

## Syllabus

GUI Programming - COMP 4450  
2:30 – 3:45 TR Science 200  
Fall 2019

**Instructor:** Frank McCown  
**Contact:** 501-279-4826, HU Box 10764, fmccown@harding.edu  
**Home Page:** <http://www.harding.edu/fmccown/classes/comp4450-f19/>  
**Office Hours:** Science 208: 8-9 daily, 4-5 Tue & Thu, 2-5 Fri or by appointment

### Course Description

This course prepares students to build applications with a graphical user interface (GUI) for the Microsoft Windows operating system. Topics include: event-driven programming, .NET Framework, C#, GUI widgets, MVC and MVVM, Windows Forms, Windows Presentation Foundation, Universal Windows Platform, and Human Computer Interaction (HCI). Prerequisite: COMP 2450 and 3450.

Required text: *Designing with the Mind in Mind, 2nd Edition* by Jeff Johnson (2014). ISBN: 978-0-12-407914-4  
Recommended: *C# 6 for Programmers, 6th Edition* by Deitel & Deitel (2016). ISBN: 978-0134596327  
Recommended: *Developing Windows 10 Applications with C#* by Baidachnyi (2016). ISBN: 978-1522894919

### Student Learning Outcomes

At the end of this course, the student will be able to...

1. Identify important events and individuals in the history of human-computer interfaces.
2. Design and develop Windows application using different Windows technologies that use a variety of GUI controls and classes to fulfill specific user requirements.
3. Explain how event driven applications use threading to perform time-consuming operations.
4. Demonstrate how to use specific features of the C# programming language to write object-oriented programs and handle run-time errors.
5. Explain in a public presentation how user interfaces should be designed to accommodate human physiology and limitations.

### Exams

Two regular exams will be given in class as well as a final comprehensive exam covering the entire course and, in more detail, the information presented since the 2nd exam. If you are unable to take an exam as scheduled due to a serious illness or some other emergency, it is **your responsibility** to call me and leave a message *before* the exam or as soon as you are physically able. If an official school function takes you out of class on an exam date, it is your responsibility to make arrangements *one week prior* to the exam as to when you will take the exam. Usually it will be given early, not late. Makeup exams for excused absences will be given, but a penalty of up to 75% will apply for unexcused absences, at the teacher's discretion. **Phones must be turned off and put away.**

### Programming Projects

Three major programming projects (written in C#) will be completed using Visual Studio. These projects will require you to integrate the information learned in class to produce non-trivial Windows applications. You should expect to spend a significant amount of time on each project.

The first two projects will be completed in teams of two or three that will be assigned by the instructor. The final project will be completed by teams of your own choosing. Pair programming may be used but is not required. Teams will use git for version control and will make their code available in private repositories on GitHub.com.

### **Quizzes and Homework**

Quizzes over reading assignments must be taken on Canvas *before* the class period on which the quiz is due. **No makeup quizzes will be given** unless extraordinary circumstances require it. Even if a student is absent from class, excused or otherwise, the student is still required to take the quiz while it is available.

Homework assignments will be assigned throughout the week that give the student opportunities to implement concepts presented in class. Homework assignments may be completed individually or in pairs using **pair programming** (both students working on the entire program together). If pair programming is used, only one person needs to submit the pair's solution to Canvas. The person submitting the solution needs to add a Canvas comment naming their partner so I can assign their partner the same score.

### **Class Presentations**

Teams of two will make 30 minute presentations to the class based on a chapter or two from the Johnson text. Presentations will be evaluated based on a number of criteria and will make up 10% of your grade. Details about the presentations will be posted on Canvas.

### **Extra Credit**

1. The McChallenge: **1%** will be added to your final grade for the completion of a program, which will be made available to you later in the semester. The program will be due the Friday before final exams. You can skip the program and still get the 1% added to your final grade if you beat me in a game of basketball, tennis, racquetball, Halo, chess, Trivia Pursuit, or any other sport/game that I know how to play. If you lose, you still may complete the program to get your 1%. Only one challenge per semester, and all challenges must be made *before* the final week of class. Come by my office to schedule a time to play.
2. Giving Blood: Donating at the Red Cross blood drives will earn you **0.2%** added to your final grade each time you donate. Donate as many times as you'd like, and give me a signed note confirming your donation each time you donate.

### **Grades**

Final grades will be computed as follows:

Exams:	25%
Projects:	30%
Quizzes:	5%
Homework Assignments:	10%
Presentations:	10%
Final Exam:	20%

Standard letter grades: A = 90-100%, B = 80-89% C = 70-79%, D = 60-69%, F = 0-59%

Late work: A maximum of 10% will be taken off *each day* (not each class period) a program or assignment is late, up to 50%. Every day is counted, including weekends. Nothing late more than 1 week will be accepted.

