

Government of Pakistan

National Vocational and Technical Training Commission

Prime Minister's Hunarmand Pakistan Program

"Skills for All"



Course Contents / Lesson Plan

Course Title: Database Administration (ORACLE DBA Track)

Duration: 3 Months

Revised Edition

Trainer Name	
Course Title	Database Administration (ORACLE DBA Track)
Objectives and Expectations	This is a special course designed to address unemployment in the youth. The course aims to achieve the above objective through hands on practical training delivery by a team of dedicated professionals having rich market/work experience. This course is therefore not just for developing a theoretical understanding/back ground of the trainees. Contrary to that, it is primarily aimed at equipping the trainees to perform commercially in a market space in independent capacity or as a member of a team. The course therefore is designed to impart not only technical skills but soft skills as well as entrepreneurial skills deemed essential for that purpose i.e. communication skills; marketing skills (including freelancing); personal grooming of the trainees and inculcation of the positive work ethics to foster better citizenship in general and improve the image of Pakistani work force in particular. Main Expectations: In short, the course under reference should be delivered by professional instructors in such a robust hands- on manner that the trainees are comfortably able to employ their skills for earning money (through wage/self-employment) at its conclusion. This course thus clearly goes beyond the domain of the traditional training practices in vogue and underscores an expectation that a market centric approach will be adopted as the main driving force while delivering it. The instructors should therefore be experienced enough to be able to identify the training needs for the possible market roles available out there. Moreover, they should also know the strengths and weaknesses of each individual trainee to prepare them for such market roles during/after the training. i. Specially designed practical tasks to be performed by the trainees have been included in the Annexure-I to this document. Their weekly distribution has also been indicated in the weekly lesson plan given in this document. The record of all tasks performed individually or in groups must be preserved by the management of the training Institute clearly labeling name, trade, session etc so that these are ready to be physically inspected/verified through monitoring visits from time to time. The weekly distribution of tasks has also been indicated in the weekly lesson plan given in this document. ii. In order to materialize the main expectations, a special module on Job Search & Entrepreneurial Skills has been included in the course through which, the trainees will be made aware of the Job search techniques in the local as well as international job markets (Gulf countries). Awareness around the visa process and immigration laws of the most favored labour destination countries also forms a part of this module. Moreover, the trainees would also be encouraged to venture into self-employment and exposed to the main requirements in this regard. It is also expected that a sense of civic duties/roles and responsibilities will be inculcated in the trainees to make them responsible citizens of the country.

iii. A module on Work Place Ethics has also been included to highlight the importance of good and positive behavior at work place in the line with the best practices elsewhere in the world. An outline of such qualities has been given in the Appendix to this document. Its importance should be conveyed in a format that is attractive and interesting for the trainees such as through PPT slides + short video documentaries. Needless to say that if the training provider puts his heart and soul into these, otherwise non-technical components, the image of Pakistani workforce would undergo a positive transformation in the local as well as international job markets. In order to maintain interest and motivation of the trainees throughout the course, modern techniques such as:

- Motivational lectures
- Success stories
- Case studies (in documentary or presentation format) These would be employed as additional training tools wherever possible (these are explained in the subsequent section on Training Methodology).

Lastly, evaluation of the competencies acquired by the trainees will be done objectively at various stages of the training and proper record of the same will be maintained. Suffice to say that for such evaluations, practical tasks would be designed by the training providers to gauge the problem solving abilities of the trainees.

(i) Motivational Lectures

The proposed methodology for the training under reference employs motivation as a tool. Hence besides the purely technical content, a trainer is required to include elements of motivation in his/her lecture. To inspire the trainees to utilize the training opportunity to the full and strive towards professional excellence. Motivational lectures may also include general topics such as the importance of moral values and civic role & responsibilities as a Pakistani. A motivational lecture should be delivered with enough zeal to produce a deep impact on the trainees. It may comprise of the following:

- Clear Purpose to convey the message to trainees effectively.
- Personal Story to quote as an example to follow.
- Trainees Fit so that the situation is actionable by trainees and not represent a just idealism.
- Ending Points to persuade the trainees on changing themselves.

A good motivational lecture should help drive creativity, curiosity, and spark the desire needed for trainees to want to learn more.

The impact of a successful motivational strategy is amongst others commonly visible in increased class participation ratios. It increases the trainees' willingness to be engaged on the practical tasks for a longer time without boredom and loss of interest because they can see in their mind's eye where their hard work would take them in short (1-3 years); medium (3 -10 years) and long term (more than 10 years).

As this tool is expected that the training providers would make arrangements for

regular well planned motivational lectures as part of a coordinated strategy interspersed throughout the training period as suggested in the weekly lesson plans in this document.

