CVM UNIVERSITY
Course Structure: B.C.A.
Semester - III
Syllabus (Effective from June 2021)

Type of Course	Course code	Course Title	T/ P	Credit	Class room/lab hrs per week	Marks			
						External	Exam Duration	Internal	Total
Core – 1	101150301	Object Oriented Programming using Java	T	3	3	60	3 hrs	40	100
	101150302	Object Oriented Programming using Java Lab	P	2	3	60	3 hrs	40	100
Core – 2	101150303	Advanced DBMS	T	3	3	60	3 hrs	40	100
	101150304	Advanced DBMS Lab	P	2	3	60	3 hrs	40	100
Core – 3	101150305	Advanced Web Technology	T	3	3	60	3 hrs	40	100
	101150306	Advanced Web Technology Lab	P	2	3	60	3 hrs	40	100
Core – 4	101150307	Computer Networks	T	3	3	60	3 hrs	40	100
	101150308	Computer Networks Lab	P	2	3	60	3 hrs	40	100
Discipline Specific	101150309	Software Engineering	T	2	2	60	2 hrs	40	100
Ability	101150310	Computer Oriented Numerical and Statistical Methods	T	2	2	60	2 hrs	40	100
Skills Enhancement (any one)	101150311	Office Application – I : Presentation	P	2	3	60	2 hrs	40	100
	101150312	Data Analysis using Spreadsheet	P	2	3	60	2 hrs	40	100
	101150313	Information Security	T	2	2	60	2 hrs	40	100
	101150314	Communication Skills in English	P	2	2	60	2 hrs	40	100
Total Credits	26								

CVM UNIVERSITY
Vallabh Vidyanagar
Program & Subject: BCA
Semester - III
(Syllabus effective from June 2021)

Paper Code: 101150301

Title: Object Oriented Programming using Java

Credit: 3	**External Marks: 60**
Contact Hrs/Week: 3	**University Examinations Hrs: 3**

All units carry equal weightage

Unit	Description in detail
I	**Introduction:** History of Java, features, the Java environment, the Java Virtual Machine (JVM) Structure of a Java program, a simple Java program, implementing a Java program Tokens, comments, constants, variables and data types Scope of variables, type casting Operators: arithmetic, relational, logical, assignment, increment/decrement, conditional, ternary operator & special operators Decision making: if statement, if…else statement, nesting of if…else, the else if ladder, switch statement Looping: while, do…while, for, for each loop, jumps in loops, labeled loops Arrays: one, two dimensional arrays
II	**Classes, Objects, Interfaces and Inheritance:** Defining a class, members of a class: variables and methods, creating objects, constructors, accessing class members Static members v/s instance members Introduction to inheritance, *super* keyword Interfaces: introduction Final variables, methods and classes, abstract methods and classes Introduction to method overloading and overriding
III	**Exception Handling, I/O Management and Packages:** Managing errors & exceptions: introduction, types of errors, exceptions, syntax of exception handling construct, multiple catch statements, the finally clause, defining and throwing user-defined exceptions, the throw statement Managing I/O files : introduction, concept of streams, Character stream classes Introduction to the concept of package, Java API packages, using the System package Using java.lang (String, Math)
IV	**Applet Programming and JDBC:** Applet architecture and skeleton Java.awt package (Button, CheckBox, CheckBoxGroup, Choice, Color, Label, List, TextArea, TextField) HTML applet tag, display techniques (DrawString, Lines, Rectangle, Ellipses, Circles, Arcs, Polygons, Color) Introduction to event handling

MAIN REFERENCE BOOKS:
1. Programming with Java- A Primer by E. Balaguruswami, 3rd Edition, TMH Publication
2. The Complete Reference – Java 2 7th Edition Herbert Schildt. TMH Publication

BOOKS FOR ADDITIONAL READING:
1. Saba Zame , Handbook of Object technology, CRC Press, Washington DC, 1999
2. Mary Campion and Kathy Walrath, Java tutorial, Second Edition, Addison Wesley Pun. 1998.
3. Java 2 Programming Black Book, Steven Holzner

