Model of a GREAT Reappointment Package
Start with a simple three-prong portfolio

Print and place an informative label on the front.
Next, obtain color coded tabbed dividers
Cover page should look like this:

Be sure to print material on both sides if possible

Index should correspond with each tab
1. Recommendation Letter from Reappointment Tenure Promotion Committee
2. Evidence of Classroom Visits

Label both sides of tabs

Second Tab
Place evidence in this section
3. Reappointment Evaluation & Recommendation (including vote total)
Be sure to have all signatures and the vote total.
4. Acknowledgment of Notification
ACKNOWLEDGMENT OF NOTIFICATION

I have been informed of the role title (Faculty Handbook 303.01) and the contents of the Reappointment/Promotion/Tenure Committee’s recommendation to the Dean.

[Signature]
Candidate

[Signature]
Chair, Reappointment/Promotion/Tenure Committee

Date

Date

Be sure to sign and date – both you and your chair.
5. Self-Evaluation & Personal Statement

Fifth Tab
(See Next)
Personal Statement and Self-Evaluation for Reappointment

Nathaniel Burch

January 24, 2015

Summary

Since my previous personal statement and self-evaluation, Fall 2013, I have continued to make significant strides in my teaching, professional development, advising, and academic citizenship and service at GU. In each of these categories, I have pursued out both local and national endeavors. Specifically, my teaching has been shaped through my involvement in Project NExT, attendance at MathFest 2014, participation in a NIMBioS Tutorial, and through careful, repeated reflection. In the direction of professional development, one research manuscript has been accepted, and another submitted, for journal publication. I also attended an opening workshop at SAMSI, presented research at MathFest 2014, and continue to work with my collaborators, both at or near GU and remotely. I have remained active as an “advisor” in the Math Club and Putnam Club at GU and, in Spring 2014, also helped to reactivate WA Epsilon, the GU Chapter of the national mathematics honor society Pi Mu Epsilon. Through my participation in the CTA’s New Faculty Learning Community and Advising Academy, I have been able to serve as a competent advisor so far in my general advising duties. I have served on several ad hoc committees for the department and university, e.g., the ISE planning committee and CTA Advisory Board. Nationally, I have volunteered my time at national conferences, e.g., to judge a student poster session at JMM 2015. In this document, I will elaborate on several of these items as well as others.

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Teaching

My goal as a teacher is for my students to think abstractly, improve their problem-solving skills, develop a deeper appreciation for mathematics, and learn how to read and understand new mathematics on their own. I believe these attributes, even when taken outside of the context of mathematics, are imperative for someone to be a life-long learner and competent contributor to his/her communities. Moreover, these skills are necessary for to handle challenging and ambiguous problems that will be asked later in their careers. Additionally, I strive to expose my students to the increasing role that computation, software, and technology play in the discipline.

To date, I have taught the following courses at GU (number of sections):

- MATH 157 – Calculus and Analytic Geometry I  Fall 2013 (1)
- MATH 258 – Calculus and Analytic Geometry II  Spring 2014 (2)
- MATH 321 – Statistics for the Experimentalist  Fall 2013 (2), Fall 2014 (3)
- MATH 454 – Partial Differential Equations  Spring 2014 (1)

Refinements of My Pedagogy

I continue to learn from my experiences at GU and make changes to my pedagogical approach. Specifically, I have focused my attention this last calendar year on:

(a) contenting to incorporate software and technology into my classes, e.g., R into MATH 321
(b) identifying course-specific learning outcomes and using them for experimentation with mastery-based testing
(c) incorporating writing projects in my courses, specifically in MATH 321
(d) using WeBWork, an online homework system to deliver, collect, and grade rudimentary homework

Communicating these ideas and changes with my students and fellow faculty has been of vital importance. To aid this effort, I maintain and update a webpage (http://web02.gonzaga.edu/faculty/burchtn/) that provides important course details as well as research opportunities, information on careers in mathematics, activities happening in the department, and resources for instructors.

Incorporating Software into MATH Courses  I use computer demonstrations on a daily basis. The particular software I use depends on the course, e.g., I have been using R in MATH 321 because it is free and open source and it is well-suited for statistical analysis. Additionally, I have required my students to gain exposure to R through both tutorials and group projects. Last year at this time, I wanted to “have students use the software rather than just me simply manipulate code in front of them.” I feel that I have made significant progress toward this goal. There has been some resistance from students, but I continue to emphasize that hands-on experience with mathematical and statistical software is a useful, and highly employable, skill.

