



School of Engineering
*Information
Technology Program*

ITP 368: Programming Graphical User Interfaces

Units: 4

Fall 2019-TBD-TBD

Location: TBD (See schedule of courses)

Instructor: Kendra Walther

Office: OHE 530E

Office Hours: TBD. See contacts on Blackboard

Contact Info: All general course/assignments questions should be asked on Piazza (every student will receive an invitation at the start of the semester).

Other questions should be asked via email: kwalther@usc.edu
(General timeline for replying to emails is within 24 hours)

Teaching Assistant: TBD

Office: TBD

Office Hours: TBD

Contact Info: TBD

IT Help: Provided by Viterbi IT

Hours of Service: 8am–5pm M-F

Walk-in: DRB 205

Contact Info: (213) 740-0517

Email: engrhelp@usc.edu

Course Description

Programming applications with dynamic graphical user interfaces. Topics include events, controls, resources, data bindings, styles, and user experience. Students will learn industry best-practice approaches for software project design using design patterns and how to understand and apply fundamental UI design principles while programming desktop UI components. Students will go through the process of building desktop applications from start to finish using Java. You will learn how to leverage your Java programming knowledge and explore JavaFX libraries to design graphical interfaces, simple animations, and mini-games. Students will also consider design aspects such as localization and internationalization, as well as accessibility for end users. Students enrolled in this course should have strong object-oriented programming skills and be able to apply their knowledge of data structures towards problem solving.

Learning Objectives

- Build and strengthen programming and software design skills
- Understand and be able to leverage existing APIs and tools for building and designing: command-line applications, animations, games, and user interfaces
- Identify and understand a core set of design patterns and be able to apply them, individually or together, to software projects
- Understand and apply fundamental UI design principles while programming desktop UI components
- Understand the considerations needed to make software accessible and why it is important to consider accessibility from the beginning of software design
- Understand why we need localization and internationalization of programs and how to set up applications to easily be localized
- Implement a self-directed demo-quality project and present it

Prerequisite(s): ITP 265 and/or CSCI 103

Course Notes

Format: This course will make use of several tools for content and assignments including Google Drive, Blackboard, and an online class discussion forum. Lecture notes and any supplemental course content will be posted to Google Drive and/or Blackboard for use by all students. Any and all announcements for the course will be posted to the class discussion forum. All assignments will be posted to Blackboard and will be submitted through Blackboard.

Required Readings and Supplementary Materials

Readings for this course will be available through **Safari Books Online**. To access, students will need an ACM student membership (\$19) and can subscribe to the course playlist. Directions for access will be given in class. Books referenced will include:

- Core Java Volume I and Volume II by Cay Horstman
- Learn JavaFX8: Building User Experience and Interfaces with Java 8 by Kishori Sharan
- Mastering JavaFX 10 by Sergey Grinev
- Head First Design Patterns by Eric Freeman, Elisabeth Robson, Bert Bates, and Kathy Sierra

Course Structure

The class meets for one hour and 50 minutes twice a week for a total of 3 hours and 40 minutes. One exam and several in-class quizzes will be given. Programming assignments or projects will be assigned to be completed outside of class time. Access to a laptop computer during class is required. ITP does have a laptop loaner policy for students enrolled who do not have a personal laptop.

Grading Breakdown

Item	% of Grade
Assignments (weighted proportionally)	45
Exam	20
Tests (4 total), lowest dropped	20
Final Project	15
Total	100

Grading Scale

Course final grades will be determined using the following scale

A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59 and below

If you are taking the class with a grade of P/NP, you must earn a grade of 70% or higher in order to receive a P.

Programming Assignment Policies

Programming assignments will generally be due one week after they are assigned and should be completed individually. All code should be submitted on Blackboard (unless otherwise stated) and must compile.

Homework

The assignments will be posted on the Google Doc Course Schedule and the submission link will be on Blackboard under the “Assignments” section. Each assignment will include instructions, requirements, point breakdown, a due date, and a link for electronic submission. Assignments must be submitted using this link. Assignments will be digitally submitted through Blackboard except where explicitly specified.

It is the student’s responsibility to submit assignments **on or before** the due date. Assignments turned in up to 24 hours late will have 15% of the total points deducted from the graded score. Assignments turned in 24-48 hours late will have 30% of the total points deducted from the graded score. Assignments turned in 48-72 hours will have 50% of the total points deducted from the graded score. After three days, submissions will **not** be accepted, and will result in a score of 0 (zero). Each student will be allowed **TWO** 24-hour late assignments for “free”, which may not be used on final project, and students must fill out the “Late Assignment” Google form.

