

Faculty Activity Report 2016

Rose-Hulman Institute of Technology

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TEACHING, STUDENT ADVISING AND CURRICULUM DEVELOPMENT

COURSES TAUGHT

<u>Quarter</u>	<u>Course Name and Number</u>	<u>Enrollment</u>
201610	CSSE494-07 Senior Thesis I	1
201610	MA223-03 Engineering Statistics I	28
201610	MA386-01 Statistical Programming	9
201620	CSSE495-07 Senior Thesis II	1
201620	MA223-01 Engineering Statistics I	25
201620	MA223-02 Engineering Statistics I	26
201620	MA485-01 Appl Regres Anly & Time Series	13
201630	BE482-01 Bioengineering Statistics	4
201630	CSSE496-07 Senior Thesis III	1
201630	MA223-06 Engineering Statistics I	27
201630	MA223-07 Engineering Statistics I	27
201630	MA482-01 Bioengineering Statistics	10
201630	MA494-02 Senior Project III	1
201630	MA496-01 Senior Thesis I	1
201640	MA223-ONL Engineering Statistics I	15

General Comments

CSSE Senior Thesis was Wenjun Kong, who is interested in pursuing a graduate work in bioinformatics; so, we felt a statistics-oriented thesis was appropriate.

COURSE DEVELOPMENT

COURSE

MA386 Statistical Programming has traditionally been part R and part SAS. This year, it was revised to be an all R course. This allowed us to cover more advanced topics and introduce data-science elements into the course.

MA223 is a course of mass instruction; typically, this means that the course syllabus and final exam are coordinated across all sections. In the Fall and Winter terms, we expanded upon this. All instructors in these two terms implemented a flipped classroom. Lectures were delivered online using videos, which I had recorded for teaching MA223 online during the summer following AY1415. All instructors used the same videos. Homework assignments, in-class activities, and exam topics were coordinated across all sections as well. This presented a unified course to these students. I acted as the coordinator for these sections both terms.

MA482 was graded using specifications grading. This was a large undertaking in setting up a system in which students were aware of what assignments needed to be completed to obtain a specific grade.

ADVISING

ACADEMIC ADVISEES

Advisee Count: 2

Advisees that were originally Leanne Holder's or Al Holder's advisees prior to their sabbatical.

Advisee Count: 12

Advisor for area minor in Statistics.

STUDENT ORG ADVISEES

Advisee Count: 50

Faculty advisor for InterVarsity Christian Fellowship.

THESIS ADVISEES

Advisee Count: 3

Advised Wenjun Kong (CS) on her senior thesis. Wenjun, wanting to pursue a career in Bioinformatics, decided to conduct a senior thesis with a primary emphasis in statistics. Her computing skills were used to develop code to implement her approach and conduct simulation studies assessing the methodology. Advised Amy Kamperman (MA/ECON) on the math portion of her senior project. Began advising Xiaomo Wang (MA) on her math senior thesis; she wanted to begin her work one term early.

Advisee Count: 1

Committee member for Christine Rollins Master's thesis. Topic is currently undecided, and it is in the early stages.

PROFESSIONAL DEVELOPMENT ACTIVITIES

PROFESSIONAL DEVELOPMENT

PUBLICATIONS

PAPERS PUBLISHED

Micromotion at the tibial plateau in primary and revision total knee arthroplasty: fixed versus rotating platform designs., Bone and Joint Research

Consulting work for JRSI lab on campus. Report also served as a case study for MA482/BE482 Bioengineering Statistics

SEMINARS

CONFERENCE PRESENTATION

Choosing to be an Outlier in a Mathematics Department, Joint Statistical Meetings

Served as a panelist about opportunities for statisticians at small colleges.

Specifications Grading in the Statistics Classroom, Joint Statistical Meetings

Let a round-table discussion for the Section on Statistical Education.

CONFERENCE/WORKSHOP ORGANIZER

Specifications Grading

Internal CPSE workshop for Rose-Hulman faculty to be exposed to the concepts of specifications grading in the classroom. This was co-led with John Mirth (ME).

WORKSHOPS ATTENDED

Machine Learning from a Statistical Perspective, American Statistical Association

In preparation for adding machine learning elements to MA386: Statistical Programming

OTHER

COURSE PARTICIPATION

Data Science

Taking online Coursera course offered by statistics faculty at John's Hopkins regarding Data Science. This is preparation for adding additional data science elements to MA386: Statistical Programming.

OTHER RESEARCH

KEEN Course Development

Internal Course Development grant received from the KEEN foundation in order to infuse my MA386 Statistical Programming course with entrepreneurial minded learning. Using data science elements and the inclusion of rich case studies, the course was redesigned to encourage creativity and get students to make connections using multiple data sources.

NON FUNDED RESEARCH

Effects of Exam Design on Test Anxiety and Performance

Diane Evans and I ran a small study during the Spring term using students currently enrolled in MA223 Engineering Statistics I. We were interested in determining if various aspects of the exam design (color of paper, font of text, and inclusion of cartoons) decreased student anxiety during the exam and translated to improved performance. We hope to turn the results of the study into a paper in the statistical education literature.

RESEARCH PROFILE

Scholarship Subject: statistics, variable selection, statistics education

Study Area: I am interested in the application of statistics to medicine. In particular, I focus on variable selection

Keywords: Biomedical Research, Multidisciplinary
Education/Instructional Programs
Educational Evaluation/Assessment
Educational Improvement
Statistics

PROFESSIONAL SERVICE ACTIVITIES

COMMITTEES

DEPARTMENTAL

Statistics and Operations Research Curriculum Group, MA (Chair)

Proposed changes to several course descriptions and restructured the minor in Statistics.

Hiring Committee, MA (Member)

Successful search for statistics faculty member.

Undergraduate Math Conference, MA (Member)

Data Science Core Group, MA (Member)

Unofficial interdisciplinary group working on the construction of a data science program (minor and second major).

INSTITUTIONAL

Animal Care and Use (Member)

PROFESSIONAL SERVICE

ON CAMPUS SERVICE

High School Mathematics Competition

I help with the online registration and on-site registration for this department-sponsored competition.

OTHER

ASA-MAA Joint Committee on Statistics Education

Serve on a joint committee which makes recommendations regarding statistics curriculum at the undergraduate level.