It has taken careful planning with Brett Hendricks, Rob Ray, and Tom McKenzie to pull some of this off. Through resources such as SageMathCloud and accessing RStudio from a server (an option currently under consideration), we have been able to obtain free, reliable, and convenient access to software, which plays well with the limitations in computing facilities in the College of Arts and Sciences. I frequently update my webpage with software tutorials and resources and several students in various departments, e.g., mathematics, economics, computer science, and biology have commented on it helpfulness.

I do still struggle with several questions related to this approach, e.g.,

(a) how best can I motivate hesitant or resistant students to engage with the software?
(b) how well do the students actually learn the software during the semester?
(c) how does using software and gaining “hands-on” experience help students learn the material?
(d) is using software in particular classes at odds with the current assessment standards in the department?

These are important questions that need addressing. I remain dedicated to exposing students to this type of learning experience, not
only because it is a direction that the majority of other departments across the country have already taken, but also because even the “purest” areas of mathematics are increasingly reliant on computational methods, e.g., computational algebraic geometry. Without this preparation, our graduates will become, or possibly remain, underprepared for jobs in industry or graduate school.

Mastery-based Testing I became informed of and interested in mastery-based testing through discussions with colleagues at the Project NExT workshop preceding MathFest 2014. In mastery-based testing, students receive full credit on a problem only after they demonstrate “mastery” of the content. That said, it is not expected that a student demonstrates mastery on the first attempt and, therefore, students receive an additional attempt (or possibly multiple attempts) later in the course. My approach has been to provide such an extra attempt on the final exam, in which a student may attempt (similar) problems from earlier in the semester that he/she missed. The important point is that students have a reason to revisit old ideas that they hadn’t fully understood.

The notion of mastery-based testing has allowed me to evaluate, and even reinvent, my grading approaches. Rather than agonizing over the point value of a nonsensical answer or trying to fairly deduct points for each minor error, I am able to look at a student’s solution with a more holistic mindset. For instance, a student may make a minor calculation error and still demonstrate mastery. Moreover, a student who makes several errors or a “small” conceptual error may receive minimal (or no) partial credit. While the student will undoubtedly argue he/she demonstrated more knowledge than the partial credit that is given, this is also the reason for multiple attempts on a problem. This enumerates a phenomenon that occurs in real life – a wrong answer is a wrong answer, no matter how close someone might get to the correct answer. It is suggested that, when considering whether or not a student has attained mastery, try to decide whether the student would benefit from studying the topic for additional time.

In consideration of course-planning and learning outcomes:

(a) I can make clear the important topics of the course to both myself and my students
(b) test questions can focus more on concepts, rather than mostly computations

The relationship between mastery-based testing and the final exam aligns well with what I view the purpose of a final exam is, e.g.,

(a) repetition: it asks students to engage with the material repeatedly until they fully understand it
(b) built-in reward: students that demonstrate mastery throughout the semester do not need to do so again on a final
(c) encouragement: students that show improvement and demonstrate mastery on the final are not penalized for earlier mistakes

I see many potential benefits to mastery-based testing, in terms of retention of knowledge, than traditional testing. That said, there are foreseeable drawbacks, or hiccups, that need some careful thought:

(a) creating alternate versions of old questions that are “sufficiently different” can be a challenge
(b) questions should be rich enough to identify whether a student has mastered the content area
(c) students may be able to guarantee themselves a particular grade before the end of the semester (and then to decide to blow off the later parts of the course)

Using Writing Assignments in MATH 321 The writing assignments I have created have been motivated by Gavin LaRose and his book “Writing Projects for Mathematics Courses: Crushed Clowns, Cars & Coffee to Go.” In fact, I had the pleasure of participating in a workshop lead by Gavin during the 2014 Project NExT. I have mimicked his approach to assigning projects in the guise of a “real-world” problem posed to a faux consulting company. By and large, the students seem to take more ownership of the project than I’ve seen in semesters past. These projects allow me to assess types of questions and understanding that is less-suitable for tests and also allow me to assess the ability to communicate in statistics. Two such group projects, as well as example student solutions, are available on my MATH 321 webpage.

Using WeBWorK for Homework Delivery, Collection, and Grading In Fall 2013, I expressed concern and frustration in the delivery, collection, and grading of homework assignments. On one hand, with the growing abundance of online resources, solutions manuals,
and computer algebra systems, the traditional approach to assigning and collecting homework seems hopeless. That said, students still need to practice many problems in a mathematics course. I believe WeBWorK strikes a good balance. I can require each student to engage with the material for at least an hour or so and the time I save grading can be used to create additional activities or assignments to supplement WeBWorK. During Summer 2014, I participated in the MAA PREP course “Authoring Effective Homework Problems with WeBWorK.” While I haven’t been creating and editing problems for my courses, I plan to in the future. I have a lot of faith in the potential that WeBWorK offers and I plan to use it for many of the courses I teach, especially now that I have gained the skills to edit and create problems. I think the mathematics department would benefit by creating a standard set of WeBWorK problems, much like we do with “suggested” problems, that can be used as a shell for a particular course (the MAA has example courses that we could use as a launching point). Many of our 100- and 200-level courses are particularly well-suited for this approach.

