Department of Integrated Science and Technology
Faculty Activity Report
2015-2016 Academic Year

Teaching

Courses taught Summer 2015-Spring 2016

Course #	Sec #	Sem	Cred	Students	Team
HUM 252	4104	U15	3	5	
JAPN 111	4101	U15	6	2	
JAPN 212	4101	U15	6	4	
JAPN 490	4101	U15	3	1	
ISAT 493	4101	U15	3	1	Radziwill
ISAT 340	1	F15	3	18	
ISAT 345	1	F15	3	11	
ISAT 348	1	F15	3	21	
ISAT 493	5	F15	3	1	Radziwill
ISAT 492	3	F15	2	4	Radziwill
ISAT 492	0202	F15	2	1	Radziwill
CS 330	1	S16	3	15	
ISAT 440	1	S16	3	15	
ISAT 252	1	S16	3	27	
ISAT 252	2	S16	3	27	
ISAT 252	3	S16	3	27	
ISAT 493	2	S16	3	4	Radziwill

Narrative

This has been a year of adjustment for me. After the experience I had in the spring of 2015, which I described in last year's FAR/FAAP, I made a major effort to revamp my assessment strategy this past fall. I abandoned choose-your-own-grade and adopted a points-accumulation approach. While I believe that the approach I used is reasonable, the students were less than enthusiastic about it. It has had the result, however, of really clarifying what the goal of my pedagogy should be.

My goal as an instructor is to inspire students to invest their time and energy in acquiring skills, and knowledge that will transform their relationships to the people around them and to themselves. The experiences should be meaningful, and there really is no way to generalize that. In other words, what counts as "meaningful" will be different and idiosyncratic to every student. Perhaps the only meaningfully generalizable metric is the amount of time each individual chooses to devote to their studies.

Students' end-of-semester narratives consistently show that they are thinking deeply about who they are and who they want to be. They are assessing their own behaviors, and trying to interpret them in the context of their courses and their lives. Many are willing to put in the effort necessary to have a transformational experience, but frequently find that they lack the persistence or "grit" necessary to do so. This is an uncomfortable realization for most, and they vary greatly in the degree to which they are honest with themselves about it.

I've decided to go back to doing choose-your-own-grade and to redouble my efforts to get to know each student individually. To let them know that they are important to me, and that I want to support them in getting the most out of their time with me, whatever that happens to mean for that person.

1. Satisfactory

A. Commitment

Student course evaluations for questions #3, #9,#10, and #15, showing scores ABOVE DEPARTMENT MEAN in green, BELOW DEPARTMENT MEAN in red, and AT DEPARTMENT MEAN in black are:

	Fall 2014	Spring 2015	Fall 2015	Spring 2016
#3	**4.33**	**3.55**	**3.38**	**3.87**
Dept. Mean	4.40	4.36	4.46	4.43
#9	**4.79**	**4.36**	**4.00**	**4.30**

Dept. Mean	4.37	4.34	4.38	4.42
#10	4.52	3.62	3.19	3.69
Dept. Mean	4.21	4.19	4.20	4.24
#15	4.45	3.93	3.75	3.67
Dept. Mean	4.13	4.08	4.23	4.23

- The lower than department mean on #3 is an artifact of the amount of autonomy that I give to the students. Because of the pedagogical approach that I take, it is difficult to "prepare for class" since each of the student teams in each section are working on different problems in different areas. Autonomy is one of the key ingredients in intrinsic motivation laid out in self-determination theory of Ryan and Deci (http://selfdeterminationtheory.org). I am not concerned about these numbers.
- Although the ratings on #9 (fair and impartial) are lower than departmental averages, only 2 students out of 84 answered "disagree." 82/84 were "neutral" or above. I think the negative trend in these numbers reflect my general level of discontent with the grading task that I've explained above.
- For #10, timely feedback has never really been my strong suit. The numbers this year are another indication of my overall lack of energy this year.
- For #15 I didn't give any exams. I don't really think these numbers are interpretable, although, they could reflect that a lot of students responded with "neutral" on this question.