Paper Code: 101150302
Title: Object Oriented Programming using Java Lab
Credit: 2   **External Marks: 60**
Contact Hrs/Week: 3   **University Examinations Hrs: 3**

Description in detail	Weightage (%)
Practical based on	100%
Object Oriented Programming using Java	

CVM UNIVERSITY
Vallabh Vidyanagar
Program & Subject: BCA
Semester - III
(Syllabus effective from June 2021)

Paper Code: 101150303
Title: Advanced DBMS
Credit: 3   **External Marks: 60**
Contact Hrs/Week: 3   **University Examinations Hrs: 3**
All units carry equal weightage

Unit	Description in detail
I	**Roles of Database Administrator and Database Architecture:** DBA's Role Different DBA Job Classification Types of Databases Database Structure – Logical, Physical Oracle Processes – User process, Oracle Process Data Consistency and Data Concurrency Backup and Recovery Architecture
II	**Analytical Queries using Advanced SQL Functions:** Analytical Functions **:** Rank, Dense_ Rank, Ordering on Multiple Expressions, TOP_N,PERCENT_RANK, Windowing Functions, Ratio_To_Report, FIRST/LAST Functions, Rollup, CUBE, Grouping Clause
III	**Basics of PL/SQL:** PL/SQL - Introduction and advantages and Disadvantages PL/SQL Block structure Fundamentals of PL/SQL Language - data types (BOOLEAN, CHAR, NUMBER, DATE, VARCHAR2), variables, constants and expressions Operators Conditional statement – IF and CASE statements Controlling loop iterations – LOOP, EXIT, EXITWHEN, WHILE, FOR
IV	**Cursors and Exception Handling:** SELECT...INTO statement Working with cursor: introduction, types, attributes and processing (i.e. declaring, opening, fetching and closing), Using cursor FOR loop Error Handling : introduction, advantages of exceptions, types of exceptions – Pre Defined (Simple Example) and User Defined (Overview) Stored procedures – introduction, creating, modifying, executing and dropping procedures Stored functions – introduction, creating, modifying, executing and dropping functions

Basic Text & Reference Books:
1. SQL-PL/SQL by Ivan bayross.
2. SQL/PL SQL for Oracle 9i, P. S. Deshpande, Dreamtech Press
3. Expert Oracle Database 10g Administration, Sam R Alapati, Apress.
4. Understanding SQL by Martin Gruber, BPB
5. Oracle–The complete reference–TMH/oracle press

Paper Code: 101150304
Title: Advanced DBMS Lab
Credit: 2   **External Marks: 60**
Contact Hrs/Week: 3   **University Examinations Hrs: 3**

Description in detail	Weightage (%)
Practical based on	100%
Advanced DBMS	

Paper Code: 101150304
Title: Advanced Web Technology

Credit: 3	**External Marks: 60**
Contact Hrs/Week: 3	**University Examinations Hrs: 3**

All units carry equal weightage

Unit	Description in detail
I	**Introduction to basic concepts** Introduction to PHP, General structure of PHP, Displaying Output, Escaping Special Characters, Comments, Variables, Data types, Data types (Getting, Setting and Testing), Constants, Operators, Super global variables
II	**Programming constructs** Decision-making structures, Looping structures, 1-D Array & its manipulation, User-Defined Functions
III	**Advanced PHP** Working with Number, Strings, Date and Time, Using PhpMyAdmin, HTML form Interaction, Validating HTML Form, Error checking or Exiting, Regular Expression, File handling
IV	**Working with Database** Integrating Forms, PHP and MySQL, Basic SQL CRUD Commands, MySQL Database functions, Report generation using PHP and MySQL, State Management, File Uploading

Basic Text & Reference Books:
1. PHP - A Beginner's guide, Vikram Vaswani, TMH 2009
2. Web enabled commercial application development using HTML, Javascript, DHTML and PHP by Ivan Bayross, BPB Publication.
3. Beginning PHP5 By Dave Mercer, Allan Kent, Steven Nowicki, David Mercer,DanSquier, Wankyu Choi, Wrox Publication
4. Professional PHP by Castagnetto Jesus, Shroff Publication

