

**NEW YORK CITY COLLEGE OF TECHNOLOGY
COMPUTER SYSTEMS TECHNOLOGY DEPARTMENT
CST4714 – DATABASE ADMINISTRATION
(2 class hours, 2 lab hours, 3 credits)**

COURSE DESCRIPTION: Students in this course will develop a fundamental understanding of the tasks and issues associated with database administration including: planning, building, tuning, troubleshooting, securing and monitoring databases. Students will learn how to manage users, privileges, and resources, implement basic backup and recovery procedures and identify tuning opportunities.

COURSE OBJECTIVES: Upon successful completion of this course, the students will have acquired the following knowledge and skills:

1. Understanding the problems and appropriate solutions involved in the role of database management and administration
2. Installing, creating, configuring and maintaining an operational database
3. Managing physical and logical database structures including users, objects and data
4. Monitoring performance and identifying performance improvements
5. Planning and implementing backup/recovery strategies
6. Managing database security

PREREQUISITES

Student must have successfully completed CST3604 with a grade of C or higher.

REQUIRED TEXTBOOK

Expert Oracle Database 11g Administration by Sam R. Alapati. Berkley: Apress (ISBN-13:978-1-4302-1015-3)

Would you please make the book descriptions consistent? Use Author, Book Title, Edition, Publisher, Year, ISBN. (1st edition, 2008)

Students are required to have a USB storage device for class projects.

ADDITIONAL MATERIAL

The instructor will identify several additional information resources during the semester including Internet resources and print material (handouts).

Attendance Policy:

Attendance is expected at every class meeting. College policy sets that a student may be absent without penalty for 10% of the number of scheduled class meetings during the semester as follows:

Class meets	Allowable Absence
1 time/week	2 classes
2 times/week	3 classes
3 times/week	4 classes

ACADEMIC INTEGRITY POLICY:

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog.

GRADING PROCEDURE:

Midterm	20%
Final	30%
Quizzes	20%
Case Assignment/Project	25%
Homework	5%
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TOTAL	100%

Letter Grade	A	A-	B+	B	B-	C+	C	D	F
Numerical Grade	93-100	90-92.9	87-89.9	83-86.9	80-82.9	77-79.9	70-76.9	60-69.9	<=59.9

COURSE OUTLINE:**Could the labs be noted in the outline?**

Week	Topics	Reading
1	Database administration – tasks and roles Review of Database design and modeling	Chapter 1,2
2	Oracle database architecture <ul style="list-style-type: none"> • Database structures • Processes • Understanding memory structure • Database transactions • Committing and Rollback • Data consistency and concurrency • Backup and recovery architecture • Data dictionary • Oracle utilities • Scheduling and resource management 	Chapter 5

3	<p>Tablespaces</p> <ul style="list-style-type: none"> • Creating and maintaining • Uses: <ul style="list-style-type: none"> • Storage • User access and security • Backup • Data transfer 	Chapter 6
4	<p>Schema Management</p> <ul style="list-style-type: none"> • Types of SQL statements • Schemas • Managing Tables; temporary, index-organized, external, partitioned • Data dictionary views for managing tables • Clusters • Managing and monitoring <ul style="list-style-type: none"> • Indexes • Views • Sequences • Triggers • Constraints • Viewing object information 	Chapter 7
5	<p>Managing Data and Concurrency</p> <ul style="list-style-type: none"> • Locking • Concurrency • UNDO data 	Chapter 8
6	Installing, uninstalling and upgrading the DBMS	Chapter 9
7	Review and Midterm Exam	
8	<p>Creating Database</p> <ul style="list-style-type: none"> • Creating parameter file • Starting and stopping the database • Log and trace files 	Chapter 10
9	<p>User management and database security</p> <ul style="list-style-type: none"> • Managing users • Database resource manager • Controlling database access • Auditing database usage • Authenticating users 	Chapter 12

	<ul style="list-style-type: none"> • Database security 	
10	Loading and transforming data <ul style="list-style-type: none"> • Using external tables • Transforming data in existing tables 	Chapter 13
11	Improving database and query performance <ul style="list-style-type: none"> • Optimizing query processing 	Chapter 19
12	Performance and tuning <ul style="list-style-type: none"> • Tuning memory • Evaluating system performance • Measuring I/O performance • Measuring instance performance 	Chapter 20
13	Backup and Recovery <ul style="list-style-type: none"> • Backing up the database • Recovery manager • Database corruption detection • Data protection for disaster recovery • Types of database failures • The recovery process 	Chapter 15, 16
14	Advanced topics: <ul style="list-style-type: none"> • Managing distributed databases • Managing data warehouse 	Handouts Internet sources
15	Final	

ASSESSMENT CRITERIA:

For the successful completion of this course a student should be able to:	Evaluation methods and criteria
Measure the student's understanding of key database concepts including but not limited to: <ol style="list-style-type: none"> 1. Database management and administration roles 2. Database installation, creation, configuration and maintenance issues 3. Management of physical and logical data structures including users, objects and data 4. Monitoring performance 	Exams, homework assignments, in-class lab exercises

5. Backup/recovery 6. Database security issues	
Understanding the role of a database administrator and the key issues involved in administrating a database including: 1. Planning 2. Installing 3. Configuring 4. Administering 5. Monitoring 6. Securing	Case Study/Project

Bibliography

Modern Database Management fifth edition by Fred R. McFadden, Jeffrey A. Hoffer and Mary B. Prescott. New York: Addison-Wesley.

Introduction to Database Systems eighth edition by C.J. Date. New York: Addison-Wesley.

1. *Modern Database Management*, J. Hoffer, M. Prescott, H. Topi, 10th edition, Prentice Hall (Pearson), 2011.

2. *Fundamentals of Database Systems* fourth edition by Ramez Elmasri and Shamkant B. Navathe. New York: Addison-Wesley. 2. Elmasri, R., Navathe, S., *Fundamentals of Database Systems*, 6th edition, Pearson, 2011, ISBN-13: 9780136086208

3. *Database Systems Design, Implementation and Management* ninth edition by Carlos Coronel, Steven Morris and Peter Rob. New York: Cengage Learning

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