

GRADUATE DEGREE PROGRAM

Bachelor of Computer Application

New Introduce Course Year 2023-24



University of Technology
Vatika Road, Jaipur Rajasthan 303903



BCA 1st Year
Course Code: BCA 101
Course Title: Office Automation and IT Tools

Course Objective:

1	Familiarize students with various office automation tools and their applications in the workplace
2	Equip students with skills to use IT tools for improving productivity and efficiency in office tasks.
3	Enable students to manage and analyze data effectively using spreadsheet applications
4	Teach students to create, edit, and format professional documents using word processing software.
5	Develop skills to create engaging and effective presentations using presentation software..

Couse Outcomes

CO 1	Demonstrate proficiency in using major office automation tools (e.g., word processors, spreadsheets, presentation software).
CO 2	Create and format professional documents, reports, and presentations.
CO 3	Analyze and manipulate data effectively using spreadsheet functions and formulas.
CO 4	Utilize collaborative tools to work effectively in team projects.
CO 5	Understand the role of IT tools in enhancing office productivity and workflow management.

COs and POs Mapping

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-	-	1
CO4	3	2	3	1	2	-	-	-	-	-	-	2
CO5	2	2	3	1	2	-	-	-	-	-	-	2



BCA 1st Year
Course Code: BCA101
Course Title: office automation and IT Tools

Syllabus

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction to Office Automation. Definition and scope of office automation , Overview of IT tools and their applications 4 Hours
2	Word Processing - Introduction to word processing software - Creating, formatting, and editing documents - Using templates, styles, mail merge, tables, graphics 8 Hours
3	Spreadsheet Applications - Introduction to spreadsheet software - Basic functions and formulas - Data manipulation: sorting, filtering, and conditional formatting - Advanced functions: VLOOKUP, pivot tables, charts 8 Hours
4	Presentation Software - Introduction to presentation tools - Creating and designing presentations - Incorporating multimedia: images, videos, animations - Best practices for effective presentations 6 Hours
5	Collaboration and Communication Tools - Overview of collaborative tools - Cloud storage and file sharing - Virtual communication: video conferencing and messaging apps 6 Hour
6.	Data Management and Automation Tools - Introduction to database management systems (DBMS) - Basics of data entry, retrieval, and reporting - Automation tools (e.g., macros in Excel, Google Apps Script) 6 Hours
7	Project Work / Practical Applications - Hands-on projects utilizing all tools learned - Presentation of projects and feedback 6 Hours

Text/Reference Books	
SN	Name of Books with Author
1	Office Automation Tools , CBH
2	, IT and Fundamental Tools Satish Jain ,
3	Computer Fundamental RBH.



BCA 1st Year
Course Code: BCA 101(B)
Course Title: Digital Electronics

Course Objective:

1	Work in the infrastructure development projects.
2	Pursue higher studies.
3	Contribute in teaching, research and other developmental activities of electronics & communication engineering and its allied fields.
4	Work in the multicultural and multidisciplinary groups for the sustainable development and growth of electronics and communication engineering projects and profession.
5	Digital Equation skills to create engaging and effective presentations using presentation software..

Couse Outcomes

CO 1	Explain number systems, basic logic gates, Boolean algebra and define characteristics of logic families and calculate their parameters.
CO 2	Illustrate the working mechanism and design guidelines of different combinational circuits in the digital system.
CO 3	Analyze the working mechanism and design guidelines of different sequential circuits.
CO 4	Evaluate the fundamental knowledge of analog and digital electronics to get different types analog to digitalized signal and vice-versa converters in real world with different changing circumstances.
CO 5	Assess the nomenclature and technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world application.