Paper Code: 101150306
Title: Advanced Web Technology Lab
Credit: 2   **External Marks: 60**
Contact Hrs/Week: 3   **University Examinations Hrs: 3**

Description in detail	Weightage (%)
Practical based on	**100%**
Advanced Web Technology	

CVM UNIVERSITY
Vallabh Vidyanagar
Program & Subject: BCA
Semester - III
(Syllabus effective from June 2021)

Paper Code:
Title: Computer Networks
Credit: 3   **External Marks: 60**
Contact Hrs/Week: 3   **University Examinations Hrs: 3**
All units carry equal weightage

Unit	Description in detail
I	**Introduction to Computer Networks** and **Data Communication Fundamentals and Techniques:** Definition: Network, Network Topologies, Network Classifications, Overview of OSI reference model, overview of TCP/IP protocol suite. Analog and Digital signals: Terminologies used in Networking, Sampling, Transmission Mode, Modulation of Digital Data – ASK, FSK, PSK, Modulation of Analog Signals, Multiplexing techniques- FDM, TDM.
II	**Transmission Media, Networks Switching Techniques , Access mechanisms and Data Link Layer Functions and Protocol**: Transmission Media, Circuit switching, Packet switching. Error detection and error correction techniques, Data-link control - framing and flow control, error recovery protocols - stop and wait ARQ, go-back-n ARQ, Selective repeat ARQ.
III	**Multiple Access Protocol , Network Devices , Networks Layer Functions and Protocols:** CSMA/CD protocols, connecting LAN and back-bone networks- repeaters, hubs, switches, bridges, router and gateways; Routing: Routing algorithms, Network layer protocol of Internet- IP Protocol.
IV	**Transport Layer Functions and Application layer protocol:** Transport services- Elements of Transport protocols Overview of DNS protocol; Overview of WWW & HTTP protocol.

Reference Books
1.   B. A. Forouzan: Data Communications and Networking, Fourth edition, THM, 2007.
2.   A. S. Tanenbaum: Computer Networks**,** Fourth edition**,** PHI , 2002

Paper Code: 101150308
Title: Computer Networks Lab
Credit: 2   **External Marks: 60**
Contact Hrs/Week: 3   **University Examinations Hrs: 3**

Description in detail	Weightage (%)
Practical based on	100%
Computer Networks	

Paper Code: 101150309
Title: Software Engineering
Credit: 2   **External Marks: 60**
Contact Hrs/Week: 3   **University Examinations Hrs: 2**
All units carry equal weightage

Unit	Description in detail
I	**Introduction:** Software and Software Engineering (Definition ONLY) Characteristics of Software process Phases of Software Development Process Models: Waterfall, Prototype, Iterative Enhancement, Spiral Model (Overview only)
II	**Requirement Specification and Software Project Planning:** Introduction: SRS and Needs Problem Analysis: (Structuring Information ONLY) Requirement Specifications: Characteristics & Components of SRS, Specification Languages(Structured English, Regular Expressions & Decision Tables – Definition only) Structure of SRS Validation of SRS COCOMO Model (with example)
III	**Software Design:** Introduction: System Design Design Objectives Design Principles / Concepts(Top-down & Bottom-up approach, Problem Partitioning, Abstraction, Modularity) Module Level concept, Coupling, Cohesion Introduction and importance of Detailed Design Verification- Design Walkthrough, Critical Design, review, Consistency checkers (Definition ONLY)
IV	**Coding and Testing:** Introduction: Coding, Top Down & Bottom Up Approach for coding Structured Programming, Information Hiding Programming Style Internal Documentation Verification (Code Reading ONLY) Introduction: Testing, Error, Fault, Failure & Reliability Levels of Testing Automated Testing Tool

Main Reference Books:

1. An Integrated Approach to Software Engineering by Pankaj Jalote, Narosa Publishing House, Second Edition,1997
2. Software Engineering a practitioner's approach by Roger S. Pressman, Tata McGraw-Hill, Fifth Edition, 2001

