Template of Course Specification

Faculty: CIT
Department: IT
Program: BIT

I.	**General information about the course :**					
1.	**Course Title:**	Database Security				
2.	**Course Code and Number :**	ITE02				
3.	**Credit Hours: 3**	**Lecture**	**Seminar/Tutorial**	**Practical**	**Training**	**Total**
		2		2		4
4.	**Study Level and Semester:**	Level 4 - Semester 7 or 8				
5.	**Pre-requisites (if any):**					
6.	**Co-requisites (if any) :**	CS221-Database Systems Design & IT412-Systems and Networks Security				
7.	**Program in which the course is offered**	BIT				
8.	**Teaching Language:**	English				
9.	**Study System :**	Semester Based				
10.	**Prepared by :**	Course Facilitator				
11.	**Approval date :**					
12.	**Approved by:**	Department				

II. Course Description:

This course introduces basic concepts of data security in database environment, computer network and internet. The topic includes basic requirement of data security control, explain the risk and threats towards integrity, availability and data confidentiality in the organization. Among other issues discussed are technologies on application and data security such as data access control, data confidentiality, user management, virtual standalone database and database auditing. Students will be exposed to techniques of data security implementation in Oracle environment.

III. Course Aims

This Course aims to:

1. Interpret and explain the concepts of information technology security with regards to database.
2. Understand the various security measures & types of disasters
3. Analyze risk, threat and devise security implementation plan for database, in line with current standards and requirements.
4. Apply the features of data security, data integrity and data access control, recovery techniques to different disaster scenarios.

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VI. Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Knowledge and Understanding PILOs	**Knowledge and Understanding CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
A1. Show knowledge and understanding in computing and mathematics appropriate to the IT discipline	a1. Know the database security risks
A2. Understand the professional, ethical, and social responsibilities	a2. Understand security policies & security requirements
A3. Recognize the need for and an ability to engage in continuing professional development	

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Intellectual Skills PILOs	**Intellectual Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
B1. Analyze a problem, and identify and define the computing requirements appropriate to its solution	b1. Recognize needs of audit & explore audit options
B2. Analyze the impact of computing on individuals, organizations, and society, including ethical, legal, security, and global policy issues	
B3. Integrate IT-based solutions into the user environment	b2. Formulate enterprise user security, privileges, roles & access control
B4. Identify and analyze user needs and take them into account in the selection, creation, and administration of computer-based systems	b3. Explore encryption concepts/challenges

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Professional and Practical Skills	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Professional and Practical Skills PILOs	**Professional and Practical Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
C1. Use current techniques, skills, and tools necessary for computing practice	c1. Apply audit techniques
C2. Use and apply the current concepts and practices of the core information technologies	
C3. Demonstrate the best practices and standards and their application	c2. Implement logical backup package data-pump
C4. Develop, implement, and evaluate a computer-based system, process, component, or program to meet desired needs	c3. Implement physical backup recovery scenarios

Transferable (General) Skills :	
Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)	
Transferable (General) Skills PILOs	**Transferable (General) Skills CILOs**
After completing this program, students would be able to:	After completing this course, students would be able to:
D1. Function effectively on teams to accomplish a common goal	d1. Write project - technical report and present projects/assignments
D2. Communicate effectively with a range of audiences	
D3. Assist in the creation of an effective project plan	

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VI. Alignment of CILOs to Teaching and Assessment Strategies

First: Alignment of Knowledge and Understanding CILOs

Knowledge and Understanding CILOs	Teaching Strategies	Assessment Strategies
a1. Know the database security risks	Lectures	Written Exam
a2. Understand security policies & security requirements	Group Discussions	Observation
	Tutorials	Reports/Screen shots
	Brain Storming	Viva/Direct Questions
		Quizzes

Second: Alignment of Intellectual Skills CILOs

Intellectual Skills CILOs	Teaching Strategies	Assessment Strategies
b1. Recognize needs of audit & explore audit options	Lectures	Written test
b2. Formulate enterprise user security, privileges, roles & access control	Tutorials	Quizzes
b3. Explore encryption concepts/challenges	Case study	Tutorial technical reports
	Assignments	Other Reports

