

Course #:	INFO-I 451
Course Title:	Development of an Information System
Course Type:	Capstone II
Prerequisites:	I450 or Senior standing and approval of the Informatics director.
Credits:	3
Text Book:	Fundamentals of Database Systems, by Elmasri and Navathe, Fifth Edition, Benjamin Cummings, 2006.
References:	Introduction to Database Systems, by C. J. Date, Vol-1, Fifth Edition. and Handouts
Current Catalog Description:	System design and development present both technical and managerial problems with which students will be familiar from their undergraduate course work. This course puts these lessons into practice as students work in teams to develop an information system. Examples of course projects include design and development of a database for a business or academic application, preparation and presentation of an interactive media performance or exhibit, or design and implementation of a simulated environment (virtual reality).
Course Goals	The student who completes this course: <ol style="list-style-type: none"> 1. Will understand of database management concepts. 2. Will be proficient in data modeling techniques and tools. 3. Will be proficient in the relational data model and relational databases technology. 4. Will be proficient in constructing a small to medium sized relational database system. (20 to 30 tables) 5. Will be proficient in writing relational algebra queries. 6. Will be proficient in writing SQL queries. 7. Will be exposed to the application developer perspective, and the use of databases in that context. 8. Will be exposed to theory behind relational databases (i.e. functional dependencies and normalization)
Major Topics Covered in the Course	<ol style="list-style-type: none"> 1. Database System Concepts and Architecture 2. Data Modeling 3. Relational Model and Relational Algebra 4. Implementations issues, File organization primitives and relational algebra operators 5. Structured Query Language (SQL) 6. Relational database management systems (MySQL, Access, Oracle, DB2) 7. Functional Dependencies and Normalization 8. Transaction Processing 9. Concurrency Control 10. Recovery 11. Database security and authentication
Laboratory projects	Installing MySQL, PHP My Admin, and other tools.

(specify number of weeks on each)																			
Estimate Curriculum Category Content (Semester hours)	<table border="1" data-bbox="623 226 1338 453"> <thead> <tr> <th>Area</th> <th>Core</th> <th>Advanced</th> </tr> </thead> <tbody> <tr> <td>Algorithms</td> <td>15</td> <td></td> </tr> <tr> <td>Software Design</td> <td>10</td> <td></td> </tr> <tr> <td>Comp. Arch.</td> <td>3</td> <td></td> </tr> <tr> <td>Data Structures</td> <td>10</td> <td></td> </tr> <tr> <td>Prog. Languages</td> <td>15</td> <td></td> </tr> </tbody> </table> <p data-bbox="534 495 1349 636">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	15		Software Design	10		Comp. Arch.	3		Data Structures	10		Prog. Languages	15	
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Oral and Written Communications	Every student is required to submit at least __1__ written reports (not including exams, tests, quizzes, or commented programs) of typically __15__ pages and to make __1__ oral presentations of typically __15__ minute's duration.																		
Social and Ethical Issues	Database privacy, security and authorization are covered during one to two class periods.																		
Theoretical Content	Students learn the set-theoretic foundation of the relational model, relational algebra, and the formal aspects of relational design (functional dependencies, normal forms, etc.), query optimization, and the theory of serializability for concurrent transactions.																		
Problem Analysis	As part of the course project, students are required to analyze database application requirements to develop an entity relationship diagram, and implement a database application. Students must apply relational database theory to analyze and evaluate their database designs.																		
Solution Design	Students must learn to convert their analysis and design document in to a fully functioning database solution.																		
Prepared By	Hakimzadeh, Adaikkalavan																		