SGR #6 - INFO 101 Introduction to Informatics

SOUTH DAKOTA BOARD OF REGENTS
Revision to General Education Requirements

SDSU Mathematics & Statistics
Laurie Stenberg Nichols 11/5/12

Institution Division/Department Institutional Approval Signature Date

SDSU Kurt Cogswell Lewis F. Brown 11/2/12
Institution Form Initiator Dean’s Approval Signature Date

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 INFO 101 Introduction to Informatics to the list of courses approved to satisfy SGR #6.

Section 2. Provide the Effective Date for the Proposed Change

Fall 2013

Section 3. Provide a Detailed Reason for the Proposed Change

This course will treat information as a fundamental quantity that is as inherent in the structure of the natural world as are chemical, physical, and biological quantities. It will develop informatics as being that natural science consisting of the application of the scientific method to information. 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.

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

SGR #6 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:

INFO 101 Introduction to Informatics: An introduction to informatics and basic computer programming. Other topics include the basic operation of hardware, software, servers, the Internet, intranets, networks, web browsers, and information security.
SGR #6 goal: Students will understand the fundamental principles of the natural sciences and apply scientific methods of inquiry to investigate the natural world.

Student Learning Outcomes: As a result of taking courses meeting this goal, students will:

1. Demonstrate the scientific method in a laboratory experience;

   Students will perform several lab based exercises that culminate in written lab reports. They will apply knowledge and techniques learned in classroom lectures and previous programming assignments in order to process large scale data sets (1 gigabyte or larger). They will apply the scientific method to the data by formulating a hypothesis about the data set, testing the validity using methods developed in the course, and analyzing and reporting on the results.

2. Gather and critically evaluate data using the scientific method;

   Students will complete several graded lab assignments. Students will collect data from the Internet based on their assumption and hypothesis related to a) census data downloaded from the US Census Web site, b) basic genomics information or c) the leading topic on twitter, analyze the data collected, and look for supporting evidence to back their hypothesis.

3. Identify and explain the basic concepts, terminology and theories of the selected natural sciences;

   Students will perform several programming assignments in order to show their competency in programming as applied to the field of informatics. Additional non-programming assignments will be given on the basic theories of information processing and computer science topics. Students will take two exams during the semester and a final exam in order to assess the knowledge gained.

4. Apply selected natural science concepts and theories to contemporary issues.

   Lab reports will require the use of the concepts and theories of informatics as applied to data sets gathered as part of the assignments. In particular, students will work with genomics data and thus encounter one of the most important contemporary issues facing science today.

Each course meeting this goal includes the following student learning outcomes: Required: #1, #2, #3, #4

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

Please see following pages.
Course Syllabus
INFO 101, Introduction to Informatics, 3 Credit Hours
Electrical Engineering and Computer Science Department
South Dakota State University
Semester: To Be Determined
Time: To Be Determined
Location: To Be Determined

Instructor:
George Hamer, Ph.D.
Office: SDEH 121
Phone: 605-688-5721
Email: George.Hamer@sdstate.edu
Office hours: To be determined and by appointment

Catalog Description: An introduction to informatics and basic computer programming. Other topics include the basic operation of hardware, software, servers, the Internet, intranets, networks, web browsers, and information security.

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 MATH 102, College Algebra or greater.

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 lab projects incorporate the knowledge and skills obtained throughout the course to apply the scientific method to examining problems commonly in the realm of informatics.

Course Goals:
To gain basic informatics programming skills and survey basic tools used in the field of informatics.

System Goal #6: Natural Sciences – Students will understand the fundamental principles of the natural sciences and apply scientific methods of inquiry to investigate the natural world.

Student Learning Outcomes:
1. Demonstrate the scientific method in a laboratory experience;
2. Gather and critically evaluate data using the scientific method;
3. Identify and explain the basic concepts, terminology, and theories of the selected natural sciences;
4. Apply selected natural science concepts and theories to contemporary issues.

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.

Evaluation Procedures: Weekly Assignments: 25%, Lab Reports: 15%, 2 Exams: 40%, Final Exam: 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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<tr>
<th>Week</th>
<th>Topic</th>
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<td>1</td>
<td>Writing simple programs in Python</td>
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<td>Variables, constants, input and output</td>
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<td>3</td>
<td>Working with functions</td>
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<td>Operators, conditionals, and looping</td>
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<td>5</td>
<td>Working with data files</td>
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<td>Data analysis</td>
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<td>Computing hardware overview</td>
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<td>Lab 1 – US Census Data Networking and the World Wide Web</td>
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<td>Web browsers and web pages</td>
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<td>Lab 2 – Genomic data sets Web browsers and web pages continued</td>
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<td>Lab 3 Mining Twitter feeds Graphics continued</td>
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<td>14</td>
<td>Moving on to C/C++/C#</td>
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<td>15</td>
<td>Moving on to C/C++/C# continued</td>
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