

# Course Outline

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School:	Eng. Tech. & Applied Science
Department:	Information and Communication Engineering Technology (ICET)
Course Title:	Software Engrg Methodologies I
Course Code:	COMP 225
Course Hours/Credits:	56
Prerequisites:	COMP 100
Co-requisites:	N/A
Eligible for Prior Learning, Assessment and Recognition:	Yes
Originated by:	Mohamed Khan
Creation Date:	Fall 2003
Revised by:	Mohamed Khan
Revision Date:	Summer 2014
Current Semester:	Winter 2016
Approved by:	<i>p pesikan</i> <i>l c/o</i>

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Chairperson/Dean

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*Students are expected to review and understand all areas of the course outline.*

*Retain this course outline for future transfer credit applications. A fee may be charged for additional copies.*

*This course outline is available in alternative formats upon request.*

## Course Description

Students will be introduced to Software Development methodologies (processes), requirement analysis and design model. UML standards (Activity diagrams and use cases and classes) are implemented in all models. Information systems context and examples are drawn from real life cases in business, health and games. The course also introduces the three-tier software architecture – Presentation tier(View), Logic tier (mainly domain classes) and the data tier(ERD). Introductory concepts of Project Management are also covered.

## Program Outcomes

Successful completion of this and other courses in the program culminates in the achievement of the Vocational Learning Outcomes (program outcomes) set by the Ministry of Training, Colleges and Universities in the Program Standard. The VLOs express the learning a student must reliably demonstrate before graduation. To ensure a meaningful learning experience and to better understand how this course and program prepare graduates for success, students are encouraged to review the Program Standard by visiting <http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/>. For apprenticeship-based programs, visit <http://www.collegeoftrades.ca/training-standards>.

## Course Learning Outcomes

The student will reliably demonstrate the ability to:

1. Explain how business organizations are structured and the information needs of various levels of management.
2. Describe different types of information systems in the context of business, health and Interactive games.
3. Apply analytical and problem solving skills to identify opportunities and problems, and to model and document users' and software & business requirements.
4. Chart a project Plan Chart for software development phases and related activities.
5. Discuss in brief the different methodologies for software development e.g Unified Process, Agile & SCRUM.
6. Implement a Process methodology and UML standards ( activity diagrams, use case diagrams, class diagrams and ERD data schema model) in all software models and diagrams.
7. Construct business/context & use case models to document system requirements.
8. Discuss the fundamentals of objects, classes and data in the context of software systems

## Essential Employability Skills (EES)

The student will reliably demonstrate the ability to\*:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
4. Apply a systematic approach to solve problems.
5. Use a variety of thinking skills to anticipate and solve problems.
6. Locate, select, organize, and document information using appropriate technology and information systems.
7. Analyze, evaluate, and apply relevant information from a variety of sources.
8. Show respect for diverse opinions, values belief systems, and contributions of others.

9. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
10. Manage the use of time and other resources to complete projects.
11. Take responsibility for one's own actions, decisions, and consequences.

\*There are 11 Essential Employability Skills outcomes as per the Ministry Program Standard. Of these 11 outcomes, the following will be assessed in this course.

## Global Citizenship and Equity (GC&E) Outcomes

The student will reliably demonstrate the ability to\*:

1. Identify one's roles and responsibilities as a global citizen in personal and professional life.
2. Identify beliefs, values and behaviours that form individual and community identities and the basis for respectful relationships.

\*There are 6 institutional Global Citizenship & Equity outcomes. Of these 6 outcomes, the following will be assessed in this course.

## Methods of Instruction

Lecture & Lab

## Text and other Instructional/Learning Materials

### Text Book(s):

Satzinger, J., Jackson, R. & Burd, S. 2012. Systems Analysis and Design In a Changing World, Sixth Edition.

