

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY,
JUNAGADH**



**Curriculum Framework for Post-Graduate Diploma Programme in
PGDCA**

As Per National Education Policy (NEP)-2020

ONE YEAR P.G. Diploma Programme

Semester- II

Effective June-2026

BHAKTA KAVI NARSINH MEHTA UNIVERSITY**Major/Minor****Syllabus of Post Graduate Diploma in Computer Application (PGDCA) as per NEP-2020****Faculty of Science****Effective from June 2026****Subject: Computer Science****SEMESTER- II****SUMMARY OF THE SYLLABUS**

Sem No.	Sr. No .	Categor y of Course	Course Title	Course Code	Cours e Level	Credit	ESE Mark s	CIA Mark s	Total Mark s	Exam Duratio n
Sem -2	1	DSC-6	RDBMS Using Oracle (Theory)	RDBDSC 6	6.0	Theory – 04	70	30	100	02:30 Hrs
	2	DSC-7	RDBMS Using Oracle (Practical)	RDBDSC 7	6.0	Practica l – 04	100	00	100	03:00 Hrs
	3	DSC-8	Web Programmin g Using PHP (Theory)	PHPDSC 8	6.0	Theory – 04	70	30	100	02:30 Hrs
	4	DSC-9	Web Programmin g Using PHP (Practical)	PHPDSC 9	6.0	Practica l – 04	100	00	100	03:00 Hrs
	5	DSC-10	In House Project	PRJDSC1 0	6.5	Practica l – 04	100	00	100	03:00 Hrs
	6	SEC-2	SAD, Software Quality Assurance & Testing	SADSEC 2	6.0	Theory – 02	35	15	50	01:00 Hrs

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Course Level	6.0	Internal Marks	30
Programme	P.G.D.C.A.	External Marks	70
Semester	2	Practical Internal	0
Category of Course	DSC-6	Practical External	0
Course Credit	4	Prac. External Exam Duration	-
Teaching Hours	Theory-60 Practical-00	Total	100
Course Code	RDBDSC6	Exam Duration	2:30 Hrs
Course Title	RDBMS Using Oracle (Theory)		

Objectives:

- Understand the fundamental concepts, architecture, characteristics, and applications of DBMS and RDBMS.
- Explain relational database concepts, Codd's rules, normalization, and database integrity.
- Apply SQL and SQL*Plus commands for defining, manipulating, controlling, and retrieving database information.
- Construct simple and complex SQL queries using joins, subqueries, set operators, special operators, and built-in functions.
- Apply database security and transaction-control mechanisms using users, roles, privileges, COMMIT, ROLLBACK, and SAVEPOINT.
- Create and manage Oracle database objects such as views, sequences, synonyms, indexes, clusters, and database links.
- Explain Oracle backup, recovery, and network connectivity concepts.
- Develop PL/SQL programs using variables, control structures, cursors, exception handling, procedures, functions, packages, triggers, and collections.
- Explain Oracle database architecture, memory and process structures, storage structures, tablespaces, rollback segments, control files, redo logs, and Oracle blocks.
- Apply Oracle database administration and data-management utilities including database creation, startup/shutdown, import, export, and SQL*Loader.

Outcomes:

- Explain the fundamental concepts of DBMS, RDBMS, normalization, SQL, and SQL*Plus.
- Apply SQL commands and advanced queries for creating, manipulating, and retrieving data from relational databases.

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- Demonstrate the use of Oracle database objects, security mechanisms, transaction control, backup/recovery, and connectivity concepts.
- Develop PL/SQL programs using procedural constructs, cursors, exception handling, procedures, functions, packages, triggers, and collections.
- Explain and apply Oracle database architecture, storage structures, database administration operations, and data-loading utilities.