Students are required to keep a copy of all of their assignments. Frequent backups to an external drive or to the cloud is strongly recommended. ITP is not responsible for any work lost.

Grading Timeline

Assignments will be graded, and students will receive feedback within two weeks after submission.

Grading Issues

Students will have two weeks after graded feedback is given to contest scores (e.g. assignments, quizzes, exam, and project). After two weeks, scores will not be changed.

Extra Credit Policy

UI Programming has many more elements than can be covered in a single class. To encourage exploration and self-study, each assignment has up to 10% extra credit bonus for features beyond the scope of the course.

Sometimes there will be specific recommendations for bonus features to implement, and sometimes it will be left to the student. Points will be earned based on rigor (how difficult was the feature to implement), functionality (does the feature work properly), and applicability (does the feature make sense given the larger assignment). It is the responsibility of the student to state in their Blackboard submission that they included extra features.

Final Project Details

Schedule

Checkpoint 1: Design Proposal, Code Model
Checkpoint 2: Code View and Controller
Checkpoint 3: Basic Functionality
Final Submission: Finished Program
Final exam period: Presentation (Graded)

Requirements

The final app will be graded on how it fulfills the requirements and the quality / completion of the code. Student must plan and implement a fully functioning user interface for an application. Successful projects will follow the style guidelines and UI standards, allow for user interaction, and demonstrate concepts learned during the course. A project must represent the student’s sole

effort; online tutorials or other examples may be consulted, but they must be improved upon and noted in the final documentation. Failure to note and provide links to any reference material will be considered cheating.

Grading Rubric

Item	Points
Final Design Document	15
Accessibility and Localization	10
Persistent Storage and User Customization	15
UI Design, Good use of components, Layout and Functionality (usability)	20
Use of Design Patterns	15
Code	25
Total	100

Additional Policies

General

No make-up exams or tests (except for documented medical or family emergencies) will be offered. The lowest test score will be dropped.

Attendance may be taken during lecture sessions electronically, verbally, or via a roster passed around the room. Do not sign in for another student; doing so is an academic integrity violation. Attendance is not mandatory, but students are responsible for any announcements made during lecture time and understanding material covered in class. Student work will be graded on the assumption that they have mastered material from class.

Do not reproduce, distribute, or post any lecture material, assignments, or exams publicly without my written consent. Students may take notes and make copies of course materials for their own use. Students may not post my course materials on sites such as CourseHero. Doing so is a copyright violation and an academic integrity violation that will be dealt with accordingly.

ITP offers open lab use for all students enrolled in ITP classes. These open labs are held beginning the second week of classes through the last week of classes. Hours are at <https://itp.usc.edu/current-students/open-lab-schedule/>. In addition, ITP has a laptop loaner program for students who may need temporary use of a laptop in order to complete an assignment.

Late Add

Per university policy, students are allowed to add the course until the end of week three. Any students wishing to add the course should plan on attending the course from the beginning of the semester. Upon adding the course after week 1, the student should email the instructor **immediately** to make sure there is a plan for completion of work and learning missed materials. Any missed work is required to be completed and submitted according to the schedule provided by the instructor.

Academic Integrity

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles.

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in **SCampus** in Part B, Section 11, “Behavior Violating University Standards” <https://policy.usc.edu/scampus-part-b/>. Other forms of academic dishonesty are equally unacceptable. See additional information in **SCampus** and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Academic integrity tutorials can be found at <https://libraries.usc.edu/research/reference-tutorials>

Examples of behavior violating University standards:

- The submission of material authored by another person but represented as the student’s own work, whether that material is paraphrased or copied in verbatim or near-verbatim form.
- Obtaining for oneself or providing for another person a solution to homework, a project or other assignments, or a copy of an exam or exam key without the knowledge and expressed consent of the instructor.
- Unauthorized collaboration on a project, homework, or other assignment.
- Fabrication: Submitting material for lab assignments, class projects, or other assignments which is wholly or partially falsified, invented, or otherwise does not represent work accomplished or undertaken by the student.

If the instructor, a grader, or a lab assistant **suspects** you of academic dishonesty, it has to be reported to SJACS (<https://sjacs.usc.edu>). Do not share assignments with any other people. Do not submit another person’s work as your own. Do not look at other students’ papers during exams. Do not leave the room during an exam without permission. **Do not cheat! As Trojans, we are faithful, scholarly, skillful, courageous, and ambitious.**

Viterbi Honor Code

Engineering enables and empowers our ambitions and is integral to our identities. In the Viterbi community, accountability is reflected in all our endeavors.