Additional Reference Books:

1. Software Engineering Fundamentals ,By Richard Fairley, Tata McGraw- Hill
2. Software Engineering, By Ian Somnmerville, Addition-Wesley, Fifth Edition, 2000

CVM University
Syllabus for BCA Sem-3
Sub: Mathematics
Course code: 101150310
Course Title: Computer Oriented Numerical and Statistical Methods
Credit – 2 (Max Marks 100: 60 Ext.+40 Int.)
Effective from June, 2021

Unit-1

Errors and Computations

Significant digits, Numbers rounded-off to n significant digits, Errors and their computations- Absolute, Relative and Percentage errors.

Iterative Methods

Methods to find a root of non-linear equation:
1. Bisection section
2. Secant method

Unit-2   **Interpolation with Equal and Unequal Intervals**

Interpolation with equal intervals
1. Newton's forward interpolation formulae
2. Newton's backward interpolation formulae

Interpolation for unequal intervals
1. Newton's divided differences formula
2. Lagrange's formula for interpolation

Unit-3   **Solutions of Systems of Linear Equations**
- Matrix inversion method
- Gauss-Seidel iterative method

Unit-4   **Curve Fitting**
- Principle of least squares
- Fitting of
    1. Second Degree (Parabolic) Trend
    2. Exponential trend

REFERENCE BOOKS:

1. Sastry S. S.: Introductory Methods ofNumerical Analysis, Prentice Hall of India Pvt. Ltd., Latest edition.
2. Salaria R S: Computer Oriented Numerical Methods, Khanna Book Publishing Co. Ltd., Latest edition.
3. Dukkipati R. V., Numerical Methods, New Age International Publishers, Latest edition.
4. Grewal B.S., Numerical Methods in Engineering and Science, Khanna Publishers, Latest edition.
5. Jain M. K., Iyengar S. R. K. and Jain R. K., Numerical Methods: Problems and Solutions,New Age International Publishers, Latest edition.
6. Sankar Rao G., Numerical Analysis, New Age International Publishers, Latest edition.
7. Vedamurthy V. N. and Iyengar N. Ch. S. N., Numerical Methods,Vikas Publishing house
8. Fundamentals of statistics by S.C. Gupta, Himalaya Publishing House, Latest edition.

Paper Code: 101150311
Title: Office Application – I : Presentation
Credit: 2   **External Marks: 60**
Contact Hrs/Week: 3   **University Examinations Hrs: 2**
All units carry equal weightage

Unit	Description in detail
I	**Introduction To Presentation Tool:** Introduction to Presentation Tool, Needs of Presentation Tool, Advantages and Limitations of Presentation Tool, Navigation and views of Presentation Tool, Creation of Presentation, Saving presentation with different format
II	**Developing and Formatting a Presentation:** Presentation Type, Adding text to Slides, Object Manipulation, Font, Paragraph, Bullets and Numbering, Spelling and Grammar Checking, In-Built Designing facility, Customize slide formatting
III	**Working with graphic objects into Presentations:** Inserting, Editing and Formatting: Picture, Graph, Table, Smart Art, Header and Footer, Slide Number, Date and Time
IV	**Advanced Presentation facilities:** Animation, Transition, Adding Sound and Video, Slide Master, Theme, Template, Setup the show, Linking within the Slides, Linking with External Resource, Action Button, Recording a presentation

Reference Books:
1. R K Taxali: PC Software For Windows 98 Made Simple
2. Relevant Manuals of the Tools

Paper Code: 101150312
Title: Data Analysis using Spreadsheet
Credit: 2   **External Marks: 60**
Contact Hrs/Week: 3   **University Examinations Hrs: 2**
All units carry equal weightage