B. Organization

	Fall 2014	Spring 2015	Fall 2015	Spring 2016
#11	4.76	3.93	4.12	3.02
Dept. Mean	4.28	4.22	4.25	4.31
#13	3.83	4.00	3.75	3.24
Dept. Mean	3.82	3.79	3.97	3.91
#16	4.68	4.06	3.86	3.98
Dept. Mean	4.18	4.14	4.21	4.25

- For #11 in Spring,
- For #13, I never assign textbooks although I recommend some. It's difficult if not impossible to interpret this number.

C. Communication

Please see course websites at:
- Course Syllabi
  - http://f15.umatter2.us/
  - http://345f15.umatter2.us/
  - http://s16.umatter2.us/syllabus/
- Open-source Course-support Software
  - http://exercism.umatter2.us/

D. Mastery

- My reputation score on StackOverflow, the key online resource for software developers, rose from 445 to 2184 (1739 points), more than quadrupling in the period between June 2015 and June 2016. I'm ranked in the top 1% of users this year (up from the top 42% last year) and have an estimated reach of approximately 198,000 users, up from 132,000 last year.
  (see: http://stackoverflow.com/users/296725/morphatic?tab=topactivity)
- I learned a new programming language this year, Typescript
- I deployed a Shiny server (data visualization package for R), and wrote several well-read blog posts on how to do this (over 4000 hits between 12/15 and 6/16).

E. Student Evaluation

- In 2015-2016, overall evaluations were **3.86** for the fall (compared to a departmental mean of 4.30) and **3.95** for the spring (compared to a departmental mean of 4.32). The spring number does NOT take into account evaluations for CS 330, which was evaluated using the CS departmental rubric.

F. Advising

N/A

G. Attitude

	Fall 2014	Spring 2015	Fall 2015	Spring 2016
#5	4.80	4.18	4.38	4.40
Dept. Mean	4.45	4.40	4.48	4.51
#6	4.88	4.47	4.56	4.54

	Dept. Mean	4.44	4.42	4.48	4.51
#7		**4.75**	**3.90**	**3.65**	**3.78**
	Dept. Mean	4.32	4.32	4.34	4.38
#8		**4.68**	**3.98**	**3.77**	**3.98**
	Dept. Mean	4.28	4.30	4.32	4.37

- I wrote one letter of recommendation this year.

H. Leadership

- I taught four "pop-up" classes in the X-Labs this year which showed students how to construct and program LED light strips. I've been asked to teach these courses again next year. In the words of one of the X-Labs innovation fellows, "It was easily one of our most popular classes this past year."
- I led a team of students to win the 2016 Caring for the Caregiver Hackathon in Richmond, VA. The team won $5000 in round one of the competition, and went on to win another $10,000 in round two. I have since helped them become an official LLC and will be working with them to complete and commercialize their product. This victory received widespread coverage in regional media.

I. Teamwork
N/A

2. Excellent

A. Student Recognition

- Student evaluations of my section of CS 330--Social and Ethical Issues in Computing were significantly above CS Departmental averages. See attached evaluations, especially written comments from students.

B. Peer Recognition

- I was selected again to chair the faculty senate's Academic Policies Committee

C. Vitality

- In the fall I developed a new badging system designed to motivate students to learn programming skills at their own pace, and in the order that was most meaningful to them. This system was a mashup of custom code and several Wordpress plugins.
- In the spring I met weekly with three new senior capstone teams working on three large, new project streams. These teams represent 9 students and have the potential to make a significant impact in the problem areas that they've chosen.

- ○ **JMU Conservation Corps**
  These students are building an organization that will provide free home energy audits to homeowners in Harrisonburg. Their efforts will be supported and publicized by an app and a website that they will build.
- ○ **Type 1 Diabetes Management**
  This is the first project in a series that I hope will be focused on better communication about and management of chronic conditions, such as diabetes, Lyme's disease, hyperthyroid, etc., using data collected from ambient devices like the Fit Bit and other wearable technology. A number of our students suffer from these conditions and have both great passion and great insight towards using their skills to make meaningful contributions to treating them.
- ○ **"JMUber"**
  This project is designed to fill a transportation gap for students that is not currently filled by personal car ownership, biking/walking, taxis, Uber, or public transportation. The goal is to leverage the JMU community to increase opportunistic ride sharing and reduce the overall number of automobile trips to and from the JMU campus.