Course Contents

UNIT		Hours
Unit 1	• DBMS Overview ▪ Introduction to DBMS ▪ Introduction to RDBMS ▪ Dr. E. F. Codd Rules ▪ Normalization • SQL and SQL*Plus ▪ Introduction to SQL ▪ SQL Commands and Datatypes ▪ Introduction to SQL*Plus ▪ SQL*Plus formatting commands ▪ Operator and Expression ▪ SQL v/s SQL*Plus	12
Unit 2	• Managing Tables and Data ▪ Creating and Altering tables (Including constraints) ▪ Data Manipulation Command like Insert, update, delete ▪ SELECT statement with WHERE, GROUP BY and HAVING, ORDER BY, DISTINCT, Special operator like IN, ANY, ALL, BETWEEN, EXISTS, LIKE ▪ Join (Inner Join, outer Join, self Join) ▪ Subquery, minus, intersect, union • Built in functions ○ Numerice Function : abs, ceil, exp, floor, greatest, least, log, max, min, rem, round, sign, sqrt ○ Character Function : chr, concat, initcap, lower, ltrim, replace, rtrim, substr, treat, trim, upper ○ Date Function : add_mons, last_cay, monts_between, next_dat, round(date), sysdate, systimestamp, trunc(date), to_date, to_char ○ Aggregate function : sum, count, avg, max, min ○ General functions : coalesce, case, when decode	12

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	• Data Control and Transaction Control Command ▪ Creating user and role ▪ Grant ▪ Revoke ▪ What is Transaction? ▪ Starting and Ending Transaction ▪ Commit, rollback and SavePoint	
Unit 3	• Other Oracle Database objects ▪ View ▪ Sequence ▪ Synonyms, Database Links ▪ Index ▪ Cluster , Snapshot • Backup & Recovery ▪ Backup & Recovery ○ Types of Backups (Control File Backups, Redo Log File Backups, Cold Backups, Hot Backups) • Net 8 ○ What is Net 8? ○ Why use Net 8? ○ Net 8 Features ○ Listener ○ Dispatcher	12
Unit 4	• Introduction to PL/SQL ▪ SQL v/s PL/SQL ▪ PL/SQL Block Structure ▪ Language construct of PL/SQL(Variables, Basic and Composite Data type, Conditions looping etc.) ▪ %TYPE and %ROWTYPE ▪ Using Cursor(Implicit, Explicit) ▪ Exception Handling • Advanced PL/SQL ▪ Creating and Using Procedure,Functions, ▪ Package, ▪ Triggers ▪ Creating Objects, ▪ Object in Database-Table ▪ PL/SQL Tables, Nested Tables, Varrays	12
Unit – 5	• Oracle Database Structure ▪ Instance Architecture ○ Database Processes	12

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	○ Memory Structure. ○ Data files ● Creating & Altering Database ● Opening & shutdown Database ● Initialization Parameter ● Control Files, Redo Logs files ● Tablespace(Create, Alter, Drop) ● Rollback Segment (Create, Alter), (System & Transaction RBS) ● Oracle Blocks ● Import ● Export ● SQL*Loader	
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Suggested Reading:

References Book:

- SQL,PL/SQL The programming Lang.Of Oracle Ivan Bayross – BPB
- Oracle Database 12c The Complete Reference Bob Bryla, Kevin Loney – Oracle Press
- Oracle Database 12c SQL Jason Price – Oracle Press
- Oracle Database 12c PL/SQL Programming McLaughlin – Oracle Press

Web site References:

- <https://www.oreilly.com/library/view/oracle-sqlplus-the/0596007469/ch01s01.html>
- https://docs.oracle.com/cd/B19306_01/server.102/b14357/qstart.htm
- <http://www.sql-plus.com/differences-between-sql-plus-and-sql.php>
- <http://www.oracle.com/us/corporate/features/database-12c/index.htm>

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Course Level	6.0	Internal Marks	00
Programme	P.G.D.C.A.	External Marks	00
Semester	2	Practical Internal	00
Category of Course	DSC-7	Practical External	100
Course Credit	4	Prac. External Exam Duration	3:00 Hrs
Teaching Hours	Theory-00 Practical-120	Total	100
Course Code	RDBDSC7	Exam Duration	-
Course Title	RDBMS Using Oracle (Practical)		

Objectives:

