DR. BHIMRAO AMBEDKAR UNIVERSITY, AGRA

BACHELOR OF COMPUTER APPLICATION (B.C.A.)

COURSE STRUCTURE

SECOND YEAR

III SEMESTER

Paper Code	Paper Name	Term Exam Max./Min. Marks	Internal Assessment Max./Min. Marks	Total Max./Min. Marks
C-301	Digital Electronics	50/20	50/20	100/40
C-302	Python Programming	50/20	50/20	100/40
C-303	Software Engineering	50/20	50/20	100/40
C-304	Computer Network	50/20	50/20	100/40
C-305	Statistical Method and Application	50/20	50/20	100/40
C-306	Practical based on above Papers			100/40
Total marks of III Semester				600/300

UNIT-V:

Asynchronous Sequential Circuits: Analysis procedure of Asynchronous sequential circuits, circuit with latches, design procedure, Reduction of state and flow table, Race-free state assignment, Hazards.

Suggested Books:

1. Digital Logic and Computer design (PHI) 1998 : M.M. Mano
2. Computer Architecture (PHI) 1998 : M.M. Mano
3. Digital Electronics (TMH) 1998 : Malvino and Lea

BACHELOR OF COMPUTER APPLICATION (B.C.A.)

DETAILED SYLLABUS

THIRD SEMESTER

PAPER CODE: C-302

Python Programming

UNIT-I

Basic of Python, Features, Application, Python interpreter, Interpreters vs Compilers, Data Types, Identifiers and keywords, Literals, Strings, Assigning Values to Variables, Multiple Assignment Basic Operators in Python: Arithmetic, Comparison, Assignment, Bitwise ,Logical ,Membership Operators (in, not in) ,Identity Operators (is, is not), Operators Precedence.

UNIT-2

Creating Python Programs: Input and Output Statements, Conditional Statement- if...else, Difference between break, continue and pass, Control statements (Looping- while Loop, for Loop, Loop Control, nested loops).

UNIT-3

Python Strings, Accessing Values in Strings, String Special Operators, String Formatting Operator, Triple Quotes , , Indexing and Slicing ,Built-in String functions. **Python Lists -**Accessing Values in Lists, Updating Lists, Basic List Operations , Indexing, Slicing, and Matrixes ,Built-in List Functions & Methods. **Python Tuples -** Accessing Values in Tuples, Updating Tuples , Delete Tuple Elements, Basic Tuples Operations ,Indexing, Slicing ,Built-in Tuple Functions.

Python Dictionary - Accessing Values in Dictionary, Updating Dictionary Python Programming ,Delete Dictionary Elements, Built-in Dictionary Functions & Methods.

Unit-4

Functions: Defining a Function ,Syntax ,Calling a Function ,call by value and call by reference, Pass by reference vs value, Function Arguments , Required arguments , Keyword arguments , Default arguments , Variable-length arguments ,The return Statement , Scope of Variable.

DR. BHIMRAO AMBEDKAR UNIVERSITY, AGRA

Unit-5 File Manipulation ,Opening Text File ,Working with a File on Python , The open function , File modes, The file object attributes , close() method, write() method ,read() method , **Files:** Input , Files: Output , Reading files ,Renaming & deleting files , Writing into a file ,remove() method.

Suggested Books:

1. Guido Van Rossum , Learning Python: Crash Course Tutorial Paperback – 22 July 2020
2. Mark Lutz, Python Pocket Reference, 5th edition Feb. 2014
3. 3. G van Rossum ,An Introduction to Python

BACHELOR OF COMPUTER APPLICATION (B.C.A.)

DETAILED SYLLABUS

THIRD SEMESTER

PAPER CODE: C- 303

Software Engineering

UNIT-I

Introduction: Definition of Software, Type of Software, Characteristic of Software, Attributes of Good Software, Definition of Software Engineering. Software Engineering Costs, Key Challenges that Software Engineering Facing, System Engineering and Software Engineering

UNIT-II

Software Development Process Model: Software Process. Software Process Model: The Waterfall Model, Evolutionary Development, Component- Based Software Engineering (CBSE). Process Iteration: Incremental Delivery, Spiral Development: Rapid Software Development: Agile Methods, Extreme Programming, Rapid Application Development.