Third: Alignment of Professional and Practical Skills CILOs		
Professional and Practical Skills CILOs	**Teaching Strategies**	**Assessment Strategies**
c1. Apply audit techniques	**Tutorials** **Homework** **Group Discussions**	**Technical Reports** **Worksheets** **Presentations** **Observations**
c2. Implement logical backup package data-pump		
c3. Implement physical backup recovery scenarios		

Fourth: Alignment of Transferable (General) Skills CILOs		
Transferable (General) Skills CILOs	**Teaching Strategies**	**Assessment Strategies**
d1. Write project - technical report and present projects/assignments	**Grouping** **Tips** **Notes** **Case Study**	**Presentations** **Observations** **Reports**

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VII. Course topics and sub-topics (theoretical and practical) with contact hours and alignment to CILOs

Topics/Units of Course Contents					
First: Theoretical Aspects					
No.	**Course Topics/Units**	**Sub-topics**	**No. of Weeks**	**Contact Hours**	**CILOs**
1	Introduction to Database Security and Database Privacy	Fundamental Data Security Requirements Data Security Concerns Security Risks Defining a Security Policy Techniques to Enforce Security	1	2	a1, a2
2	Basics of Disaster Recovery Planning	Types of disaster Scenario Planning	1	2	a1, a2
3	CHOOSING SECURITY SOLUTIONS & Developing Recovery Strategies	Maintaining Data Integrity Protecting Data Controlling Data Access Database Control: Policy Trend	1	2	b2, b3
4	AUDITING DML STATEMENTS, DATABASE USERS, PRIVILEGES, AND OBJECTS	Standard Database Auditing Setting the AUDIT_TRAIL Specifying Audit Options Auditing the SYSDBA Users	1	2	b1, c1
5	USING ENTERPRISE USER SECURITY	Enterprise User security Architecture	1	2	b2
6	USING PRIVILEGES AND ROLES AND ACCESS CONTROL	Authorization Securing Objects with Procedures	1	2	b2
7	ENCRYPTION CONCEPTS	Understanding Encryption Problems that Encryption Solves Data Encryption Challenges	1	2	b3
8	MID-TERM EXAM				
9	DATABASE EXPORT/IMPORT SECURITY	Logical backups Data pump expdb & impdp	2	4	c2
10	DATABASE SECURITY CASES AND SCENARIOS	Security scenarios	1	2	b2, b3, c1

11	DATABASE SECURITY IMPLEMENTATION; DATABASE SECURITY DEPLOYMENT; DATABASE SECURITY ENFORCEMENT;	Security implementation Security enforcement	1	2	b2, b3, c1
12	Database Audit	Audit package Auditing database/users	1	2	b1, c1
13	Database Backup and Recovery; Database Migration Security	Archive log mode Complete recovery Incomplete recovery Scenarios	2	4	c2, c3, d1
14	Revision		1	2	
15	FINAL EXAM				
Total number of weeks and hours			**15**	**30**	

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I. Teaching Strategies
Lectures
Tutorials
Group Discussions
Case study
Assignment
Homework
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Second: Practical/Tutorial/Clinical Aspects				
Write up practical/tutorial/clinical topics				
No.	**Practical/Tutorial/Clinical topics**	**No. of Weeks**	**Contact Hours**	**CILOs**
1	AUDITING DML STATEMENTS, DATABASE USERS, PRIVILEGES, AND OBJECTS	1	2	b1, c1
2	USING PRIVILEGES AND ROLES AND ACCESS CONTROL	2	4	b2, b3
3	Database Export/Import Security;	2	4	c2
4	Database Security Implementation; Database Security Deployment; Database Security Enforcement;	2	4	b1, b2, b3
5	Database Audit	2	4	b1, c1
6	Database Backup and Recovery; Database Migration Security	3	6	c3
7	Assessment - Assignment/Project/Presentation Reports	1	2	d1
8	Assessment - Assignment/Project/Presentation Reports	1	2	d1
Total number of weeks and hours		**14**	**28**	

