Course Outline

School:	Eng. Tech. & Applied Science
Department:	Information and Communication Engineering Technology (ICET)
Course Title:	Object Oriented Software Engineering
Course Code:	COMP 246
Course Hours/Credits:	56
Prerequisites:	COMP 123, COMP 225, IS 225
Co-requisites:	N/A
Eligible for Prior Learning, Assessment and Recognition:	Yes
Originated by:	Mohamed Khan
Creation Date:	Fall 2005
Revised by:	Mohamed Khan
Revision Date:	Summer 2015
Current Semester:	Fall 2015
Approved by:	*ppesikan c/o*

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Chairperson/Dean

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

This project-based course emphasizes design specifications which builds on COMP 225 Software Engineering Methodologies I. Students enhance their problem solving skills required of a Technical Systems Analyst through the analysis and design drawn from business, health and gaming domains. Best practices are illustrated in software development with iterative and incremental approaches with UML Workflows & Use Cases and design architecture with classes, sequence and state diagrams. The process methodology is adopted from Agile Modelling/SCRUM and Unified Process approaches. The essential requirements over the phases include: A requirements model/business model, use case model/users stories, business logic model, data models along with component and deployment diagrams; all of which will constitute the software Systems design specifications. A Visual Modelling Case tool is used to follow a process and prepare diagrams. Students will also use a project management tool in managing the deliverables. An overview of Software Testing and Quality is covered in one lecture.

This course provides the necessary preparation for software development projects in subsequent semesters and students are encouraged to align their projects with projects in other co-semester courses such as COMP 229 & 214.

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 the key role of a systems analyst and the importance of gathering the correct business and users' requirements.
2. Describe the OOAD paradigm – Agile Unified Modeling(AUP) and SCRUM approaches to Software Development
3. Employ the UML diagramming standards.
4. Develop Systems Project Plan using MS Project
5. Develop relevant systems analysis & design documentation for different phases of the project including workflows, use cases, class diagrams and database schema.
6. Demonstrate and document human interaction and user-centered interface design.
7. Manage and monitor project deliverables as per Term Schedule
8. Package and present coherently all documentation and deliverable pieces orally and in written form.
9. Work effectively as a team

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.
3. Execute mathematical operations accurately.
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.
4. Analyze the use of the world's resources to achieve sustainability and equitable distribution at the personal, professional, and global level.

*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, Seventh

Edition.

ISBN-13:9781305117204

Online Resource(s):

IBM & Oracle White Papers and other illustrative material from a CaseTool such as Visual Paradigm.

Visual Paradigm CaseTool – Current version – free download Community version

With Tutorials

Material(s) required for completing this course:

- See Textbook & www.visual-paradigm.com

Classroom and Equipment Requirements
lab plus Projector

Evaluation Scheme
- ⇨ Term Project: 3-Part Project -each worth 10 marks
- ⇨ Quizzes: 4 quizzes over the duration of the semester -5 marks each
- ⇨ Test # 1: Mid-Term Test - 25%
- ⇨ Final Test: Test # 2 - 25%

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

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.

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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Topical Outline (subject to change):

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
1	PART II Systems Analysis & Activities Review User stories & Use Cases and User Goals Use Cases and Event Decomposition	Required Text Chapter 3 - Identifying Users' Stories and Use Case	Describe the systems domain model and workflows Explain why identifying user stories & use cases is the key to defining functional requirements Describe the two techniques for identifying use cases & Users' Stories. Apply te user goal technique to identify user stories &use cases Apply the event decomposition technique to identify users stories & use cases Draw Use Case Diagrams by actors and subsystems Apply concepts to Ridgeline Mountain case study	Lecture & Lab	N/A	
2	PART II Domain Modeling Things in a Problem Domain Entity Relationship Diagram Domain Model Class Diagram The State Machine Project Planning and Project Development Iterative and Incremental approaches to Software Development (Agile, UP, SCRUM etc)	Required Text - Chapter 4 & 11- Domain modelling & Project Planning.	Explain how the concept of "things" in the problem domain also define requirements 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 Understand the domain model class diagram for the RMO Consolidated Sales and Marketing System Apply concepts to Ridgeline Mountain case study	Lecture & Lab	N/A	N/A
3	PART II Use Case Modeling: Use Case Descriptions Activity Diagrams for Use Cases	Required Text Chapter 5 - Use Case Modelling	Write fully developed use case descriptions Develop activity diagrams to model flow of activities Develop system sequence diagrams Develop state machine diagrams to model object behavior Explain how use case descriptions and UML	Lecture & Lab	Quiz # 1	Week 3

