

Annual Report for Academic Year 2007-2008

ASSESSMENT OF THE MASTERS PROGRAM IN STATISTICS

EXIT INTERVIEW: We received one UAF MS Program Graduate Survey from a student who graduated in the Summer of 2007 (out of four graduates). The survey is in Appendix One. We also received an e-mail from one of the students with suggestions for the program (also in Appendix One).

Of the four summer 2007 graduates, one is employed as a Quality Engineer in industry, two are in Ph.D. programs in Statistics (one at the University of Iowa, the other at the University of Texas) and one is a consultant in the transportation industry. Two of the three Spring 2008 graduates have already obtained jobs- one with an energy company in Alaska and the other with the Alaska Dept. of Fish and Game.

Based on student comments, we will continue to look for a new textbook for the Statistical Theory III course.

POST-GRADUATE INTERVIEW/ EMPLOYER INTERVIEW: See Appendix Three. Biometricians from the Alaska Department of Fish and Game (the major employer of our alumni) recommended that we (1) change the textbook in STAT653 (Linear Models), (2) create a general statistical analysis course for non-statistics graduate students [thus reserving the Spatial Statistics and Applied Time Series courses primarily for statistics graduate students] and (3) expanding the Statistics Consulting Seminar so that it could be taken by first-year graduate students.

We are presently working on a revision of the STAT653 course and are looking for a new textbook. Because of the limited number of courses we can offer, it is unlikely that we will be able to create a new, applied graduate course that covers Bayesian methods, Time Series and Spatial Models. We may be able to teach some 1 credit specialized courses. This summer we will be sending out a survey to see what topics might be of interest for 1 credit courses.

FACULTY EVALUATION OF EXAMS AND PROJECTS:

1. The 2008 comprehensive exams were very good, in general. Two of the written exams were nearly perfect, while the other two were very good. The oral exams all went quite well, also. The written exam was quite difficult and no notes or books were allowed in the exam, so the results are impressive. We initiated a seminar this year to prepare for comprehensive exams, where students worked problem sets (assigned weekly) from all areas of statistics and then presented the solutions on the board. We should continue with this seminar, as it did seem to improve the quality of the written and oral exams.

2. All of the students who planned to graduate in the academic year 2007-2008 submitted M.S. projects in the Spring of 2008. The students who planned to graduate in the academic year 2006-2007 submitted projects during the summer of 2007.

PROEJECTS:

Summer 2007 graduates:

- | | |
|------------|---|
| K. Chen | A Statistical Analysis of Terrestrial Ages of Antarctic Meteorites |
| S. Houston | Analysis of Covariance using Generalized Linear Models |
| A. Shay | A Comparative Analysis of Culturally Based Mathematics Curriculum using Bayesian Hierarchical Linear Models |
| X. Yu | Spatial Analysis of Soil Organic Carbon Along the Coastline of Northern Alaska |

Spring 2008 graduates:

- | | |
|---------------|---|
| J. Bannister | A Quantile Regression Approach to Modeling of Bending Strength in Dimension Lumber. |
| J. Jasper | Chinook Salmon Escapement |
| J. Kreinheder | Using SIMEX for Location Error in Spatial Models |

All of the projects were high-quality. We need to push students to submit some of these for publication.

TIME TO COMPLETION: The three students who planned to complete their M.S. programs during the 2007-2008 academic year finished on time in the Spring. Though there was quite a rush near the end of the Spring Semester, all students finished in two years.

ADDITIONAL ASSESSMENT: We have not yet convened an advisory board for the M.S. Statistics program. Since we regularly meet with biometricians from the Alaska Department of Fish and Game, the major employer of our alumni, and are in regular contact with alumni from the program, there does not seem to be a need for an advisory board.

CURRICULUM/ COURSES: The suggestions of the Alaska Dept. of Fish and Game biometricians, described in Appendix Three, are apt. In particular, we need to revamp the STAT653 (Linear Models) class before the next time it is taught (Spring 2010). We are also discussing whether to split STAT401 (Applied Linear Regression and Analysis of Variance) into an undergraduate and graduate course (the latter with more prerequisites and taught at a higher level).

APPENDIX ONE:

UAF Statistics MS Program Graduate Survey Spring 2008

As part of UAF's outcomes assessment process we respectfully request that you complete the following survey. The results will be kept confidential and only summary statistics across respondents will be made public. The results are used to improve the quality of the program and to satisfy institutional accreditation requirements. If you have any concerns about the survey, please feel free to contact us.