Course-related motivational lectures online link is available in **Annexure-II**.

(ii) Success Stories

Another effective way of motivating the trainees is using Success Stories. Its inclusion in the weekly lesson plan at regular intervals has been recommended till the end of the training.

A success story may be disseminated orally, through a presentation, or using a video/documentary of someone that has risen to fortune, acclaim, or brilliant achievement. A success story shows how a person achieved his goal through hard work, dedication, and devotion. An inspiring success story contains compelling and significant facts articulated clearly and easily comprehensible words. Moreover, it is helpful if it is assumed that the reader/listener knows nothing of what is being revealed. The optimum impact is created when the story is revealed in the form of:-

- Directly in person (At least 2-3 cases must be arranged by the training institute)
- Through an audio/ videotaped message (2-3 high-quality videos must be arranged by the training institute)

It is expected that the training provider would collect relevant high-quality success stories for inclusion in the training as suggested in the weekly lesson plan given in this document.

The suggestive structure and sequence of a sample success story and its various shapes can be seen in **Annexure III**.

(iii) Case Studies

Where a situation allows, case studies can also be presented to the trainees to widen their understanding of the real-life specific problem/situation and to explore the solutions.

In simple terms, the case study method of teaching uses a real-life case example/a typical case to demonstrate a phenomenon in action and explain theoretical as well as practical aspects of the knowledge related to the same. It is an effective way to help the trainees comprehend in depth both the theoretical and practical aspects of the complex phenomenon in depth with ease. Case teaching can also stimulate the trainees to participate in discussions and thereby boost their confidence. It also makes the classroom atmosphere interesting thus maintaining the trainee interest in training till the end of the course.

Depending on suitability to the trade, the weekly lesson plan in this document may suggest case studies be presented to the trainees. The trainer may adopt a PowerPoint presentation or video format for such case studies whichever is deemed suitable but only those cases must be selected that are relevant and of a learning value.

The Trainees should be required and supervised to carefully analyze the cases. For this purpose, they must be encouraged to inquire and collect specific information/data, actively participate in the discussions, and intended solutions to the problem/situation.

Case studies can be implemented in the following ways: -

	i. A good quality trade-specific documentary (At least 2-3 documentaries must be arranged by the training institute) ii. Health & Safety case studies (2 cases regarding safety and industrial accidents must be arranged by the training institute) iii. Field visits(At least one visit to a trade-specific major industry/ site must be arranged by the training institute)
Entry-level of trainees	Since intake level is Bachelor of Computer Science (BCS)/ADS / B.Sc (Computer Science) so expectations from the trainees are: • Have knowledge of Programming Concepts • Have studied languages such as C, C++, JAVA • Have concept of Computer system
Learning Outcomes of the course	After completion of this course, the trainees must be able to: • Have in-depth understanding of the DBA features of Oracle, specific Oracle concepts and knowledge required for the OCP exam, and tips and techniques for passing the Oracle OCP exam on your first attempt. • Have command on all Oracle Database Administration topics including SGA instance management, file & tablespace management, user administration & security and table & index management. • Gain first-hand experience on the key Oracle DBA concepts required to pass the Oracle OCP exam. In addition, this course will provide sample OCP exam questions and an opportunity to access your overall knowledge of Oracle DBA concepts.
Companies Offering Jobs in the respective trade	Following are the major companies offering job opportunities:- International Companies:- • Zong • Telenor • Google • Intel • Microsoft • Many more Besides overseas employment, the following Pakistani companies/firms/Organizations are also offering jobs as well, with details as

	under:- • Major Hospitals (Like RMI, Aga Khan, Shaukat Khanum, etc.) • NADRA • Ufone • PTCL • NTC • Passport Office • Excise and Taxation Office
Job Opportunities	The pass outs can work in the following capacities:- • Database Administrator • Systems / Data Analyst • SQL Developer • Database Architect • Data Architect • Database Manager
Course Execution Plan	The total duration of the course: 3 months (12 Weeks) Class hours: 4 hours per day Theory: 20% Practical: 80% Weekly hours: 20 hours per week Total contact hours: 240 hours
Instructional Resources	1. Download Oracle software https://www.oracle.com/pk/database/technologies/oracle-database-software-downloads.html 2. Installation of Oracle https://www.youtube.com/watch?v=u3DMXoD7Hg&pp=ygUTb3JhY2xllGluc3RhbGxhdGlvbG%3D%3D 3. Basics of DBMS https://www.youtube.com/watch?v=mqprM5YUdpk&pp=ygUraW50cm9kdWN0aW9uIHVlIGRhdGFhYXNlIG1hbmFnZW1lbnQgc3lzdGVtIA%3D%3D 4. Data Manipulation in Oracle https://www.youtube.com/watch?v=q6ZojdO1zcA&pp=ygUbZGF0YSBtYW5pcHVsYXRpb24gaW4qb3JhY2xl 5. Oracle single row funations https://www.youtube.com/watch?v=qxVKTMT80Fg&pp=ygUbb3JhY2xllHNpbmdsZSByb3cgZnVuY3Rpb25z 6. SQL Joins https://www.youtube.com/watch?v=F-pQGKjZRfM&pp=ygURSm9pbmluZyBpbiBvcmljGU%3D