- I worked on building a DIY bubble tube, a project that I have chronicled in a series of blog posts (http://www.morphatic.com/2016/02/24/diy-led-bubble-tube-part-1/). This project required me to learn more about microcontroller programming, and has jump-started work on Internet of Things (IoT) research.

D. Non-Traditional Leadership

- Director of JMU study abroad in Japan. Six students participated.
- I was advisor, co-advisor, or major contributor to 3 capstone projects:
  - ○ Kamienski, Nicholas. "Design for STEAM" (results have been submitted for publication in the STEAM Journal)
  - ○ Lamma, Noah and Cobb, Joshua, "SmartClickr"
  - ○ Solan, Kelsey, "GolfBot: A Mobile App to Support Statistical Coaching"

E. Contextual Variety

- I taught in the following contexts this year:
  - ○ Discussion--CS 330
  - ○ Self-paced lab--ISAT 252, ISAT 340, ISAT 348
  - ○ Seminar/Project-based--ISAT 480
  - ○ Large team project--ISAT 345
  - ○ Study Abroad to Japan

F. Breadth

- I taught courses at all levels from 2XX to 4XX this year. Course topics ranged from social and ethical impacts of computing, to Japanese language and culture, to soldering and microelectronics, to programming at the beginner and advanced levels.

G. Publication of Teaching Materials

- Developed and implemented a mashup of Wordpress, BadgeOS, and Credly that was designed to provide motivation, structure, guidance, and recognition for students to engage in self-paced learning of programming languages.

H. Presentations and Publications on Pedagogy

- Radziwill, N. M., Romano, J., Shorter, D., & **Benton, M.C**., 2015: The Ethics of Hacking - Should it be Taught? Software Quality Professional, December. *This paper was developed from work students did in CS 330 in Spring 2015.*
- Radziwill, N. M. & **Benton, M. C**., 2016: Design for Neurodiversity (DfN*): A Design foro X Process for Alternative Cognitive Styles. HASTAC, Phoenix AZ, May 13.
- **Benton, M. C.** & Radziwill, N. M., 2016: Choose Your Own Grade: Instructional Civil Disobedience. HASTAC, Phoenix AZ, May 12.

I. Workshops and Organizations

- Co-Leader of the Black Rock Educators Consortium
- Co-Chair of Black Rock Educators Consortium Annual Meeting, Black Rock City, NV, Friday, August 28, 2015.
- HASTAC - collaboratory for humanities, science, arts (& STEAM education), Annual Meeting, Tempe, AZ, May 12-14, 2016
- The Matthew Reardon Center for Autism's Autism Conference, Savannah, GA, February 11-12, 2016

J. Team Leadership

- I managed communication among the IKM Academic Team members this year.

K. Instructional Leadership

- As chair of the JMU Faculty Senate Academic Policies Committee (APC), I initiated and led a year-long effort to develop a white paper exploring the possibility of introducing micro-courses at JMU. Micro-courses are those offered for less than one credit hour. This effort required a great deal of communication and interaction with a wide array of stakeholder groups across campus including the Registrar, Financial Aid, Business Office, Senior Leadership, and constituents of the JMU Faculty Senate. The white-paper has received a positive reception and will likely lead to a pilot study to be run in 2016.

L. Other

- Won a CISE mini-grant to fund travel to the Autism Conference

Scholarship

Narrative

This was a very productive year for me in terms of scholarship, building upon the momentum that began during the 2014-2015 academic year. I received a mini-grant to purchase virtual reality (VR) hardware and anticipate beginning to use that with students during the upcoming year. I published 10 refereed articles, 3 peer-reviewed book reviews, and presented at 3 conferences. I used the microcontrollers and LEDs purchased with the grant I won last year to get students involved in creating wearable technology and began developing IoT (internet of things) technologies.

Although it has evolved somewhat with the adding of a track in design for neurodiversity, my research still remains firmly entrenched in the STEM to STEAM area, and nearly all of my scholarly activity revolves around the philosophy, science, and development of new pedagogy.

