

**Western University
Faculty of Engineering
Department of Electrical and Computer Engineering**

**SE 3351A – SOFTWARE PROJECT AND PROCESS
MANAGEMENT**

Course Outline for Fall 2023

Description: The course is an introduction to engineering processes and project management frameworks and their application for developing software. Main topics will include analysis and selection of the main activities of software development process, utilizing Git and fundamental selection criteria related to the nature of the application. It will also cover the core principles of software development process models. The emphasis will be on a hybrid model of the core models. Then, it will cover project management principles and models based on the nature of the software and the project settings to meet business quality objectives. The major focus will be on the project activities, metrics, tools, and related standards/best practices. A main objective is to apply engineering practices including quality management with quantifiable engineering principles supported with management discipline that are adequate for developing software systems for various application and project settings.

Contact Hours: 3 lecture hours/week; 2 tutorial hour/week.

Antirequisites: Computer Science 3377a/b

Prerequisites: SE 2203A/B, SE 2250A/B or ECE 3390A/B, Mathematics 2151A/B or Mathematics 2155A, SE 2205A/B or Computer Science 2210A/B.

Co-requisite: SE 3350 A/B.

CEAB Units: Engineering Science 100%.

Required Textbook:

- Roger S Pressman & Bruce R. Maxim (2015). *Software Engineering: A practitioner's approach*, 8th ed. McGraw Hill

Other Required Resource:

- Mariano Anaya (2019). *Clean Code in Python – Refactor your legacy code base*, 1st ed. Packt
- Scott Chacon & Ben Straub (2014). *Pro Git – Everything you need to know about Git*, 2nd ed. Apress (using in Tutorial)

General Learning Objectives (CEAB Graduate Attributes)

Knowledge Base (KB)		Use of Engineering Tools (ET)	D	Impact on Society and the Environment (IESE)	
Problem Analysis (PA)	A	Individual and Team Work (ITW)		Ethics and Equity (EE)	
Investigation (IN)		Communication Skills (CS)	D	Economics and Project Management (EPM)	D
Design (DE)		Professionalism (PR)		Life-Long Learning (LL)	D

Notation: *I: Introductory, D: Developed, A: Applied, or blank.* I – The instructor will introduce the topic at the level required. It is not necessary for the student to have seen the material before. D – There may be a reminder or review, but the student is expected to have seen and been tested on the material before taking the course. A – It is expected that the student can apply the knowledge without prompting (e.g. no review).

Topics and Specific Learning Objectives	CEAB GA Indicator
<p>1. Introduction to software development process</p> <p><u>At the end of this section, students will be able to:</u></p> <ul style="list-style-type: none"> • gain a level of understanding of the nature of software development projects. • gain an understanding of the main contributing challenges in relation to the nature of the software application, process, and project's settings • identify the core aspects of engineering processes and the project management contribute to the success factors of software development 	<p>PA1 LL1</p>
<p>2. Software development process</p> <p><u>At the end of this section, students will be able to:</u></p> <ul style="list-style-type: none"> • identify the core elements of software development process structure • identify the core engineering practices and activities in software development process • gain a level of understanding of software process models and agile development process • develop selection criteria for software development process driven by the characteristics of the software application and the project setting, such as <ul style="list-style-type: none"> ○ the nature of the application/solution ○ the complexity and uncertainty of application/solution ○ release cycle and lead time ○ team level of expertise and experience ○ team size and structure 	<p>PA1 LL1 CS1</p>

<p>3. Project management principles</p> <p><u>At the end of this section, students will be able to</u></p> <ul style="list-style-type: none"> • identify the core elements/parameters of project structure • identify the core activities and principles of project management • gain a level of understanding of project management lifecycle and core activities including: <ul style="list-style-type: none"> ○ business case/scope ○ planning ○ launching ○ monitoring and control ○ closing-out • assess and apply project management models (such as linear, incremental, iterative, adaptive, extreme) and best practices to define the project management structure and activities that best fit the selection criteria 	<p>PA1 LL1 CS1 EMP1</p>
<p>4. Software modeling</p> <p><u>At the end of this section, students will be able to:</u></p> <ul style="list-style-type: none"> • gain a level of understanding of the main software requirements and design concepts • gain a level of understanding of the main architectural design • gain a level of understanding of the main process in modeling such as effort and duration, and project metrics. 	<p>PA1 ET1 EPM2</p>
<p>5. Software quality management</p> <p><u>At the end of this section, students will be able to:</u></p> <ul style="list-style-type: none"> • gain a level of understanding of the quality concepts • how to review and testing software • understanding general traits of good code and SOLID principles • Common design patterns in clean code strategy 	<p>EPM1 EPM3 LL1 LL2</p>
<p>6. Software project monitoring and control</p> <p><u>At the end of this section, students will be able to:</u></p> <ul style="list-style-type: none"> • gain a level of understanding of principles of software project monitoring and control. • Familiar with what is Git • Proficient in basic operations of GitHub • Gain a level of understanding on defensive programming • Familiar of how to publish a python package and version control 	<p>EPM2 EPM4 ET1 CS2 LL1 LL2</p>
<p>7. Introduction to Software Quality</p> <p><u>At the end of this section, students will be able to</u></p> <ul style="list-style-type: none"> • Identify and develop quality framework and model utilizing industrial best practice samples in terms of quality factors, criteria and objectives as applied to software systems • Gain a level of understanding of using decorators to improve code • Gain a level of understanding on unit testing and refactoring • Familiar with GitHub workflow 	<p>ET1 PA1 CS2 CS3 EPM4 LL2</p>

