



**Advanced Diploma in Computer Science (907) – Database Technology**

<b>Prerequisites:</b> Good computing knowledge	<b>Corequisites:</b> A pass or better in Diploma in System Analysis & Design or equivalence.
<b>Aim:</b> This course covers both theory (Database Technology) and practical (Oracle SQL) sessions. Theory focuses on relationship implementation of information system development and entity relationship diagrams. Comprehensive coverage of database technology applications, database fundamentals including: relational database systems, data modelling, normalisation and Entity Relationship Diagrams (ERD). Practical sessions focus on fundamentals of relational databases; relational data model, SQL and basic query formulation.	
<b>Required Materials:</b> Recommended learning resources.	<b>Supplementary Materials:</b> Lecture notes and tutor extra reading recommendations.
<b>Special Requirements:</b> This is a hands-on course, hence practical use of computers is essential. Requires intensive lab work outside of class time.	
<p><b>Intended Learning Outcomes:</b> <i>Oracle SQL (Practical sessions)</i></p> <p>1 Describe a Database Management System (DBMS) and its functions.</p> <p>2 Demonstrate how to write basic SQL statements.</p> <p>3 Describe how to restrict the rows returned from a query by using the WHERE clause</p> <p>4 Define how built-in functions are used in SQL</p> <p>5 Describe how group functions operate on a set of rows to give one result.</p>	<p><b>Assessment Criteria:</b></p> <p>1.1 Analyse components of a relational model</p> <p>1.2 Describe relational database terminology</p> <p>1.3 Describe SQL statements</p> <p>2.1 Analyse components of a basic SELECT statement</p> <p>2.2 Explore rules and guidelines of constructing SQL statements</p> <p>2.3 Investigate different methods of executing SQL statements</p> <p>2.4 Define the keyword * (asterisk)</p> <p>2.5 Define arithmetic expressions in SQL statements</p> <p>2.6 Define NULL values</p> <p>2.7 Define column aliases</p> <p>2.8 Define literal character strings</p> <p>2.9 Define how to suppress duplicate rows</p> <p>2.10 Define SQL file commands</p> <p>2.11 Define SQL editing command</p> <p>3.1 Define how to use the WHERE clause</p> <p>3.2 Define comparison operators</p> <p>3.3 Describe how character strings and dates are used in the WHERE clause</p> <p>3.4 Describe the BETWEEN, IN, LIKE and IS NULL operators</p> <p>3.5 Define SQL wildcard characters</p> <p>3.6 Define logical operators</p> <p>3.7 Define the ORDER BY clause</p> <p>3.8 Understand how to sort in SQL</p> <p>4.1 Define case conversion functions</p> <p>4.2 Define character manipulations functions</p> <p>4.3 Describe number functions</p> <p>4.4 Define functions of SYSDATE</p> <p>4.5 Analyse Oracle date functions</p> <p>5.1 Describe the different types of group functions</p> <p>5.2 Demonstrate how group functions operate with NULL values</p>




<p>6 Describe how to create tables</p>	<p>6.1 Define Oracle data types 6.2 Describe the components of CREATE TABLE statement 6.3 Describe how to INSERT data into a table 6.4 Understand the ALTER TABLE statement 6.5 Demonstrate how to modify a column 6.6 Demonstrate how to drop a column 6.7 Demonstrate how to rename a table 6.8 Demonstrate how to update rows</p>
<p>7 Analyse how constraints are used to prevent invalid data entry into tables.</p>	<p>7.1 Describe data integrity constraints 7.2 Illustrate how to view constraints 7.3 Define a sequence 7.4 Illustrate how to create and implement a sequence</p>
<p><i>Database Technology (Theory sessions)</i> 8 Describe the characteristics of business databases and the features of database management systems.</p>	<p><i>Database Technology (Theory sessions)</i> 8.1 Describe database characteristics. 8.2 Describe Database Management System (DBMS) features, architecture and organizational roles. 8.3 Appreciate the advances in database technology and the contribution of database technology to modern society. 8.4 Define the impact of database management system architectures on distributed processing and software maintenance. 8.5 Perceive career opportunities related to database application development and database administration</p>
<p>9 Describe notations (Entity types, relationships, attributes), cardinalities and relationship patterns.</p>	<p>9.1 Define entities, attributes and relationships 9.2 Define data analysis 9.3 Define relationships 9.4 De able to draw Entity Relationship Diagrams (ERD) 9.5 Define basic notations 9.6 Demonstrate relationships, M-N relationships with attributes, self-referencing relationships, M-way relationships, M-N relationships and 1-M relationships 9.7 Describe diagram rules: completeness rules and consistency rules</p>
<p>10 Outline normalisation. Identify modification anomalies. Define functional dependencies.</p>	<p>10.1 Describe normalisation 10.2 Define 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> normal form</p>

### **Recommended Learning Resources: Database Technology**

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<p><b>Text Books</b></p>	<ul style="list-style-type: none"> <li>• Database Concepts by David M. Kroenke 2<sup>nd</sup> Edition. ISBN 10: 0131451413</li> <li>• Database Design, Application Development &amp; Administration. ISBN 0072942207</li> <li>• Database Management Systems by Jerry Post. ISBN 0072472421</li> <li>• Database Processing – Fundamentals, Design and Implementation. ISBN 10: 0131015141</li> <li>• Relational Database Principles (Paperback) by C. Ritchie (Author). ISBN-10: 0826457134</li> <li>• Relational Database Design and Implementation: Clearly Explained 3e: Clearly Explained (Paperback) by Jan L. Harrington. ISBN-10: 0123747309</li> </ul>
<p><b>Study Manuals</b></p> 	<p>BCE produced study packs</p>
<p><b>CD ROM</b></p> 	<p>Power-point slides</p>
<p><b>Software</b></p> 	<p>Oracle SQL Plus</p>