CSE 4214
Introduction to Software Engineering

REQUIRED/ELECTIVE:
Computer Science – Elective
Software Engineering – Required
Computer Engineering - Elective

CATALOG DATA:
(Prerequisite: CSE 2383 with a grade of C or better). Three hours lecture. Two hours laboratory.
Introduction to software engineering; planning, requirements analysis and specification,
design; testing; debugging; maintenance; documentation. Alternative design methods, software
metrics, software project management, reuse, and reengineering.

PREREQUISITE BY TOPIC:
1. Object-oriented programming methodology.
2. Data structures and algorithms, including stacks, linked lists, binary search trees, AVL trees
and graphs.

TEXTBOOKS AND OTHER REQUIRED MATERIAL:
IEEE Software Engineering Standards
Course web site.

COORDINATOR:
Dr. Thomas Philip

COURSE OBJECTIVES:
1. Provide an introduction to the software engineering discipline
2. Describe the SE process and select the correct process for a given software development
scenario.
3. The student will be placed in a project environment and required to work as part of a software
development team.
4. The student will be able to perform object oriented software analysis, design, test, and
implementation.
5. The student will be able to apply standard, accepted software engineering techniques to system
development and to apply appropriate metrics.
6. The student will demonstrate proficiency in eliciting requirements from a customer and refining the
high level requirements to an end product.
7. The student will demonstrate the ability to document their work to an acceptable standard.

TOPICS COVERED: (Number of class hrs)
1. Software Development Process 2
2. Software Project Management & Planning 6
3. Requirements engineering 6
4. Object-oriented Analysis and Design 8
5. Formal Specification methods 3
6. Component Based Software Development 3
7. Software Testing & quality assurance 4
8. Software Maintenance and Configuration Management  3
9. Software Metrics  3
10. Software Standards & documentation  4
11. Examinations  3

Laboratory Outline
1. ConOps Development  3 weeks
2. Requirements specification  4 weeks
3. Design specification  4 weeks
4. Coding & Testing  4 weeks

CONTRIBUTION TO PROFESSIONAL COMPONENT:
   Engineering Topic, Engineering Design

ASSESSMENTS:
1. Examinations
2. Quizzes
3. Laboratory reports
4. Participation

RELATIONSHIP TO PROGRAM OUTCOMES:
1. Provide an introduction to the software engineering discipline. (I, j, 4, 8)
2. Describe the SE process and select the correct process for a given software development
   scenario. (a, 3, 7)
3. The student will be placed in a project environment and required to work as part of a software
   development team. (c, 1, 3)
4. The student will be able to perform object oriented software analysis, design, verification &
   validation, and implementation. (b, 2)
5. The student will be able to apply standard, accepted software engineering techniques to system
   development and to apply appropriate metrics.
6. The student will demonstrate proficiency in eliciting requirements from a customer and refining
   the high level requirements to an end product to the satisfaction of the customer. (c,e,1,3,5, 6, 9)
7. The student will demonstrate the ability to document their work to an acceptable standard. (g,2)

PREPARED BY:
Thomas Philip, Professor, April 1, 2005.

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ESTIMATE CSAB CATEGORY CONTENT:

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<thead>
<tr>
<th>CORE</th>
<th>ADVANCED</th>
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<tbody>
<tr>
<td>Data Structures</td>
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<td>Algorithms</td>
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<td>Software Design</td>
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<td>Computer Organization and Architecture</td>
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<td>Concepts of Programming Languages</td>
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ORAL AND WRITTEN COMMUNICATIONS:

Every student is required to submit at least _4_ written reports (not including exams, tests,
quizzes, or commented programs) of typically _50_ pages and to make _1_ oral presentations
of typically _5_ minutes duration. Include only material that is graded for grammar, spelling, style, and so forth, as well as for technical content, completeness, and accuracy. These activities are done in teams.

SOCIAL AND ETHICAL ISSUES:

None

THEORETICAL CONTENT:

Analysis and Design
Formal Specification.

PROBLEM ANALYSIS:

Students interact with a customer to elicit requirements, analyze the requirements and develop analysis models, document them in Software Requirements Specification.

SOLUTION DESIGN:

Students evaluate solution alternatives, UML design models, and map the design to application.