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| | <ol style="list-style-type: none">7. Aggregate functions and Null values
https://www.youtube.com/watch?v=pn9OI3sSKFE&pp=ygUaYWdncmVnYXRlIGZ1bmN0aW9ucyBpbjBzcWw%3D8. Oracle database backup and Recovery
https://www.youtube.com/watch?v=vPXMemnVzUE&list=PLKCK3OyNwIzvBOMjKFGqrFrdzblOrSZYB |
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Scheduled Weeks		Days	Hours		Home Assignment
Week 1	SQL: SELECT Command	Day 1	Hour 1	• Introduction to Course	• Task 1, 2, 3, 4,5 <u>Details may be seen at Annexure-I</u>
			Hour 2	• Install, create, and administer Oracle Database	
			Hour 3	• Install, create, and administer Oracle Database	
			Hour 4	• Install, create, and administer Oracle Database	
		Day 2	Hour 1	• Basic Select Statements – Selecting All Columns – Selecting Specific Columns	
			Hour 2	• Basic Select Statements – Using Arithmetic Operators – Using Column Aliases – Using the Concatenation Operator	
			Hour 3	• Basic Select Statements – Arithmetic Expressions	
			Hour 4	• Basic Select Statements – Using the Concatenation Operator	
		Day 3	Hour 1	• SELECT FROM WHERE – Limiting Columns Using a Selection – Limiting the Rows Selected	

			Hour 2	• SELECT FROM WHERE – Using the WHERE Clause – Character Strings and Dates – Using Comparison Conditions	
			Hour 3	• SELECT FROM WHERE – Duplicate Rows – Eliminating Duplicate Rows	
			Hour 4	• SELECT FROM WHERE – Using Comparison Conditions	
		Day 4	Hour 1	• SELECT FROM WHERE – Using the between Condition	
			Hour 2	• SELECT FROM WHERE – Using the IN, LIKE, NULL Conditions	
			Hour 3	• SELECT FROM WHERE – Using the IN, LIKE, NULL Conditions	
			Hour 4	• SELECT FROM WHERE – Using the AND, OR, NOT Operators	
		Day 5	Hour 1	• DESCRIBE Command – Displaying Table Structure – Interacting with Script Files	

			Hour 2	• ORDER BY Clause – Sorting in Descending Order	
			Hour 3	• ORDER BY Clause – Sorting by Column Alias – Sorting by Multiple Columns	
			Hour 4	• Operator Precedence • Null Value	
Week 2	SQL Functions	Day 1	Hour 1	• Types of SQL Functions – Single-Row Functions	• Task 6,7,8,9,10,11,12 <i><u>Details may be seen at Annexure-I</u></i>
			Hour 2	– Character Functions – Character-Manipulation Functions	
			Hour 3	– Case Manipulation Functions	
			Hour 4	• Number Functions Using the ROUND, TRUNC, MOD Functions	
		Day 2	Hour 1	• Working with Dates Using Date Functions • Using Arithmetic Operators with Dates	
			Hour 2	• Conversion Functions – Implicit Data-Type Conversion – Explicit Data-Type Conversion	

			Hour 3	• Conversion Functions – Using the TO_CHAR Function with Dates – Using the TO_CHAR Function with Numbers – Using the TO_NUMBER and TO_DATE Functions
			Hour 4	• Nesting Functions
		Day 3	Hour 1	• NVL, NVL2 Functions • NULLIF Function
			Hour 2	• COALESCE Function
			Hour 3	• Conditional Expressions – Using the CASE Expression
			Hour 4	• Conditional Expressions – Using the DECODE Function
		Day 4	Hour 1	• Multi-row Functions – Aggregate Functions
			Hour 2	• AVG, SUM, MIN, MAX, COUNT Functions
			Hour 3	• Group Functions and Null Values – NVL Function with Group Functions
			Hour 4	• GROUP BY Clause • ORDER BY Clause
		Day 5	Hour 1	• Creating Groups of Data: GROUP BY Clause Syntax

