

Course #:	CSCI-C 308
Course Title:	System Analysis and Design
Course Type:	Required core
Prerequisites:	C243 Data Structures
Credits:	4
Text Book:	Systems Analysis & Design Methods, by Witten and Bentley. 4th. Edition.
References:	Handouts Object-Oriented and Classical Software Engineering by Stephen R. Schach
Current Catalog Description:	Software development life cycle; structured top-down and bottom-up design; data flow diagramming; entity relationship modeling; study of computer aided software engineering; I/O design and validation; file and database design; design of user interfaces; comparison of structured vs. object oriented design. A team project will be completed.
Course Goals	The student who completes this course: <ol style="list-style-type: none"> 1. Will understand the basic software development life cycle (Planning, Analysis, Design, Implementation, and Testing). 2. Will be proficient in the tools and techniques for analyzing complex system requirement. (i.e. data, process, and object modeling, using DFDs, ERDs, and UML) 3. Will be experienced in group dynamics and working within groups. 4. Will be exposed to project management, cost and time estimation. 5. Will be required to make a technical presentation.
Major Topics Covered in the Course	<ol style="list-style-type: none"> 1. The Modern System Analyst, responsibilities, qualifications, etc. 2. Information Systems Building Blocks (People, Data, Activities, Networks, Technology) 3. Information System Development (System Development Life Cycle) (SDLC) (Planning, Analysis, Design, Implementation, Testing, Maintenance and Support) 4. Team formation 5. System Analysis, structured analysis, prototyping, JAD, OOA, surveying, analysis and cross life cycle activities. 6. Introduction to CASE tools 7. Rapid Application Development (RAD) Tools (Visual Basic Programming) 8. Data Modeling (Entity Relationship Modeling) 9. Process Modeling, Data Flow Diagrams, functional

	<p>decomposition, Object Modeling (Objects, methods, messages, inheritance, encapsulation, polymorphism) 10. Database Design (Data Analysis, intro to normalization) 11. Introduction to MS-ACCESS 12. Input and Output Design 13. User interface Design</p>																		
Laboratory projects (specify number of weeks on each)	<p>One course project is assigned to teams from the 3rd week until the 16 week. During these 13 weeks, students need to produce four documents and give four presentations. These documents are:</p> <ul style="list-style-type: none"> • Project proposal (2 weeks) • Project analysis (3 weeks) • Project design (3 weeks) • Implementation/code (5 weeks) 																		
Estimate Curriculum Category Content (Semester hours)	<table border="1"> <thead> <tr> <th>Area</th> <th>Core</th> <th>Advanced</th> </tr> </thead> <tbody> <tr> <td>Algorithms</td> <td></td> <td></td> </tr> <tr> <td>Software Design</td> <td>40</td> <td>15</td> </tr> <tr> <td>Comp. Arch.</td> <td></td> <td></td> </tr> <tr> <td>Data Structures</td> <td>10</td> <td></td> </tr> <tr> <td>Prog. Languages</td> <td>5</td> <td></td> </tr> </tbody> </table> <p>Additional hours may be dedicated to curriculum categories not listed above. For example explanation of concepts and theories. Discussion of social and ethical issues, discussion of inter personal relationships and working within groups.</p>	Area	Core	Advanced	Algorithms			Software Design	40	15	Comp. Arch.			Data Structures	10		Prog. Languages	5	
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Algorithms																			
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Oral and Written Communications	<p>Every student is required to submit at least __4__ written reports typically __6 to 15__ pages and to make __1 to 4__ oral presentations of typically __15__ minute's duration.</p>																		
Social and Ethical Issues	<p>Students are given online references and homework. This topic is also covered in exam. Both the homework and the tests are based on the case studies selected from online resources, such as CERIAS (http://www.cerias.purdue.edu/education/post_secondary_education/past_offerings/curriculum_development/ethical_social_prof_issues/). Approximately, one lecture is used to cover this topic.</p>																		
Theoretical Content	<p>The basic software life-cycle theory, capacity, maturity model. Approximately 2 to 3 lectures.</p>																		
Problem Analysis	<p>The course covers both classical analysis and object-oriented analysis. Students are introduced with data-flow diagram, entity relationship diagram, UML diagram, finite state machine, and petri net. Problem analysis is about 30% of the entire class.</p>																		
Solution Design	<p>The course cover architecture design and detail design. These topics include: system decomposition, database design,</p>																		

	architecture style, design pattern. Input, output, and GUI design. Homework is assigned for each topic. Solution design is about 30% of the entire class.
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