COs and POs Mapping

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	-	-	-	-	-	-	-	-	-
CO2	2	2	1	-	-	-	-	-	-	-	-	-
CO3	2	2	1	-	-	-	-	-	-	-	-	1
CO4	2	2	1	1	2	-	-	-	-	-	-	2
CO5	2	2	1	1	2	-	-	-	-	-	-	2



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year
Course Code: BCA101(B)
Course Title: Digital Electronics
Session 2020-21
Syllabus

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Module I: Number Systems & Codes (6L) Decimal Number, Binary Number, Octal Number, Hexadecimal Number, Conversion – Decimal to Binary, Binary to Decimal, Octal to Binary, Binary to Octal, Hexadecimal to Binary, Binary to Hexadecimal, Octal to Binary to Hexadecimal, Hexadecimal to Binary to Octal; Floating Point Number Representation, Conversion of Floating Point Numbers, Binary Arithmetic, 1's and 2's Complement, 9's and 10's Complement, Complement Arithmetic, BCD, BCD addition, BCD subtraction, Weighted Binary codes, Non-weighted codes, Parity checker and generator, Alphanumeric co
2	Module II: Logic Gates (2L) OR, AND, NOT, NAND, NOR, Exclusive – OR, Exclusive – NOR, Mixed logic
3	Module III: Boolean Algebra (4L) Boolean Logic Operations, Basic Law of Boolean Algebra, Demorgan's Theorem, Principle of Duality
4	Module IV: Minimization Techniques (5L) Sum of Products, Product of Sums, Karnaugh Map (up to 4 variables)
5	Module V: Multilevel Gate Network (3L) Implementation of Multilevel Gate Network, Conversion to NAND-NAND and NOR-NOR Gate Networks
6.	Module VI: Arithmetic Circuits (5L) Half Adder, Full Adder, Half Subtractor, Full Subtractor, Carry Look Ahead Adder, 4-Bit Parallel Adder
7	Module VII: Combinational Circuits (5L) Basic 2-input and 4-input multiplexer, Demultiplexur, Basic binary decoder, BCD to binary converters, Binary to Gray codeconverters, Gray code to binary converters, Encoder.
8.	Module VIII: Sequential Circuits (5L) Introduction to sequential circuit, Latch, SR Flip Flop, D Flip Flop, T Flip Flop, JK Flip Flop, Master Slave Flip Flop. SISO, SIPO, PISO, PIPO, Universal Registers. Basics of Counters (2L) Asynchronous (Ripple or serial) counter, Synchronous (parallel) counter.

Text/Reference Books

SN	Name of Books with Author
1	Digital Circuit & Design, Salivahan, VIKAS
2	, Digital Design, M. Morris. Mano & Michael D. Ciletti, PEARSON
3	Digital Electronics; S. Rangnekar



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year
Course Code: BCA 103
Session 2022-23
Course Title: Operating System

Course Objective:

1	To understand the fundamental concepts and functions of operating systems.
2	To learn about process management, scheduling algorithms, and inter-process communication.
3	To explore memory management techniques, including paging and segmentation.
4	To examine file system organization and management.
5	To discuss security and protection mechanisms within operating systems..

Couse Outcomes

CO 1	Explain the fundamental concepts and architecture of operating systems.
CO 2	Analyze process management and scheduling algorithms..
CO 3	Evaluate memory management techniques and their implementations.
CO 4	Describe file system structures and management processes.
CO 5	Discuss security issues and protection mechanisms in operating systems.

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	-
CO2	3	3	2		-	-	-	-	-	-	-	-
CO3	3	2	2	1	-	-	-	-	-	-	-	-
CO4	2	2	2	3	-	-	-	-	-	-	-	-
CO5	2	2	3	1	2	-	-	-	-	-	-	-



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year
Course Code: BCA 103
Session 2022-23
Course Title: Operating system

Syllabus

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction to Operating Systems - Definition and types of operating systems - Operating system architecture 4 Hours
2	Process Management - Process concept and states - Process scheduling algorithms - Inter-process communication (IPC) 8 Hours
3	Memory Management - Memory allocation techniques - Paging and segmentation - Virtual memory concepts 8 Hours
4	File Systems - File concepts and operations - Directory structures - File system management and implementation 8 Hours
5	Concurrency and Deadlocks - Synchronization mechanisms - Deadlock prevention and avoidance 6 Hour
6.	Security and Protection - Security issues in operating systems - Protection mechanisms and authentication methods 4 Hours
7	Case Studies of Operating Systems - Overview of popular operating systems (Windows, Linux, macOS) - Comparative analysis of features and functionalities 6 Hours