1. Satisfactory

A. Professional Organizations
- IEEE Computer Society
- ACM
- HASTAC

B. Participation in Professional Meetings, Conferences, and Gatherings
- Co-chaired Black Rock Educators Consortium Annual Meeting, Black Rock City, NV, August 28, 2014
- ASQ Innovation Division Conference, Charlottesville VA, September 19-20, 2015
- The Matthew Reardon Center for Autism, Autism Conference, Savannah, GA, February 11-12, 2015
- SXSWedu, Austin TX, Mar 6-9, 2016
- HASTAC Annual Meeting, Tempe, AZ, May 12-14, 2016

C. Research Involving Independent Study or Honors Students
- Radziwill, N., Kamienski, N., Benton, M. Design for STEAM: Creating Participatory Art with Purpose (submitted for publication to the STEAM Journal)

D. Supervising Honors Projects
N/A

E. Regional Meeting Presentations
N/A

F. Non-refereed Journal Publications
N/A

G. Development of Instructional or Educational Materials

- Developed and implemented a mashup of Wordpress, BadgeOS, and Credly that was designed to provide motivation, structure, guidance, and recognition for students to engage in self-paced learning of programming languages.

H. Short-Courses, Workshops, Professional Development
N/A

I. Ongoing Unpublished Research
N/A

J. Presentation of Faculty Seminars or Colloquia
N/A

K. Proposal Reviewer
N/A

2. Excellent

A. Focused, Goal-directed Research Contributions

- I posted 1 new articles on The Burning Mind Project website (http://www.burningmindproject.org)
- I revitalized my personal blog (http://morphatic.com) and published 17 new blog posts. Went from zero hits per day to now averaging over 30 hits/day in six months.

B. Professional Achievement Awards and External Recognition
N/A

C. Invited Lectures at National or International Conferences

- **Benton, M**. "The Source of Innovation: Empathy, Gifts, & the 10 Principles", ASQ Innovation Division Conference, Charlottesville, VA, September 18-20, 2015
- Radziwill, N. M. & **Benton, M. C**., 2016: The Future of Quality: Cognitive Production, Ambient Intelligence, Smart Manufacturing, and Emergent Analytics. ASQ Boston Conference on Quality, Boston MA, April 11.
- **Benton, M**. and Radziwill, N. "Choose-Your-Own-Grade: Instructional Civil Disobedience", presented at HASTAC 2016, Tempe, AZ, May 12-14, 2016
- Radziwill, N., **Benton, M**. "Design for Neurodiversity (DfN): A "Design for X" Process for Alternative Cognitive Styles", presented at HASTAC 2016, Tempe, AZ, May 12-14, 2016

D. Publication of Book Reviews, Discussions, or Technical Reports

- Review of *Throwing Rocks at the Google Bus,* published in Quality Management Journal, January 2016
- Review of *The End of Average*, published in Quality Management Journal, April 2016
- Review of *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, published in Quality Management Journal, July 2016

E. Publication of Books

- Benton, M., *The Draconic Ephemeris,* Lapis Lucera, 2015.

F. Service as Editor or Referee of National or International Journal

N/A

G. Recipient of Government or Foundation Grants, Awards or Contracts

- CISE Mini-Grant for Oculus VR, $725

H. Active Research Leading to Publication or Presentation

- N. Radziwill and I are developing a research track in the area of STEM to STEAM (adding Arts to STEM education) which, in our case, takes the form of technologically advanced art projects.
  - Radziwill, N., Kamienski, N., Benton, M. Design for STEAM: Creating Participatory Art with Purpose (submitted for publication to the STEAM Journal)