- Understand the fundamental concepts, architecture, characteristics, and applications of DBMS and RDBMS.
- Explain relational database concepts, Codd's rules, normalization, and database integrity.
- Apply SQL and SQL*Plus commands for defining, manipulating, controlling, and retrieving database information.
- Construct simple and complex SQL queries using joins, subqueries, set operators, special operators, and built-in functions.
- Apply database security and transaction-control mechanisms using users, roles, privileges, COMMIT, ROLLBACK, and SAVEPOINT.
- Create and manage Oracle database objects such as views, sequences, synonyms, indexes, clusters, and database links.
- Explain Oracle backup, recovery, and network connectivity concepts.
- Develop PL/SQL programs using variables, control structures, cursors, exception handling, procedures, functions, packages, triggers, and collections.
- Explain Oracle database architecture, memory and process structures, storage structures, tablespaces, rollback segments, control files, redo logs, and Oracle blocks.
- Apply Oracle database administration and data-management utilities including database creation, startup/shutdown, import, export, and SQL*Loader.

Outcomes:

- Explain the fundamental concepts of DBMS, RDBMS, normalization, SQL, and SQL*Plus.
- Apply SQL commands and advanced queries for creating, manipulating, and retrieving data from relational databases.

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- Demonstrate the use of Oracle database objects, security mechanisms, transaction control, backup/recovery, and connectivity concepts.
- Develop PL/SQL programs using procedural constructs, cursors, exception handling, procedures, functions, packages, triggers, and collections.
- Explain and apply Oracle database architecture, storage structures, database administration operations, and data-loading utilities.

Course Contents

UNIT		Hours
Unit 1	• DBMS Overview ▪ Introduction to DBMS ▪ Introduction to RDBMS ▪ Dr. E. F. Codd Rules ▪ Normalization • SQL and SQL*Plus ▪ Introduction to SQL ▪ SQL Commands and Datatypes ▪ Introduction to SQL*Plus ▪ SQL*Plus formatting commands ▪ Operator and Expression ▪ SQL v/s SQL*Plus	24
Unit 2	• Managing Tables and Data ▪ Creating and Altering tables (Including constraints) ▪ Data Manipulation Command like Insert, update, delete ▪ SELECT statement with WHERE, GROUP BY and HAVING, ORDER BY, DISTINCT, Special operator like IN, ANY, ALL, BETWEEN, EXISTS, LIKE ▪ Join (Inner Join, outer Join, self Join) ▪ Subquery, minus, intersect, union • Built in functions ○ Numerice Function : abs, ceil, exp, floor, greatest, least, log, max, min, rem, round, sign, sqrt ○ Character Function : chr, concat, initcap, lower, ltrim, replace, rtrim, substr, treat, trim, upper ○ Date Function : add_mons, last_cay, monts_between, next_dat, round(date), sysdate, systimestamp, trunc(date), to_date, to_char ○ Aggregate function : sum, count, avg, max, min ○ General functions : coalesce, case, when, decode	24

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	• Data Control and Transaction Control Command ▪ Creating user and role ▪ Grant ▪ Revoke ▪ What is Transaction? ▪ Starting and Ending Transaction ▪ Commit, rollback and SavePoint	
Unit 3	• Other Oracle Database objects ▪ View ▪ Sequence ▪ Synonyms, Database Links ▪ Index ▪ Cluster , Snapshot • Backup & Recovery ▪ Backup & Recovery ○ Types of Backups (Control File Backups, Redo Log File Backups, Cold Backups, Hot Backups) • Net 8 ○ What is Net 8? ○ Why use Net 8? ○ Net 8 Features ○ Listener ○ Dispatcher	24
Unit 4	• Introduction to PL/SQL ▪ SQL v/s PL/SQL ▪ PL/SQL Block Structure ▪ Language construct of PL/SQL(Variables, Basic and Composite Data type, Conditions looping etc.) ▪ %TYPE and %ROWTYPE ▪ Using Cursor(Implicit, Explicit) ▪ Exception Handling • Advanced PL/SQL ▪ Creating and Using Procedure,Functions, ▪ Package, ▪ Triggers ▪ Creating Objects, ▪ Object in Database-Table ▪ PL/SQL Tables, Nested Tables, Varrays	24
Unit – 5	• Oracle Database Structure ▪ Instance Architecture ○ Database Processes	24

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	○ Memory Structure. ○ Data files ● Creating & Altering Database ● Opening & shutdown Database ● Initialization Parameter ● Control Files, Redo Logs files ● Tablespace(Create, Alter, Drop) ● Rollback Segment (Create, Alter), (System & Transaction RBS) ● Oracle Blocks ● Import ● Export ● SQL*Loader	
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Suggested Reading:

