NORTHWESTERN POLYTECHNIC

SCIENCE DEPARTMENT

COURSE OUTLINE – Fall 2025

CS 3610: Software Engineering 3 (3-0-3) UT

90 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land, and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR: Dr. Hanna Yehoshyna **PHONE:** 780-539-2074
OFFICE: C-302 **E-MAIL:** hyehoshyna@nwpolytech.ca
OFFICE HOURS: appointment by email

CALENDAR DESCRIPTION:

This course focuses on the principles and knowledge of software engineering. It covers the approaches taken in developing large programming projects, including requirements analysis, specification, design (e.g., top-down modularization), coding (e.g., structured programming), debugging and testing, maintenance, and thorough documentation.

PREREQUISITE(S):

CS2010 - Practical Programming Methodology (3)

COREQUISITE: None

REQUIRED TEXT/RESOURCE MATERIALS:

The text for this course is:

- *Software Engineering, 10th Edition, Ian Sommerville, Pearson, 2016, ISBN 9780137503148*

Recommended textbooks:

- *Learning UML 2.0 / Russ Miles, Kim Hamilton, O'Reilly Media, Inc., 2006*
- *Design Patterns: Elements of reusable object-oriented software / Erich Gamma [et al.], Addison-Wesley Professional, 1994*

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DELIVERY MODE(S):

In Person. This course is delivered in person at the Grande Prairie campus.

This course includes 3-hours of lecture per week and a 2-hour lab per week:

Lecture:	A2	G112	Mon. 10:00 – 11:20
			Wed. 10:00 – 11:20
Labs	L1	G112	Mon. 14.30 – 17.20

LEARNING OUTCOMES:

On the successful completion of this course, students will be able to

- understand the methods for the elicitation, analysis, and specification of system requirements and be able to apply those methods in practice;
- document, manage, research, and communicate business requirements from the initial stakeholder meeting to the final solution assessment and validation phase;
- work together in a team that interacts with clients/stakeholders to elicit requirements;
- apply principles of UX design to analyze and evaluate the user interface of an interactive application;
- apply design-thinking processes and user-centered evaluation methods to meet requirements;
- understand the meaning of every UML notation or diagram and when to use them;
- identify, analyze, and model structural and behavioral concepts of the system by using UML diagrams;
- evaluate a problem and determine the appropriate architectural style for the solution;
- identify and select appropriate design patterns for specific scenarios;
- implement and evaluate software design patterns to compose the design of a software system

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page http://www.transferalberta.alberta.ca.

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. **Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability.**

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EVALUATIONS:

Your final grade will be determined in the following manner:

Assignments	*35%*
Quizzes	*10%*
Midterm Exam	*25%*
Final Exam	*30%*

Course Evaluation Practices:

- all assignments must be completed as individual efforts unless the Instructor states otherwise;
- quizzes and tests must be written as scheduled by the Instructor;
- a student must average at least 50% on the tests combined in order to receive credit for this course;
- a student must average at least 50% on the assignments in order to receive credit for this course.

GRADING CRITERIA

Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

Alpha Grade	4-point Equivalent	Percentage Guidelines	Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	95-100	C+	2.3	67-69
A	4.0	85-94	C	2.0	63-66
A-	3.7	80-84	C-	1.7	60-62
B+	3.3	77-79	D+	1.3	55-59
B	3.0	73-76	D	1.0	50-54
B-	2.7	70-72	F	0.0	00-49

COURSE SCHEDULE/TENTATIVE TIMELINE:

Weeks	Topics
1	Introduction to Software Engineering
2	Software Requirement Analysis and Specification.
3	User Experience Design: Personas, User Stories and Story Mapping, User Scenario, UX Sitemap

Weeks	Topics
4	Introduction to Object-Oriented Analysis and Design. Diagrams in UML. Diagram types. Diagram design tools
5	Use case diagrams
6	Class diagrams
7	Statechart and Activity diagrams
8	Interaction Diagrams: Sequence diagrams and Collaboration diagrams
9	Component Diagrams, Deployment Diagrams
10	**Midterm**
11	Introduction to design patterns, creational patterns
12	Structural patterns
13	Behavioral patterns. Part 1
14	Behavioral patterns. Part 2
15	**Final Exam**

STUDENT RESPONSIBILITIES:

- Students are responsible for all material taught, discussed, assigned or presented by the Instructor. It is the student's responsibility to obtain any missed material covered during classes.
- Students take the two examinations at the date and time announced by the Instructor and/or Student Services. If the midterm is missed due to illness the weight will be put on the final. If the final is missed due to illness it will be deferred.
- Documented illness is the only valid excuse for missing an exam. An original medical note will be required in both cases. A grade of 0 may be assigned for any missed exam.
- Students must be prepared for class with the proper books and assignments, and having read and/or completed all assigned material.
- Students are supposed to complete assignments on or before the due the time and date announced by the Instructor
- Students are not permitted to work together on assignments or exams (unless otherwise instructed by the Instructor).

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at https://www.nwpolytech.ca/about/polytechnic-leadership/policies-directory.

**Note: all Academic and Administrative policies are available on the same page.