APPLIED COMPUTER SCIENCE

Course Number: ACS-2913-050
Course Name: Software Requirements Analysis and design
Course Webpage: https://nexus.uwinnipeg.ca

Instructor Information

Instructor: David Tenjo
E-mail: d.tenjo@uwinnipeg.ca
Office Hours: Thursdays 12:00noon-1:00PM via Zoom

Class meeting time: Thursdays   18:00- 21:00   via Zoom

Meeting info for office hours, class time and lab sessions will be posted on Nexus.

Important Dates

1. First Class: Tuesday, September 7, 2021
2. Reading Week (no classes):   October 10-16
3. Midterm Test: Thursday, October 21, 2021
4. Final Withdrawal Date w/o academic penalty*:   Tuesday, November 16, 2021
5. Last Class: Wednesday, December 8, 2021
6. Final Exam: TBD
7. University closures: Truth and Reconciliation Day   Thursday, September 30, 2021
                          Thanksgiving Day   Monday, October 11, 2021
                          Remembrance Day   Thursday, November 11, 2021

*A minimum of 20% of the work on which the final grade is based will be evaluated and available to the student before the voluntary withdrawal date.

Course Objectives / Learning Outcomes

Objectives:
This course is intended to introduce students to the requirements definition and design specification phases of software development. It aims to provide coverage of object-oriented approaches. Models, notations and processes for requirements elicitation, representation, and design are treated in depth.

The specific objectives of this course are:
- To convey a thorough understanding of the requirements definition phase of software development
- To instill in students an appreciation of the object-oriented approach to requirements analysis and design, and its current documentation tools.
- To provide a solid foundation for the application of techniques used in software requirements *gathering, modelling and design*

Outcomes:
- To understand the different phases of a typical project using SDLC under an Agile approach
- To be able to apply specific techniques to gather software requirements
- To be able to create use case diagrams / descriptions and activity diagrams used in modelling software requirements
- To be able to create class diagrams
- To be able to create sequence diagrams
- To understand communication (Collaboration) diagrams
- To understand basic Object-oriented concepts and terminology
- To be able to model class packages

Remote Learning

All course material including lecture notes, slides and videos, sample code, assignment and lab details will be available on Nexus. Class times are reserved for further discussion and Q&A, with the remaining time for office hours.

Students must be available via Zoom during the lecture and lab times.
- Students must display their real/full name
- Use of video is optional
- Participants must be muted when not speaking
- Students may interact via chat, voice or gestures

Students can find answers to frequently asked questions related to remote learning here: https://www.uwinnipeg.ca/covid-19/remote-learning-faq.html.

Note: A permitted or necessary change in mode of delivery may require adjustments to important aspects of course outlines, like class schedule and the number, nature, and weighting of assignments and/or exams.

Evaluation Criteria

1. **Assignments (18%)**
   - Assignment 1 due Thursday, October 7, 2021

- Assignment 2 due Thursday, November 4, 2021
- Assignment 3 due Thursday, November 18, 2021
- Assignment 4 due Wednesday, December 8, 2021

Assignments Submission:

➢ All assignments are due 11:59pm on the due date and are to be submitted electronically via Nexus.

➢ **As a rule, you WILL NOT be able to submit your assignments LATE on Nexus unless you have received an approval to do so before the due date due to documented extenuating circumstances**, such as a medical situation, that prevented the timely completion of the work.

➢ Assignments MUST be submitted in PDF format. Further details and submission procedure will be posted on Nexus.

2. Online Participation/Group Discussion (12%):
- Students will be expected to read the Lesson notes ahead of the class
- During class, students will be randomly distributed into groups
- The Instructor will provide a relevant topic or guiding questions for students to discuss relating to the lesson of the day.
- Students will discuss the topic/question in their groups for about 10 minutes
- Students will be given about 5 minutes to write down their reflections/thoughts based on the discussion in the group discussion forum on Nexus. Students can also comment on other students' submissions.
- Each group will appoint a representative to summarize each group findings
- The Instructor will summarize the topic, clarify misconceptions and answer any resulting question.
- Students will receive maximum of 2 marks each week based on their participation in the online activities.

3. **Midterm Test** (**30%**) – *Thursday, October 21, 2021*
- Missed exam will receive a mark of zero, unless a medical certificate is provided, no accommodation is made for missed exams.

4. **Final Exam (40%) -** Date: *TBD*

Keep a copy of all class work handed back in case there is an error in recording of marks by the instructor.

Students should contact the instructor as soon as possible if extenuating circumstances require missing a lab, assignment, test or examination. A medical certificate from a practicing physician may be required before any adjustments are considered.

Test / Exam Requirements

- Photo ID is required for midterm tests and the final exam.
- Midterm and final exams will be delivered via Nexus and proctored via Zoom. Students must have video capability, and video must be turned on for the duration of the exam for proctoring.

- Midterm and final exams are open book.
  - Students are permitted to view only the following authorized course material:
    - Class notes, slides, recordings, sample code, assignment descriptions and solutions posted by the instructor
    - Course textbook
    - Student's own course notes and assignment submissions
  - Students may use an external tool such as a text editor or IDE to write answers to questions before entering them into the exam
  - Students may contact the instructor to ask questions
  - External resources (or any material not listed above) are NOT PERMITTED
  - Communication with others (except the instructor) is NOT PERMITTED
  - All work must be entirely the students' own. Collaboration or sharing of work is NOT PERMITTED.

Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., note-takers) are   encouraged to contact Accessibility Services (AS) at 204-786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential.
https://www.uwinnipeg.ca/accessibility-services.

Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide opportunity for students to make up work examinations without penalty. A list of religious holidays can be found in the 2019-20 Undergraduate Academic Calendar online at http://uwinnipeg.ca/academics/calendar/docs/important-notes.pdf

Final Letter Grade Assignment

Historically, numerical percentages have been converted to letter grades using the following scale. However, instructors can deviate from these values based on pedagogical nuances of a particular class, and final grades are subject to approval by the Department Review Committee.

A+	90 – 100%	B+	75 – 79%	C	60 – 64%
A	85 – 89 %	B	70 – 74%	D	50 – 59%
A-	80 – 84%	C+	65 – 69%	F	below 50%

Required Textbook / Reading List

- Textbook: Systems Analysis and Design in a Changing World, (7th Edition). John Satzinger, Robert Jackson, Stephen Burd - Cengage Learning ISBN 978-1-305-11720-4
- Complementary Readings might be posted on Nexus.
- Class Notes will be available on Nexus

Prerequisite Information

- ACS-1903 or ACS-1905 with a minimum grade of C
- Students cannot hold credit in ACS-2913(3) and ACS-2911(3) and/or ACS-2912(3).

Regulations, Policies, and Academic Integrity

Academic dishonesty is a very serious offense and will be dealt in accordance with the University's policies.

Avoiding Academic Misconduct: Students are encouraged to familiarize themselves with the Academic Regulations and Policies found in the University Academic Calendar at:
https://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf
Particular attention should be given to subsections 8 (Student Discipline), 9 (Senate Appeals) and 10 (Grade Appeals). Please note, in particular, the subsection of Student Discipline pertaining to plagiarism and other forms of cheating.

Detailed information can be found at the following:

- Academic Misconduct Policy and Procedures: https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-policy.pdf and https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf
- UW Library video tutorial "Avoiding Plagiarism" https://www.youtube.com/watch?v=UvFdxRU9a8g

Uploading essays and other assignments to essay vendor or trader sites (filesharing sites that are known providers of essays for use by others who submit them to instructors as their own work) involves "aiding and abetting" plagiarism. Students who do this can be charged with Academic Misconduct.

Non-academic misconduct. Students are expected to conduct themselves in a respectful manner on campus and in the learning environment irrespective of platform being used. Behaviour, communication, or acts that are inconsistent with a number of UW policies could be considered "non-academic" misconduct. More detailed information can be found here:

- Respectful Working and Learning Environment Policy https://www.uwinnipeg.ca/respect/respect-policy.html,
- Acceptable Use of Information Technology Policy https://www.uwinnipeg.ca/institutional-analysis/docs/policies/acceptable-use-of-information-technology-policy.pdf
- Non-Academic Misconduct Policy and Procedures: https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-policy.pdf and https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-procedures.pdf.

Copyright and Intellectual Property. Course materials are the property of the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides—irrespective of format. Students who upload these materials to filesharing sites, or in any other way share these materials with others outside the class without prior permission of the instructor/presenter, are in violation of copyright law and University policy. Students must also seek prior permission of the instructor/presenter before, for example, photographing, recording, or taking screenshots of slides, presentations, lectures, and notes on the board. Students found to be in violation of an instructor's intellectual property rights could face serious consequences pursuant to the Academic Misconduct or Non-Academic Misconduct Policy; such consequences could possibly involve legal sanction under the Copyright Policy
https://copyright.uwinnipeg.ca/docs/copyright_policy_2017.pdf

Privacy

Students have rights in relation of the collecting of personal data the University of Winnipeg: https://www.uwinnipeg.ca/privacy/admissions-privacy-notice.html.

More information:

- Zoom and Privacy: https://www.uwinnipeg.ca/privacy/zoom-privacy-notice.html
- Testing/Proctoring: https://www.uwinnipeg.ca/privacy/zoom-test-and-exam-proctoring.html.

Class Cancellation, Correspondence with Students and Withdrawing from Course

When it is necessary to cancel a class due to exceptional circumstances, the course instructor will make every effort to inform students via uwinnipeg email and Nexus.

Students are reminded that they have a responsibility to regularly check their uwinnipeg e-mail addresses to ensure timely receipt of correspondence from the University and/or the course instructor*.*

Please let course instructor know if you plan on withdrawing from the course. Note that withdrawing before the VW date does not necessarily result in a fee refund.

Topics to be covered (tentative)

1. **Overview of Systems Analysis and Design**
   a. Systems Development Lifecycle
   b. Iterative Development
   c. Core process of systems development

2. **System Requirements**
   a. Definition
   b. Models and Modelling
   c. Information gathering techniques
   d. Workflows and activity diagrams

3. **Use Case Analysis**
   a. Use Cases and user Goals
   b. Event Decomposition
   c. CRUD Technique

4. **Domain Modelling**
   a. Entity-Relationship Diagrams
   b. Domain-Model Class diagram

5. **Extended Requirements Modelling**
   a. System Sequence Diagram
   b. State Machine Diagram
   c. Integrating Requirements Models

6. **Object-Oriented design and Principles**
   a. Object-Oriented Architectural Design
   b. Principles of Object-oriented design
   c. Design classes
   d. Class diagrams
   e. CRC Cards

7. **Advanced OO Concepts**
   a. Three Layer Design
   b. Design Patterns
   c. Sequence Diagrams
   d. Communication Diagrams
   e. Packages

Note that all topics listed may not be covered and may be offered in a slightly different time order.