<p>8. Risk management and people management</p> <p><u>At the end of this section, students will be able to:</u></p> <ul style="list-style-type: none"> • gain a level of understanding of principles, lifecycle, and approaches of the “positive attitude” of risk management • gain a level of understanding and apply risk assessment and control for the execution of the project plan • gain a level of understanding of the importance of people’s role in a software project • gain a level of understanding of different role/access in GitHub repository/project 	LL2 PA1 ET1 CS3 EPM3
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Evaluation:

Course Component	Weight
Written Assignments	30%
Midterm Exam	15%
Final Exam	55%

To obtain a passing grade in the course, a mark of 50% or more must be achieved on the final examination as well as on the midterm. A final examination or midterm mark < 50% will result in a final course grade of 48% or less.

Homework Assignments: There will be 3 assignments. Homework assignments have different weights. Homework assignments may be programming-based. All assignments should be submitted as soft copies to the course website at OWL. Hard copies are not required. All assignments will be checked for plagiarism.

STATEMENT ON GENDER-BASED AND SEXUAL VIOLENCE

Western [is committed to reducing incidents of gender-based and sexual violence](#) and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced gender-based or sexual violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts, [here](#). To connect with a case manager or set up an appointment, please contact support@uwo.ca.

INSTRUCTIONS FOR STUDENTS UNABLE TO WRITE TESTS OR EXAMINATIONS OR SUBMIT ASSIGNMENTS AS SCHEDULED

If, on medical or compassionate grounds, you are unable to write term tests or final examinations or complete course work by the due date, you should follow the instructions listed below. You should understand that academic relief will not be granted automatically on request. You must demonstrate to your department (or the Undergraduate Services Office) that there are compelling medical or compassionate grounds that can be documented before academic relief will be considered. Different regulations apply to term tests, final examinations and late assignments. Please read the instructions carefully.

A. GENERAL REGULATIONS & PROCEDURES

1. All first-year students will report to the Undergraduate Services Office by submitting the [Academic Consideration Request Form](#), for all instances.
2. If you are an upper year student and you are missing a test/assignment/lab or examination you will report the absence by submitting [Academic Consideration Request Form](#). Absences worth LESS THAN 10% of your mark, will be processed by your department office. If your course work is worth 10% OR MORE of your final grade, your request will be processed by the Undergraduate Services Office.

3. Check the course outline to see if the instructor has a policy for missed tests, examinations, late assignments or attendance.
4. Documentation must be provided as soon as possible. If no one is available in your department office or the Undergraduate Services Office, leave a message clearly stating your name & student number and reason for your call. The department telephone numbers are given at the end of these instructions.
5. If you decide to write a test or an examination you should be prepared to accept the mark you earn. Rewriting tests or examinations or having the value of a test or examination reweighted on a retroactive basis is not permitted.

B. TERM/MIDTERM TESTS

1. If you are in first year and you are unable to write a midterm/term test, contact the Undergraduate Services Office, SEB 2097 PRIOR to the scheduled date of the test.
2. If you are an upper year student and you are unable to write a midterm/term test, inform your instructor PRIOR to the scheduled date of the test and request relief through the [Academic Consideration Request Form](#). If the instructor is not available, leave a message for him/her at the department office. If the test is worth LESS THAN 10% of your mark, your request for relief will be processed by your department office. If the test is worth MORE THAN 10% of your final grade your request for relief will be processed by the Undergraduate Services Office.
3. Be prepared to attach supporting documentation to the Department Chair and/or the Undergraduate Services Office through the online form (see next page for information on documentation).
4. Discuss with the instructor if and when the test can be rescheduled. The approval of the Chair or the Undergraduate Services Office is required when rescheduling midterm/term tests.

C. FINAL EXAMINATIONS

1. If you are unable to write a final examination, contact the Undergraduate Services Office PRIOR TO THE SCHEDULED EXAMINATION TIME to report your absence using the [Academic Consideration Request Form](#) and request permission to write a Special Final Examination. If no one is available in the Undergraduate Services Office, leave a message clearly stating your name & student number.
2. Be prepared to provide the Undergraduate Services Office with supporting documentation (see next page for information on documentation) the next day, or as soon as possible (in cases where students are hospitalized). The following circumstances are not considered grounds for missing a final examination or requesting special examinations: common cold, headache, sleeping in, misreading timetable and travel arrangements.
3. In order to receive permission to write a Special Examination, you must obtain the approval of the Chair of the Department **and** the Associate Dean and in order to apply you must submit an "[Application for a Special Exam](#)" form. The Undergraduate Services Office will then notify the course instructor(s) and reschedule the examination on your behalf.