I. National/International Refereed Publications

- Radziwill, N. M., **Benton, M. C**., Boadu, K., & Perdomo, W., 2015: A Case-Based Look at Integrating Social Context into Software Quality. Software Quality Professional, December.
- Radziwill, N. M., Romano, J., Shorter, D., & **Benton, M.C**., 2015: The Ethics of Hacking - Should it be Taught? Software Quality Professional, December.
- Radziwill, N. M., **Benton, M. C**., & Moellers, C. 2015: From STEM to STEAM: Reframing What it Means to Learn. The STEAM Journal (Claremont, CA), July.
- **Benton, M. C.** & Radziwill, N.M., 2016: A Paradigm Matures: Transitioning to Functional Programming. Software Quality Professional, June.
- **Benton, M. C.** & Radziwill, N.M., 2016: Merit Pay in Higher Education: Rationale, Unintended Consequences, and Alternatives. Journal for Quality and Participation, October.
- Radziwill, N. M., **Benton, M. C.,** Boadu, K., & Perdomo, W., 2015: A Case-Based Look at Integrating Social Context into Software Quality. Software Quality Professional, December.
- Radziwill, N. M., Romano, J., Shorter, D., & **Benton, M.C.,** 2015: The Ethics of Hacking - Should it be Taught? Software Quality Professional, December.
- Radziwill, N. M., **Benton, M. C**., & Moellers, C. 2015: From STEM to STEAM: Reframing What it Means to Learn. The STEAM Journal (Claremont, CA), July.
- Radziwill, N. M. & **Benton, M. C.,** 2016: Design for X (DfX) in the Internet of Things (IoT). Submitted to Quality Management Journal.
- Radziwill, N. M. & **Benton, M. C.,** 2016: Bot or Not? Using Recurrence Maps to Characterize Tweet Interarrival Patterns. Submitted to Social Media + Society.

J. Presentations at National/International Professional Meetings

- Radziwill, N. M. & **Benton, M. C.,** 2016: Design for Neurodiversity (DfN*): A Design for X Process for Alternative Cognitive Styles. HASTAC, Phoenix AZ, May 13.

- **Benton, M. C.** & Radziwill, N. M., 2016: Choose Your Own Grade: Instructional Civil Disobedience. HASTAC, Phoenix AZ, May 12.
- Radziwill, N. M. & **Benton, M. C.,** 2016: The Future of Quality: Cognitive Production, Ambient Intelligence, Smart Manufacturing, and Emergent Analytics. ASQ Boston Conference on Quality, Boston MA, April 11.

K. Initiating and/or Directing Successful External Grant Funded Project
N/A

L. Authoring Textbooks or Teaching Materials
N/A

M. Professional Consulting
- I am the owner of Morphatic Web Hosting, for which I regularly build and/or provide maintenance to clients' websites.

N. Other
N/A

Service

Narrative

Given the output of my scholarly work this year, my service was not as robust as it has been in previous years. I continued in my roles as chair of the Faculty Senate's Academic Policies Committee, and I remained an active member of the ISAT Program Assessment Committee, playing a significant role in Assessment Day and in video recording the ISAT Senior Symposium. I also spent a significant amount of time with job candidates for the SPS/AM hires that we made this spring.

Last year I reported my excitement to contribute to the ISAT curriculum renewal process through my work on development of ISAT 190, into which I had put a considerable effort. For reasons unknown to me I was excluded from participating in this process this year. All of the work that I had done in the spring of 2015 was ignored and left out of the final curriculum renewal proposal. The team apparently went through an entire design process at CFI during the summer about which I was neither informed, nor to which I was invited. By the time I found out about it, during one of the Fall 2015 faculty meetings, I was so taken aback, that I did not know how to respond. I have been pretty angry about that, and as a result, have been less than enthusiastic about contributing to the department.

1. To University, College, and Department

A. Departmental/Program Committees
- Assessment Committee--active participant--5 hours/month. This year I took notes at five of the Assessment Day focus groups for seniors. I also researched and organized the purchase of 10 video cameras and trained 40 students to collect videos of the capstone presentations, as well as obtaining students' permission to use those videos.
- Member of IKM and Social Context Academic teams--2 hours/month--IKM hardly met this year.
- Although not formally a member, I participated in numerous events with candidates for the new manufacturing hire

B. College/University Committees

College Teams/Committees
N/A

University Teams/Committees
- ISAT Department Representative to JMU Faculty Senate--2 hours/month
- Chair, JMU Faculty Senate Academic Policies Committee (APC)--4 hours/month
  I have been selected to serve this role again during the 2016-2017 academic year.
- Judge for Bluestone Hacks, JMU X-Labs, April 2

- Member of the Board of Directors for FUELED, a student-led effort to bring a healthy, locally-sourced food truck to JMU

C. Participating in Public Relations Events and Student Recruiting

- Led a cross-disciplinary team of students to victory at the 2016 Annual Caring for the Caregiver Hackathon in Richmond, VA, March 25-27. The team won $5000 in round one, resulting in publication in regional news and on the JMU website
- Led the same team to win round two, $10,000, resulting in more press coverage. The team has now officially formed an LLC and I'm working with them to commercialize their product.