II. Tasks and Assignments :				
No.	**Task/Assignment**	**CILOs**	**Week due**	**Mark**
1	Assignment 1	b1, b2, b3, d1	10	10%
2	Assignment 2	c1, c2, c3, d1	12	10%

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III. Learning Assessment:

No.	Assessment Tasks	Week due	Mark	Proportion of Final Assessment	Aligned CILOs
1	Assignments + Reports	12	20	20%	b1, b2, b3, c1, c2, c3, d1
2	Quiz 1 & Quiz 2	4 & 9	5	5%	a1, a2, b1, b2
3	Midterm exam	7	15	15%	b3, c3
4	Tutorials		10	10%	c1, c2, c3
5	Final Exam	15	50	50%	ALL Course ILO's
Total			100		

IV. Learning Resources :

(Author, (Year), Book Title, Edition, Publisher, Country of publishing)

Textbooks-not more than 2

1. Afyouni, Hassan A. (2006) Database Security and Auditing – Protecting Data Integrity and Accessibility. Thomson-Course Technology.
2. Mullins, Craig S. (2002) Database Administration – The Complete Guide to Practices and Procedures. Addison-Wesley.

Essential References-not less than 4

1. Loney, K., and Theriault, M. (2002) Oracle9i DBA Handbook. Oracle Press.
2. Palmer, M. (2004) Guide to operating systems security. Thomson-Course Technology.
3. Canavan, John, E. (2001) Fundamentals of Network Security. Artech House Publishers.
4. Schmeh, K. (2003) Cryptography And Public Key Infrastructure On The Internet. Wiley.

Electronic Materials and Web Sites

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V. Course Policies (To be determined by Faculty Deanship):	
Based on university regulations, the following aspects should be figured out:	
1.	**(**Class Attendance**) :**
2.	**(**Tardy**) :**
3.	**(**Exam Attendance/Punctuality**) :**
4.	**(**Assignments & Projects**) :**
5.	**(**Cheating**) :**
6.	**(**Plagiarism**) :**
7.	**(**Other policies**) :**

Template of Course Syllabus

Faculty : TIC
Department: IT
Program : BIT

I. General information about the course instructor :							
Name	[Course Facilitator]	**Office Hours (3 Hours Weekly)**					
Location & phone number	USTY	**Sat**	**Sun**	**Mon**	**Tue**	**Wed**	**Thu**
Email							

II. General information about the course:						
1.	**Course Title :**	Database Security				
2.	**Course Code and Number :**	ITE02				
3.	**Credit Hours :**	**Credit Hours**				**Total**
		Theoretical	**Seminar/Tutorial**	**Practical**	**Training**	
		2		2		4
4.	**Study Level and Semester:**	Level 4 - Semester 7 or 8				
5.	**Pre-requisites (if any):**	CS221-Database Systems Design; IT412-Systems and Networks Security				
6.	**Co-requisites (if any):**	CIT09 - Introduction to Database; CS223 - Principles of Data Communication and Networks				
7.	**Program in which the course is offered:**	BIT				
8.	**Teaching Language:**	English				
9.	**Instruction location:**	N/A				

I. Course Description

This course introduces basic concepts of data security in database environment, computer network and internet. The topic includes basic requirement of data security control, explain the risk and threats towards integrity, availability and data confidentiality in the organization. Among other issues discussed are technologies on application and data security such as data access control, data confidentiality, user management, virtual standalone database and database auditing. Students will be exposed to techniques of data security implementation in Oracle environment.

II. Course Aims:

This course aims to:

1. Interpret and explain the concepts of information technology security with regards to database.
2. Understand the various security measures & types of disasters
3. Analyze risk, threat and devise security implementation plan for database, in line with current standards and requirements.
4. Apply the features of data security, data integrity and data access control, recovery techniques to different disaster scenarios.