			Hour 2	– Grouping by More Than One Column	
			Hour 3	• HAVING Clause	
			Hour 4	• Aggregate Functions and HAVING Clause	
Week 3	SQL Joins and Subqueries	Day 1	Hour 1	• Introduction and purpose of Joins	• Task 13-15 <u>Details may be seen at Annexure-I</u>
			Hour 2	• Joining of multiple tables – Obtaining Data from Multiple Tables	
			Hour 3	• Types of Joins	
			Hour 4	• Outer Joins • Self Joins • Cross Joins	
		Day 2	Hour 1	• Natural Joins	
			Hour 2	• LEFT OUTER JOIN • RIGHT OUTER JOIN • FULL OUTER JOIN	
			Hour 3	• Joining Multiple tables using the AND Operator	
			Hour 4	• Resolving Ambiguous Column Names during the joining of tables	

		Day 3	Hour 1	Joining More than two Tables using AND operator	
			Hour 2	Joining More than two Tables using Natural Join	
			Hour 3	- Creating Joins with the ON Clause - Three-Way Joins with the ON Clause	
			Hour 4	Overview of the overall Joining mechanisms in databases	
		Day 4	Hour 1	- Introduction to subqueries - Subquery Syntax - Guidelines for Using Subqueries	
			Hour 2	- Single-Row Subqueries - Multi-row subqueries - Using the ANY Operator in Multiple-Row Subqueries - Using the ALL Operator in Multiple-Row Subqueries	
			Hour 3	Group Functions in a Subquery	
			Hour 4	HAVING Clause with Subqueries	
		Day 5	Hour 1	- Dealing with variables - DEFINE and UNDEFINE Commands	
			Hour 2	DEFINE Command with & Substitution Variable	

			Hour 3	Multi-level subqueries	
			Hour 4	- Null Values in a Subquery - Using the Substitution Variable	
Week 4	Data Manipulation Language	Day 1	Hour 1	- INSERT Statement Syntax - Inserting New Rows - Inserting Special Values	• Task 16-21 <i><u>Details may be seen at Annexure-I</u></i>
			Hour 2	- Inserting Rows with Null Values - Inserting Specific Date Values	
			Hour 3	Copying Rows from Another Table	
			Hour 4	Using a Subquery in an INSERT Statement	
		Day 2	Hour 1	- The UPDATE Statement Syntax - Updating Two Columns with a Subquery	
			Hour 2	Updating Rows Based on Another Table	
			Hour 3	- Update multiple values in at a time - Update and merge query	
			Hour 4	Updating Rows: Integrity Constraint Error	
		Day 3	Hour 1	- The DELETE Statement - Deleting Rows from a Table	

			Hour 2	Deleting Rows Based on Another Table	
			Hour 3	Deleting Rows: Integrity Constraint Error	
			Hour 4	- The MERGE Statement - MERGE data in table	
		Day 4	Hour 1	- Database Transactions - ACID	
			Hour 2	COMMIT and ROLLBACK Statements	
			Hour 3	Implicit Transaction Processing	
			Hour 4	- Data Before COMMIT or ROLLBACK - Data After COMMIT	
		Day 5	Hour 1	- Read Consistency - Implementation of Read Consistency	
			Hour 2	- Controlling transactions - Managing Database Transactions	
			Hour 3	- Locking 2-Phase Locking protocol	
			Hour 4	- Statement-Level Rollback - Data After ROLLBACK	

Week 5	SQL: Data Definition Language	Day 1	Hour 1	- The CREATE TABLE Statement - Creating a Table by Using a Subquery	• Task 22-27 <i><u>Details may be seen at Annexure-I</u></i>
			Hour 2	- Data Types - Datetime Data Types - Timestamp With Time Zone Data Type - Timestamp With Local Time Data Type - Numeric and text	
			Hour 3	- The ALTER TABLE Statement - Adding a Column - Modifying a Column - Dropping a Column	
			Hour 4	- The ALTER TABLE Statement - Adding constraints - Dropping a Column	
		Day 2	Hour 1	- Dropping a Table - Dropping constraints	
			Hour 2	- The SET UNUSED Option - Truncating a Table	
			Hour 3	- Creating an Index - When to Create an Index - When Not to Create an Index	
			Hour 4	- Synonyms - Creating and Removing Synonyms	

		Day 3	Hour 1	• What Are Constraints? – The NOT NULL Constraint – The UNIQUE Constraint – The PRIMARY KEY Constraint – The FOREIGN KEY Constraint	
			Hour 2	• What Are Constraints? – The NOT NULL Constraint – The UNIQUE Constraint – The PRIMARY KEY Constraint – The FOREIGN KEY Constraint	
			Hour 3	• Adding a Constraint • Dropping a Constraint • Disabling Constraints	
			Hour 4	• Enabling Constraints – Viewing Constraints – Viewing the Columns Associated with Constraints	
		Day 4	Hour 1	• What Is a View? – Creating a View – Why Use Views?	
			Hour 2	• Simple Views and Complex Views – Retrieving Data from a View	

