BACHELOR OF COMPUTER APPLICATIONS

Curriculum and Syllabus

(For Students admitted from academic year 2022– 2023 onwards)

UNDER CHOICE BASED CREDIT SYSTEM

[Regulations 2019]

DIRECTORATE OF DISTANCE EDUCATION
SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
SRM NAGAR, KATTANKULATHUR – 603 203

BACHELOR OF COMPUTER APPLICATIONS
(For Students admitted from academic year 2022 - 2023 onwards)
CURRICULUM

SEMESTER V

Course Code	Course Title	L	T	P	L+T+P	C
BCAD1951	**SOFTWARE ENGINEERING AND TESTING**	**4**	**0**	**0**	**4**	**4**

INSTRUCTIONAL OBJECTIVES At the end of this course the learner is expected:		**Student Outcomes**				
1.	To classify the various Software Process Models	a		l		
2.	To understand the Software Testing Concepts.		e			
3.	To implement the Software Quality and Control Concepts		b			j
4.	To Design the Test cases and to get familiarity over Automated Testing tools	a				j

UNIT I - THE PRODUCT AND THE PROCESS

The Evolving Role of Software– Software Characteristics– Software Applications– Software: A Crisis on the Horizon?- Software Myths- Software Engineering: A Layered Technology– The Software Process– Software Process Models– The Linear Sequential Model– The Prototyping Model- The RAD Model- Evolutionary Software Process Models- Component-Based Development.

UNIT II - SYSTEM ENGINEERING AND ANALYSIS CONCEPTS

Computer-Based Systems– The System Engineering Hierarchy – Business Process Engineering: An Overview– Product Engineering: An Overview– Requirements Engineering– System Modeling– Requirement Analysis- Requirements Elicitation for Software- Software Prototyping- Specification- Specification Review.

UNIT III PRINCIPLES OF TESTING

PRINCIPLES OF TESTING: Introduction - Phases of software – Quality assurance and Quality control - Testing verification and validation - TECHNIQUES: White box - static testing - structural testing - challenges in white box testing - Black box testing.

UNIT IV - TYPES OF TESTING

TYPES OF TESTING: Integration testing - Top-Down Integration – Bottomup integration-Bi-Directional Integration - System - Integration – SYSTEM ACCEPTANCE TESTING: Functional versus Non Functional Testing - Functional System Testing - Non Functional Testing Acceptance Testing.

UNIT V - PERFORMANCE TESTING

PERFORMANCE TESTING: Introduction - Factors of governing - performance testing - Methodology for performance testing - Tools for performance testing - Process for performance Testing – REGRESSION TESTING : Introduction - Types regression testing - Best pratice in regression testing.

TEXT BOOKS

1. Roger S. Pressman, (2001), "*Software Engineering* ", Fifth edition, McGraw-Hill Higher Education - A Division of The McGraw-Hill Companies.
2. Srinivasan Desikan and Gopalasamy Ramesh, "*Software Testing for Principles and Practices*", Person Education,.

REFERENCES

1. William E. Perry (2006), "*Effective Methods of Software Testing*", 3rd Ed, Wiley India.
2. Renu Rajani, Pradeep Oak (2007), *"Software Testing"*, TMH.

Course Nature: Theory				
Assessment Method(Maximum marks)				
In Semester	Assessment Tool	Assignment I	Assignment II	Total
	Marks	15	15	30
End Semester				70
Total				100

Course Code	Course Title	L	T	P	L+T+P	C
BCAD1952	PHP AND MYSQL PROGRAMMING	4	0	0	4	4

INSTRUCTIONAL OBJECTIVES At the end of this course the learner is expected:		Student Outcomes				
1.	To Understand PHP and MYSQL	a	i			
2.	To have clear understanding about the Network programming	a	c	e		

UNIT I - BASICS OF PHP

Introduction to PHP – what does PHP Do? – a brief history of PHP – language basics – lexical structure – data types – variables – expressions and operators – flow control statements – including code – embedding PHP in web pages.

UNIT II - FUNCTIONS & STRINGS

Functions & Strings: Calling a function – defining a function – variable scope – function parameters – return values – variable functions – anonymous functions. Strings: Accessing individual characters – cleaning strings – encoding and escaping – comparing strings – manipulating and searching strings – regular expression.

