Course Content

Software Engineering 2009 – 2010
University of North Dakota – Emanuel S. Grant

Course: CSci463 Software Engineering - Fall 2007

Course Text: *Required -* Software Engineering, *Ian Sommerville,* 8th ed. ISBN 0-321-21026-3

Reference Text: Applying UML and Patterns, *Craig Larman,* 3rd ed. ISBN 0-13-148906-2

Description: The course will cover software engineering principles and techniques used in the specification, design, implementation, verification, and maintenance of large-scale software systems.

Goal: On completion of this course, students will be able to:

- Identify and apply software engineering principles in building models of large complex systems within a CASE tool environment.
- Demonstrate knowledge of software development methodologies.
- Understand formal notations and their use in software development.
- Document software development activities.
- Apply various software testing techniques.
- Participate in team development.
- Conduct system maintenance.

Grading:
Writing assignments	20%
Team project	30%
Project presentation	15%
Class survey	10% (participation)
Final exam	25%

Date:
Team project: Assigned: Due:
Progress report:
Mid-term exam: **NO MID TERM EXAMINATION**.
Project presentation:
Final exam: (Take Home) Assigned: Due:
Class survey:
Reading Assignment:

Team project: The class will be divided into teams of no less than two and no more than four students each. The teams will operate as independent entities, with the purpose of developing a team project within the specified timeframe. The teams will each elect a team-leader, who will be responsible for submitting deliverables for the team. Team members will select a name for their team. Project teams that include graduate student will have to include two additional *approved* system functionalities for each graduate student in the team.

"Does just what it says on the tin"

Project progress report: Each project team is required to submit progress reports of the work being done on the team project. The project progress reports will document: (1) what has been accomplished since the last report; (2) planned tasks for the next progress report; and (3) problems encountered and solutions implemented.

Reading assignment: Three reading assignments will be given over the semester. Students are expected to read each article and compile a, 1 – 2 page, written report on each article. Graduate students will compile a five page written report on each article.

Project presentation: Each project team will make an in-class presentation of their project. The presentation should be in the form of a MS Power Point type presentation of the work done in building the application, and a demonstration of the application. The time limit for each presentation will be based on the number of teams we have, but can be expected to be between 15 and 20 minutes. All members of each team are expected to participate in their team's presentation.

Class survey: The class will be given a series of surveys, to be completed in class. These surveys are intended to document the students' comprehension of selected topics, and points will be assigned for *participation*.

Final exam: The final exam will be a take-home and based on **all** the topics covered in the course. Undergraduate students may use the class text as the single source of information in compiling their answers. Graduate students must cite at least one additional authoritative source of information for each question answered – **Wikipedia, personal blogs, and web addresses are not authoritative sources of information**.

Assessment Rubric

All written assignments will be assessed by the following rubric:

Writing Rubric
Each scale has six points, but not all points are defined specifically. Points 1 and 6 are defined, as is the center of the scale, which falls between 3 and 4. A score of 1 is assigned when the attribute being measured is absent. Scores of 2-3 are assigned when the attribute is developing. Scores of 4-5 indicate adequate performance. A score of 6 is assigned when the attribute is fully developed.
Scale I: Organization/Format **6** Organizes material in a required clear, appropriate, and precise manner. **3-4** Organizes material in an appropriate manner, but may lack some clarity or consistency. Presents basic information but may have extraneous material. **1** Little evidence of a cohesive plan. Little or no description or detail. Ideas seem scrambled, jumbled, or disconnected.
Scale II: Content **6** Material content is clear, relevant, accurate, and concise. **3-4** Material is appropriate, but may lack a clear connection to the purpose. **1** Little evidence of appropriate content.
Scale III: Writing Conventions **6** Enhances the readability of the paper. **3-4** Minor errors are present, but they do not detract from the readability of the paper. **1** Little or no evidence of correct writing. Poor conventions seriously limit the paper's readability.

"Does just what it says on the tin"

Scale IV: Research and Interpret Data/Information
6 Correct interpretation of data or information. Analysis and conclusion are based on research.
3-4 Correctly interprets data or information, but analysis or conclusion may not be supported by research.
1 Incorrectly interprets data or information with little or no analysis or conclusion. Little or no evidence of research presented.

Scale V: Appropriate Vocabulary
6 Articulates appropriate vocabulary and terms associated with the subject matter.
3-4 Some inappropriate vocabulary present or limited use of appropriate vocabulary.
1 Inappropriate vocabulary and use occurs.

Presentations will be graded as follows:

Presentation Rubric
Each scale has six points, but not all points are defined specifically. Points 1 and 6 are defined, as is the center of the scale, which falls between 3 and 4. A score of 1 is assigned when the attribute being measured is absent. Scores of 2-3 are assigned when the attribute is developing. Scores of 4-5 indicate adequate performance. A score of 6 is assigned when the attribute is fully developed.

