ECSI/ECII/ECCI 4105	Database Administration and Security	48 HRS

PURPOSE OF THE COURSE:

- To provide students with an in-depth understanding of the administration and security methods applied in database systems

EXPECTED LEARNING OUTCOMES:

The learner should be able to:

1. Work with databases with a comfortable level of skill and knowledge using SQL for the purpose of administration and security of database
2. Practically handle SQL database administration and security tasks in the work place regardless of the database being used

TOPICS TO BE COVERED

- Database Concepts: Database, DBMS, Database Administration, Functions/Roles of a Database Administrator (DBA) , Database Security and Threats; Introduction to SQL related database (Oracle, MS-SQL, My-SQL etc); Installation of a Database; Database Server Architecture: Communication, Data, Administrative and Application Architectures; servers' security; Physical database Structures: Data Files, Control Files, Redo log files, Archives Log Files, Parameter Files, Alert and Trace Files, Backup Files; Logical Database: Tablespaces Administration (Online and Offline), Data blocks (Extents, segment), Database Scheme Objects administration (Tables, Indexes, Views Clusters synonyms); Database Dictionary, Database Instance and multiple instances, Memory Structures (System Global Area & Program Global Area), Background vs Foreground Processes; Accessing the Database: Network Configuration, Login Authentication, permission Validation, Database User Accounts and roles/privileges; Database Management Systems Setup: Database Configuration, Creating, Starting, mounting, opening and Stopping Database instances, Dropping and managing a Database; Data transfer: Transformation services and Linked Servers; Scalability and Performance Tuning: Clustering, Read Consistency, Locking Mechanism, Quiesce Database, Real Application Clusters, Portability; Database Failures : user, statement, process, instance, media ; Backing up and Restoring Databases: Backup types, Backup Devices, Monitoring and Maintaining a Database Server; Structures for Recovery; undo records, control files and backup ; Database Replication: Distributed Data, Replication Types, and Physical Replication Models. Security Features : system and data, authorization, authentication, Access restrictions , Policies and Auditing, Data integrity and triggers; Enterprise Manager Console (Administer, Schedule and Monitor tasks, diagnose , modify and Tune Multiple Databases, Group Tasks), Other related Database Administration tools ; Business intelligence Component: Ware housing, ETL, OLAP, Data mining; Database Globalization; Emerging Trends in Database Technology (Cloud Computing, Big Data, Internet of Things, Business intelligence etc

MODE OF DELIVERY

Lectures , directed reading, Group/class discussions and practical exercises

INSTRUCTIONAL MATERIALS / EQUIPMENT

Audio visual equipment, Computers, writing boards, writing materials, projectors

COURSE ASSESSMENT

Student Performance

Combination of continuous assessment tests (CAT)(minimum of two sit-in tests), individual assignment, Tutorials, practicals, seminar presentation and end of semester examinations.

Assessment of lecturer's performance

Observation of the lesson by Head of Department and other lecturers, evaluation forms completed by students

RECOMMEND READING MATERIALS

1. *Thomas M. Connolly, Carolyn E. Begg , Database Systems: A Practical Approach to Design, Implementation, and Management, , Addison-Wesley Pub Co, ISBN: 0201342871*
2. *Ron Ben Natan(2011). Database Administration and Security : ISBN-13: 978-1555583347*
3. *Craig S Mullin(2013). Database Administration Second edition. Addison Wesley*
4. *Oracle Education (2010). Oracle 11g Database Administration. Oracle Press*
5. *Scott Gaetjen(2015) . Oracle Database 12c Security Kindle Edition*
6. *Alfred Basta . Database Security 1st Edition. ISBN-13: 978-1435453906*

Journals

1. *Keng Siau .Journal of Database Management (JDM).Missouri University of Science and Technology(USA)*
2. *Journal of Database Management (JDM). ISSN 1533-8010.*
3. *Database Systems Journal.Vol. IV, Issue 1/2013 Issue Topic: Database Administration and Security*
4. *Deepika , Nitasha Soni (2015).International Journal of Advanced Computer Science and Software Engineering. Database Security,:Threats and Security Techniques. Vol 5*
5. *Pradeep Kumar Mittal. International Journal of Advanced Computer Science and Software Engineering. Database Security:Threats and Challenges*

References Recommended For Further Reading

1.*Oracle Database Environment and other resources:*

2. MS-SQL Database Environment and other resources

LECTURER: MR. SIMON MUCHIRI