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- Oracle Database 12c The Complete Reference Bob Bryla, Kevin Loney – Oracle Press
- Oracle Database 12c SQL Jason Price – Oracle Press
- Oracle Database 12c PL/SQL Programming McLaughlin – Oracle Press

Web site References:

- <https://www.oreilly.com/library/view/oracle-sqlplus-the/0596007469/ch01s01.html>
- https://docs.oracle.com/cd/B19306_01/server.102/b14357/qstart.htm
- <http://www.sql-plus.com/differences-between-sql-plus-and-sql.php>
- <http://www.oracle.com/us/corporate/features/database-12c/index.htm>

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CourseLevel	6.0	InternalMarks	30
Programme	P.G.D.C.A.	ExternalMarks	70
Semester	2	PracticalInternal	00
Categoryof Course	DSC-8	PracticalExternal	00
CourseCredit	4	Prac.ExternalExam Duration	-
TeachingHours	Theory- 60 Practical-00	Total	100
CourseCode	PHPDSC8	ExamDuration	2:30 Hrs
CourseTitle	Web programming using PHP (Theory)		

Objectives:

- To introduce static and dynamic web programming.
- To explain client-side and server-side scripting.
- To introduce PHP programming concepts.
- To teach PHP functions and file handling.
- To explain form processing, cookies, and sessions.
- To introduce AJAX and asynchronous communication.
- To teach MySQL database operations using PHP.
- To introduce JSON and web-service concepts.
- To teach jQuery syntax, selectors, events, and effects.
- To introduce jQuery UI interactions and widgets.

Outcomes:

- Explain fundamental web-programming concepts, web-server architecture, client-side and server-side scripting, hosting, and PHP configuration.
- Develop PHP programs using variables, operators, control structures, arrays, functions, string/date/math functions, file handling, and other PHP facilities.
- Implement dynamic web applications using forms, cookies, sessions, file uploads, regular expressions, email, PHP components, AJAX, and server-side processing.
- Apply SQL, MySQL, phpMyAdmin, and MySQLi to develop database-driven PHP applications and perform database operations.
- Develop interactive web applications using JSON/XML, jQuery, AJAX, jQuery events/effects, and jQuery UI interactions and widgets.

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UNIT		Hours
Unit 1	Web Programming: ▪ Static and Dynamic Web ▪ Client side & Server side Scripting ▪ Introduction to other Server side languages ▪ Webserver (IIS & Apache) ▪ Web Hosting, Virtual Host, Multi-Homing ▪ Distributed Web Server Overview PHP Basics: ▪ Introduction to PHP ▪ PHP configuration in IIS & Apache Web server ▪ Understanding of PHP.INI file ▪ Understanding of PHP .htaccess file ▪ PHP variable ▪ Static & Global variables ▪ GET & POST method ▪ PHP Operators ▪ Conditional Structure & Looping Structure ▪ Array	12
Unit 2	PHP Function: • User Defined Functions: ○ argument function ○ default argument function ○ variable function ○ return function • Variable Length Argument Functions: func_num_args, func_get_arg, func_get_args • Variable Functions: gettype, settype, isset, unset, strval, floatval, intval, print_r • String Functions: chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, trim, substr, strcmp, strcasecmp, strpos, strrpos, strstr, stristr, str_replace, strrev, echo, print, explode, implode, join, md5, str_split, str_shuffle, ucfirst, ucwords. • Math Functions: abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand, bindec, decbin, hexdec, dechex, is_finite, is_infinite • Date Functions: date, getdate, setdate, checkdate, time, mktime, date_add, date_create, date_format, gmdate, localtime, strftime • Array Functions: count, list, in_array, current, next, previous,	12