ISBN-13: 978-1-111-534158

### Online Resource(s):

Various authentic sites e.g IBM, Oracle, Visual\_Paradigm

### Material(s) required for completing this course:

Required Text

## Evaluation Scheme

- ◇ Quizzes: 4 Quizzes over the duration of the semester - 5 marks
- ◇ Test # 1: First Term Test - 25%
- ◇ Final Test: Th Final Test is worth 25%
- ◇ 3-PART Term Project: PARTS A, B & C each worth 10 marks each

Evaluation Name	CLO(s)	EES Outcome(s)	GCE Outcome(s)	Weight/100
Quizzes	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 4, 5, 6, 7, 8, 9, 10, 11	1, 2	20
Test # 1	1, 2, 3, 4, 8	1, 2, 4, 5, 6, 7, 8, 9, 10, 11		25
Final Test	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 4, 5, 6, 7, 8, 9, 10, 11		25
3-PART Term Project	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 4, 5, 6	1, 2	30
<b>Total</b>				<b>100%</b>

If students are unable to write a test they should immediately contact their professor or program Chair for advice. In exceptional and well documented circumstances (e.g. unforeseen family problems, serious

illness, or death of a close family member), students may be able to write a make-up test.

All submitted work may be reviewed for authenticity and originality utilizing Turnitin®. Students who do not wish to have their work submitted to Turnitin® must, by the end of the second week of class, communicate this in writing to the instructor and make mutually agreeable alternate arrangements.

When writing tests, students must be able to produce official College photo identification or they may be refused the right to take the test or test results will be void.

## Student Accommodation

It is College Policy to provide accommodation based on grounds defined in the Ontario Human Rights Code. Accommodation may include modifications to standard practices. Students with disabilities who require academic accommodations must register with the Centre for Students with Disabilities. Students requiring accommodation based on other human rights grounds should talk with their professors as early as possible. Please see the Student Accommodation Policy.

## Use of Dictionaries

- Any dictionary (hard copy or electronic) may be used in regular class work.

## Program or School Policies

N/A

## Course Policies

N/A

## College Policies

Students should familiarize themselves with all College Policies that cover academic matters and student conduct.

All students and employees have the right to study and work in an environment that is free from discrimination and harassment and promotes respect and equity. Centennial policies ensure all incidents of harassment, discrimination, bullying and violence will be addressed and responded to accordingly.

Academic honesty is integral to the learning process and a necessary ingredient of academic integrity. Academic dishonesty includes cheating, plagiarism, and impersonation. All of these occur when the work of others is presented by a student as their own and/or without citing sources of information. Breaches of academic honesty may result in a failing grade on the assignment/course, suspension or expulsion from the college.

For more information on these and other policies, please visit [www.centennialcollege.ca/about-centennial/college-overview/college-policies](http://www.centennialcollege.ca/about-centennial/college-overview/college-policies).

Students enrolled in a joint or collaborative program are subject to the partner institution's academic

policies.

## PLAR Process

This course is eligible for Prior Learning Assessment and Recognition (PLAR). PLAR is a process by which course credit may be granted for past learning acquired through work or other life experiences. The PLAR process involves completing an assessment (portfolio, test, assignment, etc.) that reliably demonstrates achievement of the course learning outcomes. Contact the academic school to obtain information on the PLAR process and the required assessment.

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Semester:	Winter 2016	Professor Name:	Bob Pajkowski & Viji Tiruchengode
Section Code:	001 - 016	Contact Information:	bpajkows@my.centennialcollege.ca vtiruche@my.centennialcollege.ca
Meeting Time & Location:	As per published schedule	Office Hours:	TBA
Last Date to Drop Course:	TBA	Delivery Method:	TBA

Topical Outline (subject to change):

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
1	PART I: INTRODUCTION TO SYSTEM DEVELOPMENT • Software Development and Systems Analysis and Design • Role of Systems Analyst • Required skills of the systems analyst: Analytical, Technical, Management, Interpersonal, and Communication skills • Systems Development Life Cycle. • Iterative and Agile System Development • Types of Computer based Information Systems.	Required Text: Appendix A	<ul style="list-style-type: none"> <li>• Describe the purpose of systems analysis and design in the development of information systems.</li> <li>• Define the terms Systems analysis, Systems Design and Information System Analyst.</li> <li>• Describe the skills required of a systems analyst.</li> <li>• Describe the characteristics of iterative systems development.</li> <li>• Explain Systems Development Life Cycle.</li> <li>• Identify key documents that are used in planning a project.</li> <li>• Identify key diagrams used in systems analysis and systems design.</li> <li>• Explain the utility of identifying use cases in systems development.</li> <li>• Explain the utility of identifying object classes in systems development.</li> <li>• Define and describe various types of systems, including: TPS, MIS, DSS, ERP, and Productivity Systems.</li> </ul>	Lecture & Lab	N/A	N/A
2	PART I: INTRODUCTION TO SYSTEM DEVELOPMENT • Introduction to Project: Ridgeline	Required Text Chapter 1	<ul style="list-style-type: none"> <li>• Identify different activities in new projects.</li> <li>• Describe different documents required in systems analysis and design.</li> <li>• Recognize the different phases of SDLC.</li> <li>• Describe the activities in each phase of the SDLC (problem definition, requirements</li> </ul>	Lecture & Lab	Quiz # 1 worth 5 marks	Week 2