Engineering+ Integrity.

Engineering+ Responsibility.

Engineering+ Community.

Think good. Do better. Be great.

These are the pillars we stand upon as we address the challenges of society and enrich lives.

ITP 368 Course Schedule: A Weekly Breakdown

Note: Approx. 8 hours/week of work outside of class is expected outside of class. Reading (2-3 hrs/wk) + HW (5-6 hrs/wk). Except for HW0, assignment will be posted on the week shown, to be due the following week before the second lecture

Week	Topics	Reading	Assignment
1	Java Overview	Core Java Volume I, Chapters 1-4	HW0: Introduction
	Class Design. IDE.		HW1: Debugging. Class Design.
2	Inheritance, Enums. Project Design	Core Java Volume I, Chapter 5. 6.1, 6.2, 7.1-7.3, Ch 9 (skim) and Effective Java Chapter 3 or article	HW2: Inheritance Project Part 1
	Testing & Debugging, Interfaces, Exceptions, Collections		
3	Labor Day (No Class)	Head First Design Patterns	HW3: Inheritance Project Part 2
	Quiz 1. Code Design and Design Patterns		
4	Design Patterns, cont'd.	Core Java Volume 2, Chapters 1	HW4: Design Patterns Project
	Functional Programming. Lambdas. Streams.		
5	Scene Graphs. Java FX Basics.	Mastering JavaFX 10, Ch 1 (Stages and Scenes) Ch 2 (Building Blocks)	HW5: Shapes
	Guest Lecture(Concurrency)		
6	Quiz 2. More FX Basics. FXML and CSS.	Sharan: Ch 8: Styling nodes Mastering JavaFX 10, Ch 5 (Animation)	HW6: Shape Animation
	Java FX Animations. (Transitions)		
7	Layouts Panes and UI Controls.	Sharan: Ch 10: Understanding Layout, Ch 12: Understanding Controls	HW7: Simple UI Design
	UI Controls. Gestalt and UI Design		
8	Quiz 3. Events. Event Handling. Key & Mouse Events.	Sharan: Ch 9: Event Handling, Ch 2: Properties and Bindings	HW8: UI with functionality
	Properties. Styles and Skins		
9	Listeners. Binding. Multimedia and other resources	Mastering JavaFX 10, Ch 3 (Connecting Pieces - Binding)	HW9: Game Design Preparation.
	Interface Design Rules. Accessibility		
10	Switching Scenes Game Design	Animation Timer online article Sharan: Ch 11 Model View Controller Pattern	HW10: Lights Out Game Design
	KeyFrames and Animation Timer		
11	Quiz 4. Movement (Animation)	Mastering JavaFX 10, Ch 10 (Advanced Controls and Charts)	HW11: Moving Game
	Lists and List Customization		
12	Localization. Internationalization	Java Trail: Internationalization	HW12: List and i18n Project
	Persistence. Tables. Field checking		
13	Final Project Guidelines and Samples. Review		HW13: Final Project Design
	Exam		
14	Final Project Workshop.		HW14: Final Project Checkpoint
	(Thanksgiving Break)		
15	Deploying JavaFX Applications		HW15: Final Project Checkpoint
	Final Project Workshop.		
Study Days	Special Office Hours will be Announced on Piazza		
Finals	Final Project Presentations, individually presented during class exam period or mutually agreed upon time**		

** For final exam presentations, students will present in 10-15 minute slots, with times available during their final exam period, but with additional time slots available and scheduled via a Doodle poll.

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” <https://policy.usc.edu/scampus-part-b/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems

Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. <https://engemannshc.usc.edu/counseling/>

National Suicide Prevention Lifeline - 1-800-273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. <http://www.suicidepreventionlifeline.org>

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. <https://engemannshc.usc.edu/rsvp/>

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: <http://sarc.usc.edu/>

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. <https://equity.usc.edu/>

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. <https://studentaffairs.usc.edu/bias-assessment-response-support/>

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. <http://dsp.usc.edu>

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. <https://studentaffairs.usc.edu/ssa/>

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. <https://diversity.usc.edu/>

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible, <http://emergency.usc.edu>

USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime.

Provides overall safety to USC community. <http://dps.usc.edu>