The University Senate of Michigan Technological University

Proposal 25-14

(Voting Units: Academic)

"Proposal for a Minor in Statistics "
Department of Mathematical Sciences

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1   Introduction

The proposed Minor in Statistics, sponsored by the Department of Mathematical Sciences, offers Michigan Tech students the opportunity to obtain a working knowledge of modern statistical tech- niques. Such knowledge will materially help scientists, engineers, and other professionals in their careers and will make graduating students more attractive on the job market.

   The Minor requires introductory courses on statistics and probability, training in statistical computing, and three courses (to be chosen from a defined list) on advanced statistical techniques.

2   Rationale

Statistical analysis has long been essential in many areas of applied science and engineering (such as clinical trials of pharmaceuticals and quality control, to give just two examples). Increasing amounts of data are being recorded in many areas, including traditional and new applications, and the ability to understand statistical analyses is now useful in a broad range of careers.

3   Details of catalog copy

3.1   Title of Minor

Statistics

3.2   Catalog Description

This minor, offered by the Department of Mathematical Sciences, will provide students with a solid grasp of statistical analysis and computing. This knowledge will be useful in many scientific, technical, and business-oriented careers.

3.3   List of courses

The minor requires one introductory statistics course (chosen from a list of three possibilities), a course on probability, a course on statistical computing, and three advanced electives in statistics (chosen from a list of six possibilities). The total number of credits required is 18, and only one course (three credits) can be 2000-level or below.

Introductory statistics (choose 1)	MA2710 Introduction to Statistical Analysis 3 MA3710 Engineering Statistics 3 MA3715 Biostatistics 3
Probability	MA3720 Probability 3
Statistical computing	MA3740 Statistical Programming and Analysis 3
Advanced electives (choose 3)	MA4710 Regression Analysis 3 MA4720 Design and Analysis of Experiments 3 MA4760 Mathematical Statistics I 3 MA4770 Mathematical Statistics II 3 MA4780 Times Series Analysis and Forecasting 3 MA4790 Predictive Modeling 3

3.4 Prerequisites

The only prerequisites that are not part of the minor comprise the calculus sequence (MA1160, MA2160, MA3160). The required introductory course in statistics is the only prerequisite for the other courses in the minor, except that MA4790 requires a second statistics course as a prerequisite and the theoretical electives MA4760, MA4770 require MA3720 (probability).

Course	Prerequisites
MA2710	MA1160 or MA1161
MA3710	MA2160 (MA1160 or MA1161)
MA3715	MA1135 or MA1160 or MA1161
MA3720	MA3160
MA3740	MA2710 or MA2720 or MA3710 or MA3715
MA4710	MA2710 or MA2720 or MA3710 or MA3715
MA4720	MA2710 or MA2720 or MA3710 or MA3715
MA4760	MA3720
MA4770	MA4760
MA4780	MA2710 or MA2720 or MA3710 or MA3715
MA4790	MA3740 or MA4710 or MA4720 or MA4780

4 New course descriptions

None are proposed.

5 Estimated costs

This program will be delivered with existing courses, so there may be no new costs. Because some of the courses (especially MA4710 and MA4720) are currently being offered at or near capacity, it may be required to offer additional sections of some courses if the minor proves to be popular.

6 Planned implementation date

Fall 2014.

Introduced to Senate: 05 March 2014
Approved by Senate: 26 March 2014
Approved by Administration: 03 April 2014