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	end, each, sort, rsort, assort, arsort, array_merge, array_reverse, array_diff, array_unique, array_key_exists, array_push, array_pop, array_search • Miscellaneous Functions: define, constant, include, require, header, die, exit • File Handling Functions: fopen, fread, fwrite, fclose, file_exists, is_readable, is_writable, fgets, fgetc, file, file_get_contents, fputs, file_put_contents, ftell, fseek, rewind, copy, unlink, rename, move_uploaded_file.	
Unit 3	Handling Form, Session Tracking & PHP Components ▪ Handling form with GET & POST ▪ Cookie ▪ Session ▪ Server Variable ▪ PHP Components: ○ PHP GD Library ○ PHP Regular expression ○ Uploading file ○ Sending mail using mail() ○ Sending mail using smtp() AJAX: ▪ What is AJAX? ▪ PHP with AJAX ▪ How AJAX works with PHP ▪ Working with AJAX as background process ▪ Using JQuery with PHP ▪ JQuery AJAX with PHP	12
Unit 4	Introduction of SQL, MySQL Functions • Working with MySQL using PhpMyAdmin • SQL DML Statement (Insert, Update, Select, Delete) • MySQLi Functions: mysqli_connect, mysqli_select_db, mysqli_query, mysqli_affected_rows, mysqli_num_row, mysqli_autocommit, mysqli_commit, mysqli_fetch_array, mysqli_fetch_assoc, mysqli_fetch_object, mysqli_fetch_row, mysqli_prepare	12
Unit 5	Web Services: ▪ XML and JSON ▪ Introduction to JSON ▪ Installation & Configuration ▪ Resource Types	12

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	▪ JsonSerializable ▪ JSON Functions: json_decode, json_encode JQuery: ▪ What is jQuery? ▪ jQuery Syntax ▪ jQuery Selector: Element Selector , Class Selector, ID Selector ▪ jQuery Events: - click, dblclick, keypress, keydown, keyup, submit, change, focus, blur, load, resize, scroll, unload ▪ jQuery Effects: hide show, fade, slide JQueryUI: ▪ Introduction JQueryUI ▪ JQueryUI Interactions (draggable, droppable, resizable , selectable, sortable) ▪ JQueryUI Widgets (accordion, autocomplete, button, datepicker, Dialog, Menu, Progressbar, slider, spinner, tabs, tooltip)	
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Suggested Reading:

References Book:

- Modern PHP: New Features and Good Practices Josh Lockhart (ORELLY)
- PHP Cookbook: Solutions & Examples for PHP Programmer David Sklar and Adam
- Programming PHP Kevin Tatro and Peter MacIntyre ORELLY)
- PHP for the Web: Visual QuickStart Guide (4th Edition) Larry Ullman (Peachpit Press)

Web site References:

- <http://php.net/manual/en/book.mysqli.php>
- https://www.w3schools.com/php/php_ref_mysqli.asp
- <https://www.tutorialspoint.com/index.htm>

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CourseLevel	6.0	InternalMarks	00
Programme	P.G.D.C.A.	ExternalMarks	00
Semester	2	PracticalInternal	00
Categoryof Course	DSC-9	PracticalExternal	100
CourseCredit	4	Prac.ExternalExam Duration	3:00 Hours
TeachingHours	Theory- 00 Practical - 120	Total	100
Course Code	PHPDSC9		
CourseTitle	Web programming using PHP (Practical)		

Objectives:

- To introduce static and dynamic web programming.
- To explain client-side and server-side scripting.
- To introduce PHP programming concepts.
- To teach PHP functions and file handling.
- To explain form processing, cookies, and sessions.
- To introduce AJAX and asynchronous communication.
- To teach MySQL database operations using PHP.
- To introduce JSON and web-service concepts.
- To teach jQuery syntax, selectors, events, and effects.
- To introduce jQuery UI interactions and widgets.

Outcomes:

- Explain fundamental web-programming concepts, web-server architecture, client-side and server-side scripting, hosting, and PHP configuration.
- Develop PHP programs using variables, operators, control structures, arrays, functions, string/date/math functions, file handling, and other PHP facilities.
- Implement dynamic web applications using forms, cookies, sessions, file uploads, regular expressions, email, PHP components, AJAX, and server-side processing.
- Apply SQL, MySQL, phpMyAdmin, and MySQLi to develop database-driven PHP applications and perform database operations.
- Develop interactive web applications using JSON/XML, jQuery, AJAX, jQuery events/effects, and jQuery UI interactions and widgets.