UNIT III - ARRAYS & OBJECTS

Arrays and Objects : Indexed Vs associative arrays – identifying elements of an array – storing data in arrays – multidimensional arrays – extracting multiple values – converting between arrays and variables – traversing arrays – sorting. Objects: Creating an object – accessing properties and methods – declaring a class – introspection.

UNIT IV - MYSQL AN OVERVIEW

Introduction – connecting to and disconnecting from the server – Entering queries – Creating and using a database – Creating and selecting a database – creating a table – loading data into a table – Retrieving information from a table – selecting all data – selecting particular rows – selecting particular columns – sorting rows – date calculations – working with NULL values – pattern matching – counting rows – using more than one tables.

UNIT V - MYSQL DATABASES IN PHP

Introduction – connecting to a MySQL database – querying the database – Retrieving and displaying the results – modifying data – deleting data. Designing simple applications.

TEXT BOOKS

1. Rasmus Lerdorf, Kevin Tatroe, Bob Kaehms, Ric McGredy (2002), Programming PHP, O'REILLY(SPD). (Unit I,II & III)
2. Lee Babin, Nathan A. Good, Frank M. Kromann, Jon Stephens (2005), "PHP 5 Recipes, A problem solution approach", après.(Unit IV & V)

REFERENCE

1. Vikram Vaswani (2008), PHP: A BEGINNER'S GUIDE, McGraw-Hill.

Course Nature: Theory				
Assessment Method(Maximum marks)				
In Semester	Assessment Tool	Assignment I	Assignment II	Total
	Marks	15	15	30
End Semester				70
Total				100

Course Code	**Course Title**	**L**	**T**	**P**	**L+T+P**	**C**
BCAD1953	**OPERATING SYSTEM**	**4**	**1**	**0**	**5**	**5**

INSTRUCTIONAL OBJECTIVES At the end of this course the learner is expected:		**Student Outcomes**				
1.	To learn different types of Operating Systems	a		l		
2.	To Perform Scheduling and memory management.		e			
3.	To Handle Components of Operating System and Deadlocks		b			j

UNIT - INTRODUCTION

Definition – Mainframe system – Desktop Systems – Multiprocessor systems – Distributed systems – clustered systems – Real time and Hand held systems – System components – OS Services – System Calls – Programs.

UNIT II - PROCESSES & SCHEDULING

Process concepts – Process Scheduling – operation on Process – Cooperating process – IPC – CPU Scheduling: Basic Concepts – Scheduling criteria – Scheduling algorithms – Multiprocessor Scheduling – Real time Scheduling.

UNIT III - PROCESS SYNCHRONIZATION

Background – The critical Section problem – synchronization hardware – semaphores – Classic Problems of Synchronization - critical Regions – Monitors.

UNIT IV - DEADLOCKS

System model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock prevention – Deadlock Avoidance – Deadlock Detection and Recovery from Deadlock.

UNIT V - MEMORY MANAGEMENT

Swapping – Contiguous memory Allocation – Paging – segmentation – segmentation with paging – Demand Paging – Process creation – Page Replacement – Thrashing

TEXT BOOK

1. Abraham Silberschatz, Peter Baer Galvin & Greg Gagne (2006), "Operating System Concepts", Sixth Edition, John Wiley & Sons, Inc.

REFERENCES

1. Milankovic M (1992),"Operating System concepts and Design, 2nd edition, Tata Mcgraw hill.
2. Deitel H.M. (2002), "An Introduction to Operating Sysems",2nd edition, Pearson Education.

Course Nature: Theory				
Assessment Method(Maximum marks)				
In Semester	Assessment Tool	Assignment I	Assignment II	Total
	Marks	15	15	30
End Semester				70
Total				100

Course Code	Course Title	L	T	P	L+T+P	C
BCAD1954	PHP AND MYSQL PROGRAMMING LABORATORY	0	0	4	4	2

INSTRUCTIONAL OBJECTIVES At the end of this course the learner is expected:		Student Outcomes				
1.	To acquire basic knowledge about programming in PHP	a	b			
2.	To acquire basic knowledge about MYSQL database	a	b			
3.	To develop the skills in spplying the tools for solving basic problems in computer networks			c	e	

LIST OF EXPERIMENTS

1. Creating simple webpage using PHP
2. Use of conditional statements in PHP
3. Use of looping statements in PHP
4. Creating different types of arrays
5. Usage of array functions
6. Creating user defined functions
7. Creating simple applications using PHP
8. Creating simple table with constraints
9. Insertion, Updation and Deletion of rows in MYSQL tables
10. Searching of data by different criteria
11. Sorting of data
12. Working with string and date functions
13. Database connectivity in PHP with MySQL

Any Application Using PHP and MySQL based on syllabus can be included.

