Application in Study of Membrane*, department math club

13. Professional Development

Conferences, Workshops and Seminars Participant

August 5-September 5, 2020	Keep Teaching Online (Intermediate), Asynchronous Online Course, Creighton University Virtual Workshops, Omaha NE (Anticipated)
July 20-24, 2020	Keep Teaching Online (Basic), Synchronous Online Course, Creighton University Virtual Workshops, Omaha NE (Anticipated)
May 25-July 15, 2020	Introduction to Digital Learning and Academic Technologies, Asynchronous Online Course, Creighton University, Omaha NE
June 5-6, 2020	Mastery Grading Conference, Virtual Conference (600 registered)
October 25-26, 2019	Iowa MAA Section Meeting, Sioux Center, IA
June 18-21, 2019	Academy of Inquiry Based Learning Workshop on Inquiry Based Learning, Minneapolis, MN
April 5-6, 2019	Nebraska-Southeast South Dakota MAA Section Meeting, Omaha, NE
January 25-27, 2019	Nebraska Conference for Undergraduate Women in Mathematics, Lincoln, NE
October 27-28, 2018	NIMBioS Undergraduate Research Conference at the Interface of Mathematics and Biology, Knoxville, TN
August 9, 2018	Micro-Conference on Parameter Estimation of Physiological Models after SIAM LS, Minneapolis MN
August 1-4, 2018	MAA MathFest, Denver CO
Fall 2017-Spring 2018	Seminar on Jesuit Higher Education, Omaha, NE
October 30- November 3, 2017	Math Biosciences Institute Emphasis Workshop 3: Control of Disease: Personalized Medicine Across Heterogeneous Populations, Columbus, OH
February 3-5, 2017	Nebraska Conference for Undergraduate Women in Mathematics, Lincoln, NE
January 4-7 2017	Joint Mathematics Meetings, Atlanta, GA
June 19-25, 2016	Mathematics Research Community in Mathematics in Physiology and Medicine, Snowbird, UT
April 9, 2016	Midwest Undergraduate Mathematics Symposium, Indianola, IA
January 6-9, 2016	Joint Mathematics Meetings, Seattle, WA

November 21-22, 2015	NIMBioS Undergraduate Research Conference at the Interface of Mathematics and Biology, Knoxville, TN
August 5-8, 2015	MAA MathFest, Washington D.C.
July 23-25, 2015	Midwest Auditory Research Conference (MARC-MANS), Omaha, NE
April 10-11, 2015	Midwest Undergraduate Research Symposium, Indianola, IA
January 23-25, 2015	Nebraska Conference for Undergraduate Women in Mathematics, Lincoln, NE
January 15-18, 2014	Joint Mathematics Meetings, Baltimore, MD
October 18-19, 2013	MAA Iowa Section and Iowa Section-NEXT Meetings, Wartburg College, IA
January 9-12, 2013	Joint Mathematics Meetings, San Diego, CA
October 5-6, 2012	MAA Iowa Section and Iowa Section-NEXT Meetings, Simpson College, IA
2009-2012	Heartland Partnership Annual Meeting, The University of Iowa, IA
August 2-4, 2012	MAA Mathfest, Madison, WI
June 18-29, 2012	Summer School on Recent Advances in the Theory of Homogenization, The University of Chicago, IL
May 17-19, 2012	Symmetries of Differential Equations: Frames, Invariants and Applications (Peter J. Olver Birthday Conference), The University of Minnesota, MN
2009-2011	Mathematical Biology Micro-Conferences, The University of Iowa, IA
June 2009	Women and Mathematics Summer Program: Program on Geometric PDEs, Institute for Advanced Studies
2008	Blackwell-Tapia Conference, University of Minnesota, MN

Conferences, Workshops and Seminars as Organizer

April 20-23, 2017	Organizer and Local Host, Workshop and colloquia on mathematical biology, Creighton University, NE
2011	Lead Organizer, Sonia Kovalevsky Day for Women in Mathematics, Iowa City, IA
2011	Co-organizer, American Mathematical Society Central Section Meeting Special Event (Poster Session for Graduate Students, a first in the history)

14. Service

Academic Advising

Pre-Health Professions Advising, by appointment, 2015-Current
 Freshman and Sophomore Pre-Major Advising, 15 Students, Class of 2024

Freshman and Sophomore Pre-Major Advising, 15 Students, Class of 2021
 Freshman and Sophomore Pre-Major Advising, 14 Students, Class of 2019
 Ozioma Ofoma, Class of 2021
 Sehun Lee, Class of 2021
 Anna Rossini, Class of 2020
 Jackie Ramos, Class of 2019
 Dominic (Dom) Theis, Class of 2019
 Cameron Kell, Class of 2019
 Patrick O'Neill, Class of 2018

