

<b>Course Title</b>	<b>Database Systems Lab</b>
<b>Course Code</b>	<b>CC-215L</b>
<b>Credit Hours</b>	1
<b>Category</b>	Computing Core
<b>Prerequisite</b>	None
<b>Co-Requisite</b>	None
<b>Follow-up</b>	DI-324: Database Administration and Management
<b>Course Description</b>	<p><b>Introduction to SQL environment:</b> Writing Basic SQL Statements; SELECT Statement, Arithmetic Expressions, Operator Precedence, Null Value, Column Alias, Concatenation Operator, Display table Structure. <b>From Clause:</b> Table list, Table Alias. Restricting and Sorting Data; WHERE Clause, Comparison operators, Logical operators, ORDER BY clause</p> <p><b>Where Clause:</b> Conditions, logical operators and their precedence, order by clause. <b>Single row functions:</b> character functions, number functions, date functions, type conversion functions. <b>Multi row Functions:</b> Sum, Average, Standard deviation, Variance, Subgrouping of data, Group by Clause, use of Having clause. <b>Join:</b> Cross product, natural join, Equi-join, Non equi-join, left outer-join, right outer-join, self-join. <b>Subquery:</b> use of subquery, subquery syntax, Multiple Column Subqueries, pairwise comparison, Non-pair wise comparison, Null Value in a subquery, Subquery in From Clause. <b>Creating and Altering SQL tables:</b> Create table statement, Defining Constraints, Column Level and Table Level, NOT NULL Constraint, UNIQUE Key Constraint, PRIMARY Key Constraint, FOREIGN Key Constraint, CHECK Constraint, Alter table statement, drop statement, <b>Data Manipulation:</b> Insert, Update, Delete statements. <b>SQL Objects:</b> Views, Sequences, Indexes. <b>User Management:</b> Create user, user privileges, user groups, Grant, Revoke statements.</p>
<b>Text Book(s)</b>	1. Michael McLaughlin, Oracle Database 11g PL/SQL Programming, 1 <sup>st</sup> Edition, McGraw-Hill Education, 2008, ISBN: 0071494456.
<b>Reference Material</b>	<ol style="list-style-type: none"> <li>1. Jeffrey A. Hoffer, Ramesh Venkataraman, Heikki Topi, Modern Database Management, 12<sup>th</sup> Edition, Pearson, 2015. ISBN-10: 0133544613.</li> <li>2. Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to Design, Implementation and Management, 6<sup>th</sup> Edition, Pearson, 2015. ISBN-10: 1292061189.</li> </ol>