Project Handbook

Senior Systems Development Project
ACS-4901 (6)

Department of Applied Computer Science
University of Winnipeg

This Project Handbook is a department document to serve as a guide for all projects in the capstone course ACS-4901 (6). It references other materials including the Standards Handbook and the Course Outline. It includes descriptions of team roles, course regulations, important events, logistics, and a completion checklist. It must be used in conjunction with the Standards Handbook and Course Outline, which collectively explain the work standards, control procedures and measures, reviews and reporting requirements, and management and change procedures.

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Introduction

This is the capstone course in the Applied Computer Science program. The Project course draws on material from many of the preceding courses in the program. In the Project course, students, working in teams, undertake a complete systems development project, from the initial gathering of user requirements through to the installation of a fully-tested system. Students are required to manage the project themselves, including preparing estimates and a schedule, monitoring project progress, and conducting regular status reviews. Practices in the course deal with principles and techniques of project management, for example, engaging stakeholders continuously, defining and aligning on goals, planning with purpose, monitoring progress and adapting, managing risks proactively, fostering a collaborative team, ensuring built-in quality, and committing to continuous improvement. Two formal presentations of project work are required, providing students with the opportunity to develop their presentation skills, and faculty members the opportunity to provide input into the project work.

This is a very challenging course. It provides experience in the complexities of developing a real system for a real end-user. It also exposes students to all aspects of the systems development process, many of which may have to this point been just academic exercises in course assignments. Students leave the course with a greater appreciation for real-world systems development. The course develops skills not only in the technical aspects of design and development, but in communication, teamwork, and time management. These real-world features of the course are of interest to prospective employers. Many Applied Computer Science graduates have commented on the amount of time interviewers have spent asking about the graduate's experience in the Project course.

Course Materials

To have a complete description of this course, there are three documents you should have:

- The Course Outline gives specific information regarding the running of the course for the current academic year.
- The Project Handbook (this document) describes the course in more general terms than the course outline.
- The Standards Handbook describes the content of the deliverables produced as part of a project.

Project Handbook

The rest of this document describes the roles and responsibilities of faculty members and students, the repositories that each project builds, logistics, and a completion checklist for completing the course.

Roles and Responsibilities

We list below the roles that faculty and students take on in the Project Course. The roles and responsibilities for students listed for team members are based on two popular project management methodologies, Waterfall and Agile (Scrum), and meant as a guideline only. The team must decide for itself, with the advice of its IS Director, the methodology to adopt, organizational structure to select, and the duties that each team member will perform on the team. On teams of seven or eight people, there are more resources to study the problem more thoroughly and explore more advanced and better solutions. On teams of four or five people, it's likely none of these roles will be full time. For each team member, you may want to designate a "primary" and a "secondary" role. Teams may also designate further specialist roles if they feel it is beneficial to do so.

Course Coordinator

· The Course Coordinator is a faculty member responsible for the overall coordination of teams, projects, and facilities.

System Administrator

· The System Administrator is department staff member, who provides technical advice and support to the teams.

IS Director

· The Information Systems Director is a faculty member assigned to your project.
· The IS Director meets with you regularly, reviews your work, attends some team meetings (especially phase-end meetings), provides consultation throughout the project, and assists with problem resolution.
· The IS Director recommends grades.

User/Project Sponsor

· Sponsors the project.
· Provides user requirements.
· Approves project proposal
· Reviews deliverables
· Attends milestone presentations
· Signs acceptance for finished system.
· Provides access to their organization's infrastructures/computers/information that are needed for the project.
· User should be prepared for the testing on site before or by deadline. User's cooperation is necessary and required.

Teams using the Waterfall methodology

Project Leader

· Manages the project.
· Provides a main liaison point with the user, IS Director, technical units, etc.
· Prepares phase activity plans, and monitors and reports progress against these plans to the IS Director.
· Obtains approval for all project and phase plans from the IS Director.
· Reports project status to the IS Director at agreed-upon intervals.
· Advises the IS Director immediately of any deviation beyond agree-upon tolerance levels.
· Provides estimates and costs.
· Manages human resources on the team.
· Controls and directs the work of the project team.
· Ensures that the project is conducted according to project management standards and that all completed work is of good quality and conforms to the appropriate technical and documentation standards.
· Ensures that the design and installation criteria are met.