Text/Reference Books

SN	Name of Books
1	Operating System ,Firewall Publication
2	Fundamental of Operating system RBH
3	Operating system Satish Jain BPP Publication



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 103(A)

Session 2023-24

Course Title: Big Data Analytics

Course Objective:

1	To Understand and Target Customers
2	To Take Strategic Decision
3	Cost Optimization
4	To Improve Customer Experiences

Couse Outcomes

CO 1	Optimize business decisions and create competitive advantage with Big Data analytics
CO 2	Understand Java concepts required for developing map reduce programs
CO 3	Derive business benefit from unstructured data
CO 4	Learn the architectural concepts of Hadoop and introducing map reduce paradigm

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	-
CO2	3	3	2		-	-	-	-	-	-	-	-
CO3	3	2	2	1	-	-	-	-	-	-	-	-
CO4	2	2	2	3	-	-	-	-	-	-	-	-
CO5	2	2	3	1	2	-	-	-	-	-	-	-



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year
Course Code: BCA 103 (A)
Session 2023-24
Course Title: Big Data Analytics

Syllabus

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction, Why Big Data, History of Big Data, Characteristics of Big Data - The Four V's, advantages and disadvantages, Big Data Management approach, Technology challenges for Big Data, Big Data Architecture, Applications of Big Data 4 Hours
2	Linked List, Stacks, Queues, Sets, Maps, Generics: Generic classes and Type parameters, Implementing Generic Types, Generic methods, Wrapper classes, Concept of serialization. 8 Hours
3	Hadoop framework, Hadoop Distributed File System (HDFS), Comparison between HDFS and Google File system, Building Blocks of Hadoop (Namenode, Datanode, Secondary Namenode, Job Tracker, Task Tracker),. 8 Hours
4	Introducing and configuring Hadoop cluster (Local, Pseudo-distributed mode, Fully distributed node), YARN architecture 8 Hours
5	MapReduce: Overview, MapReduce programming: Driver code, Mapper Code, Reducer code, Combiner, Partitioner, Sorting, Shuffling, MapReduce Jobs Execution, Hadoop Streaming, Introduction to Hive and Pig. 6 Hour

Text/Reference Books	
SN	Name of Books
1	Hadoop: The Definitive Guide by Tom White,
2	Seema Acharya (Author, Big Data and Analytics
3	Big Data, Black Book: Covers Hadoop



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 105

Course Title: Computer Fundamental and Operating System

Session 2023-24

Course Objective:

1	The course is designed to aim at imparting a basic level appreciation programme for the common man.
2	After completing the course the incumbent is able to use the computer for basic purposes of preparing his personnel/business letters, viewing information on Internet (the web), sending mails, using internet banking services etc.
3	This allows a common man or housewife to be also a part of computer users list by making them digitally literate.
4	This would also aid the PC penetration program.
5	the computers and enjoy in the world of Information Technology.

Couse Outcomes

CO 1	Understanding the concept of input and output devices of Computers
CO 2	Learn the functional units and classify types of computers, how they process information and how individual computers interact with other computing systems and devices.
CO 3	Understand an operating system and its working, and solve common problems related to operating systems
CO 4	Learn basic word processing, Spreadsheet and Presentation Graphics Software skills.
CO 5	Study to use the Internet safely, legally, and responsibly

COs and POs Mapping

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-	-	1
CO4	3	2	3	1	2	-	-	-	-	-	-	2
CO5	2	2	3	1	2	-	-	-	-	-	-	2



