Course Title	Advanced Topics in DBMS with Database Administration in ORACLE
Course Code	ITEC474
Type	Full Time
Semester	Fall/Spring
Category	AE (Area Elective)
Workload	180 Hours
EMU Credit	(3,1,0)
Prerequisite	ITEC212
Language	English
Level	Fourth Year
Teaching Format	2 Hours Lecture, 2 Hours Laboratory per week
ECTS Credit	6
Course Web Site	http://staff.emu.edu.tr/sebnemcoban

Instructor(s)	Şebnem Çoban – Oracle Certified Associate	**Office Tel**	+90 392 6301677
E-mail	sebnem.coban@emu.edu.tr	**Office No**	CT117

Course Description
The main aim of this course is to provide advanced database management topics using a technology component for database administration. The advanced database management topics consist of discussion lectures on advanced areas of database management in industry. The technology component focuses mainly on Oracle tools for database administration and advanced database management SQL commands. The course covers architecture of a DBMS, responsibilities and tasks of a DBA, installation, logical DB layouts, physical DB layouts, query processing, indexing, and transaction management, data concurrency, logging, managing the development process, user security, flashback recovery and backup / recovery.

General Learning Outcomes
On successful completion of this course students should be able to: ▪ Define relational database concepts and terms ▪ Understand the architecture of a client-server database ▪ Learn database administration process ▪ Define the tasks performed by a DBA (Database Administrator) ▪ Understand DBA tasks using the web browser-based Oracle Enterprise Manager Utility ▪ Understand and practice how to manage control files, redo-log files, archive redo-log files ▪ Understand and practice data concurrency and undo management ▪ Understand and apply flashback technology ▪ Apply backup/recover a database ▪ Apply SQL commands to create and manage database objects ▪ Apply SQL commands to retrieve metadata using data dictionary commands ▪ Apply SQL commands using the web browser-based Oracle SQL Developer Utility ▪ Administer a database via team collaboration ▪ Working with various technical people as database developers, database designers, data analysts, data designer, etc.

Teaching Methodology / Classroom Procedures
▪ Learning topics will be covered in the lectures theoretically and by discussions on real-life sample cases. ▪ A project management case will be given to the whole class. ▪ Different roles in a project team will be selected by the learners and project phases are expected to be completed in collaboration. ▪ The learner can communicate with peers and contribute to the project via social networks at anytime, anywhere.

Course Materials / Main References

Text Book:
Bob Bryla , Kevin Loney. Oracle Database 11g – DBA Handbook. 1st Edition. McGraw Hill, 2008. Print.
 ISBN-13: 978-0071496636
Resource Books:
- David M. Kroenke, David J. Auer. Database *Processing: Fundamentals, Design and Implementation.* 12th Edition. Pearson Prentice-Hall, 2012. Print. ISBN 13: 978-0-13-214537-4

Lecture Notes:
All course materials are also available online in Adobe PDF (Portable Document Format).

Weekly Schedule / Summary of Topics	
Week 1	**Overview of Database Concepts:** Introduction to Oracle Database Administration.
Weeks 2,3	**Architecture of a DBMS:** Oracle database architecture, instance architecture, memory structures, background processes, logical and physical storage structures.
Week 4	**Oracle Database Management Tools:** SQL*Plus, SQL Developer, Calling a SQL script from SQL*Plus, Oracle Enterprise Manager.
Week 5	**Managing the Database Instance:** Initialization Parameter Files, Initialization Parameters, Using SQL*plus to view parameter files, Changing parameter values, starting up Oracle Database instance, shutdown options.
Week 6	**Configuring the Oracle Network Environment:** Oracle Net environment, Listener, creating a listener, Adding a new listener, naming methods, listener.ora, tnsnames.ora.
Week 7	**Managing Database Storage Structures:** Storage of table row data in blocks, tablespaces and data files, Automatic Storage Management (ASM).
Weeks 8, 9	**Midterm Exams**
Week 10	**Administering User Security:** Create and manage database user accounts, grant, revoke privileges, create and manage roles, create and manage privileges.
Week 11	**Managing Undo Data:** Undo segment; Read consistency; Automatic undo management, Undo tablespaces; Sizing Undo tablespace; Obtaining undo segment information. Configure undo retention, Guarantee undo retention.
Week 12	**Managing Data Concurrency:** Describe the locking mechanism and how Oracle manages data concurrency, Monitor and resolve locking conflicts.
Week 13	**Flashback Technology:** Perform Flashback Query, Use Flashback Version Query, Enable row movement on a table, Perform Flashback Table operations, Use Flashback Transaction Query.
Week 14	**Backup and Recovery:** Database backup, restore, recovery, checkpoints, redo log files, and archived log files, SQL.
Week 15	**Introduction to Multitenant architecture:** CDB, PDB, Benefits of multitenant architecture, Oracle Enterprise Manager Database Express (EM Express), Oracle Enterprise Manager Cloud Control (Cloud Control).
Weeks 16,17,18	**Final Exams**

Topics which will be covered in the laboratory sessions

- DDL Statements – Create and Manage Tables
- Creating Other Schemas - View, Sequence, Synonym and Index
- Create and manage database users, controlling the database accounts, roles, privileges, profiles, password security.
- Startup and shutdown the database
- Creating and Managing Data files and Tablespaces
- Data Dictionary and Dynamic Performance Views
- Flashback Query, Flashback Table, Flashback Version Query, Flashback Transaction Query

Requirements

- Plagiarism is not accepted, which means deliberately copying the project of another learner; copying directly from any published work without using quotation marks; failing to acknowledge sources used in submitted assignments with proper citation methods; Re-submitting a project submitted in one course as an original piece of work for this course. Work that shows evidence of plagiarism will be penalized in accordance with the seriousness of the case. This may involve 50% reductions in grades for minor infractions, a failing grade for more serious cases, and in extreme circumstances the disciplinary procedures of the institute may be invoked.
- Only one Make-up examination will be offered to those learners who have not attended. Mid-term and/or the Final Examination and who brings a valid report signed from the EMU Health Center within three days after the exam. The

Make-up examination covers entire course content. The Make-up exam mark will be counted for one missing examination only (Generally for the examination with higher percentage).
- Learners are kindly requested to obey the Instructor's Office hour policy.
- The learners are kindly requested to obey the rules in the LAB.

Method of Assessment				
Evaluation and Grading	**Assignments**	**Project**	**Final Exam**	**Total**
Percentage	%20	%40	%40	%100

Grading Criteria *											
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**D-**	**F**
90 -100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 – 39

* Letter grades will be decided upon after calculating the averages at the end of the semester and distribution of the averages will play a significant role in the evaluation of the letter grades.