D. Grant Proposals for External Funding for Teaching and Equipment Support
N/A

E. Faculty Advisor to Student Organizations

- Japan Club Advisor

F. Satisfactory Student Curriculum Advisor
N/A

G. Initiating a Program that leads to Significant Increase of Resources
N/A

H. Major Service/Office at Department, College, or University Level

- JMU Faculty Senate APC Chair (see 1B above)
- Created and taught four "pop-up" classes at the JMU X-Labs on how to build wearable LED light strips controlled by microcontrollers. Reviews indicated that these courses were easily among the most popular offered in the X-Labs this year. Have been invited back to do them again in Fall 2016.

I. Service Leadership
N/A

J. Other Professional Service
N/A

2. To the Scholarly Community

A. Referee for Articles/Books
N/A

B. Grant Reviewer
N/A

C. Officer of a Professional Organization

- Co-Organizer for the Black Rock Educators Consortium

D. Editor of a Professional Journal
- I joined the editorial board for the Software Quality Professional Journal

E. Organized Workshops/Symposia/Conferences in one's scholarly area
- Co-chaired Black Rock Educators Consortium Annual Meeting, Black Rock City, NV, August 28, 2015

F. Other
N/A

3. To Society

A. Using University Resources for Local/Regional/State/National/Int'l Good
N/A

B. Using Personal Expertise for Local/Regional/State/National/Int'l Good
- I built and managed website for the Shenandoah Valley Children's Choir

C. Major Service/Office at Local/State/National Level using one's expertise
N/A

D. Other Significant Contributions
N/A

General Comments

Describe your most outstanding or satisfying activities for 2015-2016. Why do you consider these outstanding or extremely satisfying?

I'd have to say I'm most satisfied with the amount of scholarly activity I've achieved this year. These ideas are beginning to flow and receive attention from the outside world, if not among my colleagues.

What do you feel we have accomplished, as a Department, in 2015-2016?

I think we pretty much failed to make any meaningful progress as a department this year. Bullying and unprofessionalism was rampant. The curriculum renewal proposal is utterly uninspiring.

What should our priorities be for improvement, as a Department, for 2016-2017?

I think the psyche of the department is badly wounded, and unless we do something about it, the department will languish. I have repeatedly called attention to the problems of uncollegiality and lack of professionalism and interpersonal conflict over the past several years, but nothing has been done about these issues as far as I can tell. Bullies go unpunished, and to the contrary are treated with kid gloves.

Suggested Discussion Topics for the August 2016 Summit:

Sensitivity training.

Faculty Anticipated Activities Plan for 2016-2017

1. Teaching (50%)

Courses: ISAT 252 (3-4 sections), ISAT 340 (1 section), ISAT 345 (1 section), ISAT 348 (1-2 sections), CS 330 (1 section), ISAT 430 (1 section)

Given that we will be launching the new SPS/AM curriculum this year, I expect to have to pick up some overload sections.

2. Service (15%)

Department Committees: Assessment, IKM, SPS/AM
College Committees: none
University Committees: JMU Faculty Senate APC Chair
External: Black Rock Educators Consortium Organizer

My major tasks for this year will be continuing to shepherd the micro-course proposal through APC and into the pilot test phase at the university level, and providing support to the SPS/AM.

3. Scholarship (30%)

My goal is still to finish and publish my book on grades. I also have a number of other papers in half-finished condition that I'd like to get done. I will be again organizing the Black Rock Educators Consortium annual meeting at Burning Man and continuing to serve as organizer for that organization throughout the year. I also plan to continue working on IoT to support Design for Neurodiversity

4. Other (5%)

I will continue to do web development as part of Morphatic Web Hosting and for other clients.

Faculty Conflict of Interest Disclosure

1. List any companies or organizations for which you have consulted this year.
    a. Morphatic
2. List any companies which you own or in which you have significant financial interest.
    a. Morphatic
    b. Tony Britt's Spotter Charts LLC
3. List any other areas of potential conflict of interest that you would like to discuss in our annual review meeting:
    a. none