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UNIT		Hours
Unit 1	Web Programming: ▪ Static and Dynamic Web ▪ Client side & Server side Scripting ▪ Introduction to other Server side languages ▪ Webserver (IIS & Apache) ▪ Web Hosting, Virtual Host, Multi-Homing ▪ Distributed Web Server Overview PHP Basics: ▪ Introduction to PHP ▪ PHP configuration in IIS & Apache Web server ▪ Understanding of PHP.INI file ▪ Understanding of PHP .htaccess file ▪ PHP variable ▪ Static & Global variables ▪ GET & POST method ▪ PHP Operators ▪ Conditional Structure & Looping Structure ▪ Array	24
Unit 2	PHP Function: • User Defined Functions: ○ argument function ○ default argument function ○ variable function ○ return function • Variable Length Argument Functions: func_num_args, func_get_arg, func_get_args • Variable Functions: gettype, settype, isset, unset, strval, floatval, intval, print_r • String Functions: chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, trim, substr, strcmp, strcasecmp, strpos, strrpos, strstr, stristr, str_replace, strrev, echo, print, explode, implode, join, md5, str_split, str_shuffle, ucfirst, ucwords. • Math Functions: abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand, bindec, decbin, hexdec, dechex, is_finite, is_infinite • Date Functions: date, getdate, setdate, checkdate, time, mktime, date_add, date_create, date_format, gmdate, localtime, strftime • Array Functions: count, list, in_array, current, next, previous,	24

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	end, each, sort, rsort, assort, arsort, array_merge, array_reverse, array_diff, array_unique, array_key_exists, array_push, array_pop, array_search • Miscellaneous Functions: define, constant, include, require, header, die, exit • File Handling Functions: fopen, fread, fwrite, fclose, file_exists, is_readable, is_writable, fgets, fgetc, file, file_get_contents, fputs, file_put_contents, ftell, fseek, rewind, copy, unlink, rename, move_uploaded_file.	
Unit 3	Handling Form, Session Tracking & PHP Components ▪ Handling form with GET & POST ▪ Cookie ▪ Session ▪ Server Variable ▪ PHP Components: ○ PHP GD Library ○ PHP Regular expression ○ Uploading file ○ Sending mail using mail() ○ Sending mail using smtp() AJAX: ▪ What is AJAX? ▪ PHP with AJAX ▪ How AJAX works with PHP ▪ Working with AJAX as background process ▪ Using JQuery with PHP ▪ JQuery AJAX with PHP	24
Unit 4	Introduction of SQL, MySQL Functions • Working with MySQL using PhpMyAdmin • SQL DML Statement (Insert, Update, Select, Delete) • MySQLi Functions: mysqli_connect, mysqli_select_db, mysqli_query, mysqli_affected_rows, mysqli_num_row, mysqli_autocommit, mysqli_commit, mysqli_fetch_array, mysqli_fetch_assoc, mysqli_fetch_object, mysqli_fetch_row, mysqli_prepare	24
Unit 5	Web Services: ▪ XML and JSON ▪ Introduction to JSON ▪ Installation & Configuration ▪ Resource Types	24

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	▪ JsonSerializable ▪ JSON Functions: json_decode, json_encode JQuery: ▪ What is jQuery? ▪ jQuery Syntax ▪ jQuery Selector: Element Selector , Class Selector, ID Selector ▪ jQuery Events: - click, dblclick, keypress, keydown, keyup, submit, change, focus, blur, load, resize, scroll, unload ▪ jQuery Effects: hide show, fade, slide JQueryUI: ▪ Introduction JQueryUI ▪ JQueryUI Interactions (draggable, droppable, resizable , selectable, sortable) ▪ JQueryUI Widgets (accordion, autocomplete, button, datepicker, Dialog, Menu, Progressbar, slider, spinner, tabs, tooltip)	
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Suggested Reading:

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- Modern PHP: New Features and Good Practices Josh Lockhart (ORELLY)
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- PHP for the Web: Visual QuickStart Guide (4th Edition) Larry Ullman (Peachpit Press)

Web site References:

- <http://php.net/manual/en/book.mysql.php>
- https://www.w3schools.com/php/php_ref_mysql.asp
- <https://www.tutorialspoint.com/index.htm>