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 105

Course Title: Computer Fundamental and Operating System

Session 2023-24

Syllabus

Credit: 2

40-44 Hours

Max. Marks: 100

End Term Exam: 3 Hours

SN	CONTENTS
1	Computer definition, uses of computers in modern society e.g. weather forecasting, concus oil exploration, speech recognition, banking, publishing, accounting, research etc. Information concept and processing-evaluation of information processing data, information, language and communication. Computers arithmetic and number systems ASCII, EBCDIC character sets.
2	Element of a computer processing system-hardware, software, computer capabilities and limitations, Concepts of file and directories. Hardware features and use – CPU, I/O devices, Storage devices and media.
3	Introduction to networking, multiprocessing, time sharing, Multitasking and real time computing. Variety of hardware systems and features, Various types of computers available in market, Micro, mini and main frames, Supercomputers. Introduction to various categories of softwares, Operating System and its function, Interaction of operating system with reference to DOS, Single user operating System, Memory Management.
4	File management, Directory structure in DOS, Moving, renaming, copying, deleting and undeleting files under DOS, Devices management, Control of various devices, Device drivers, interrupt driven and poll driven data transfers, Need of software and hardware protocols. BIOS, DOS, DOS internal and external commands, Use of DOS commands, Taking and restoring backups, interrupts.
5	Multi user, Multitasking, Multiprocessing and real time operating systems, Introduction to Memory Management techniques. File systems, File management, Process management and scheduling, Special requirements and facilities for multiprocessing environment, Examples of Multiprocessing operating systems, Introduction to Unix, User management in Unix commands.

Text/Reference Books

SN	Name of Books
1	Computer Fundamental and IT Tools P.K.Sinha BPB
2	Basic Computer Fundamental , Satish Jain BPB
3	Computer Fundamental and office Tools CBH



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year
Course Code: BCA 106
Course Title: Web Technology
Session 2022-23

Course Objective:

1	To understand the foundational concepts of web technologies and their applications.
2	To learn the structure and semantics of HTML and CSS for web design.
3	To develop client-side scripting skills using JavaScript.
4	To explore server-side programming concepts and technologies
5	To apply best practices in web development, including usability and accessibility.

Couse Outcomes

CO 1	Understand the basic concepts of web technologies and their components
CO 2	Create and design web pages using HTML and CSS.
CO 3	Develop interactive web pages using JavaScript and DOM manipulation.
CO 4	Implement server-side programming concepts using a suitable technology (e.g., PHP).
CO 5	Apply web development best practices, including usability, accessibility, and SEO

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-	-	-
CO4	2	2	3	1	-	-	-	-	-	-	-	-
CO5	2	2	2	2	1	-	-	-	-	-	-	-



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 106

Course Title: Web Technology

Session 2022-23

Syllabus

Credit: 2

40-44 Hours

Max. Marks: 100

End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction to Web Technologies - Overview of web technologies and the internet - Web browsers and servers 4 Hours
2	HTML Fundamentals - Structure of an HTML document - Common HTML tags and attributes 6 Hours
3	CSS for Web Design - Introduction to CSS and styles - CSS selectors, properties, and layout 6 Hours
4	JavaScript Basics - Introduction to JavaScript - Variables, data types, and control structures 8 Hours
5	DOM Manipulation and Event Handling - Understanding the Document Object Model (DOM) - Event handling and user interactions 6 Hour
6.	Server-Side Programming - Introduction to server-side languages (e.g., PHP) - Handling form data and database connectivity 6 Hours
7	Web Development Best Practices - Usability, accessibility, and responsive design - Search Engine Optimization (SEO) 4 Hours
8	Web Development Best Practices - Usability, accessibility, and responsive design - Search Engine Optimization (SEO) 4 Hours

Text/Reference Books

SN	Name of Books
1	The Complete Reference: HTML & XHTML.
2	Mastering HTML 4.0 by Deborah S. Ray and Eric J. Ray From BPB
3	Internet and web technology by Raj Kamal, TMH Publication
4	The Complete Reference Java Scripts,, TataMcGraw – Hill

BCA 1st Year

Course Code: BCA 151

Subject :- Technical Writing and Operating System Lab.