Unit	Description in detail
I	**Introduction to Data and Working with Data in Spreadsheet** Introduction – Data, Types of Data, Conversion of data in various Formats, Importing Data in spreadsheet, Conversion of Data to Columns, Grouping and Ungrouping the data
II	**Data Analysis - Basics** Types Of Cell References, Sort, Remove Duplicates, Conditional Formatting, Filter, Advanced Filter, Chart
III	**Data Analysis – Advanced I** Statistical Functions: max, min, count, counta, sumif, countif, averageif, rank, median Information Functions: iseven, isodd, isnumber, istext Lookup and Reference: vlookup, index, match, transpose Text: exact, find, len, mid Logical: if, iferror
IV	**Data Analysis – Advanced II** Data Validation, Subtotal, Pivot Table, Pivot Chart What if Analysis – Goal Seek, Scenario, Data Table

Basic Text & Reference Books:

1. R K Taxali: PC Software For Windows 98 Made Simple
2. Step by Step by Curtis D. Frye
3. Relevant Manuals of the Tool

Paper Code: 101150313
Title: Information Security
Credit: 2   **External Marks: 60**
Contact Hrs/Week: 2   **University Examinations Hrs: 2**
All units carry equal weightage

Unit	Description in Detail
I	**Introduction to Information Security** Information Security, Cyber Security and Network Security – Definition and fundamental difference The need for Information security Aspects of Information Security Security Attacks – Passive attacks, Active attacks Security services A model for network security
II	**Cryptography** Cryptography – Definition and brief description Basic terms : plaintext, cipher text, encryption, decryption, cryptanalysis Symmetric Key Cryptography vs. Asymmetric Key Cryptography Classification of Cryptographic systems Types of attacks on Encrypted messages Substitution vs. Transposition Cipher Applications of Public Key Cryptosystems
III	**Cryptography Algorithms** RSA algorithm Advanced Encryption Standard Cryptography Hash functions (Introduction, Features of Hash functions, Properties of Hash functions, List of Hash functions, Applications of Hash functions) **Network Security** Digital signatures Firewalls : Introduction, design principles, characteristics, types
IV	**System Security** Intruders Viruses and related threats : trap doors, logic bombs, Trojan horses, viruses, worms, bacteria Types of viruses Antivirus approaches : detection, identification and removal

Basic Text & Reference Books:

1. William Stallings: Network Security Essentials (Applications and Standards), Pearson Education India, 2001.
2. Behrouz Forouzan, Introduction to Data Communications and Networking, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 1998.

CVM University

Syllabus of Functional English
Course: BCA   Semester - III
Course Title: Communication Skills in English
Course Code: 101150314
Credits: Two (Two hours per week)
Evaluation: Internal 40 Marks & External 60 Marks

Course objectives:

The objectives of this course are to enable students to…
a) Identify, understand and produce English sounds
b) use prepositions and degrees of comparison
c) use types of conditional sentences
d) write social letters for various purposes

Topics to be covered in journal

1. Learning to read Phonetic symbols in dictionaries
2. Differentiating the major English sounds from their Indian equivalents
3. Overcoming major problems in pronouncing English Sounds
4. Prepositions of Place, Time and Direction
5. Punctuation Marks
6. Causative Verbs
7. Conditional Sentences
8. Jumbled Sentences
9. Letters for Social Occasions (Condolence, Making Arrangements, Invitations, encouragement and best wishes)
10. Listening Comprehension ('Look Ahead' – An Audio-Visual BBC Course)

❖ Books / Audio-Visual Courses recommended

1. *Corridors to Communication* by- Ranu Vanikar (Orient Longman)
2. Champa Tickoo and Jaya Sasikumar (2000). '*Writing with a Purpose'* ,Chennai, OUP
3. David Jolly (1988). *Writing Tasks: An Authentic Task Approach to Individual Writing Needs* (Cambridge University Press)
4. *Spoken English*—D Sasikumar and PV Dhamija. (Tata Mcgraw Hill Publication Ltd, New Delhi) (Units 1-13)
5. Grant Taylor. *English Conversation Practice.* (Tata McGraw Hill, New Delhi)
6. R. P. Bhatnagar and R. T. Bell (1999) *Communication in English***,** (Orient Longman, Hyderabad)
7. *Look Ahead* **–** (An Audio-Visual BBC Course)