Scale I: Vocal Expression
Vocal expression refers to the distinctness of the articulation and pronunciation of words. This refers to the voice rather than to meaning. The rating is an evaluation of the clearness of the expression, not the understandability of the meaning of the word being used.
6 Clear throughout
3-4 Generally clear
1 Poor articulation

Scale II: Physical Expression
Physical expression refers to the degree to which the speaker maintains eye contact with the listeners. One extreme is represented by the person who either avoids eye contact altogether, the other by the person who seems to be staring constantly at you. The ideal is represented by the person who attracts the listener's attention and interest through use of the eyes without making the listener uncomfortable.
6 Involves audience with eye contact
3-4 Some eye contact
1 Avoids eye contact

Scale III: Organization
Organization refers to the sequencing of main points within the message. No order would be extremely confusing to listeners, while effective order helps them both to follow and to anticipate ideas.
6 Effective order
3-4 Some order
1 No order

Scale IV: Support and Elaboration
Support and elaboration refer to the way the speaker works with each idea. Does the speaker provide proof, data, and evidence? Are illustrations, examples, etc., sufficient to support and clarify the ideas and their relevance to the social implication of the subject/topic?
6 Reasoning clear and effective
3-4 Reasoning clear

"Does just what it says on the tin"

Timetable:

Lecture	Lecture Topic *(topics are subject to change)*
Wk. 01 Lec. 01	*Course introduction, HTMLez introduction, Course and class room policy. Professional and ethical responsibilities of software developers.*
Wk. 01 Lec. 02	*Introduction to CASE tools, Project team description and assignment. History of software development,*
Wk. 02 Lec. 03	*Introduction to Software Engineering, Software development processes, Types of software systems, Software development project management.*
Wk. 02 Lec. 04	*Requirements engineering – elicitation and analysis, Requirements validation. Class survey . Project teams due.*
Wk. 03 Lec. 05	*Concept Models*
Wk. 03 Lec. 06	*CLASS CANCELLED.*
Wk. 04 Lec. 07	*Requirements engineering – elicitation and analysis, Requirements validation*
Wk. 04 Lec. 08	*Introduction to: UML models, Writing Assignment handed out.*
Wk. 05 Lec. 09	*Requirements engineering – elicitation and analysis, Requirements validation*
Wk. 05 Lec. 10	*More UML models, Progress Report 1 review*
Wk. 06 Lec. 11	*Taped lecture – Dr. Mary Shaw CMU – Software Architecture, Reading assignment 1 due*
Wk. 06 Lec. 12	
Wk. 07 Lec. 17	
Wk. 07 Lec. 18	
Wk. 07 Lec. 19	
Wk. 08 Lec. 20	*UML models and concept maps*
Wk. 08 Lec. 21	*UML models and concept maps*
Wk. 08 Lec. 22	*UML models and concept maps*
Wk. 09 Lec. 23	*UML design models – code generation*
Wk. 09 Lec. 24	*UML design models – code generation*
Wk. 09 Lec. 25	*Progress Report 2 due,*
Wk. 10	*, Reading assignment 2 assigned*

"Does just what it says on the tin"

Lec. 26	
Wk. 10 Lec. 27	*.Guest lecture – Dr. Hassan Reza UND – Formal notation (Petrie Nets)*
Wk. 10 Lec. 28	*Project review*
Wk. 11 Lec. 29	*Software reuse – application model instantiation from domain models.*
Wk. 11 Lec. 30	*Software reuse – application model instantiation from domain models Reading assignment 2 due*
Wk. 11 Lec. 31	*Formal specification, Z notation*
Wk. 12 Lec. 32	*Software testing, system testing, component testing*
Wk. 12 Lec. 33	*Software testing, test design*
Wk. 12 Lec. 34	*Software testing, test automation*
Wk. 13 Lec. 35	*Software maintenance – improvement, scheduling.*
Wk. 13 Lec. 36	***Progress Report 3 due, Reading assignment 3 assigned***
Wk. 14 Lec. 37	*Software maintenance – improvement, scheduling*
Wk. 14 Lec. 38	*Change management, Version and release management*
Wk. 15 Lec. 39	*Emerging technologies – Service-oriented SE*
Wk. 15 Lec. 40	*Emerging technologies – Aspect-oriented SE*
Wk. 15 Lec. 41	*.Guest lecture – Dr. Hassan Reza UND – Formal notation (Petrie Nets),* ***Reading assignment 3 due***
Wk. 16 Lec. 42	***Course review, final exam review, class survey***
Wk. 16 Lec. 43	***Project presentation.***

Rationale: The selection of topics and the order of these topics are intended to provide the student with theoretical material that is synchronized with the software development methodology, being used in developing the course team project.

"Does just what it says on the tin"