			Hour 3	– Querying a View – Modifying a View				
			Hour 4	• DML commands on View				
		Day 5	Hour 1	• What Is a Sequence? – The CREATE SEQUENCE Statement – Using & Modifying a Sequence				
			Hour 2	• Removing a Sequence • NEXTVAL and CURRVAL Pseudo columns				
			Hour 3	• Use of sequence while inserting new data in table				
			Hour 4	• Querying the Data Dictionary				
		Week 6	Managing Users, Roles and Privileges - Oracle	Day 1		Hour 1	• Introduction to Database Security	• Task 28-32 <u>Details may be seen at Annexure-I</u>
						Hour 2	• DBA responsibilities for security	
Hour 3	• Apply the principle of least privilege							
Hour 4	• Create and manage database user accounts							
Day 2	Hour 1			• Authenticate users				
	Hour 2			• Creating Users – What Is a Role? – Create Role				

			Hour 3	– Privileges – System Privileges – Object Privileges	
			Hour 4	• Creating and Granting Privileges to a Role	
		Day 3	Hour 1	• Granting System Privileges	
			Hour 2	• Granting Object Privileges	
			Hour 3	• Using the WITH GRANT OPTION and PUBLIC Keywords in Grant	
			Hour 4	• Confirming Privileges Granted	
		Day 4	Hour 1	• Creating and using Database Links	
			Hour 2	• Create and assigning roles to users	
			Hour 3	• Revoking System Privileges	
			Hour 4	• Revoking Object Privileges	
		Day 5	Hour 1	• Create and manage profiles	
			Hour 2	• Control resource usage by users	
			Hour 3	• Enable standard database auditing – Specify audit options	

			Hour 4	Review audit information	
Week 7	Oracle Database Architecture	Day 1	Hour 1	Difference between undo data and redo data	•Task 33 <u>Details may be seen at Annexure-I</u>
			Hour 2	Monitor and administer undo data	
			Hour 3	Explain DML and undo data generation	
			Hour 4	Configure undo retention	
		Day 2	Hour 1	Guarantee undo retention	
			Hour 2	Create additional listeners	
			Hour 3	Create Oracle Net Service aliases	
			Hour 4	- Control the Oracle Net Listener - Configure connect-time failover	
		Day 3	Hour 1	Use tnsping to test Oracle Net connectivity	
			Hour 2	Shared servers versus dedicated servers	
			Hour 3	Manage the Automatic Workload Repository (AWR)	
			Hour 4	Use the Automatic Database Diagnostic Monitor (ADDM)	

		Day 4	Hour 1	Oracle Database Instance Configurations	
			Hour 2	Oracle Database Instance Configurations	
			Hour 3	Oracle Database Memory Structures	
			Hour 4	Oracle Database Process Structures	
		Day 5	Hour 1	Logical Database Structures	
			Hour 2	Physical Database Structures	
			Hour 3	Oracle Database Server Architecture	
			Hour 4	Managing Database Instances	
Week 8	Performance and Failure Management	Day 1	Hour 1	Use Enterprise Manager to monitor performance	Task 34,35 <i><u>Details may be seen at Annexure-I</u></i>
			Hour 2	Tune SQL by using the SQL Tuning Advisor	
			Hour 3	Tune SQL by using the SQL Access Advisor	
			Hour 4	- SQL Tuning Advisor - SQL Access Advisor	
		Day 2	Hour 1	Automatic Shared Memory Management	
			Hour 2	Automatic Shared Memory Management	
			Hour 3	Memory Advisor to size memory buffers	

			Hour 4	View performance-related dynamic views	
		Day 3	Hour 1	Identify the types of failure that may occur in an Oracle database	
			Hour 2	Identify the types of failure that may occur in an Oracle database	
			Hour 3	Describe ways to tune instance recovery	
			Hour 4	Checkpoints and its importance in recovery	
		Day 4	Hour 1	redo log files, and archive log files	
			Hour 2	Configure ARCHIVELOG mode	
			Hour 3	Configure ARCHIVELOG mode	
			Hour 4	Concepts of Backup in databases	
		Day 5	Hour 1	Create consistent database backups	
			Hour 2	Back up your database without shutting it down	
			Hour 3	Create incremental backups	
			Hour 4	Automate database backups	
Week 9	Database Recovery	Day 1	Hour 1	Redo log file	• Task 36