PLEASE NOTE: It is the student's responsibility to check the date, time and location of the Special Examination.

D. LATE ASSIGNMENTS

1. Advise the instructor if you are having problems completing the assignment on time (**prior** to the due date of the assignment).
2. Be prepared to submit the [Academic Consideration Request Form](#) and provide documentation if requested by the instructor (see reverse side for information on documentation).
3. If you are granted an extension, establish a due date. The approval of the Chair of your Department (or the Assistant Dean, First Year Studies, if you are in first year) is not required if assignments will be completed prior to the last day of classes.
4. i) Extensions beyond the end of classes must have the consent of the instructor, the department Chair and the

Associate Dean, Undergraduate Studies. Documentation is mandatory.

- ii) A Recommendation of Incomplete Form must be filled out indicating the work to be completed and the date by which it is due. This form must be signed by the student, the instructor, the department Chair and the Associate Dean, Undergraduate Studies.

E. **SHORT ABSENCES**

If you miss a class due to a minor illness or other problem, check your course outlines for information regarding attendance requirements and make sure you are not missing a test, laboratory or assignment. Cover any readings and arrange to borrow notes from a classmate.

F. **EXTENDED ABSENCES**

If you are absent more than one week or if you get too far behind to catch up, you should consider reducing your workload by dropping one or more courses. (Note drop deadlines listed below). You are strongly encouraged to seek advice from your Academic Counsellor in the Undergraduate Services Office.

G. **DOCUMENTATION**

If you consulted an off-campus doctor or Student Health Services regarding your illness or personal problem, **you must provide the doctor with a Student Medical Certificate** to complete at the time of your visit and then bring it to the Department (or the Undergraduate Services Office). **This note must contain the following information: severity of illness, effect on academic studies and duration of absence. Regular doctor's notes will not be accepted; only the Student Medical Certificate will be accepted.**

In Case of Serious Illness of a Family Member: Provide a Student Medical Certificate to your family member's physician to complete and bring it to the Department (or the Undergraduate Services Office if you are in first year).

In Case of a Death: Obtain a copy of the death certificate or the notice provided by the funeral director's office. You must include your relationship to the deceased and bring it to the Department (or the Undergraduate Services Office if you are in first year).

For Other Extenuating Circumstances: If you are not sure what documentation to provide, ask the Departmental Office (or the Undergraduate Services Office if you are in first year) for direction.

Note: Forged notes and certificates will be dealt with severely. To submit a forged document is a scholastic offence (see below).

H. **ACADEMIC CONCERNS**

1. You need to know if your instructors have a policy on late penalties, missed tests, etc. This information may be included on the course outlines. If not, ask your instructor(s).
2. You should also be aware of attendance requirements in some courses. You can be debarred from writing the final examination if your attendance is not satisfactory.
3. If you are in academic difficulty, check out the minimum requirements for progression in the calendar. If in doubt, see your Academic Counsellor.

Calendar References: Check these regulations in your 2023 Western Academic Calendar available at www.westerncalendar.uwo.ca.

Absences Due to Illness:

https://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_13

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_10

Academic Accommodations for Religious or Holy Days:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_16

Course Withdrawals:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=6&SelectedCalendar=Live&ArchiveID=#Page_75

Examinations:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?PolicyCategoryID=5&command=showCategory&SelectedCalendar=Live&ArchiveID=#Page_78

Scheduling of Term Assignments:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=5&SelectedCalendar=Live&ArchiveID=#SubHeading_78

Scholastic Offences:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_20

Student Medical Certificate:

<https://www.eng.uwo.ca/files/undergraduate/student-medical-certificate.pdf>

Engineering Academic Regulations:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=4&SelectedCalendar=Live&ArchiveID=#Page_86

Note: These instructions apply to all students registered in the Faculty of Engineering regardless of whether the courses are offered by the Faculty of Engineering or other faculties in the University.

Add Deadlines:

First term half course (i.e. “A” or “F”)	September 15, 2023
Full courses and full-year half course (i.e. “E”, “Y” or no suffix)	September 15, 2023
Second term half course (i.e. “B” or “G”)	January 16, 2024

Drop Deadlines:

First term half course without penalty (i.e. “A” or “F”)	November 13, 2023
Full courses and full-year half courses without penalty (i.e. “E”, “Y” or no suffix)	November 30, 2023
Second term half or second term full course without penalty (i.e. “B” or “G”)	March 7, 2024

Contact Information:

Undergraduate Services Office:	SEB 2097 Phone: 519-661-2130	E-mail: engugrad@uwo.ca
Chemical & Green Process Engineering:	TEB 477 Phone: 519-661-2131	E-mail: cbeugrad@uwo.ca
Civil Engineering:	SEB 3005 Phone: 519-661-2139	E-mail: civil@uwo.ca
Computer, Electrical, Mechatronic Systems & Software Engineering	TEB 279 Phone: 519-661-3758	E-mail: eceugrad@uwo.ca
Integrated Engineering	ACEB 2410 Phone: 519-661-6725	E-mail: engceli@uwo.ca
Mechanical Engineering:	SEB 3002 Phone: 519-661-4122	E-mail: mmeundergraduate@uwo.ca