Course: CSC 421/521 Graphical User Interfaces (3 credits)
Prerequisite: CSC 300 Data Structures
Room: McLaury 310
Time: MWF 11:00-11:50AM

Instructor: Dr. Weiss
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Office Hours: MWF noon-12:50PM and Th 11:00-11:50AM, or by appointment

SDSM&T Course Catalog Description: CSC 421/521 Graphical User Interfaces
(3-0) 3 credits. Prerequisite: CSC 300. This introductory course in graphical user interface (GUI)
concepts will cover graphical user interface elements and style, events, component and object oriented
user interface models, and graphical application programming issues. Topics will be covered in the
context of common graphical user interface environments and programming languages. Possible topics
include current GUI development languages such as Java, Web interfaces, GUI design principles and
standards, and the role of the GUI in the overall application. Students enrolling in CSC 521 will be
held to a higher standard than those enrolling 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. 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.

Textbook: none required (online resources will be provided)

Course Requirements
1. C++ GUI project 15%
2. C# GUI project 15%
3. Java GUI project 15%
4. midterm exam 20%
5. final exam 35%

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 C# in Microsoft Visual Studio (3 weeks)
5. GUI programming using Java Swing classes in the Netbeans IDE (3 weeks)
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 the Qt library, C# using Microsoft Visual Studio, and Java using Swing classes in the Netbeans IDE.

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 library on the Linux operating system will be used in the first programming project. Linux is installed on the computers in the departmental Linux Lab in McLaury 215; each student enrolled in CSC 421/521 will be given an account to use on these systems. Subsequent projects will use the Microsoft Visual Studio C# development environment on Windows, and Java Swing classes using the Netbeans IDE on either Linux or Windows. All software used this semester is free, and may be installed on your home PC. Further instructions and handouts on using this software will be given in class as the semester progresses.

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. The assignments will 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 (standardized formatting, meaningful identifiers, modular code, good documentation, etc.). Program grading is further discussed in the Programming Guidelines document on the course Website.
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 on the Classroom Conduct policy statement on the course Website.

Course Website
http://www.mcs.sdsmt.edu/csc421

Electronic Devices Policy
Please turn off cell phones and pagers before class starts. Notebook computers may be used to take notes, but not for answering email, browsing the Web, or other non-course related activities. No use of any other electronic or computer media is allowed during class time.

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.