			Hour 2	Data file and redo log file	<u>Details may be seen at Annexure-I</u>
			Hour 3	Monitor the flash recovery area	
			Hour 4	Flashback	
		Day 2	Hour 1	Restore the table content to a specific point in the past with Flashback	
			Hour 2	Recover from a dropped table	
			Hour 3	Flashback Versions Query	
			Hour 4	Versions of a row over time with Flashback Versions Query	
		Day 3	Hour 1	Directory objects	
			Hour 2	Create and use directory objects	
			Hour 3	Concept of Data Pump	
			Hour 4	General architecture of Data Pump	
		Day 4	Hour 1	Data Pump Export	
			Hour 2	Data Pump Import	
			Hour 3	Data Pump Export and Import to move data between Oracle databases	

			Hour 4	Use external tables to move data via platform-independent files	
		Day 5	Hour 1	Use SQL*Loader to load data from a non-Oracle database (or user files)	
			Hour 2	Use SQL*Loader to load data from a non-Oracle database (or user files)	
			Hour 3	Moving data from files to database	
			Hour 4	Moving Data from database to flat file	
Week 10	Configuring Recovery Manager	Day 1	Hour 1	Explain the concept and importance of recovery	Task 37,38,39 <i><u>Details may be seen at Annexure-I</u></i>
			Hour 2	Recovery tools	
			Hour 3	Recovery methods	
			Hour 4	RMAN (Recovery MANager)	
		Day 2	Hour 1	RMAN repository	
			Hour 2	RMAN recovery catalog	
			Hour 3	Configure database parameters that affect RMAN operations	
			Hour 4	Configure database parameters that affect RMAN operations	
		Day 3	Hour 1	Retention policies	

			Hour 2	Retention policies and RMAN	
			Hour 3	Recover temporary tablespaces	
			Hour 4	Recover a redo log group member	
		Day 4	Hour 1	Detect database corruption Technique	
			Hour 2	Detect database corruption by using DBMS_REPAIR	
			Hour 3	Recover from a lost index	
			Hour 4	Re-create the password file	
		Day 5	Hour 1	Perform complete or incomplete user- managed recovery	
			Hour 2	Identify situations where incomplete recovery is necessary	
			Hour 3	Perform complete or incomplete recovery by using RMAN	
			Hour 4	Perform incomplete recovery based on time	
Week 11	Oracle: Recovery Manager	Day 1	Hour 1	incomplete recovery in databases	•Task 40,41 <u>Details may be seen at Annexure-I</u>
			Hour 2	Identify situations where incomplete recovery is necessary	

			Hour 3	Complete or incomplete recovery	
			Hour 4	Perform complete or incomplete recovery by using RMAN	
		Day 2	Hour 1	Perform incomplete recovery based on time, SCN	
			Hour 2	Perform incomplete recovery based on log sequence	
			Hour 3	Perform incomplete recovery based on restore points	
			Hour 4	Perform incomplete recovery based on the cancel method	
		Day 3	Hour 1	Methods to Recover automatically	
			Hour 2	Recover an automatically backed up control file	
			Hour 3	Enterprise Manager Recovery	
			Hour 4	Recovery though Flashback	
		Day 4	Hour 1	Guaranteed restore points	
			Hour 2	Use guaranteed restore points with Flashback Database	
			Hour 3	Types of database corruption	

			Hour 4	Causes of database corruption	
		Day 5	Hour 1	Causes of database corruption due to Hardware	
			Hour 2	Causes of database corruption due to Software	
			Hour 3	Detect database corruption by using: ANALYZE	
			Hour 4	Detect database corruption by using: DBVERIFY	
Week 12		Day 1	Hour 1	Detect database corruption by using: DB_BLOCK_CHECKING	•Task 42,43 <u>Details may be seen at Annexure-I</u>
			Hour 2	Detect database corruption by using: DBMS_REPAIR	
			Hour 3	Repair corruptions by using RMAN	
			Hour 4	Repair corruptions by using RMAN	
		Day 2	Hour 1	SGA (Shared Global Architecture)	
			Hour 2	Memory components in the SGA	
			Hour 3	Shared Memory Management	
			Hour 4	Implement Automatic Shared Memory Management	

		Day 3	Hour 1	SGA parameters	
			Hour 2	Manually configure SGA parameters	
			Hour 3	PGA memory	
			Hour 4	Configure automatic PGA memory management	
		Day 4	Hour 1	Diagnose database performance issues	
			Hour 2	Automatic Workload Repository	
			Hour 3	Configure the Automatic Workload Repository	
			Hour 4	Database advisors	
		Day 5	Hour 1	Access the database advisors	
			Hour 2	Use the SQL Access Advisor to improve database performance	
			Hour 3	Perform related DBA tasks:	
			Hour 4	Configure the Database Resource Manager	

Annexure-I

Tasks For Oracle Certified Professional (OCP) Database

Administrator (DBA) Track

Note: The following tasks are required to be performed multiple times by each trainee/group until sufficient proficiency level is acquired. The trainer is required to determine the number of times the task needs to be repeated by a trainee as per his/her low/medium/high level of skill and proficiency during any stage of the course.

