

Course #:	CSCI-B561								
Course Title:	Advanced Database Concepts								
Course Type:	Graduate / Upper level elective for undergraduates								
Prerequisites:	C442 (Database Systems)								
Credits:	3								
Text Book:	Database System Concepts by Silberschatz, Korth and Sudarshan, McGrawHill								
References:	Class notes.								
Current Catalog Description:	Database models and systems: specially relational and object-oriented; relational database design theory; structures for efficient data access; query languages and processing; database applications development; views. Transaction management: concurrency and recovery. (Graduate Project)								
Course Goals	<p>The student who completes this course will be introduced to:</p> <ul style="list-style-type: none"> • File Organization • Internal Design of a Mini Database Engine • Transaction Management and Concurrency Control • Query Processing and Query Optimization • Distributed Databases and Client/Server Architecture • Object-Oriented Databases • Database Recovery Techniques • Data Warehousing and Data Mining • Deductive Databases • Emerging Database Technologies 								
Major Topics Covered in the Course	<ul style="list-style-type: none"> • File Organization • Internal Design of a Mini Database Engine • Transaction Management and Concurrency Control • Query Processing and Query Optimization • Distributed Databases and Client/Server Architecture • Object-Oriented Databases • Database Recovery Techniques • Data Warehousing and Data Mining • Deductive Databases • Emerging Database Technologies 								
Laboratory projects (specify number of weeks on each)	No close laboratories.								
Estimate Curriculum Category Content	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Area</th> <th style="width: 25%;">Core</th> <th style="width: 25%;">Advanced</th> </tr> </thead> <tbody> <tr> <td>Algorithms</td> <td></td> <td>25</td> </tr> </tbody> </table>			Area	Core	Advanced	Algorithms		25
Area	Core	Advanced							
Algorithms		25							

(Semester hours)	Software Design		15
	Comp. Arch.		
	Data Structures		15
	Prog. Languages		
Oral and Written Communications	Every student is required to submit at least __2__ written reports (not including exams, tests, quizzes, or commented programs) of typically __15__ pages and to make __1__ oral presentations of typically __20__ minute's duration.		
Social and Ethical Issues	Not a course objective		
Theoretical Content	Study of various algorithms for organizing and accessing files, algorithms for developing a database engine, algorithms for the design of a query language such as relational algebra or SQL, transaction management and concurrency control algorithms, query processing and query optimization techniques, distributed databases and client/server architecture, Object-Oriented databases, and recovery techniques.		
Problem Analysis	The assignments in the course are designed to implement a fully functioning Mini-Database engine. This problem is broken down into five stages.		
Solution Design	The Mini-Database problems described above, is analyzed in class and alternative solutions discussed.		
Prepared By	Hakimzadeh		