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
	Systems Sequence Diagram SSD notation Use Cases & CRUD Integrating Requirements Models		diagrams work together to define functional requirements Apply concepts to Ridgeline Mountain case study			
4	PART III : Essentials of Systems Design Essentials of design and the design discipline What is Systems Design Design Activities Systems Controls & Secuirity	Required Text Chapters 6 - Foundations of Design	Describe the difference between systems analysis and systems design List documents and models used as inputs to or output from systems Design Explain each major design activity Apply concepts to Ridgeline Mountain case study	Lecture & Lab	Term Project Part A (Use Cases)	Week 4
5	PART III Architectural Concepts and Diagrams Interoperability Describing the environment Designing Application Components	Required Text : Chapters 7 - Defining Systems Architecture	Describe a system's environment by drawing architectural diagrams Design larger application components Apply concepts to Ridgeline Mountain case study	Lecture & Lab	Quiz # 2	Week 5
6	PART III Designing the User Interface Principles of User-Interface design User-interface design Designing Reports, statements and turnaround documents	Required Text Chapter 8- Designing the User's Interface	Explain the concepts of User experience, user interface and usability Discuss the principles of navigation Describe guideslines for user-interface for desktop and mobile devices. Design printed and on-line reports based on users' needs Apply concepts to Ridgeline Mountain case study	Lab & Lecture	N/A	N/A
7	Review and Term Test # 1	Required Text: Chapters 3-8 & 11	Test # 1 worth 25%	Lab & Written Test	Test # 1	Week 7
8	PART IV: Review of Database Design Relational Databases Database Admin	Required Text: Chapter 9 - Designing the Database	Design a relational Database Schema based on the Class Diagram Describe different methods of configuring distributed databases	Lab & Lecture	N/A	N/A

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
	Distributed Database Architecture		Explain the importance of and methods for protecting the database. Explain the importance of database Administration			
9	PART IV : Advanced Design & Deployment Concepts - Object-oriented design use case realizations.	Required Text Chapter 12 - Object Oriented Design Fundamentals	Discuss the principles of modern OO design Develop design class diagrams Use CRC cards to define class responsibilities	Lab & Lecture	N/A	N/A
10-11	PART IV: OOD Use Case Realization Sequence Diagrams Packaging the Design Classes Design Patterns	Required Text : Chapter 13 -- OO design - Use Case Realization	Explain the different types of objects layers in a design Packaging sequence diagrams and the design class diagrams. Explain design patterns and recognize specific and common patterns. Apply concepts to Ridgeline Mountain case study	Lab & Lecture	Quiz # 3 Term Project Part B is due	Week 10
12	PART IV: Advanced Design & Deployment Concepts Making the system operation Testing and Deployment	Required Text Chapter 14 - Deploying the New System	Describe implementation and deployment activities Describe various types of software tests and explain how and why each is used Explain the importance of configuration management, change management, and source code control to the implementation, testing, and deployment of a system	Lecture & Lab	N/A	N/A
13	Completing systems documentation - Packaging the Deliverables with TOC Review & Oral Presentation	Chapters 9, 12, 13 & 14	Assemble all deliverables in a single package for submission -- includes Parts A, B & C. Prepare and present Project work in a 15 mins scheduled presentation. Review for Final test	Lab. review lecture & Students' oral presentation	Written Term Project Part with C packaged with Parts A & B is due with Oral Presenatation	Week 13
14	Final Test	Required Text: 9, 12, 13 & 14	N/A	N/A	Final Test	Week 14