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Course Level	6.5	Internal Marks	00
Programme	P.G.D.C.A.	External Marks	00
Semester	2	Practical Internal	00
Category of Course	DSC-10	Practical External	100
Course Credit	4	Prac. External Exam Duration	-
Teaching Hours	Theory- 00 Practical - 120	Total	100
Course Code	PRJDSC10	Exam Duration	3:00 Hrs
Course Title	In House Project Development		

Course Contents

Module	Content	Hours
1	Project Development (In-house) With any of the Minor or Major Subject Basics.	120

Suggestive assessment scheme:

Component	Marks	Type
External Practical	25	Proposal, Flowcharts and Diagrams, attendance
	25	Code Implementation and Testing
	50	Final report, viva, project presentation

Guidelines:

- Project must be developed in the computer laboratory of concern institute under the supervision of faculties of concern institute on any subject of previous semester or current semester.
- At the time of Project-Viva examination student must show all the Workouts, SDLC, Documentation, Program codes and project in running mode.
- The guide shall monitor progress of the student continuously. A student is required to present the progress of the Project work during the semester as per the schedule provided by the Guide.
- Student has to submit a hard copy of Project Report, workbook and a copy of Project as per guide suggestion.
- Project submission should follow the guide's schedule, with a mandatory live demonstration during the viva, supported by a multimedia presentation.

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CourseLevel	6.0		InternalMarks	15
Programme	P.G.D.C.A.		ExternalMarks	35
Semester	2		PracticalInternal	00
Categoryof Course	SEC-2		PracticalExternal	00
CourseCredit	2		Prac.ExternalExam Duration	-
TeachingHours	Theory-30 Practical-00		Total	50
CourseCode	SADSEC2		ExamDuration	1:00Hrs
CourseTitle	SAD, SOFTWARE QUALITY & ASSURANCE TESTING			

Objectives:

- Define system, subsystem, information system, SDLC, software engineering, bug, error, defect, fault, failure, test case, test plan, black-box testing, white-box testing
- Explain system analyst role, SDLC, fact-finding methods, DFD, data dictionary, testing types, verification/validation, testing levels and SDLC models
- Conduct fact finding, construct DFDs, construct decision trees/tables, prepare data dictionaries, create test cases, apply equivalence partitioning and boundary value analysis
- Analyze business rules, DFDs, software failures, testing requirements, state transitions, code coverage and project characteristics
- Select appropriate fact-finding techniques, testing techniques, test levels and SDLC models; evaluate advantages/limitations
- Develop system models, decision tables, DFDs, data dictionaries, test cases, test suites, test plans and testing strategies

Outcomes:

- Explain fundamental concepts of system analysis, information systems, software engineering, SDLC, and software testing.
- Apply fact-finding and system documentation techniques to analyze software systems and represent their processes using decision trees, decision tables, DFDs, and data dictionaries.
- Identify and explain software errors, bugs, defects, faults, failures, and fundamental testing artifacts.
- Apply appropriate software testing techniques, including black-box, white-box, grey-

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box, and non-functional testing, to design effective test cases.

- Analyze and differentiate software testing levels, verification and validation approaches, and various testing techniques.
- Evaluate and select an appropriate Software Development Life Cycle model and testing approach based on project requirements, risks, and constraints.

Course Contents

UNIT		Hours
Unit 1	• System Analysis & Design AND Software Engineering ▪ Definitions: • What is system • Subsystem, • business system • Information system • System Analyst Role: • Information Analyst • Systems Designer & Programmer • SDLC ○ Fact - finding techniques(Interview, Questionnaire, Record review and observation) • Tools for Documenting Procedures and Decisions ○ Decision Trees and Decision Tables • Data Flow analysis Tool ○ Types of DFD ○ DFD(context and zero level) and Data Dictionary • Software Engineering (Brief introduction) • Basic of Software Testing ▪ Introduction to software Testing ▪ Software faults and failures ○ Bug ○ Error ○ Defect ○ Faults ○ Failures ▪ Testing Artifacts ○ Test case ○ Test Script ○ Test Plan ○ Test Suite	15
Unit 2	Types of software Testing, Verification and Validation ▪ Static Testing ▪ Dynamic Testing ▪ Test Levels ○ Unit testing ○ Integration Testing	15