UNIT-III

Design Concept: Abstraction, Architecture, Patterns, Modularity: Cohesion, coupling; Information Hiding, Functional Independence, Model, Client Server Model, Layered Model, User Interface Design: Human-Computer Interaction, Information Presentation, Interface Evaluation; Design Notation

UNIT-IV

Software Testing and Quality Assurance: Verification and Validation, Techniques of Testing: Black-Box and White Box Testing , Inspections. Level of Testing: Unit Testing, Integration Testing ,, Interface testing, System Testing, Alpha and Beta Testing, Regression Testing. Design of test Cases, Quality Management activities, Product and process quality, capability Maturity Model (CMM)

UNIT-V

Software Cost Estimation: Introduction - Software Cost Factors - Software Cost Estimation Techniques - Stating Level estimation - Estimating Software Maintenance Costs Software Requirements Definition - Software Requirements Specification - Specification Techniques - Languages and Processors for Requirements.

Suggested Books:

1. Ian SommerVille, Pearson , Software Engineering, 10 th Edition.
2. Amiya Kumar Rath, Fundamental of Software Engineering.
3. Roger S. Pressman, McGrewHill, Software Engineering a practitioner Approach.

BACHELOR OF COMPUTER APPLICATION (B.C.A.)

DETAILED SYLLABUS

THIRD SEMESTER

PAPER CODE: C-304

Computer Network

UNIT I

Data Communications: **Introduction:** Theoretical basis for communication, Fourier analysis, Band limited signals, Maximum data rate of a channel: Transmission impairments, Attenuation distortion, Delay distortion, Dispersion, Noise: Data transmission modes, Serial & Parallel, Simplex, Half duplex & full duplex, Synchronous & Asynchronous transmission:

Transmission Medium: Introduction: Transmission medium, Guided & Unguided Transmission medium, Twisted pair, Coaxial cable, Optical fiber, Comparison of fiber optics and copper wire: Wireless transmission.

UNIT II

Computer Network: Introduction: Definition of a Computer Network, Components of a computer network**,** Types of Network: Based on Topology (Bus, Star, Ring Mesh, Tree), Based on Size Technology and ownership (LAN, MAN, WAN). Network topologies, Linear Bus Topology, Ring Topology, Star Topology, Hierarchical or Tree Topology**,** OSI reference model**.**

Multiplexing, FDM, Frequency division multiplexing, WDM, Wavelength division multiplexing, TDM, Time division multiplexing.

UNIT III

Data Link Layer: Services provided to the Upper Layer, Framing, Error Control, Flow Control, sliding window protocols **Medium Access Sub Layer:** Medium access sub layer - channel allocations, LAN protocols – aloha protocols - overview of IEEE standards - FDDI.

UNIT IV

Network Layer: Services provided to the Upper Layer: Routing Algorithms (Centralized, Distributed), Congestion Control (Token Based and Non Token Based), Internetworking, TCP /IP, IPpacket, IP address, and IPv4 and IPV6. **Transport Layer:** Design issues, and connection management, TCP, UDP

UNIT V

Session Layer: Design issues and remote procedure call**. Presentation Layer:** Design issues**.**
Application Layer: File transfer, access and management, electronic mail, virtual terminals, other application.

Suggested Books:

1. W. Stallings, “Data and Computer Communication”, Pearson Education.
2. A. S. Tanenbaum, “Computer Network”, 4th, Edition, Pearson Education.
3. Forouzan, “Data Communication and Networking”, 2nd Edition, Tata McGraw Hill.

BACHELOR OF COMPUTER APPLICATION (B.C.A.)

DETAILED SYLLABUS

THIRD SEMESTER

PAPER CODE: C-305

Statistical Method and Application

UNIT I

Classification of data, Tabulation of data, Preparation of frequency distribution, Presentation of data through histogram, frequency polygon, frequency curve

UNIT II

Measures of Central Tendency: Computation of Arithmetic mean, median and mode for ungrouped data and grouped data, Verification of median through ogives.

UNIT III

Measures of dispersion: Computation of Range, Quartile deviation, mean deviation and Standard deviation, coefficient of variation. (Numerical Applications Only)

UNIT IV

Concept of Skewness, Karl Pearson's and Bowley's Coefficients of Skewness(Numerical Applications Only)

UNIT V

Meaning of Correlation, types of correlation, correlation coefficient, Karl Pearson, spearman's rank correlation coefficient. (Numerical Applications Only)

Suggested Books:

1. StatisticalMethods,"Dr.S.P. Gupta,SultanChand&Sons".
2. Quantitative Techniques by "C. Sathyadevi,S. Chand".
3. FundamentalofMathematicalStatistics,"S.C.Gupta&V.K.Kapoor,SultanChand"
4. StatisticalMethods,"SnedecorG.W.&CochranW.G.oxford&+DII"
5. Elementsof Statistics,"Mode.E.B.,PrenticeHall"