

Deliverable: #3 - System Architecture and Design
Course: COMP 3004A: Object-Oriented Software Engineering
Website: http://olgabaysal.com/teaching/fall17/comp3004/comp3004_f17.html

Lectures: Wednesday & Friday, 11:35 AM – 12:55 PM, AT 101.

Instructor: Dr. Olga Baysal, olga.baysal@carleton.ca, HP 5125D. Office hours by appointment.

TAs: Lexi Brown, lexibrown@cmail.carleton.ca. Office hours: TBA
Alex Patel, alexpatel@cmail.carleton.ca. Office hours: TBA
Amir Aghasharif, amiraghasharif@cmail.carleton.ca. Office hours: TBA
Junaid Maqsood, junaidmaqsood@cmail.carleton.ca. Office hours: TBA
Tansin Jahan, [tansinjahan\[at\]cmail.carleton.ca](mailto:tansinjahan[at]cmail.carleton.ca). Office hours: TBA

Deliverable Overview:

This deliverable will consist of two independent parts: architecture + design descriptions and an oral presentation where your team will meet with us to discuss the architecture and design of your system.

The written component of this deliverable will describe your project architecture (4 pages: 2 pages of text and 2 pages of diagrams), design (4 pages: 2 pages of primarily text and 4 pages of primarily diagrams), and give an overview of what each member of your team is doing (1 page).

For the oral component, be prepared to defend your system's design. We will also likely ask about how your design could adapt to specific given evolutionary constraints (e.g., "you must now support XXX, how would you do that?").

The scheduling of the oral exam will be announced in-class.

(1) Architecture

Your project proposals provided an overview of the functionality your project aims to provide; they also provided some insight into the non-functional, or quality, attributes you want your project to exhibit. In class we have described a variety of architectural styles and design patterns, each of which has both strengths and weaknesses. The intent of this part (1) is to identify, describe, and justify the architecture of your project. Do not be constrained by the individual styles and patterns we described in class; it is expected that a heterogeneous set of styles and patterns (including ones we may not have covered in class) may best suit your project.

The outcome of the *Architecture* documentation is a system architecture that supports the functional goals and non-functional attributes of your project. Non-functional attributes should be specific enough to tell whether or not your app has them. Note: a two-box client/server component diagram will be insufficient here. For example, every BB10 service you interact with (e.g., NFC, Geolocation, Contacts, etc.) should be clearly identified and can be treated as individual components; you should investigate their API in advance to ensure the components provide what your app requires.

(2) Design

The second part of your document should describe the design of your system, and its rationalization, such that a junior programmer could implement some subset of the system and integrate it appropriately. Your design should include a clear description of the structure of the components and its externally visible interfaces. Rationale must be provided documenting why you selected your design. The applicability of your design compared to alternative designs should also be referenced in this discussion.

You should reference descriptions in your Architecture part (1) of important patterns, classes abstractions, and data structures / algorithms that are critical to the successful implementation of your system. Use

diagrams as appropriate for this report. At a minimum, include a class diagram that shows all of the classes and public API for your system and how they interact. You may include a sequence diagram (optional) that captures how your system behaves for each of the scenarios from the initial proposal. Clarify the physical location of where the classes will reside (e.g., on the client, on a server), as well as any external API your system will use.

An analysis of how your design minimizes coupling and accommodates changing requirements is required. Think critically about how you could envision your system being altered and discuss how your design would support or inhibit evolving to meet those changed requirements. Identify one ways you think your system may need to evolve in the future and describe how your project's design would support these changes.

Document Requirements:

1. Page 1: Metadata: Project title, team member names, team member student IDs.
2. Pages 2–5: Architectural description.
3. Pages 6–9: System design.
4. Page 10: Assignment of tasks for each team member (aka who is doing what).
5. Only one team member needs to submit this document via cuLearn by **09:00 AM November 19**. PDF only. File naming scheme: `comp3004-d3_<project-name>.pdf` (use - instead of space in file names).

Assessment:

This deliverable is worth 30% of your final grade. The written component is worth 60% of the deliverable mark; the oral component constitutes the remaining 40%.