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
	Project: Ridgeline Mountain Outfitters <ul style="list-style-type: none"> <li>• Develop RMO's Tradeshow System</li> <li>• Phases of (SDLC) Planning, Analysis, Design, Implementation, Support and Maintenance.</li> <li>• Strategic Planning – S.W.O.T. (Strengths, Weaknesses, Opportunities, and Threats)</li> </ul>		SDLC (problem definition, requirements analysis, design, development, testing, implementation, modification, and maintenance). <ul style="list-style-type: none"> <li>• Case Analysis -System vision document for RMO.</li> <li>• Develop Work breakdown Structure</li> <li>• Explain Work sequence draft</li> <li>• Describe Use cases, use case diagram, object classes(domain classes) class diagram</li> <li>• Design class diagram</li> <li>• Design high level structural design (architectural design)</li> <li>• Draft Database schema and Screen layout.</li> <li>• Explain S.W.O.T.</li> </ul>			
3	PART II: Systems Analysis and Activities <ul style="list-style-type: none"> <li>• Technology Architecture and Application Architecture</li> <li>• System Analysis Activities</li> <li>• System Requirements; Functional and Non Functional Requirements</li> <li>• FURPS framework</li> <li>• Models and Modelling imperative to system analysis and design.</li> <li>• System Development Tools and Techniques.</li> <li>• Introduction to UML- Unified Modeling Language</li> </ul>	Required Text Chapter 2	<ul style="list-style-type: none"> <li>• Describe the proposed Consolidated Sales and Marketing System to update and enhance RMO sales and marketing.</li> <li>• Describe the analysis activities: Gather detailed information, Define requirements, Prioritize requirements, Develop user-interface dialogs and Evaluate requirements with users.</li> <li>• Describe information gathering and defining system requirements</li> <li>• Describe analysis in 2 Categories, functional and non functional.</li> <li>• Describe FURPS requirements framework; Functionality, Usability, Reliability, Performance and Security.</li> <li>• Define Modeling, Prototyping and Computer-Aided Systems Engineering (Case) Tools.</li> <li>• Recognize rationale of modeling.</li> <li>• Describe different Modeling techniques.</li> <li>• Describe UML graphical models; use case diagram, class diagram, sequence diagram, communication diagram and state machine diagram</li> </ul>	Lecture & Lab	N/A	N/A
4	PART II: Systems Analysis and Activities	Required Text Chapter 2	<ul style="list-style-type: none"> <li>• Define the primary source of information for system requirements.</li> <li>• Recognize different Business and operation</li> </ul>	Lecture & Lab	Quiz # 2 worth 5 marks	Week 4

