TECHNICAL UNIVERSITY OF KENYA
Education and Training for the Real World
School of Computing and Information Technology

IBL 3300
Software Engineering Studio

Course outline

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Description
In this course, students will be working on a large-scale and real project in one of several teams. The projects will be carried out from conceptualization to completion using the current technologies.

Technical goals
Apply object-oriented development methodologies, Use design patterns in architectural and detail designs, Use UML throughout the development process, Practice project management and software process improvement techniques.

Topics and Key Practices
1. Programming studio projects in small teams, project & team management,
2. Requirements analysis and specifications,
3. Object-oriented modeling and design techniques,
4. Distributed and collaborative software development ,
5. Tools for software development,
6. Iterative development processes, agile processes,
7. Construction and unit testing techniques,
8. Design and code reviews, quality assurance, configuration management, refactoring,
9. software maintenance,
10. Software & project documentation.

Learning outcomes
By the end of this course the student should be able to:

1. Conceptualize a software development project from beginning to end
2. Use modeling tools for requirements analysis and modeling
3. Use modern software development frameworks and environments
4. Carry out software development, demo and documentation

Course activities and deliverables

Topic / Course Item / Task	Deliverable	Marks
1. Project establishment		**10**
1.1. Team formation	Submit names including the team leader	1
1.2. Project topic / title	Description including an indication of expected functionalities	2
1.3. Project plan	A Gantt chart	4
1.4. Version control system	Project workspace on a version control system	3
2. Requirements Analysis and Specification		**25**
2.1. Scenario narration	A one page narration of the process	5
2.2. Process modeling 1	Use case summary	10
2.3. Process modeling 2	Swim lane diagram (using Microsoft visio or similar tool)	10
3. Tools for software development		**15**
3.1. Selection of tools for development	List of selected IDEs, frameworks, code bases, etc	3
3.2. Installation and set up	Installed and working IDEs for the project	6
3.3. Tools use	Demo of tools working	6
4. Software development		**40**
4.1. First prototype review	Demo	10
4.2. Second prototype review	Demo	10
4.3. Third prototype review	Demo	20
5. Documentation		**10**
5.1. Project workspace populated	Project workspace populated	5
5.2. Code repository	Code repository accessible from the version control system	5
	TOTAL	**100%**

Course Schedule

1. Introductory session (15/1 – 20/1)
    a. Course objectives, goals and overview of the entire course
    b. Project establishment activities
2. Version control systems (22/1 – 27/1)
    a. Overview, share experiences
    b. Github essentials
    c. Activities – installations and creating first documents (e.g the Gantt chart)
3. Requirements modeling (29/1 – 3/2)
    a. Example case study: Narration, document flow, use case summary, swim lane diagram
4. Students research (5/2 – 10/2)
    a. A look at existing projects with similar features, look and feel, etc
    b. Demo / description of web development frameworks
5. Software development (5/2 – 10/2, 12/2 – 17/2, 19/2 – 24/2)
    a. Scheduled group presentations
6. Group and individual demonstrations (19/2 – 24/2)
    a. Final project status demo