**Student Evaluations**

I have tabulated averages for each of my courses in the table below. In future years, after more student evaluation data has been collected, I plan to investigate temporal trends in my evaluations to tease out interesting features.

<table>
<thead>
<tr>
<th>Course Year</th>
<th>Semester</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fall 2013</td>
<td>4.37</td>
</tr>
<tr>
<td>2</td>
<td>Fall 2013</td>
<td>4.49</td>
</tr>
<tr>
<td>3</td>
<td>Fall 2013</td>
<td>4.52</td>
</tr>
<tr>
<td>4</td>
<td>Spring 2014</td>
<td>4.44</td>
</tr>
<tr>
<td>5</td>
<td>Spring 2014</td>
<td>4.12</td>
</tr>
<tr>
<td>6</td>
<td>Spring 2014</td>
<td>4.27</td>
</tr>
</tbody>
</table>

In short, I am very happy with my evaluations so far. Closer examination shows my weakest categories are fostering student interest in the subject, use of appropriate textbook, content of tests, and explanation of ideas. Coincidentally, the first three of these are items that I independently noted I needed to improve. From Fall 2013 to Spring 2014 improvement in fostering class discussions has been documented in my student evaluations.

I must say that I was surprised to see my lowest evaluation occur in MATH 258. While this is countered by a relatively high evaluation in the same course and same semester, I believe that the semester went well and that I effectively used quizzes, discussion, and WeBWorK, and also was organized and delivered the material in an effective manner. On the other hand, I was also surprised to see how high how my evaluations for MATH 454 were. By no stretch of my imagination can I say that I thought that class went well. I selected a textbook that I, in hindsight, did not like. I ended up not following the textbook too closely and this caused frustration with my students. This was the first time I had selected a textbook and did not appreciate the thought that must go into that process. The group of students was very diverse in their interests and abilities. Part of this is a by-product of the limited number of 400-level courses we offer (and thus students are “forced” into courses they may not be interested in or prepared for). Most importantly, the
class description and the prerequisites for the course do not match. Namely, it would be more appropriate to have MATH 260 (and maybe MATH 339) as a prerequisite. Additionally, the overlap in material with ENSC 371 – Advanced Engineering Mathematics is too large. I would like to see ENSC 371 cross-listed as a mathematics course and taught as a two-semester sequence with MATH 454, i.e., students must take ENSC/MATH 371 before taking MATH 454.

Self-Evaluation and Future Goals

Looking ahead to the upcoming year, my goals for teaching are, in all honesty, to continue on the trajectory I am currently on. I’ve experimented with a lot of things this semester and am largely happy with the results. The two upcoming Project NExT workshops in San Antonio, TX and Washington DC will help provide me some feedback and offer another opportunity to learn about new pedagogical practices in the discipline. That said, I do have a bulleted-list of things I would like to pursue before next year:

(a) create Mathematica demonstrations and labs, much like what I have done in R for MATH 321, for the calculus sequence
(b) investigate using open access online textbooks, some of which have been approved by the American Institute of Mathematics
   * I don’t view the current MATH 321 textbook as a particularly valuable, or affordable, resource and believe I can effectively replace it with a free option for our students, supplemented by my notes and R demonstrations
(c) apply to the CTA SoTL Initiative in Spring 2015
   * and I’ve spoken a little with David Boose in the past about some of my ideas for projects
(d) continue to use and refine mastery-based testing in several of my courses
(e) continue to produce PDF versions of my notes (via \LaTeX) and make available to students and faculty
   * I’ve used these to make lectures more efficient and they can also easily be shared, or turned into worksheets so to pseudo-flip the classroom or have the students experience moments of IBL

I would like to reflect specifically on what has been happening in the MATH 321 courses this fall. My first time teaching MATH 321 at GU (and at GU, general), I gave suggested problems and collected and graded very few assignments. I made assumptions about the students’ dedication, motivation, interest, self-motivation, etc. that, in hindsight, should not have been made. As a result, the students learned less, retained less, went largely unchallenged (until a test), and suffered lower grades. This did not sit well with me and I vowed either to never teach MATH 321 again or to make make significant changes if I did.

I used the summer of 2014 to create R laboratories and demonstrations, incorporate real applications and real data, and create group projects for the course, all in preparation of teaching MATH 321 in Fall 2014. I’ve also tried to find resources to motivate and engage the students, e.g., my webpage has a growing list of great resources and I have also purchased several expository and fun books for my bookshelf related to statistics. I decided to aim for “it was a hard class, but I got a lot out of it” rather than “it was easy, but I didn’t learn much”, which I had been hearing far too often. The Project NExT workshop on teaching introductory statistics, lead by Carolyn Cuff (Westminster College), was also very helpful in this effort.