Task No.	Task	Description	Week No
1.	Installation / Uninstallation	Install and uninstall Oracle 11g	Week-1
2.	Use of Select command	Select all data from the table. Display the last name concatenated with the job ID, separated by a comma and space. Name this column Employee and Title.	
3.	Use of Select command with Parameters	Show the structure of the EMPLOYEES table. Create a query to display the last name, job code, hire date, and employee number for each employee, with employee number appearing first. Save your SQL statement to a file named lab1_7.sql.	
4.	Use of Select & Unique commands together	Create a query to display unique job codes from the EMPLOYEES table.	
5.	Use of Select & greater Than commands together	Create a query to display the last name and salary of employees earning more than \$12,000. Place your SQL statement in a text file named lab2_1.sql. Run your query.	
6.	Automatically calculate increase in salary by 15% and display new salary	For each employee, display the employee ID number, last-name, salary, and salary increased by 15% and expressed as a whole number. Label the column New Salary. Place your SQL statement in a text file named lab32.sql.	
7.	Display the name of only those employees whose names starts with J, A, or M with first letter capitalized. Also calculate the length of their names	Write a query that displays the employee's last names with the first letter capitalized and all other letters lowercase and the length of the names, for all employees whose name starts with J, A, or M. Give each column an appropriate label. Sort the results by the employees' last names.	Week-2

8.	Calculate the total months of Employment	For each employee, display the employee's last name, and calculate the number of months between today and the date the employee was hired. Label the column MONTHS_WORKED. Order your results by the number of months	
9.	Display only few columns from the table	Write a query to display the last name, department number, and department name for all employees.	Week - 2
10.	Display data of only those employees who earn Commission	Write a query to display the employee last name, department name, location ID, and city of all employees who earn a commission.	
11.	Display only those records whose last name is in lower case letters	Display the employee last name and department name for all employees who have a (lowercase) in their last names. Place your SQL statement in a text file named lab4_4.sql.	
12.	Text manipulation column Names	Display the employee last name and employee number along with their manager's last name and manager number. Label the columns Employee, Emp#, Manager, and Mgr#, respectively. Place your SQL statement in a text file named lab4_6.sql.	
13.	Display the highest, lowest, sum, and average salary of all employees	Display the highest, lowest, sum, and average salary of all employees. Label the columns Maximum, Minimum, Sum, and Average, respectively. Round your results to the nearest whole number. Place your SQL statement in a text file named lab5_6.sql.	Week-3
14.	Display the minimum, maximum, sum, and average salary for each job type	Modify the query in lab5_4.sql to display the minimum, maximum, sum, and average salary for each job type. Resave lab5_4.sql to lab5_5.sql. Run the statement in lab5_5.sql.	
15.	Display the record of employees who earn more than the average salary	Create a query to display the employee numbers and last names of all employees who earn more than the average salary. Sort the results in ascending order of salary.	
16.	Display the details of Executive employees only	Display the department number, last name, and job ID for every employee in the Executive department.	Week-4
17.	Adding data in the first row of table	Add the first row of data to the MY_EMPLOYEE table from the following sample data. Do not list the columns in the INSERT clause.	
18.	Adding data in the second row of table	Populate the MY_EMPLOYEE table with the second row of sample data from the preceding list. This time, list the columns explicitly in the INSERT clause.	
19.	Use of Insert Command	Populate the table with the next two rows of sample data by running the INSERT statement in the script that you created	