Syllabus

Credit: 2

Max. Marks: 100



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

40-44 Hours

End Term Exam: 3 Hours

Course Objective:

1	how to communicate technical and often quite complicated information so that the reader can understand with less difficulty,
2	how to organize the thoughts
3	how to draw the attention and interests of your reader.
4	Connective words also convey the links of the thoughts.

Course Outcomes

CO 1	An ability to communicate effectively with a range of audiences.
CO 2	To invite you to begin to change the ways you think about writing, especially writing as a professional.
CO 3	To help you recognize strategies that will improve the writing you are doing or will do, to make it more effective for your readers.
CO 4	Think of writing as part of your tool collection.



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 106

Course Title: Technical Writing and Operating System

Syllabus

Credit: 2

40-44 Hours

Max. Marks: 100

End Term Exam: 3 Hours

SN	CONTENTS
1	An introduction to basics of grammar and a study of advanced grammar concepts... • English Grammar: adjectives, adverbs, conjunctions, interjections, nouns, prepositions, pronouns, verbs, functional shift; case, gender, mood, number, person, tense; subject-verb agreement; modifiers; pronoun reference; sentence faults • Punctuation and Mechanics: abbreviations, capitalization, contractions, dates, indentation, italics, numbers, proofreading, spelling, symbols • MS Style Guides • Business Communication & Email Etiquette
2	Technical Writing Software Tools A study of select technical communication software tools including Microsoft Word, Adobe FrameMaker Macromedia
3	<u>About Microsoft word</u> Introduction Features ,Starting the Application, Accessibility, Formatting Text, Font and Paragraph settings,Bullets and Numbering, Cross-references, Borders and Shading, Styles and Formatting ,Template Creation, Working with Table, Working with Bookmark, Working with Hyperlink, Creating Sections, Generating Table of Contents Generating Table of Figures, Generating Index,Header and Footer,Working with Reviewing toolbar,Toolbars,Footnote and Endnote, • Protecting the Document
4	<u>PowerPoint</u> • Getting Started,Exploring the PowerPoint environment, Closing presentations and closing PowerPoint ,Building New Presentations, Creating new presentations , Saving presentations , Formatting Slides , Exploring text formatting, Working with text, Setting tabs and alignment, Using Drawing Tools, Drawing objects, • Working With Graphics, Using Tables And Charts, Working with tables, Creating and modifying charts, Creating organization charts • Modifying Presentations, Using templates, Working with the slide master, Adding transitions and timings, Adding speaker notes and footers , Setting up slide shows.
5	work and utilize the different type of operating system .know the feature of operating system.

Text/Reference Books	
SN	Name of Books
1	Lab Manual .



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA –IInd year
Course Code: BCA 203
Session 2022-23

Course Title: Software Engineering

Course Objective:

1	Understanding System Design: To introduce students to the principles and methodologies of system design.
2	Requirements Analysis: To equip students with skills to gather and analyze requirements for effective system design.
3	Architectural Design: To teach the fundamentals of software architecture and its role in system design.
4	Design Patterns: To familiarize students with common design patterns and their applications in solving design problems
5	. Hands-on Project Development: To provide practical experience through projects that apply system design concepts.

Couse Outcomes

CO 1	Explain fundamental concepts and methodologies in system design.
CO 2	Conduct thorough requirements analysis to inform design decisions.
CO 3	Develop software architectures that meet specified requirements.
CO 4	Apply design patterns to create reusable and efficient system designs.
CO 5	Complete a project demonstrating the application of system design concepts

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	2	-	-	-	-	-	-	-	-
CO2	2	3	2	2	-	-	-	-	-	-	-	-
CO3	3	3	2	1	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	2	3	3	3		-	-	-	-	-	-	-



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IInd Year
Course Code: BCA 202
Course Title: SOFTWARE ENGINEERING
Syllabus (Session 2022-23)