What I have done seems to have worked. While there have been a few students that have not bought into my system (and quite frankly have been rude and distracting for the class), as a whole, the students seem more engaged and much more competent with the material than just a year ago. Maybe it is a character flaw, but seeing the success thus far makes me want to push a little harder. Specifically, I would like to continue to build up resources for R in MATH 321 and have the students engage more with R. Interactions with Vivek Patil have left me very interested in learning how to use R Markdown to create interactive and dynamic lecture notes. I am participating in a minicourse offered during JMM on “Teaching Statistics Using R and R Studio” that will continue to hone my skills at effectively using R in the classroom. Most importantly, I would like to share my resources with fellow GU faculty members that are teaching MATH 321 and interested in incorporating R.
Professional Development

I have split professional development into two categories depending on whether it is directly related to pedagogy or not.

Pedagogical Professional Development

I have some ambitious plans for my future pedagogical professional development. Since the MAA MathFest in Aug. 2014, I have engaged in discussion with Project NExT fellows regarding mastery-based testing and a subgroup of interested faculty around the country have been organizing this approach in efforts to publicize this method. I would like to find an appropriate avenue for publishing my course notes for MATH 321 as an open-source and open access resource (maybe just for GU students and faculty). I’ve also been designing a topics course meant to serve as a follow-up to MATH 321 to be offered in Spring 2015. The planning stages have involved conversations with Scott Coble, Rob Ray, Tom McKenzie, Ryan Herzog, Noel Bormann, among others, as far as appropriate topics and recommended audience. I have several exciting ideas for the course, some of which have been inspired through my participation in INRUG and subsequent discussions with Vivek Patil about his course at GU on data visualization. My experiences in the above endeavors will be appropriate for a presentation of my findings at both USCOTS and MathFest in the summer of 2015.

I have been fortunate to participate in several pedagogy-related programs (many funded externally):

(a) New Faculty Learning Community (2013-2014, GU CTA)
(b) NIMBioS Tutorial (summer 2014, University of Tennessee)
   * how to incorporate biology applications into a mathematics classroom?
   * how to team teach with math and bio?
   * how to design a math course for bio students that does not have a calc prereq?
(c) MAA PREP course on "Authoring Effective Homework Problems with WeBWorK" (summer 2014, MAA, online)
(d) Project NExT (2014 Fellow, preceding MathFest 2014 in Portland, OR)

In various ways, each of these experiences has had a profound impact on my pedagogy. For brevity, I will discuss in detail only my participation in Project NExT.

Project NExT I was accepted into Project NExT, a selective national professional development program designed to train educators of mathematics in their first or second year of full-time teaching. In August of 2014, I participated in a three-day workshop overlapping MathFest in Portland, OR. Two additional workshops will occur during the Joint Mathematics Meeting in January of 2015 (San Antonio, TX) and MathFest in August of 2015 (Washington D.C.). The cohort of 2014-2015 NExT Fellows communicates and shares experiences regularly. I will join the regional NExT Program in the future so that I can also establish a regional cohort of peers. This experience has been invaluable and I wish to express my sincere thanks to my department for its support and to the College of Arts and Sciences, specifically Dean Mermann-Jozwiak, for the financial support. While it’s a seemingly expensive investment, I hope to prove the dividends to be generous.

Research and Consulting

During the summer of 2014, one manuscript was accepted for journal publication and another was submitted. I was also fortunate to attend the Opening Workshop on Mathematical and Statistical Ecology at SAMSI in August 2014 and have joined two working groups that formed thereafter. Unfortunately, I have been unable to contribute to the groups simply due to lack of time. I also presented research at MathFest 2014 and continue to work with several collaborators, e.g., Nancy Staub and I have looked at both analysis of salamander hormone data and fitting von Bertalanffy growth models to mark and recapture data. I also continue to work
with Andrea Bertotto-Metoyer and Geoff Glenn on the solid waste research project with the City of Spokane. I performed some minimal consulting for Minapsys in Spring 2014, but not much came out of that work. Together, these projects have been exciting ways to get involved in the community, work with students, and start collaborations on interdisciplinary projects with other GU faculty members. My personal research interests lie in studying movement ecology. Specifically, I am investigating so-called jump processes that arise in applications that necessitate nonlocal interactions or long-range effects.

