Course: CSC 421/521 Graphical User Interfaces with Object-Oriented Programming
Prerequisite: CSC 300 Data Structures
Room: McLaury 310
Time: MWF 11:00-11:50AM
Website: http://www.mcs.sdsmt.edu/csc421
Textbook: none required (online resources will be provided)

Instructor: Dr. Weiss
Office: McLaury 311
Phone: 394-6145
Email: John.Weiss@sdsmt.edu
Office Hours: MTWTh noon-1:00PM, or by appointment

SDSM&T Course Catalog Description:
CSC 421/521 Graphical User Interfaces with Object Oriented Programming
(3-0) 3 credits. Prerequisite: CSC 300 with a “C” or better. This course provides an introduction to graphical user interface (GUI) programming, using an object-oriented programming (OOP) approach. Topics include an introduction to GUI design, fundamental concepts in GUI programming, and advanced OOP subjects. Course projects will make use of current GUI development environments (e.g., C++ with Qt, Java, C#). Students enrolled in CSC 521 will be held to a higher standard than those enrolled in CSC 421.

Prerequisites
CSC 421/521 is an upper-level undergraduate/graduate computer science course, comprising an introduction to the study of graphical user interface concepts and object-oriented programming. Prior exposure to GUI programming is not required, but you should have a strong background in computer science, including a programming course in data structures. OOP fundamentals and C++ programming skills are prerequisites for the course (but not Java or C#).

Topics
1. Fundamental GUI principles (3 weeks)
2. Fundamental OOP principles (3 weeks)
3. GUI programming using C++ and the Qt library (3 weeks)
4. GUI programming using Java Swing classes in the Netbeans IDE (3 weeks)
5. GUI programming using C# in Microsoft Visual Studio (3 weeks)

Course Requirements
1. C++ GUI project 15%
2. Java GUI project 15%
3. C# GUI project 15%
4. midterm exam 20%
5. final exam 35%
Objectives
The primary objective of this course is to give the student an introduction to the theory and practice of graphical user interface concepts and object-oriented programming. From a theoretical standpoint, we will discuss topics such as basic GUI principles, human-computer interaction, usability guidelines, and the object-oriented programming paradigm. From a practical standpoint, we will cover GUI programming and OOP in three environments: C++ using Qt Creator and the Qt SDK, Java using Swing classes in the Netbeans IDE, and C# using Microsoft Visual Studio.

Outcomes
Upon completion of this course, students will obtain the following outcomes:
• understanding of fundamental graphical user interface concepts
• understanding of the object-oriented programming paradigm
• experience writing GUI programs in C++ using the Qt library
• experience writing GUI programs in C# using Microsoft Visual Studio
• experience writing GUI programs in Java using Swing classes in the Netbeans IDE
• experience using drag-and-drop GUI design software
• greater understanding of the software development process
• experience working in teams on software projects

Grading
Letter grades will be assigned at the end of the semester, based on the weighted scoring system outlined above. Note that the programming projects have a significant impact upon your final grade. To pass the course, you must successfully complete these assignments, as well as pass the exams.

There is no “late policy” in this class. All assignments must be turned in by the due date, otherwise they will not be accepted. To receive full credit, programs must not only be correct, but must adhere to good programming style guidelines (standard formatting, meaningful identifiers, modular code, good documentation, etc.). Program grading is further discussed in the Programming Guidelines document on the course Website.

Software
CSC 421/521 is a programming-intensive course, so be prepared to spend many hours struggling with the computer this semester. All programming projects will be done in teams. The GNU C++ compiler with the Qt GUI framework (Linux or Windows) will be used in the first programming project. The second assignment will use Java Swing classes, with development in the Netbeans IDE (Linux or Windows). The Microsoft Visual Studio C# development environment (Windows) will be used for the final program.

All CSC421/521 software is free to SDSM&T students, and may be installed on your personal Linux or Windows PC. The departmental Linux Lab computers in McLaury 215 may be used for Linux assignments (students enrolled in CSC 421/521 have accounts on these systems). Further instructions and handouts will be given in class as the semester progresses.
**Academic Integrity**

Although you may exchange ideas with your classmates, you must complete these assignments by yourself (or with members of your team, in the case of group projects). In particular, it is forbidden under any circumstances whatsoever to exchange source code with your classmates. **COPYING CODE IS A SERIOUS INFRINGEMENT UPON THE SDSM&T ACADEMIC INTEGRITY POLICY, AND WILL BE TREATED ACCORDINGLY.** Academic integrity is further discussed on the Academic Integrity policy statement on the course Website.

**Attendance**

Attendance is required for all courses at SDSM&T. You are responsible for the lecture material as well as any assigned readings. Lecture material may diverge significantly from the assigned readings, so good attendance is particularly important in this class. Attendance is further discussed in the Classroom Conduct policy statement on the course Website.

**Electronic Devices Policy**

Notebook computers may be used to take notes, but not for answering email, browsing the Web, or other non-course related activities. No other electronic devices may be used during class time. Please be sure to turn off cell phones and pagers before class starts.

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The following statements must appear on all SDSM&T course syllabi:

**ADA Statement**

Students with special needs or requiring special accommodations should contact the instructor (John Weiss, 394-6145) and/or the campus ADA coordinator (Jolie McCoy, 394-1924) at the earliest opportunity.

**Freedom in Learning Statement**

Under Board of Regents and University policy, student academic performance may be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Students who believe that an academic evaluation reflects prejudiced or capricious consideration of student opinions or conduct unrelated to academic standards should contact the dean of the college which offers the class to initiate a review of the evaluation.