- now: IT security customer service manager, Austin TX

Fernanda Sandoval, Class of 2018

- now: JD law at Villanova University

Meixuan (Michelle) Yu, Class of 2017

- Graduated in 3 years
- now: Consultant at Deloitte Consulting in Chicago, IL

Blake Wach, Class of 2017

- now: High School math teacher, robotics and soccer coach, Modesto CA
- now: applying for graduate programs in data science and statistics

Monika Satkauskas, Class of 2017

- now: Chemistry Ph.D. candidate, University of Toronto

Departmental Service at Creighton University

Fall 2016-current	WeBWork Administrator
2015-current	Course Coordinator, MTH 231
Fall 2016-Spring 2017	Hiring Committee Assistant Professor in Statistics
Fall 2015-Fall 2016	Course Designer and Author of Magis Core Proposal MTH 448 [Previously MTH 548]
Fall 2015-Spring 2016	Hiring Committee Assistant Professor of Mathematics
Fall 2014-Spring 2015	Hiring Committee Visiting Assistant Professor of Mathematics

College/University Service at Creighton University

2015-current	Pre-Health Professions Advisor Attendance of related monthly workshops and meeting with prospective students
Summer 2020-Spring 2021,	Faculty Preceptor, for Ratio Studiorum Program

Summer 2017-Spring 2018, and
Summer-Fall 2015

Summer 2020

Guest Discussion leader for First-Year online
course "A Unique Perspective on COVID-19"

Fall 2019-Spring 2020

Representative for Math Reasoning, Magis Core
Curriculum Committee Workshops

Spring 2016-Spring 2017

College of Arts and Sciences Mission Catalysts
Committee

April 2016-February 2017

Selection Committee
PBK Visiting Scholar to Creighton University

April 2019 and March 2016
and March 2015

Panelist
Women in Sciences/Clare Boothe Luce
Seminar

January-November 2015

Selection Committee
PBK Visiting Scholar to Creighton University

March-April 2015

Scholarship Committee
Clare Booth Luce Scholarship

Service to the Mathematical Profession

Fall 2019-current

Journal Reviewer, PRIMUS: Problems, Resources,
and Issues in Mathematics Undergraduate
Studies
Two reviews

July 2019-current

MAA-Nebraska/SE South Dakota Section
Mentor

January 2017-August 2020

MAA-Early Career Mentoring Mentor

January 2017-August 2020

MAA Project-NExT (New Experiences in Teaching)
Mentor

January 2019, January 2015

Breakout Session Chair
Nebraska Conference for Undergraduate
Women in Mathematics

January 2017

Reviewer in Focus Group
MAA Instructional Practices Guide

Summer 2016	Textbook Reviewer, Yale University Press One textbook
2008-2013	(Leadership) Committee Chair and Volunteer Sonia Kovalevsky Day for Women in Mathematics
October 2012	Presentation Judge Iowa Math Modeling Competition

Abbreviated List of Service with the Greater Community

2019-2020	Third Grade Catechist, St. John Vianney Catholic Church, Omaha NE
2006-2007	Volunteer Math Teacher, Lincoln Adult Education Center, Minneapolis MN

15. Teaching at Creighton University

Summary of Teaching at Creighton University

At Creighton I have had the honor of teaching 541 students, 34 sections of classes, and 11 different courses/preps (excluding special courses “Directed Independent Study” (MTH 495), “Directed Independent Research” (MTH 497), and the Ratio Studiorum Program seminar). A list of these courses and their frequency follows:

- Applied Mathematics (MTH 201, 2 sections)
- Mathematics for the Modern World (MTH 205, 7 sections)
- Calculus for the Biological sciences (MTH 231, 10 sections)
- Calculus I (MTH 245, 4 sections)
- Calculus II (MTH 246, 1 section)
- Introduction to Abstract Mathematics (MTH 310, 3 sections)
- Calculus III (MTH 349, 1 section)
- Fundamentals of Epidemiology (MTH 355, 1 section)
- Linear Algebra (MTH 529, 1 section)
- Math in Medicine and the Life Sciences I (MTH 447, previously MTH 547, 6 sections)
- Math in Medicine and the Life Sciences II (MTH 448, previously MTH 548, 1 section)
- Ratio Studiorum Program Seminar (RSP 101, 3 sections)*
- Directed Independent Study (MTH 495, 1 section)*
- Directed Independent Research (MTH 497, 4 sections)*

More details on these courses can be found in my faculty profile, and Student Evaluations of Teaching are available in full. I average 9 student contact hours in class per week, and 4 hours of office hours.