Submitted or Published Papers The following manuscripts have either been accepted or submitted for publication in the last year:

(a) Computing the Exit-time for a Finite-range Symmetric Jump Process, Monte Carlo Methods and Applications (submitted, 2014)
(b) The Exit-time Problem for a Markov Jump Process, European Physical Journal Special Topics (to appear, 2014)

Conferences and Workshops Attended I’ve had only a few opportunities to travel to and present at research conferences

(a) MAA MathFest 2014 (talk: “The Second-order Lanczos Derivative and a Nonlocal Flux”)
(b) SAMSI Opening Workshop on Mathematical and Statistical Ecology

I have not been able to pursue, or fully participate, in other other conferences due simply to lack of time.

Self-Evaluation and Future Goals

Considering I have focused my attentions largely on teaching, advising, and service, I’m very satisfied with the progress of my professional development. Most important, I’ve been thrilled to see my research interests and directions evolve in a natural and unforced manner. I’ve been able to attend some conferences and publish results. I’ve made collaborators here at and near GU and remained in touch with some of my existing collaborators. I would like to build my research and attend more research conferences, but this might be better-suited for my post-tenure career.

Advising

General Advising

I was assigned four freshman advisees in Fall 2014 and have since added a junior mathematics major. My participation in the CTA Advising Academy has been very helpful in walking me through the process of general advising. Namely, we have constructed an advising syllabus and I have built a webpage for my advisees that contains useful links. Viewing the advising process in terms of a syllabus and specifying learning outcomes has been a worthwhile exercise in understanding my role as an advisor. I am increasingly being asked to write letters of recommendation and have formalized the process of students requesting letters on my webpage as well.

Undergraduate Research Advising

I have had limited experience, largely due to limited time, working with students on research projects. From Fall 2013 to Summer 2014, I worked with Tucker Keuter on the City of Spokane refuse and recycling project. Throughout the project, Tucker and I had many discussions about graduate school. Tucker is now in a graduate program at the Wisconsin Medical School studying biostatistics. During Spring 2014, I co-advised Allison Fisher (with Nancy Staub), who held a student research assistantship through the Biology department. The project concerned analyzing salamander hormone levels using R. Allison presented her work during the poster
session at SIRC in 2014. This was a good learning experience for me in the sense of pointing out some items I need to think harder about so to create a project suitable to give to an undergraduate student.

Mathematics Department Advising

Pi Mu Epsilon  The mathematics department reactivated WA Epsilon at Gonzaga University in Spring 2014 and was awarded a $500 Richard A. Good Lectureship to help defray costs of reactivating the chapter. We also hand generous support from the College of Arts and Sciences and Dean Mermann-Jozwiak. We hosted Dr. Paul Fishback from the National Pi Mu Epsilon (PME) Council to deliver a seminar and organize the reactivation ceremony. Since Spring 2014 I have served as the Chapter Advisor. As Chapter Advisor, I attended the PME National Conference and Centennial Celebration in August 2014 held in Portland, OR. We inducted 16 new students into WA Epsilon in Spring 2014. We were able to send a student speaker, Martin Tucker Dean, to MathFest and the PME National Conference in August 2014 and Tucker received funding through PME.

Looking ahead, the department has had some informal discussions about an annual mathematics department awards ceremony in conjunction with the PME induction. We ran a prototype of this event last spring with pretty good success. Additionally, PME offers grants to match awards that the department gives to students. If awarded such a grant, we can use the external PME funding help defray costs for refreshments and such.

Miscellaneous Mentoring and Advising Activities  I have remained active in the Math Club and helping out with administering the Putnam Exam. The Math Club meets roughly once a month to provide an informal gathering place for students of all classes to promote interest in mathematics, provide knowledge of careers in mathematics, and socialize with other majors. I’ve had some informal discussions with other faculty members about increasing the participation from our majors in departmental events such as Math Club, Putnam Club, Saturday Morning Tutoring, Spokane Regional Colloquium, etc. After recently seeing the model that the Biology Department has in place, I’d like to discuss a similar model with the department for making it a requirement for students to participate in some subset of events, e.g., an additional MATH 499 requirement.

Self-Evaluation and Future Goals

I’ve taken my general advising duties seriously, but I still have much to learn. Helping to reactivate PME was no short task, but I believe it will continue to pay dividends far into the future. I must confess that I am a little perturbed, or frustrated, about the lack of student involvement in departmental events. Related to this, I see my involvement in PME, Math Club, and the Putnam Club fading in the future. Instead, I hope to focus my efforts on student research projects or independent studies.