Technical Leader

· Acts as technical advisor to Project Leader.
· Assists the Project Leader in the general management of the project.
· Prepares detailed technical plans.
· Ensures that all team members are trained in the necessary technical standards and techniques.
· Reports regularly on the project technical status and the resources used to the Project Leader.
· Handles the sizing and assessment of the impact of any proposed modifications.

Lead Systems Analyst/Designer

· Plans and conducts interviews with the user.
· Documents requirements and other information obtained from the user.
· Proposes solution alternatives.
· Does cost-benefit analysis where required.
· Analyzes/designs a data model to support the system requirements.
· Analyzes processing requirements and designs specifications for the programmers.
· Analyzes the human interface requirements and designs an appropriate interface.
· Analyzes risk and control issues and designs appropriate measures.
· Designs plans for testing, training, conversion, and installation.
· Assists in the systems test.
· Prepares documentation as required.

· Supervises Systems Analyst/Designer team members.

Lead Programmer

· Develops programming standards.
· Analyzes programming specifications for completeness, accuracy, and adherence to standards.
· Develops the system from the specifications provided by the Systems Analyst/Designer.
· Participates in designing the test plan, creating test data, and testing the system.
· Leads system walkthroughs in the Development phase.
· Prepares documentation as required.
· Supervises Programming team members.

Lead Quality Control Specialist

· Assists the Project Leader in preparing project/phase plans.
· Gathers and records actual project effort and costs against the plan.
· Monitors weekly/monthly/total team member activity during the project.
· Administers project filing system and documentation.
· Ensures standards are being followed (e.g. user meeting documents, documentation on data structures, interfaces, and design)
· Participates in walkthroughs of source code and documentation.
· Coordinates program testing prior to the user viewing/receiving any working versions (prototypes/programs) of the application.
· Evaluates the implementation of user requirements for accuracy/completeness.
· Supervises other team members involved in quality control.

Teams using the Agile (Scrum) methodology

In Agile (Scrum) framework, the project team is deliberately kept lean and cross-functional, with clear but collaborative roles

Product Owner

· Represents the project client/customer organization.

· Define and communicate the product vision and goals.
· Own and prioritize the Product Backlog (what the team works on).
· Translate stakeholder needs into clear user stories and acceptance criteria.
· Ensure the backlog items are visible, transparent, and understood by the team.
· Make trade-off decisions (scope, priorities, deadlines, budget).
· Accept or reject completed work (based on Definition of Done).

Engage with stakeholders to gather feedback and update priorities.
Ensure maximum value delivery in each sprint and for the overall product.

Scrum Master

· A servant-leader who ensures the Scrum framework is followed.

- · Coach the team and organization on Scrum principles and practices.
- · Facilitate Scrum events (Daily Scrum, Sprint Planning, Sprint Review, Sprint Retrospective).
- · Help remove impediments that block team progress.
- · Foster self-organization and accountability within the team.
- · Protect the team from scope creep and external distractions.
- · Promote continuous improvement through retrospectives and feedback loops.
- · Act as a bridge between stakeholders and the team, ensuring collaboration without micromanagement.
- · Support the Product Owner in managing the backlog effectively.

Development Team

· Cross-functional professionals who actually build the product

- · Self-organize to determine how to deliver backlog items.
- · Deliver a potentially shippable increment at the end of every sprint.
- · Estimate work and commit to a realistic sprint backlog.
- · Collaborate closely with the PO to refine user stories.
- · Maintain quality standards (unit testing, peer reviews, CI/CD).
- · Continuously improve processes and practices.
- · Ensure transparency through updating task boards, burndown charts, etc.
- · Share knowledge and support each other to stay cross-functional.
- · Take collective ownership of the work delivered (no silos).

Note: The Development Team does **not** have fixed sub-roles even though individual members may possess following common skill sets inside the development team:

- Software engineers / developers
- Testers / QA
- UX/UI designers
- Business analysts (sometimes integrated)
- DevOps or system specialists

Repositories

Each project team must create and maintain a project repository in which to file important documents pertaining to the project. Important documents are filed periodically. Later versions of the same documents can be filed to replace the earlier versions (with the permission of the IS Director). The objective of this process is that the repository grows with the development of the project.

Repository Format

The IS director and the project team, with the consultation with the system administrator(s) can discuss and determine the appropriate system/format to be used for the repository.

All the important documents (as described below) should adhere to the document standards as specified in the Standards Handbook.

