Oregon TECH

CST 238:

GUI DESIGN

- GRAPHIC USER INTERFACE -

COURSE INFORMATION

Instructor: David Bishop

Pre-Requisites: CST 211 + SPE 111

Goals:

- 3-month personal project that demonstrates mastery of GUI concepts (QT + QML) as well as version control (Git)
- Increased problem-solving ability to prepare for front-end, GUI-based technical interviews

Easy, Right?!

GRADE BREAKDOWN

Textbook

The textbook we will be using is entirely free and online. You may find it at the following link: QmlBook
https://qmlbook.github.io/index.html

PERSONAL PROJECT

You are to choose your own project

- Work Alone
- Team up! (either section)
- 10-Weeks long

Extreme programming is the preferred software development process we intend to use. This consists of the JBE method of documentation (Just Barely Enough).

The requirements are as follows:

1. Must be written in C++ (Qt) or C# (Unity or WPF)

2. Must demonstrate mastery of all GUI concepts (see schedule below)

3. Must include additional requirements as specified by lab specifications (see below)

4. Must be hosted on a private server or GitHub (we will grade your project via your commits + running the app)

LABS

Lab 1	Storyboard	600 points
Lab 2	Splash Screen	600 points
Lab 3	Embedding C++	600 points
Lab 4	Settings	600 points
Lab 5	Advanced User Input	600 points
Lab 6	Multimedia	600 points
Lab 7	Advanced C++ Integration	600 points
Lab 8	Animation + Threading	600 points
Lab 9	Installer	600 points
Lab 10	Presentation + Deployment on phone	600 points
Total		6000 points

*Figure 6 is dependent to your app
*We will work on and grade these labs based on progress.

GUI PUZZLES

These are basically our tests and quizzes.

Instead of making you memorize definitions or algorithms that will forget in six months or making you play the "Guessing Game" on what is going to be on a test or give you a study guide that will only tell you what is not going to be on the test, you will actually use your brain and learn how to problem solve. Infinite retakes are allow for all GUI puzzles.

Okay, you failed to even get one line of code right for a GUI puzzle. Does that mean you're a bad student? Does that mean you should be punished or deemed a wise? Absolutely not. There is a reason why you failed to solve the puzzle and it's the instructor's job to help you debug the cognitive reasons of not only what you're doing wrong, but what you're doing right. These puzzles are going to be modeled directly after what you're to see when you start technical interviews.

Do you think technical interviews are going to be "give me the definitions of these commands, or 'pump out this well-known algorithm.'" No. It's going to be questions that really test your understanding. Instead of "write a binary tree," it might be "Given two binary trees, write a function to check if they are the same tree or not."

We will provide food, drinks and snacks on occasion. If anyone has any allergies, please let me be aware.

Attendance

This is the easiest ten percent you will get in the class. Just show up and participate and you get a free ten percent.

Mondays → Lectures
See schedule for more details.

Wednesdays → Lectures/Guest Lectures/Miscellaneous
See schedule for more details.

Thursdays → Labs
Mr. Jacob, Mark and Stu will help you get over hurdles in lab. Please show up if you want help.
Labs are due on Thursdays @ 7:59 AM.

Fridays → Problem Solving
Three GUI Puzzles will be given to solve. You may choose any one. After the puzzle is solved, attempt to GUI-ify the problem. For example, if you solve a puzzle like "invert a binary tree" your task is then to animate a binary tree being inverted.

Term Schedule

Week	M	R	F
1	QML •Syllabus •Intro •Demo •Installation	QML •Item •Rectangle •Text •Image •Qt.exit Name	Lab 1 (Storyboard) •Storyboard •Text •Rectangle •Text •Image	Puzzle 1 Q & A For the week.
2	QML •Ternary Operator •Property Bindings •Anchors	QML •Mouse Input •Mouse Area •Qt Quick Controls	Lab 2 (Splash Screen) •Resource File •Javascript Functions	Puzzle 2 Q & A For the week.
3	QML •Row, Column, Grid •Validator's Input Mask	QML •Keyboard Input •Text Input	Lab 3 (Embedding C++) •Signals/Slots •Call C++ from QML	Puzzle 3 Q & A For the week.
4	QML •States •Transition •Behaviors	QML/C++ •TimerEvent •C++ Event •File I/O	Lab 4 (Settings) •Settings •Qsettings •Basic C++ integration	Puzzle 4 Q & A For the week.
5	QML •Graphic Effects •Fun Stuff in QML you might want to play with	QML •Repeater •Loaders •Memory Management (JS)	Lab 5 (Advanced User Input) •Custom input handling (input forwarders)	Puzzle 5 Q & A For the week.
6	QML •Media Player •Video •GPS •Audio	C++ •Pixel Buffers •Image Provider •Sprite Sheets	Lab 6 (Multimedia) •Camera •Video Stream •Capture Image •Save Image	Puzzle 6 Q & A For the week.
7	C++ •Qt C++ Introduction •Data Structures •Meta Object Compiler	C++ •Extending QML •Exposing QML Item •Qmldir •Register Type (MOC)	Lab 7 (Advanced C++ Integration) •Hashing •Password Encryption	Puzzle 7 Q & A For the week.
8	QML •Animations •Property, Number, Property, Parallel	C++ •Threaded Graphical Processing •User Interface Thread(s) •Threading	Lab 8 (Animations and Threading) •Custom C++ driven animation •Animation sequencing / queuing	Puzzle 8 Q & A For the week.
9	Qt •Intro to Installers •Offline/Online •Features •Tools involved	Qt •Building your first installer	Lab 9 (Installer) •Build an offline installer for you project	Puzzle 9 Q & A For the week.
10	Project •Work on Project •Get Help From TAs •Ask Questions	Project •Work on Project •Get Help From TAs •Ask Questions	Project •Begin Presentations	Puzzle 10 Q & A For the week.

Teaching Assistants:

Stu Taylor — QT + JavaScript Expert

Software Engineer for Raytheon
Master's of Science
Georgia Institute of Technology (2016–2018)
Computer Science (Computer Perception and Robotics)
Bachelor's of Science
Oregon Institute of Technology (2012–2016)
Software Engineering

https://github.com/StewartTaylor http://complexzone.com/

Jacob Neal — SFML + QT + OpenGL Expert

Software Engineer for Hewlett Packard
Bachelor's of Science
Oregon Institute of Technology (2012–2016)
Software Engineering

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Mark Shankin — Unity + WPF Expert

Bachelor's of Science
Oregon Institute of Technology (2012–2018)
Software Engineering