Teaching by Semester

Semester	Course	Credits	Enrollment
Fall 2014	MTH 245 Calculus I	4	25
	MTH 245 Calculus I	4	22
	MTH 547 Math in Medicine and the Life Sciences I	3	9
	MTH 495 Directed Independent Study	1	2
Spring 2015	MTH 347 Calculus III	3	9
	MTH 201 Applied Mathematics	3	25
	MTH 497 Directed Independent Research	1	1
Fall 2015	MTH 310 Introduction to Abstract Mathematics	3	4
	MTH 231 Calculus for the Biological Sciences	3	20
	MTH 547 Math in Medicine and the Life Sciences I	3	5
	RSP 101 Ratio Studiorum Program (Seminar)	1	14
	MTH 497 Directed Independent Research	1	2
Spring 2016	MTH 529 Linear Algebra	3	20
	MTH 231 Calculus for the Biological Sciences	3	22
	MTH 548 Math in Medicine and the Life Sciences II	3	3
	MTH 497 Directed Independent Research	1	3
Summer 2016	MTH 355 Fundamentals of Epidemiology	3	1
Fall 2016	MTH 231 Calculus for the Biological Sciences	3	17
	MTH 231 Calculus for the Biological Sciences	3	15
	MTH 447 Math in Medicine and the Life Sciences I	3	5
	MTH 310	3	1

	Introduction to Abstract Mathematics		
Spring 2017	MTH 246 Calculus II	4	32
	MTH 310 Introduction to Abstract Mathematics	3	6
	MTH 205 Math in the Modern World	2	27
Fall 2017	MTH 245 Calculus I	4	24
	MTH 447 Math in Medicine and the Life Sciences I	3	5
	MTH 205 Math in the Modern World	2	26
	RSP 101 Ratio Studiorum Program (Seminar)	0.5	15
Spring 2018	MTH 231 Calculus for the Biological Sciences	3	29
	MTH 205 Math in the Modern World	2	16
	RSP 101 Ratio Studiorum Program (Seminar)	0.5	14
Summer 2018	MTH 245 Calculus I	4	5
Fall 2018	MTH 447 Math in Medicine and the Life Sciences I	3	4
	MTH 205 Math in the Modern World	2	23
	MTH 205 Math in the Modern World	2	24
	MTH 205 Math in the Modern World	2	16
Spring 2019	MTH 231 Calculus for the Biological Sciences	3	27
	MTH 231 Calculus for the Biological Sciences	3	6
	MTH 205 Math in the Modern World	2	15
Fall 2019	MTH 231 Calculus for the Biological Sciences	3	15
	MTH 231 Calculus for the Biological Sciences	3	11
	Additional Assignment*	N/A	N/A
Spring 2020	MTH 201 Applied Mathematics	3	18
	MTH 231	3	7

Calculus for the Biological Sciences MTH 447	3	5
Math in Medicine and the Life Sciences I MTH 497	1	1
Directed Independent Research		

*I was originally assigned to teach MTH 201 in Fall 2019 but was reassigned to course development for a new course.

Teaching by Type, with Student Evaluation Summary

A simplistic but reproducible way to measure teaching effectiveness is by the following three course evaluation items given on a Likert agreement scale (1-5):

1. Overall, I rate this instructor an excellent teacher ("Excellent Teacher") (Adjusted)¹
(Where unavailable, What is your overall impression of the quality of this instructor?)
2. Overall, I rate this course as excellent ("Excellent Course") (Adjusted)
(Where unavailable, What is your overall impression of the quality of this course?)
3. This Instructor displayed a personal interest in students and learning ("Students and Learning")
(Not available prior to Fall 2017 in any form)

A summary table of course evaluation items across all semesters follows. Peer observations of teaching were made twice (Drs. Crist and Nielsen) and comments are part of the peer letters of support.

	Excellent Teacher	Excellent Course	Students and Learning
REG	3.03	2.86	3.58
Math Department	3.41	3.26	3.57
College	4.06	4.08	4.30

The comparison groups (department, college level) are weighted by the courses taught by me in each semester. Where small-class and large-class evaluations both contain the question, the published averages for comparison groups are weighted by the number of each class. In this way, the published average may differ from group to group because they are compared in different semesters.

Calculus Course Evaluations (5 sections)

Calculus I-II are required for chemistry and physics majors, as well as math majors. In the past, my Calculus II class has had an unusual share of students who graduate with latin honors, and the modal test score is 'A' for Calculus II. I have greatly enjoyed teaching it. Since Spring 2017, I have used standards-based grading to track learning outcome progress for each student in the course and determine course grade.

- Excellent Teacher (Adj) (4 sections): 2.73 (Math mean: 3.44; College mean: 4.19)
- Excellent Course (Adj) (4 sections): 3.05 (Math mean: 3.48, College mean: 4.05)

¹ The IDEA Adjusted value reflects audience differences in student background preparation, work habits, motivation, course difficulty, and class size.