Course Nature: Practical					
Assessment Method(Maximum marks)					
In Semester	Assessment Tool	Practical exercises - I	Practical exercises - II	Practical exercises - III	Total
		10	10	10	**30**
End Semester		Practicals			**70**
				Total	**100**

Course Code	Course Title	L	T	P	L+T+P	C
BCAD1955	INTRODUCTION TO R PROGRAMMING	0	2	2	4	3

INSTRUCTIONAL OBJECTIVES At the end of this course the learner is expected:		Student Outcomes				
1.	To learn about R Programming	c				
2.	To understand the basics of R Programming	b	d			
3.	To analyze and acquire knowledge in Data Science using R Language		d			
4.	To write codes for various operations of Statistical Models		e	l		

UNIT - I

INTRODUCTION TO R : The R Evironment – CLI – Rstudio – Revolution Analytics RPE – Installing, Loading, Building Packages – Basic Math – Variables, Datatypes, Vectors – Calling Functions – Missing Data

UNIT - II

DATA STRUCTURES: data.frames – Lists – Matrices – Arrays – Reading CSVs – Excel Data – Reading from Databases – Data From Statistical Tools – R binary Files – Extract Data from Web sites

UNIT - III

GRAPHICS AND FUNCTIONS: Base Graphics – ggplot2 – Writing R Functions – Function Arguments – Return Values – do.call

UNIT - IV

CONTROL STATEMENTS AND LOOPS: if and else – switch – ifelse – Compound Tests – for Loops – while Loops – Conrolling Loops – Group Manipulation – Data Reshaping – Manipulating Strings

UNIT - V

PROBABILITY DISTRIBUTION AND STATISTICS : Normal Distribution – Binomial Distribution – Poisson Distribution – Other Distribution – Summary Statistics – Correlation and Covariance – T-Tests – ANOVA – Linear an Non Linear Models

TEXT BOOK

1. Jared P.Lander (2014). *"R for Everyone – Advanced Analytics and Graphics*" - Addison Wesley Data and Analytics Series, Pearson Education.

REFERENCE

1. Notman Matloff (2009), “The Art of R Programming – O-Relly

LIST OF EXPERIMENTS

1. Generation of Fibonacci Series
2. Programming Using Vectors
3. Find the list of random Numbers in Normal Distribution
4. Read the .csv file and display the contents
5. Matrix Manipulations using R Programming
6. Drawing Graphs
7. Drawing Plots
8. Creating Data Frames
9. Sorting of given data frame by multiple columns
10. Comparision of two data frames

Any Program Using R Programming based on syllabus can be included.

<table>
<tr><td colspan="7">Course Nature: Theory-Cum-Practical</td></tr>
<tr><td colspan="7">Assessment Method(Maximum marks)</td></tr>
<tr><td rowspan="3">In Semester</td><td rowspan="3">Assessment Tool</td><td colspan="2">Practical exercises -I</td><td colspan="2">Practical exercises - II</td><td rowspan="3">Total</td></tr>
<tr><td>Theory</td><td>Practical</td><td>Theory</td><td>Practical</td></tr>
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<tr><td rowspan="2">End Semester</td><td rowspan="2">Marks</td><td colspan="3">Theory</td><td>Practical</td><td rowspan="2">70</td></tr>
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Course Code	Course Title	L	T	P	L+T+P	C
BCAD1956	CLOUD COMPUTING	0	2	2	4	3

	INSTRUCTIONAL OBJECTIVES At the end of this course the learner is expected:	Student Outcomes				
1.	To understand the basic concepts on cloud computing.	c				
2.	To attain the knowledge on the reason for migration on cloud	b	d			
3.	To acquire the clear idea about the working principles of cloud computing.		d			

UNIT I - CLOUD COMPUTING BASICS

Cloud Computing Overview- Applications – Intranets and the cloud – Why Cloud Computing Matters – Benefits – Limitations – Companies in the Cloud Today – Cloud Services.