20.	Use of insert command for populating table	Populate the table with the last row of sample data by modifying the statements in the script that you created in step 6. Run the statements in the script.	
21.	Delete all records from a Table	Empty the entire table. Confirm that the table is empty.	
22.	Create a Table named Dept	Create the DEPT table based on the following table instance chart. Place the syntax in a script called lab9_1.sql, then execute the statement in the script to create the table.	Week-5
23.	Populate one table with the data of another table	Populate the DEPT table with data from the DEPARTMENTS table. Include only columns that you need.	
24.	Increase the column size of last name column	Modify the EMP table to allow for longer employee last names. Confirm your modification.	
25.	Adding a Primary Key in a table	Add a table-level PRIMARY KEY constraint to the EMP table on the ID column. The constraint should be named at creation. Name the constraint my_emp_id_pk	
26.	Create a View	Create a view called EMPLOYEES_VU based on the employee numbers, employee names, and department numbers from the EMPLOYEES table. Change the heading for the employee name to EMPLOYEE	
27.	Selecting the data from View	Select the view name and text from the USER_VIEWS data dictionary view.	
28.	Use of sequence and primary key constraint	Create a sequence to be used with the primary key column of the DEPT table. The sequence should start at 200 and have a maximum value of 1000. Have your sequence increment by ten numbers. Name the sequence DEPT_ID_SEQ	Week-6
29.	Use of Non-Unique index	Create a nonunique index on the foreign key column (DEPT_ID) in the EMP table.	
30.	Define privileges	You are the DBA. You are creating many users who require the same system privileges. What should you use to make your job easier?	
31.	Grant access to another user	Grant another user access to your DEPARTMENTS table. Have the user grant you query access to his or her DEPARTMENTS table.	
32.	Create a Profile to limit resources	Creating a profile to limit resource consumption • Creating two roles: – HRCLERK – HRMANAGER • Creating four new users: – One manager and two clerks – One schema user for the next practice session	

33.	Configuring Listener	Configure new listener and Oracle Services	Week-7
34.	Tips to improve Performance	What are some tips to improve the performance of SQL queries performance of a Database	Week-8
35.	Archive Log of Database	Configure database into Archive Log. Perform an Online backup.	
36.	Backup Operations	Perform the following • Logical Backups • Cold Backups • Hot Backups (Archive log)	Week-9
37.	Configure RMAN	Configure RMAN, Perform complete database backup using RMAN. Perform Incremental backup using RMAN	Week-10
38.	Detect corruption in RMAN	Detect corruption of the block in the RMAN database, What are the steps to fix this?	
39.	RMAN Recovery	What are the steps to install the RMAN recovery catalog?	
40.	Oracle Flashback drop	Disable and enable Flashback How to use Oracle Flashback drop	Week-11
41.	Recovery	Recover a cold backup using Operating System Command. Recover a data base using Operating System RMAN.	
42.	Recovering Table	Recover a single table, User schema using Imp/Expand Data pump utility	Week-12
43.	How to Enable and disable Automatic Memory	Enable and disable Automatic Memory Management commands .	

Workplace/Institute Ethics Guide

Work ethic is a standard of conduct and values for job performance. The modern definition of what constitutes good work ethics often varies. Different businesses have different expectations. Work ethic is a belief that hard work and diligence have a moral benefit and an inherent ability, virtue, or value to strengthen character and individual abilities. It is a set of values-centered on the importance of work and manifested by determination or desire to work hard.

The following ten work ethics are defined as essential for student success:

1. Attendance:

Be at work every day possible, plan your absences don't abuse leave time. Be punctual every day.

2. Character:

Honesty is the single most important factor having a direct bearing on the final success of an individual, corporation, or product. Complete assigned tasks correctly and promptly. Look to improve your skills.

3. Team Work:

The ability to get along with others including those you don't necessarily like. The ability to carry your weight and help others who are struggling. Recognize when to speak up with an idea and when to compromise by blend ideas together.

4. Appearance:

Dress for success set your best foot forward, personal hygiene, good manner, remember that the first impression of who you are can last a lifetime

5. Attitude:

Listen to suggestions and be positive, accept responsibility. If you make a mistake, admit it. Values workplace safety rules and precautions for personal and co-worker safety. Avoids unnecessary risks. Willing to learn new processes, systems, and procedures in light of changing responsibilities.

6. Productivity:

Do the work correctly, quality and timelines are prized. Get along with fellows,

cooperation is the key to productivity. Help out whenever asked, do extra without being asked. Take pride in your work, do things the best you know-how. Eagerly focuses energy on accomplishing tasks, also referred to as demonstrating ownership. Takes pride in work.

7. Organizational Skills:

Make an effort to improve, learn ways to better yourself. Time management; utilize time and resources to get the most out of both. Take an appropriate approach to social interactions at work. Maintains focus on work responsibilities.

8. Communication:

Written communication, being able to correctly write reports and memos. Verbal communications, being able to communicate one on one or to a group.

9. Cooperation:

Follow institute rules and regulations, learn and follow expectations. Get along with fellows, cooperation is the key to productivity. Able to welcome and adapt to changing work situations and the application of new or different skills.

10. Respect:

Work hard, work to the best of your ability. Carry out orders, do what's asked the first time. Show respect, accept, and acknowledge an individual's talents and knowledge. Respects diversity in the workplace, including showing due respect for different perspectives, opinions, and suggestions.