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	○ System Testing ▪ Techniques of software Testing ▪ Black Box Testing ○ Equivalence Partitioning ○ Boundary Data Analysing ○ Decision Table Testing ○ State Transition Testing ▪ White Box Testing ▪ Statement testing and coverage ▪ Decision testing and coverage ▪ Grey Box Testing ▪ Non-functional Testing • Performance Testing • Stress Testing • Load Testing • Usability Testing • Security Testing Software Development Life Cycle ▪ Waterfall Model ▪ Iterative Model ▪ V-Model ▪ Spiral Model ▪ Big Bang Model ▪ Prototyping Model	
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Suggested Reading:**References Book:**

Book	Author(s)	Edition / Publication	Publisher	Major syllabus coverage
Systems Analysis and Design	Scott Tilley	12th Ed., 2019/2020	Cengage	Systems, system analyst, SDLC, fact-finding, DFD, system analysis/design
Software Engineering	Ian Sommerville	10th Ed., 2021	Pearson	Software engineering, software processes, SDLC models, requirements, testing
Software Testing: Principles and Practices	Srinivasan Desikan & Gopalaswamy Ramesh	1st Ed., 2016	Pearson Education	Testing principles, testing types, white-box/black-box testing, SDLC and testing
Software	Ron Patton	2nd Ed.	Sams/Pearson	Testing fundamentals, test

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Book	Author(s)	Edition / Publication	Publisher	Major syllabus coverage
Testing				cases, test plans, test techniques
Software Testing Techniques	Boris Beizer	2nd Ed., 1990	Van Nostrand Reinhold	Black-box techniques, decision tables, state-transition testing, coverage, unit/integration/system testing

Web site References:

- http://en.wikipedia.org/wiki/Software_testing
- <http://www.onestoptesting.com/>
- <http://www.opensourcetesting.org/functional.php>

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Sr. No.	Evaluation Component	4-Credit Subjects (Marks)	2-Credit Subjects (Marks)
1	Assignments, seminars, quizzes, mid-term tests, lab records, presentations, Term Paper, Viva-voce, Projects/Surveys/Field visits, Journal Writing (Any three – 5 marks each for 4-credit; anyone – 5 marks for 2-credit)	15	05
2	Mid-Term Evaluation	15	10
TOTAL		30	15

Structure of the External Question Paper (4 Credit)

Ques. No.	Particulars	From which Unit	Marks
1	Questions (Any Two Out Of Four)	1	14
2	Questions (Any Two Out Of Four)	2	14
3	Questions (Any Two Out Of Four)	3	14
4	Questions (Any Two Out Of Four)	4	14
5	Questions (Any Two Out Of Four)	5	14
		Total Marks	70

Structure of the External Question Paper (2 Credit)

Ques. No.	Particulars	From which Unit	Marks
1	Questions (Any Two Out Of Four)	1	14
2	Questions (Any Two Out Of Four)	2	14
3	Questions (Any Two Out Of Four)	From Each Unit	07
		Total Marks	35

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Note: This syllabus has been prepared in accordance with the Regulations for Curriculum and Credit Framework for Postgraduate Programmes (Effective from Academic Year 2026–2027) of Bhakta Kavi Narsinh Mehta University (BKNMU) and is aligned with the National Education Policy (NEP) 2020 and the UGC Curriculum and Credit Framework for Postgraduate Programmes (CCFPG), 2024. The teaching-learning process, assessment, examination, credit requirements, and all other academic provisions shall be governed by the applicable regulations, ordinances, notifications, and guidelines issued by BKNMU from time to time.

This syllabus is prepared with reference to BKNMU Reference No.: બીકેએનએમયુ / એકેડેમિક/૧૪૪૮ / ૨૦૨૬, Dated: 16/06/2026, titled Regulations for Curriculum and Credit Framework for Postgraduate Programmes (Effective from Academic Year 2026–2027).

The official regulations are available at:

<https://bknmu.edu.in/uploads/assest/regulationsforcurriculumandcreditframeworkforpostgraduateprogrammes06162026014654800.pdf>