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
	<ul style="list-style-type: none"> <li>• Stakeholders / System Users and their needs.</li> <li>• Information Gathering Techniques</li> <li>• Interview Users and Other Stakeholders</li> <li>• Questionnaires</li> <li>• Review Inputs, Outputs, and Procedures</li> <li>• Observe and Document Business Processes</li> <li>• Research Vendor Solutions</li> <li>• Collect Active User Comments and Suggestions.</li> <li>• Document Workflows with Activity Diagrams</li> </ul>		<ul style="list-style-type: none"> <li>requirements.</li> <li>• Describe Internal and external stakeholder requirement.</li> <li>• Describe the different information gathering techniques and determine when each is best applied</li> <li>• Define the Question Themes and types of questions; Open-ended questions and Closed- ended questions</li> <li>• Describe the preparation required to have a successful interview.</li> <li>• Define checklist in conducting an Interview</li> <li>• Define requirements through questionnaires</li> <li>• Recognize requirements from an existing procedures.</li> <li>• Define requirement by Observation</li> <li>• Gather requirements from research Vendor Solutions.</li> <li>• Define requirements from User feedback, comments and suggestions.</li> <li>• Describe workflow from the gathered requirements.</li> <li>• Define Activity Diagram Symbols</li> <li>• Develop activity diagram to model workflow with concurrent paths</li> </ul>			
5	PART II: Systems Analysis and Activities Workflows and Activity Diagrams <ul style="list-style-type: none"> <li>• Use Cases and User Goals</li> <li>• Use Cases and Event Decomposition</li> </ul>	Required Text Chapter 3	<ul style="list-style-type: none"> <li>• Explain why identifying use cases is the key to defining functional requirements</li> <li>• Describe the two techniques for identifying use cases.</li> <li>• Apply te user goal technique to identify use cases</li> </ul>	Lecture & Lab	Part A Term Assignment Worth 10 marks	
6	PART II: Systems Analysis and Activities <ul style="list-style-type: none"> <li>• Use Cases and CRUD</li> <li>• Use Cases in the Ridgeline Mountain</li> </ul>	Required Text Chapter 3	<ul style="list-style-type: none"> <li>• Apply the event decomposition technique to identify use cases</li> <li>• Apply the CRUD technique to validate and refine the list of use cases.</li> <li>• Describe the notation and purpose for the use case diagram</li> <li>• Draw use case diagrams by actor and by subsystem</li> </ul>	Lecture & Lab	Part A - Term Assignment Review	Week 6



Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
	Outfitters Case • Use Case Diagram					
7	Review Test # 1 worth 25%	Chapters A, 1-3	N/A	Test # 1	Test # 1	Week 7
8	PART II: System Analysis and Activities Test # 1 & Part A Assignment feedback and review • “Things” in the Problem Domain	Required Text Chapter 4	• Explain how the concept of “things” in the problem domain also defines requirements.	Lab & Lecture	Quiz # 3 worth 5 marks	
9	PART II: System Analysis and Activities  • The Entity-Relationship Diagram • The Domain Model Class Diagram	Required Text Chapter 4	• Identify and analyze data entities and domain classes needed in the system • Read, Interpret, and create an entity-relationship diagram • Read, interpret, and create a domain model class diagram • Describe the domain model class diagram for the RMO Consolidated Sales and Marketing System	Lecture & Lab	Quiz # 3 worth 5 marks	Week 9
10	Part II System Analysis and Activities  • Use Case Description • The System Sequence Diagram- Identifying Inputs and Outputs	Required Text Chapter 5	• Write fully developed use case descriptions • Develop activity diagrams to model flow of activities • Develop system sequence diagrams	Lab & Lecture	Part B Term Assignment worth 10 marks	
11	Part II System Analysis and Activities  • The State Machine Diagram- Identifying object Behavior • Integrating Requirements Models	Required Text Chapter 5	• Develop state machine diagrams to model object behavior. • Explain how use case descriptions and UML diagrams work together to define functional requirements	Lecture & lab	Part B - Term Assignment worth Review	Week 11

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
12	PART II: Systems Analysis And Activities <ul style="list-style-type: none"> <li>• The Systems Development Life Cycle</li> <li>• The Support Phase</li> <li>• Methodologies, Models, Tools and Techniques</li> <li>• Two Approaches to Software Construction and Modeling</li> <li>• Agile Development</li> </ul>	Required Text Chapter 8 Appendix B	<ul style="list-style-type: none"> <li>• Compare the underlying assumptions and uses of a predictive and an adaptive system development life cycle (SDLC)</li> <li>• Describe the key activities and tasks of information system support</li> <li>• Explain what comprises a system development methodology- the SDLC as well as models, tools and techniques.</li> <li>• Describe the two overall approaches used for software construction and modeling; the structured approach and the object-oriented approach.</li> <li>• Describe the key features of Agile development.</li> </ul>	Lecture & Lab	Quiz 4 Worth 10 marks	Week 12
13	PART C Term Project - Oral Presentation	Term Project Presentation material	Orally Present PART C of Term Project	In-class group presentation	PART C - Term Project	Week 13
14	Final Test # 2 Comprehensive Written PART C Term Project	Chapters Appendices A & B , 1, 2, 3, 4 5,8	N/A	Test # 2	Final Test worth 25 marks & Final PART C of Term Project in Written form	Week 14