1. Please respond to each of the following statements with

1 = strongly agree 2 = agree 3 = neutral 4 = disagree 5 = strongly disagree

Please feel free to write comments on any of these questions.

- | | |
|---|---|
| a) I would recommend the statistics MS degree program to others. | 2 |
| b) The quality of instruction by statistics faculty is excellent. | 1 |
| c) The core MS statistics courses (STAT 651, 652, 653) provided a solid foundation. | 2 |
| d) I had access to modern computing equipment and statistics software. | 1 |
| e) Statistics faculty members were accessible and involved in my education. | 1 |
| f) I learned a lot in completing the MS project. | 1 |
| g) Sufficient elective courses were offered. | 2 |
| h) Statistics elective courses were at an appropriately challenging level. | 2 |
| i) Degree requirements were well communicated. | 1 |

2. Please provide a narrative response to each of the following:

a) How should the statistics MS program be changed to improve it?

If the textbook for some course, such as STAT 653 can be update to the more popular one, it will greatly help the student who wants to transfer credits in other university.

b) What components of the statistics MS program worked particularly well?

The graduate project is really a good way to practice statistical knowledge and skills.

APPENDIX TWO: (list of graduates):

1998: Gordon Bower, Pam McNeley, Alex Prichard, Bob Sutherland, Brian Taras
1999: Arny Blanchard, Peter Dillingham, Julie McIntyre, Franz Mueter
2000: Gwen Gruenig
2001: Kelley Cadman, Xinxian Zhang
2002: Helen Nute
2003: Anton Antonovich, Colleen Ianuzzi, Randy Mullen
2004: Sherri Dressel, Xiang Fang, Joseph Liddle, Mark Olson, Yongmei Qin
2005: Randolph Phillips
2006: Xi Chen
2007: Shuo Jiao, Yingte Zhang
2008 [Summer 2007]: Kun Chen, Steve Houston, Alan Shay, Xian Yu
2008: John Bannister, Jim Jasper, Jennifer Kreinheder

Due to graduate 2008: Jiaqi Huang, Hui Liu

APPENDIX THREE:

Excerpt of an e-mail from Dana Thomas, based on a meeting he had with Alan Bingham, Brian Taras and Dan Reed (all of the Alaska Dept. of Fish and Game):

1) Strengthen the linear model class STAT 653. While they recognized the need to include nonlinear topics they thought this was the only weakness in our Core of MS courses. They suggested we look at Montana State's linear model class which is based on lecture notes not a text; Brian is trying to get a copy of the notes for us to see. I went looking at other texts. Has anyone had a look at the following text?
Following is copied from

http://www.springer.com/cda/content/document/cda_downloaddocument/M0636_STAT_NL_07_final_US.pdf?SGWID=0-0-45-360201-0&teaserId=304895&CENTER_ID=68915

Linear and Generalized Linear Mixed Models and Their Applications J. Jiang, University of California, Davis, CA, USA This book covers two major classes of mixed effects models, linear mixed models and generalized linear mixed models. It presents an up-to-date account of theory and methods in analysis of these models as well as their applications in various fields. The book offers a systematic approach to inference about non-Gaussian linear mixed models. Furthermore, it includes recently developed methods, such as mixed model diagnostics, mixed model selection, and jackknife method in the context of mixed models. 2007. Approx. 270 p. (Springer Series in Statistics) Hardcover ISBN 978-0-387-47941-5 7 \$89.95

2) They felt strongly we should create a one year class with broad coverage for graduate students in the sciences rather than having these students in our time series, Bayesian, and Spatial classes in particular. They would supplement this year long course with 1 credit targeted applied courses (like nonlinear regression). They stated that the mix of our grad students with grad science students weakened our classes. We also discussed an alternative of having a one credit addition to each of these classes for our graduate students but they preferred separating the groups. They understood why this would be difficult given our enrollments - thus, a solution is to raise the number of STAT graduate students.

3) They proposed that our consulting practice for graduate students start in the first year by having graduate students observe local biometricians consulting with biologists a few times during spring semester. They also noted that some stat programs video students working with a consultee then a self critic and a critic by a faculty member are written. Should we consider this?