Academic Citizenship and Service

Slowly, but surely, I’ve increased my academic citizenship and service activities. I have been engaged in departmental activities, e.g.,

(a) Spokane Regional Mathematics Colloquium co-liaison (Fall 2013 and Spring 2014)
    * Bonni Dichone has taken over this job starting Fall 2014
(b) Mathematics Department Awards Committee
(c) MATH 321 Core Working Group
activities for the university, e.g.,

(a) Steering Committee for the Sciences Summit
(b) ISE Planning meetings (since Spring 2014)
(c) CTA Advisory Board
as well as services to the discipline at the national level, e.g.,
(a) referee for Journal of Computational Physics (May 2014)

To help become and active member in regional and national communities, I've used faculty professional development funds and startup funds to join Project NExT, MAA, SIGMAA-StatEd, ASA, and ISs. The support and resources from these groups has been really helpful.

Inland Northwest R User Group (INRUG) The Inland Northwest R Users Groups (INRUG) was recently started by a few faculty members from GU and EWU (see http://inrug.github.io), namely

Gonzaga University: Vivek Patil, Nate Burch, Ta-Tao Chuang, Stephen Hayes, and Shawn Bowers
Eastern Washington University: Krisztian Magori, James Hallett

INRUG seeks R enthusiasts with interests in using R for pedagogy, research, or, honestly, just fun. It also provides a great venue for potential collaborations of various sorts.
(a) foster research collaborations
(b) grow and build a network of users of R in the Inland Northwest
(c) promote the use of R, particularly in undergraduate instruction

Self-Evaluation and Future Goals

For brevity, I'll simply state that I have made progress being an active member in the department, at the university, and in my field. When my teaching and research endeavors settle down, I hope to take on more service responsibilities.

Concluding Thoughts

In Math Teaching Circles, the question came up: "Bonni and Nate, how has your second year gone so far?" In many ways, I think my first year was easier. My first year at GU, I was oblivious to many things – many of the fine details that help create a productive and successful classroom environment. My experience in Project NExT and other independent investigations have opened my eyes to what I want to achieve in a classroom and how I want to achieve it. I've made a lot of changes to my pedagogy this year and have, largely, seen positive results. Unfortunately, it's taken an extremely large amount of time to achieve this. So, without a doubt, my second year at GU has been tougher. That said, I feel very confident this year that what I am doing has been more effective. In the future, I need to learn to dedicate more time to research, advising, and service. I am looking forward to another year of trial, error, and improvement at GU.
6. Up-to-Date Curriculum Vitae
CURRICULUM VITAE
NATHANIAL BURCH

Address: Gonzaga University
         Mathematics Department
         502 E. Boone Ave.
         MSC Box 2615
         Spokane, WA 99258

Phone: (509) 313-5977
Email: burchn@ Gonzaga.edu
Website: http://web02.gonzaga.edu/faculty/burchn/

Education
2011 Ph.D. Colorado State University, Fort Collins, CO, Department of Mathematics
Probabilistic Foundation of Nonlocal Diffusion and Formulation and Analysis for Elliptic Problems on Uncertain Domains
Advisor: Donald Estep

2009 M.Sc. Colorado State University, Fort Collins, CO, Department of Statistics
On Optimal Sampling Strategies to Determine Unknown Coefficients in Elliptic Partial Differential Equations
Advisors: Jennifer Hoeting and Donald Estep

2008 M.Sc. Colorado State University, Fort Collins, CO, Department of Mathematics
Continuum Modeling of Stochastic Wireless Sensor Networks
Advisor: Donald Estep

2006 B.Sc. Grand Valley State University, Allendale, MI, Department of Mathematics
Numerical Analysis and Statistical Properties of Higher-order Lanczos’ Derivatives
Advisor: Paul Fishback

Employment

Positions
2013 – present Assistant Professor, Gonzaga University, Spokane, WA
2013 Adjunct Lecturer, North Carolina State University, Raleigh, NC
2011 – 2013 Postdoctoral Research Scholar, SAMSI, Research Triangle Park, NC
(jointly affiliated with North Carolina State University, Raleigh, NC)
2009 – 2011 CSRI Intern, Sandia National Laboratories, Albuquerque, NM

Consulting
2013 – 2014 City of Spokane, Spokane, WA

Selected Honors and Grants
2014 Center for Teaching and Advising, Gonzaga University ($1000 travel grant)
2011 US Junior Oberwolfach Fellowship, National Science Foundation ($500 travel grant)
various Graduate Research Assistantship, Colorado State University
various Graduate Teaching Assistantship, Colorado State University
2007 – 2008 PRIMES NSF IGERT Graduate Fellowship, Colorado State University
2006 – 2007 Graduate Student Fellowship, Colorado State University ($1500 stipend)
2004 Best in Session Award, Mathfest MAA Student Paper Session

Memberships and Associations
2014 – present Mathematical Association of America (MAA)
2014 – present SIGMAA-StatEd
2014 – present American Statistical Association (ASA)
2014 – present Isolated Statisticians Network (ISs)
2011 – 2014 Society of Industrial and Applied Mathematics (SIAM)