Final grades are not rounded unless the student has given significant effort which is evidenced by regular attendance, completion of nearly all homework assignments, significant effort on projects, etc.

## **Miscellaneous**

1. Notes for each day will be made available to you on Canvas. I encourage you to print them out before class and write on them during class.
2. To be successful in this course, be prepared to spend at least **two hours outside of class** for every hour in class studying, reading, completing quizzes and homework, working on projects, and preparing for exams. This works out to about 9 hours a week.
3. You must check Canvas **regularly** for announcements and class assignments. You can also post to the Canvas Discussions to ask questions outside of class and give help to others on homework and projects.
4. You are expected to hold to the **highest standard** of personal conduct and **integrity**. Cheating in all its forms is inconsistent with Christian faith and practice and will result in sanctions up to and including dismissal from the class with a failing grade. Homework and quizzes should be completed *individually* (not in teams or pairs), and it should be *your* work, not the work of someone else. One thing that you should *never do* is allow someone to see your source code as this often leads to cheating. Come by during office hours (or we'll arrange a time) for assistance on programs. Also see my [Plea for Integrity](#).
5. Please adhere to the **dress code** as described in the Student Handbook. Please wear shoes to class (flip flops are OK).
6. No laptops or phones in class. Why?
  - Professors who have banned electronics show improves grades, and students are fine with the ban.
  - Students not using electronics are harmed when others do.
  - Humans simply cannot multitask when using higher-level brain functions.
  - Multitasking lowers your IQ and may damage your brain.
  - Links to evidence: <https://frankmccown.blogspot.com/2019/08/no-laptops-or-phones-in-class.html>

GUI Programming may be one of the most practical courses for your career in software development. Whether programming a desktop app, a mobile app, or a web application, the concepts covered in this course will lead you to make better decisions when designing interfaces and help you produce much more usable software. You can apply these principles immediately in your senior capstone course.

If you ever need assistance in this class or anything else, please don't hesitate to come by my office or give me a call.

## **Assessment**

Harding University, since its charter in 1924, has been strongly committed to providing the best resources and environment for the teaching-learning process. The board, administration, faculty, and staff are wholeheartedly committed to full compliance with all criteria of the Higher Learning Commission. The university values continuous, rigorous assessment at every level for its potential to improve student learning and achievement and for its centrality in fulfilling the stated mission of Harding. Thus, a comprehensive assessment program has been developed that includes both the Academic units and the Administrative and Educational Support (AES) units. Specifically, all academic units will be assessed in reference to the following Expanded Statement of Institutional Purpose: **The University provides programs that enable students to acquire essential knowledge, skills, and dispositions in their academic disciplines for successful careers, advanced studies, and servant leadership.**

## **Students with Disabilities**

It is the policy for Harding University to accommodate students with disabilities, pursuant to federal and state law. Therefore, any student with a documented disability condition (e.g., physical, learning, and psychological) who needs to arrange reasonable accommodations must contact the instructor and the Disabilities Office at the beginning of each semester. (If the diagnosis of the disability occurs during the academic year, the student must self-identify with the Disabilities Director as soon as possible in order to get academic accommodations in place for the remainder of the semester.) The Disabilities Office is located in Room 205 of the Student Center, telephone, (501) 279-4019.

## Schedule

The following schedule is subject to change but gives you an idea of how the class will progress:

Week 1	Introduction History of comp interfaces Intro to .NET Framework	Week 6	WPF and XAML Laying out controls Event handling Chap 5 (Johnson)	Week 11	UWP app Layout, Navigation Chap 10 & 11 (Johnson)
Week 2	Intro to C# GUI dev in Visual Studio	Week 7	LINQ ADO.NET and DataGridView Testing GUI apps Chap 6 (Johnson)	Week 12	Saving state File I/O and file pickers Chap 12 (Johnson)
Week 3	C# details Dialog boxes Chap 1 (Johnson)	Week 8	Project 2: Music Player Context menus Drag-and-drop Chap 7 (Johnson)	Week 13	Project 3: UWP Data binding MVVM Chap 13 & 14 (Johnson)
Week 4	TreeView and ListView Threading and async Project 1: Photo Editor Chap 2 & 3 (Johnson)	Week 9	Misc GUI controls Chap 8 (Johnson)	Week 14	Usability testing Student presentations  <i>Thanksgiving Break</i>
Week 5	Common dialog boxes Sep 17 Chap 4 (Johnson) <b>Exam 1</b>	Week 10	Chap 9 (Johnson) Oct 22 <b>Exam 2</b>	Week 15	Student presentation Project presentations Review for Final Exam
				Week 16	<b>Final Exam</b> Dec 10



DILBERT reprinted by permission of United Feature Syndicate, Inc.