SGR #5 - MATH 202 Applied Informatics

SOUTH DAKOTA BOARD OF REGENTS
Revision to General Education Requirements

Indicate (X) the component of the General Education Curriculum that the proposal impacts.

X  System General Education Requirements

Indicate (X) the revision(s) that is being proposed (more than one may be checked).

X  Addition of a course to the set of approved courses

Section 1. Provide a Concise Description of the Proposed Change

Add MATH 202 Applied Informatics to the list of courses approved to satisfy SGR #5.

Section 2. Provide the Effective Date for the Proposed Change

Fall 2013

Section 3. Provide a Detailed Reason for the Proposed Change

Because informatics plays a critical role in many 21st century professions, it is important to introduce informatics courses into the SGR curriculum. This will encourage students to develop expertise in this important discipline, enhance their professional preparation, and enhance their ability to function as informed citizens in an increasingly information-driven world. This course in particular will focus on the former enhancement.

Section 4. Provide Clear Evidence that the Proposed Modification will Address the Specified Goals and Student Learning Outcomes

SGR #5 goals and SLO’s are detailed below, along with specific means by which this course will address each goal and achieve each objective. The course description is provided here for reference.

Course description: MATH 202 Applied Informatics: An introduction to discipline-specific applications of informatics including basic mathematical/statistical models, algorithms and problem solving with software. Students complete an informatics project that is strongly related their major. P, Math 102, INFO 101.

SGR #5 goal: Students will understand and apply fundamental mathematical processes and
reasoning.

The entire content of MATH 202 is focused on developing students’ ability to build mathematical and statistical models and reason with them in order to derive actionable information from data.

SGR#5 Student Learning Outcomes: As a result of taking courses meeting this goal, students will:
1. Use mathematical symbols and mathematical structure to model and solve real world problems;
   As a result of taking MATH 202, students will be able to analyze information and develop appropriate mathematical and statistical equation, and utilize mathematical and statistical expressions to solve real-world problems.
2. Demonstrate appropriate communication skills related to mathematical terms and concepts;
   As a result of taking MATH 202, students will be able to explain common mathematical and statistical terms, symbols think logically, and write descriptions of data analyses in a coherent writing style.
3. Demonstrate the correct use of quantifiable measurements of real world situations.
   As a result of taking MATH 202, students will be able to interpret graphical representations of real-world data appropriately, and develop a mathematical or statistical model representing real-world data and use this model to make predictions.

Each course meeting this goal includes the following student learning outcomes: Required: #1, #2 and #3

Section 5. Provide a Copy of all Course Syllabi and Other Supporting Documentation

Please see following pages.

Course Syllabus
MATH 202, Applied Informatics, 3 Credit
Hours Mathematics and Statistics Department
South Dakota State University
Semester: To Be Determined
Time: To Be Determined
Location: To Be Determined

Instructor:
Gary Hatfield, Ph.D.
Office: Harding Hall 212
Phone: 605-688-5846
Email: gary.hatfield@sdstate.edu
Office hours: To be determined and by appointment

Catalog Description: An introduction to discipline-specific applications of informatics including basic mathematical/statistical models, algorithms and problem solving with software. Students complete an informatics project that is strongly related to their major.

Course Description: This course provides a practical coverage of topics and resources relevant to informatics. Students will review real-world uses of informatics to develop skills related to the effective use of data, information, and knowledge in their areas of interest. Through assignments and a course project, students will gain hands on experience in developing and applying informatics solutions.

Prerequisite: Students taking this course will have completed INFO 101, Introduction to Informatics,
and MATH 102, College Algebra.

**Description of Instructional Methods:** Lecture, discussion, and software demonstrations.

**Required Text:** To be determined.

**Course Content:** Weekly assignments will consist of readings and hands on exercises where students actively use particular resources or tools. The semester project incorporates the knowledge and skills obtained throughout the course to address a need or question in the student’s area of interest. A project topic and proposal will be determined by mid-semester that is based on an initial literature review of related work along with a description of the proposed methods and anticipated results. The final report is a written summary of the project which includes an abstract and a full-length paper that clearly describes the motivation for the project, related background, methods, results, and discussion. The final presentation summarizes pertinent information in the final report and utilizes presentation software.

**Course Goals:** To gain basic informatics skills and knowledge that will be applied to address a need or question in each student’s area of interest.

**System Goal #5:** Students will understand and apply fundamental mathematical processes and reasoning.

**Student Learning Outcomes:**
1. Use mathematical symbols and mathematical structure to model and solve real-world problems.
   Students will be able to:
   a. analyze information and develop appropriate mathematical and statistical equations
   b. utilize mathematical and statistical expressions to solve real-world problems

2. Demonstrate appropriate communication skills related to mathematical terms and concepts.
   Students will be able to:
   a. explain common mathematical and statistical terms and symbols
   b. think logically and write descriptions of data analyses in a coherent writing style

3. Demonstrate the correct use of quantifiable measurements of real-world situations.
   Students will be able to:
   a. interpret graphical representation of real-world data appropriately
   b. develop a mathematical or statistical model representing real-world data and use this model to make predictions

**Additional Student Learning Outcomes:**
1. Gain familiarity with and appreciation for the wide variety of applications of informatics.
2. Demonstrate proficiency with data sources, standards, tools, applications, and systems relevant to informatics.
3. Apply techniques to obtain, manage, transform, analyze, and summarize results.
4. Use verbal and written communication to disseminate knowledge gained by applying informatics to a real-world need or question.

**Evaluation Procedures:** Weekly Assignments: 30%, Mid-term Project Proposal: 15%, Final Project Report: 35%, Final Project Presentation: 20%. A score of at least 90% of the total points will guarantee an A, at least 80% will guarantee a B, at least 70% will guarantee a C, at least 60% will guarantee a D, and below 60% is a F.

**Attendance:** Attendance is required. However, you will not be penalized for infrequent or excused
absences. Excused absences are defined in the University attendance policy. You are responsible for everything covered or announced in class.

**Academic Integrity:** Academic dishonesty will not be tolerated.

Cheating—Directly copying from any source other than yourself, including but not limited to your classmates and online sources. It does not mean that you will not talk to other students about homework problems; however, you need to demonstrate *your understanding* of the problem by writing up the solution by yourself.

Plagiarism—Offering as one’s own work the words, ideas, or arguments of another person without appropriate attribution by quotation, reference, or footnote.

Cheating or plagiarism will result in a score of 0 for that particular assignment for all parties involved. More than one offense will result in a failing grade for the course AND formal reporting of the incident to the Division of Student Affairs.

**Freedom in Learning:** Students are responsible for learning the content of any course of study in which they are enrolled. Under Board of Regents and University policy, student academic performance shall be evaluated solely on an academic basis and students should be free to take reasoned exception to the data or views offered in any courses of study. Students who believe that an academic evaluation is unrelated to academic standards but is related instead to judgment of their personal opinion or conduct should first contact the instructor of the course. If the student remains unsatisfied, the student may contact the department head and/or dean of the college which offers the class to initiate a review of the evaluation.

**ADA Statement:** Any student who feels s/he may need an accommodation based on the impact of a disability should contact Nancy Hartenhoff-Crooks, Coordinator of Disability Services (605-688-4504 or FAX, 605-688-4987) to privately discuss your specific needs. The Office of Disability Services is located in Room 065, the Student Union.

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