Publications
Peer-reviewed articles


Conference proceedings


Other publications


Presentations

Invited

2012 Nov. Workshop on Nonlocal Models and Peridynamics, Berlin, Germany
Talk: *Symmetric Jump Processes Restricted to a Bounded Domain*

Talk: *Nonlocal Diffusion and Symmetric Jump Processes Restricted to a Bounded Domain*
Poster: *Computing the Exit-Time for a Symmetric Jump Process*

2012 Apr. Peridynamics, Dissipative Particle Dynamics, and the Mori-Zwanzig Formulation, Providence, RI
Talk: *A Survey of Nonlocal Diffusion Equations and the Underlying Jump Processes*

2012 Mar. Workshop on Models with Complex and Uncertain Domains, Research Triangle Park, NC
Talk: *Nonparametric Density Estimation for Elliptic Problems on Uncertain Domains*
Poster: *Computing Exit-times for a Symmetric Jump Process from a Class of Domains*

2011 Jan. Oberwolfach Mini-Workshop on the Mathematical Analysis for Peridynamics, Wolfach, Germany
Talk: *Probabilistic Interpretation of Nonlocal Diffusion*

**Contributed**

2014 Aug. MAA MathFest, Portland, OR
Talk: *The Second-Order Lanczos Derivative and a Nonlocal Flux*

2013 Jan. Joint Mathematical Meetings, San Diego, CA
Talk: *The Utility of Transient Sensitivity Analysis for Malaria Intervention Strategies*

2012 Jul. Joint Statistical Meetings, San Diego, CA
Talk: *Probabilistic Foundation of Nonlocal Diffusion with Volume Constraints*

2011 Dec. Masamu Workshop in Biomathematics, Livingstone, Zambia
Talk: *Transient Sensitivity Analysis in Biological and Ecological Models*

2010 May Workshop on Uncertainty Quantification, International Centre for Mathematical Sciences, Edinburgh, Scotland
Poster: *Sensitivity Analysis for Solutions of Elliptic PDEs on Domains with Randomly Perturbed Boundaries*

**Local**

2014 Oct. Biology Dept. Seminar (with Bonni Dichone and Rick Cangelsi), Gonzaga University, Spokane, WA

2011–2013 SAMSI Postdoctoral Research Seminar, Research Triangle Park, NC

2010 Aug. Sandia National Laboratories CSRI Student Seminar, Albuquerque, NM

2006–2011 Greenslopes Graduate Student Seminar, Fort Collins, CO

**Professional Development**

**Pedagogical training**

2015 May United States Conference on Teaching Statistics (USCOTS), Penn St. University

2014 Summer MAA PREP – Authoring Effective Homework Problems with WeBWorkK, online course

2014 Summer Algebraic and Discrete Biological Models for Undergraduate Courses, NIMBioS

2014 Spring Informative Speeches Scoring Group, Gonzaga University

2014 Spring Shared Classroom Initiative, Gonzaga University

2013–2014 New Faculty Learning Community, Gonzaga University

2012–2013 Mentoring and Teaching Practicum, North Carolina State University
(in cooperation with Kirsten Doehler at Elon University)


2006 Fall College Supervised Teaching, Colorado State University

2006 Fall Graduate Teaching Assistantship Training, Colorado State University

**Research conferences**

2015 MAA MathFest, Washington DC (upcoming)

2015 Joint Mathematical Meetings, San Antonio, TX (upcoming)

2014 Program on Mathematical and Statistical Ecology Opening Workshop, SAMSI, Research Triangle Park, NC

2014 MAA MathFest, Portland, OR

2013 Joint Mathematical Meetings, San Diego, CA

2012 Workshop on Nonlocal Models and Peridynamics, Berlin, Germany

2012 Joint Statistical Meetings, San Diego, CA
2012 Nonlocal Continuum Models for Diffusion, Mechanics, and Other Applications, SAMSI, Research Triangle Park, NC
2012 Peridynamics, Dissipative Particle Dynamics, and the Mori-Zwanzig Formulation, Providence, RI
2012 Workshop on Models with Complex and Uncertain Domains, Research Triangle Park, NC
2012 SIAM Conference on Uncertainty Quantification, Raleigh, NC
2011 Methodology Opening Workshop and Tutorials, SAMSI, Research Triangle Park, NC
2011 Climate Modeling Opening Workshop, SAMSI, Livermore, CA
2011 Summer School on Uncertainty Quantification, Albuquerque, NM
2011 Workshop on the Future Directions of Applied Mathematics, North Carolina State University, Raleigh, NC
2011 Oberwolfach Mini-Workshop on the Mathematical Analysis for Peridynamics, Wolfach, Germany
2010 Workshop on Uncertainty Quantification, International Centre for Mathematical Sciences, Edinburgh, Scotland
2009 Hawaii International Conference on Statistics, Mathematics and Related Fields, Honolulu, HI
2008 Environmental Sensor Networks Opening Workshop and Tutorials, SAMSI, Research Triangle Park, NC