- Students and Learning (4 sections): 3.21 (Math mean: 3.56, College mean: 4.29)

Spring 2015 (347) received a qualitative small course survey. They indicated that my boardwork was messy and I wouldn't always communicate the idea clearly the first time, but office hours were extremely helpful in tying up loose ends and discovering surprises. Since this course, I've learned to manage boardwork better, sometimes preferring the linear direction of an opaque projector: the direction of notes is easy for learners who need more structure, all corners are easy to reach and I can refer backward and forward as needed.

Applied Medical Mathematics Course Evaluations (17 sections)

One thing I've learned from comments on other 547/447 course evaluations is that students were frustrated with the topics of the course I developed with an emphasis on biology and ecology, finding them difficult to apply to medicine. So in Spring 2020 I changed the textbook, emphasized professional skills and professional ethics, and added computing as a way to involve more learners in high-level problems without an analytical solution.

I stay current on trends in mathematical biology education, and serve as the MTH 231 course coordinator since its actuation. The audience for these courses and for MTH 355 is primarily pre-medical-professionals, who as an audience expect excellence of themselves.

- Excellent Teacher (Adj) (14 sections): 3.13 (Math mean: 3.44; College mean: 4.31)
- Excellent Course (Adj) (14 sections): 2.81 (Math mean: 3.22, College mean: 4.07)
- Students and Learning (9 sections): 4.05 (Math mean: 3.59; College mean: 4.33)

Fall 2015 (547), Spring 2016 (548) received a qualitative small course survey; 547 wished for better boardwork but appreciated my Canvas site structure to retrieve anything they were missing.

A special analysis of Spring 2020 courses is found in the Faculty Profile.

Math Major, Upper Division Course Evaluations (3 sections)

Math majors take Calculus III (sometimes in their senior year), Linear Algebra, and Introduction to Abstract Mathematics. Intro to Abstract Mathematics traditionally uses inquiry-based learning (IBL) and a textbook script that invites greater student participation, teaching them to make mathematics; pushback is a part of teaching this course, as is encouraging students to embrace challenge.

- Excellent Teacher (Adj) (2 sections): 3.85 (Math mean: 3.50, College mean: 4.21)
- Excellent Course (Adj) (2 sections): 3.35 (Math mean: 3.21, College mean: 3.94)
- Students and Learning (0 sections)

Fall 2015 (310) received a qualitative small course survey. Like some of my later courses, the students applauded the clear structure and even appreciated some of the behind-the-scenes work in making a student-taught class: "This course had a plan at all times. Dr. Gasper knew how she planned to go through the class while still giving us the opportunity to explore the material" (with one dissent). Of the readings and homework, "They were necessary for understanding because it was helpful to do the proof head on and try it yourself before you can do anything else." Of the course quality and inquiry-based backbone, "Every math major in the country should take a course like this that forces them to think critically and differently."

Service Course Evaluations (9 sections)

Our service courses with no prerequisite, which fit the college core Mathematical Reasoning requirement, are MTH 201 and MTH 205. MTH 201 was a business course required for almost all business college students from 2014-2020, but is not a pre-calculus course, focusing on formal logic, interest and mortgages, and other topics. MTH 205 has been remade over the last two years from a recreational math course (modular arithmetic, for example) into a modular course with topics of the instructors' choice such as predatory loans, representative democracy, and how to calculate your own course grade. It is now a project-based collaborative class. I taught this in Spring 2019 as a mastery course, where students needed to pass each of six projects but could resubmit after receiving feedback.

- Excellent Teacher (Adj) (9 sections): 2.83 (Math mean: 3.43, College mean: 4.29)
- Excellent Course (Adj) (9 sections): 2.74 (Math mean: 3.22, College mean: 4.09)
- Students and Learning (9 sections): 3.25 (Math mean: 3.54, College mean: 4.29)

A special analysis of Spring 2020 courses is found in the Faculty Profile.

Ratio Studiorum Program Course Evaluations

Creighton's required freshman program, the Ratio Studiorum program, has two continuing course evaluation questions:

1. Overall, your faculty advisor's performance as an academic advisor (rating 1-5)
2. I felt my advisor cared about me as a student (Yes/No)

Semester	Course	Course Meeting Time	As Advisor	Cared %
Fall 2015	RSP 101 Ratio Studiorum Program (Seminar)	3:30pm	4.5	91.7
Fall 2017	RSP 101 Ratio Studiorum Program (Seminar)	3:30pm	2.5	100
Spring 2018	RSP 101 Ratio Studiorum Program (Seminar)	2:00pm	2.43	85.7