UNIT II - CLOUD COMPUTING TECHNOLOGY

Hardware and Infrastructure – Clients – Security- Network – Services – Accessing the Cloud - Platforms – Web Applications – Web APIs –Web Browsers –Cloud Storage – Overview – Cloud Storage Providers –Standards – Application – Client – Infrastructure – Service.

UNIT III - CLOUD COMPUTING AT WORK

Software as a service – Overview – Driving Forces – Company offerings – Industries

Software plus Services – Overview - Mobile Device Integration –Providers – Microsoft Online.

UNIT IV - DEVELOPING APPLICATIONS

Google – Microsoft – Intuit Quick Base – Cast Iron Cloud – Bungee Connect - Local clouds and Thin Clients – Virtualization – Server Solutions – Thin Clients.

UNIT V - MIGRATING TO THE CLOUD

Cloud Services for Individuals – Cloud services aimed at the mid-market – Enterprise- Class Cloud Offerings – Migration.

TEXT BOOK

1.Velte T. Antony, Velte J. Toby. and Elsen Peter Robert (2010), "Cloud Computing: A Practical Approach", Tata McGraw- Hill

REFERENCES

1. Miller Michael (2008), "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", Que Publishing.

2. Beard Haley (2008), "Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs", Emereo Pvt. Limited.

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Subject Code	Subject Title	L	T	P	Total of LTP	C
BESD19EC	ENVIRONMENTAL STUDIES	2	1	0	3	3

INSTRUCTIONAL OBJECTIVES At the end of this course the learner is expected:	
1.	To gain knowledge on the importance of natural resources and energy
2.	To understand the structure and function of an ecosystem
3.	To imbibe an aesthetic value with respect to biodiversity, understand the threats and its conservation and appreciate the concept of interdependence
4.	To understand the causes of types of pollution and disaster management
5.	To observe and discover the surrounding environment through field work

UNIT I - INTRODUCTION TO NATURAL RESOURCES/ENERGY

Natural Resources – Definition – Scope and Importance – Need for Public Awareness – Renewable and Non-renewable Resources: Natural resources and associated problems. Forest resources and over-exploitation – Water resources and over-utilization – Mineralresource extraction and its effects - Food resources - food problems and Modern agriculture - Energy resources and its future.

UNIT II - ECOSYSTEMS

Concept of an ecosystem-structure and function of an ecosystem-producers, consumers and decomposers- ecological succession- food chains(any 2 Examples)- food webs(any 2 Examples)-ecological pyramids.

UNIT III-ENVIRONMENTAL POLLUTION /DISASTER MANAGEMENT

Definition-causes, effects and control measures of: Air, Water and Soil pollution- e-waste management- Disaster management: Natural and man-made-food / earthquake / cyclone, tsunami and landslides.

UNIT IV - SOCIAL ISSUES AND THE ENVIRONMENT

Sustainable development- Climate change: global warming, acid rain, ozone layer depletion and nuclear radiation- Environment Protection Act (any 2) air, water, wildlife and forest.

UNIT V - HUMAN POPULATION AND THE ENVIRONMENT

Population growth, variation among nations - Population explosion—Family Welfare Programme - Environment and human health - Human rights - Value education - HIV/AIDS - Women and Child Welfare - Role of Information Technology in environment and human health.

REFERENCES

1. Bharucha Erach, (2013), Textbook of Environmental Studies for Undergraduate Courses (Second edition). Telangana, India: Orient BlackSwan.
2. Basu Mahua, Savarimuthu Xavier, (2017), SJ Fundamentals of Environmental Studies. Cambridge, United Kingdom: Cambridge University Press.
3. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
4. De A.K., Environmental Chemistry, Wiley Eastern Ltd.

e-BOOK

Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India, Email:mapin@icenet.net (R)

Course Nature: Theory				
Assessment Method(Maximum marks)				
In Semester	Assessment Tool	Assignment I	Assignment II	Total
	Marks	15	15	30
End Semester				70
Total				100