III. Course Intended Learning Outcomes (CILOs) :

a1. Know the database security risks
a2. Understand security policies & security requirements
b1. Recognize needs of audit & explore audit options
b2. Formulate enterprise user security, privileges, roles & access control
b3. Explore encryption concepts/challenges
c1. Apply audit techniques
c2. Implement logical backup package data-pump
c3. Implement physical backup recovery scenarios
d1. Write project - technical report and present projects/assignments

IV. Course Contents

Theoretical Aspect:

No.	Course Units	Sub-topics	Week due	Contact Hours
1.	Unit-1	1) Introduction to Database Security and Database Privacy 2) Basics of Disaster Recovery Planning 3) Choosing Security Solutions & Developing Recovery Strategies	Week 4	8
2.	Unit-2	4) Auditing DML statements, Database Users, Privileges, and Objects 5) Using Enterprise User Security 6) Using Privileges and Roles and access control	Week 8	8
3.	Unit-3	7) Encryption Concepts 8) Database Export/Import Security; 9) Database Security Cases and Scenarios	Week 10	6
4.	Unit-4	10) Database Security Implementation; Database Security Deployment; Database Security Enforcement; 11) Database Audit 12) Database Backup and Recovery; Database Migration Security	Week 12	6
Total number of weeks and hours			14	28

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Second: Practical/Tutorial/Clinical Aspects :			
Write up practical/tutorial/clinical topics			
No.	**Practical/Tutorial/Clinical topics**	**No. of Weeks**	**Contact Hours**
1.	AUDITING DML STATEMENTS, DATABASE USERS, PRIVILEGES, AND OBJECTS	1	2
2.	USING PRIVILEGES AND ROLES AND ACCESS CONTROL	2	4
3.	Database Export/Import Security;	2	4
4.	Database Security Implementation; Database Security Deployment; Database Security Enforcement;	2	4
5.	Database Audit	2	4
6.	Database Backup and Recovery; Database Migration Security	3	6
7	Assessment - Assignment/Project/Presentation Reports	1	2
8	Assessment - Assignment/Project/Presentation Reports	1	2
Total number of weeks and hours		**14**	**28**

V. Teaching Strategies

1. Lectures
2. Tutorials
3. Group Discussions
4. Case study
5. Assignment
6. Homework

VI. Tasks and Assignments

No.	Task/Assignment	Week due	Mark
1.	Assignment 1	WEEK 10	10
2.	Assignment 2	WEEK 12	10

VII. Learning Assessment:

No.	Assessment Tasks	Assessment day & date	Mark	Weight
1	Quiz 1	WEEK 3	5	5%
2	Quiz 2	WEEK 5		
3	Midterm exam	WEEK 8	15	15%
4	Tutorials	WEEK 10	10	10%
6	Assignments + Reports	WEEK 12 & 13	20	20%
8	Final Exam	WEEK 15	50	50%
	Total			

VIII. Learning Resources

SKOOB TXET

1. Afyouni, Hassan A. (2006) Database Security and Auditing – Protecting Data Integrity and Accessibility. Thomson-Course Technology.
2. Mullins, Craig S. (2002) Database Administration – The Complete Guide to Practices and Procedures. Addison-Wesley.

SECNEREFER

1. Loney, K., and Theriault, M. (2002) Oracle9i DBA Handbook. Oracle Press.
2. Palmer, M. (2004) Guide to operating systems security. Thomson-Course Technology.
3. Canavan, John, E. (2001) Fundamentals of Network Security. Artech House Publishers.
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IX. Course Policies (To be determined by Faculty Deanship)	
1.	**Class Attendance :**
2.	**Tardy :**
3.	**Exam Attendance/Punctuality:**
4.	**Assignments & Projects:**
5.	**Cheating:**
6.	**Plagiarism:**
7.	**Other policies:**