Access to Previous Repositories

Soft copy of some past repositories will also be available on the project laboratory server. In addition, IS Directors may have some previous repositories (hard copies) available for review. These repositories may be examined at the office shown, *during that faculty member's office hours*

You are reminded that previous repositories are good examples. However, they are not necessarily models for you to follow blindly. Discuss with your IS Director.

Project Repositories: Detailed Contents

Each project team must create important documents such as the Project Proposal, Project Plan Report (PPR), Mid Project Report (MPR), Project Completion Report (PCR), Technical Manual, User Manual, and minutes of meetings with users, forms, team standards, project plans, etc., as the project progresses. These documents will be inserted in the appropriate phase. They can be updated or replaced only with the discretion of the team's IS director. Refer to Standards Handbook for details.

Logistics

The following guidelines are set up so that your team can operate smoothly during the project year.

1. Photocopying
   - Each team is permitted to use University facilities to photocopy up to 1,000 pages during the project. These accounts are monitored for excessive use.
   - An account will be set up for each team on the departmental photocopier in the Duckworth building. This account is for project-related documents only. Any use of it to do non-project work (e.g. copying class notes or material related to other courses) will result in the account being disabled.
   - Photocopying must be used for short documents only. Longer documents such as reports and manuals must be submitted to Printing Services. See Printing below.
   - Once you have been assigned a project, you must arrange to use your end-user's photocopying services, if at all possible.
   - Please note that faculty members have priority to use the photocopier in the staff room, i.e. you must suspend your photocopying if a faculty member queues up behind you.

2. Printing
   - The University's Printing Services department (in the basement of Bryce Hall) may be used for reasonable printing requests in the course.
   - Printing Services (as opposed to the photocopier) must be used for long documents, and for shorter documents when many copies are required.
   - Any document to be printed must first be reviewed and approved by your IS Director, who will sign a "Duplicating Requisition" form for you.
   - Deliver the form and your originals to Printing Services. If your printing job has special requirements, you must discuss them with Printing Services.
   - Printing Services has a five-working-day lead time.

3. Lab Access

   ID01 (Project Lab):
   - Teams will be granted the access at the appropriate time.
   - Use of the Applied Computer Science labs is governed by the Applied Computer Science Project Labs Code of Conduct.

   3C13 (Computing Lab):
   - Teams may also request access to 3C13. Check the department web site www.acs.uwinnipeg.ca for Lab Procedures.

4. Team Accounts
   - Each team will be given an account on the ACS network.
   - Requests for special accounts should be approved by the IS Director and then forwarded to the System Administrator.

5. Room Bookings
   - The Department will reserve a room for each team for team meetings throughout the year.
   - To obtain a room booking, the Project Leader should email to the Project Coordinator stating the team number and desired meeting time, including the day, start time, and duration.
   - Room bookings for Project Plan Reviews and Project Completion Seminars will also be handled by the Department. Details will follow later.

6. Equipment Bookings and Room Set-Up
   - The Department will attempt to make arrangements to provide equipment required for formal project reviews.
   - To obtain equipment, email to the project coordinator stating clearly the details of your request. Include date, start time, duration, and location as soon as possible.

If your team requires further services or facilities, see the Project Coordinator.

Completion Checklist

All of the following items must be completed before your final grade in ACS-4901/6 will be submitted to Student Records. If you fail to complete all of these items **by the date specified in the Course Outline**, your grade will be negatively affected.

1. Complete the **Peer Evaluation** form. Each team member must complete the form individually and privately; each team member must return the finished evaluation to the IS Coordinator, in a way that preserves confidentiality.

2. Complete **Project Repository**. Ensure that your repository contains *final actuals*.

3. Submit to the System Administrator the following items:
   · The electronic project repository. See Standards Handbook for details.
   · Your complete system. See the System Administrator for details.
   · The EPRL form for your project. See the System Administrator for details.
4. Remove all software that you installed on any computer in the project lab or on the network.
5. Delete all sundry project files (EXCEPT THE WORKING COPY OF THE DEVELOPED APPLICATION) from all computers in the Project Lab and from the network.
6. Return all items (software, books, etc.) you have received from your user or the Applied Computer Science Department.
7. Remove all personal/team items from the Project Lab.
8. Remove the contents of your project locker, if there is any, and remove the lock.

NOTE:
· Items 3 to 8 require sign-off from the System Administrator.
· Your IS Director may also impose additional requirements that are specific to your team. Please check with him/her well in advance.