Service activity

Service to Gonzaga University
2014 Spring used my MATH 454 class for assessment of GU graduates’ presentation skills
2014 Spring Contributed to ABET Accreditation
2013 Fall* SIRC Organizing Committee
* did not serve for 2014 Spring due to scheduling conflicts

Service to the mathematics department
2014 – represented department at Integrated Engineering and Science Center Meetings
2014 – Integrated Science and Engineering Center Planning
2014 – served on departmental awards committee
2013 – 2015 active advisor in Math Club
2013 – 2015 active in organizing the Putnam Exam, and Putnam preparation sessions
2014 Spring co-led (with Bonni Dichone) the reactivation of WA Epsilon, Gonzaga University’s Pi Mu Epsilon Chapter
2013 – 2014 represented department on the Steering Committee for the Sciences Summit
2013 – 2014 co-liaison for Spokane Regional Mathematics Colloquium

Service to the profession
2015 Jan. Judge for JMM 2015 Student Poster Competition
2013 May Interdisciplinary Workshop for Undergraduates, SAMSI
2013 Career Panel (audience: undergraduates)
2013 Feb. Undergraduate Workshop, SAMSI
2010 – 2011 Graduate Student and Postdoc Panel (audience: undergraduates)
2010 – 2011 Officer of inaugural Colorado State University SIAM Student Chapter
2008, 2009 Co-organizer of Poster-Blitz Session for Graduate Student Recruitment Day
2006, 2007 Reader for Math Day Competition
2007 – 2008 Greenslopes Departmental Seminar Organizer

Referee Activity
Peer-reviewed journals
2014 Spring Journal of Computational Physics

Teaching
Courses taught at Gonzaga University
2015 Spring  MATH 321: Statistics for the Experimentalist (2 sections)
2015 Spring  MATH 360: Advanced Topics in Inferential Statistics
2014 Fall    MATH 321: Statistics for the Experimentalist (3 sections)
2014 Spring  MATH 258: Calculus & Analytic Geometry II (2 sections)
2014 Spring  MATH 454: Partial Differential Equations
2013 Fall    MATH 157: Calculus & Analytic Geometry I
2013 Fall    MATH 321: Statistics for the Experimentalist (2 sections)

Courses taught at North Carolina State University
2013 Sum.    MA 401: Applied Differential Equations II
2012 Fall    MA 241: Calculus II

Recitations led at Colorado State University
2011 Spring  STAT 460/560: Applied Multivariate Analysis

Courses taught at Colorado State University
2009 Spring  MATH 340: Introduction to Ordinary Differential Equations
2008 Fall    MATH 340: Introduction to Ordinary Differential Equations
2007 Spring  MATH 155: Calculus for Biological Scientists I
2006 Fall    MATH 155: Calculus for Biological Scientists I

Special tutorials
2012 Oct.    Undergraduate Workshop, SAMSI
             Tutorial: *PCA, SVD, and JPEGs, ASAP!*
2012 May     Interdisciplinary Workshop for Undergraduate Students, SAMSI
             Tutorial: *Introduction to Data Assimilation and the Kalman Filter*
             Tutorial: *Linear Algebra Review and Introduction to the Method of Least Squares*
2012 Feb.    Undergraduate Workshop, SAMSI
             Tutorial: *Sensitivity Analysis Based Uncertainty Quantification*
2011 Oct.    Undergraduate Workshop, SAMSI
             Tutorial and MATLAB Laboratory: *Data Assimilation and the Kalman Filter*

Advising

Clubs, tutorials, and study groups
2014 – 2015  PME Chapter Advisor at Gonzaga University (Washington Epsilon)
             • (Spring 2015) awarded a $100 prize-matching grant from PME
             • (Spring 2014) awarded a $500 grant to host Paul Fishback for the Richard A. Good Lecture
2013 – 2015  active advisor in Math Club
2013 – 2015  active in organizing the Putnam Exam, and Putnam preparation sessions
2013 – 2014  led a study group for Exam P

Undergraduate research projects advised
2014 Summer  Martin Tucker Dean (talk "Using Differential Equations to Solve the Lion and Man Game" presented at National PME Meetings, 2014)
7. Numerical Portion of Student Course Evaluations since last Evaluation

Seventh Tab
Place Student Evaluations in this section
Complete Reappointment Package