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction to System Design Overview of System Design, Importance, System Development Life Cycle (SDLC) 6
2	Requirements Analysis Gathering Requirements, Types of Requirements, Requirement Specification Techniques 8
3	Software Architecture Architectural Patterns, Client-Server Architecture, Microservices, Design Principles 8
4	Design Patterns Introduction to Design Patterns, Creational Patterns, Structural Patterns, Behavioral Patterns 8 Hours
5	User Interface Design Principles of UI/UX Design, Prototyping, Usability Testing 6 Hour
6.	Practical Application and Project Work Project Development, Documentation, Code Review, Best Practices in System Design 8 Hours

Text/Reference Books

SN	Name of Books
1	Electronic Devices and Circuits, Jimmy J Cathey, Schaum's outline series,
2	Digital Principles, 3/e, Roger L. Tokheim, Schaum's outline series,
3	Digital Design, 5/e, Morris Mano and Michael D. Cilette, Pearson, 2011.



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA –IInd year

Course Code: BCA 203 A

Course Title: Android application Development

Session 2022-23

Course Objective:

1	Understanding of an open source and Linux-based Operating System for mobile devices such as smart phones and tablet computers.
2	Knowledge and ability to implement application development for mobile devices
3	Getting programming experience of Android application development on either of the following
4	. Hands-on Project Development: To provide practical experience through projects that apply system design concepts.

Couse Outcomes

CO 1	Understand Android OS, gradle, Android Studio
CO 2	Debug Android Application and Develop UI based Mobile Application using Android Studio.
CO 3	Design application for Mobile using various sensors..
CO 4	Design and develop an application using Database
CO 5	Adapt to learn new mobile technologies.

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	2	-	-	-	-	-	-	-	-
CO2	2	3	2	2	-	-	-	-	-	-	-	-
CO3	3	3	2	1	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	2	3	3	3		-	-	-	-	-	-	-



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IInd Year
Course Code: BCA 203 A
Course Title: Android Application Development
Syllabus (2022-23)

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction to ANDROID: What is Android? Features of Android, Android Applications, Android: Environment Setup, Architecture, Applications, Components, Hello world Example, Organizing & accessing the resources, Activities, Services, Broadcast receivers, Content providers, Fragments, Intents & Filters
2	UI Layouts, UI Controls, Event Handling, Styles & Themes, Custom Components, Drag & Drop, Notifications, Location-Based Services, Sending e-mail, Sending SMS, Phone Calls, Publishing Android application, Alert Dialog
3	Animations, Audio Capture, Audio Manager, Autocomplete, Bluetooth, Camera, Clipboard, Custom Fonts, Data Backup, Developer Tools, Emulator, Facebook Integration, Gestures, Google Maps, Image Effects, Image Switcher, Internal Storage, Jetplayer
4	Loading Spinner, Localization, Login Screen, Media Player, Multitouch, Navigation, Network Connection, PHP/MySQL, Progress Circle, Progress Bar Using Progress Dialog, Push Notification
5	SDK Manager, Sensors, Session Management, Sqlite Database, Support Library, Testing, UI Design, UI Patterns, UI Testing, Android – Webview

Text/Reference Books

SN	Name of Books
1	Android Application Development, Black Book, Dreamtech Press
2	Android Programming: The Big Nerd Ranch Guide, 4th Edition by Bill Phillips, Chris Stewart, Kristin Marsicano, Brian Gardner (O'REILLY)



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA –IInd year

Course Code: BCA 203(A)

Session (2019-20)

Course Title: Network Security and cryptography

Course Objective:

1	To understand basics of Cryptography and Network Security.
2	To be able to secure a message over insecure channel by various means.
3	To learn about how to maintain the Confidentiality, Integrity and Availability of a data.
4	To understand various protocols for network security to protect against the threats in the networks.

Course Outcomes

CO 1	Provide security of the data over the network. 2. Do research in the emerging areas of cryptography and network security. 3. Implement various networking protocols. 4. Protect any network from the threats in the world.
CO 2	Do research in the emerging areas of cryptography and network security.
CO 3	Implement various networking protocols
CO 4	Protect any network from the threats in the world.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	3	2	-	-	-	-	3	2	3
CO2	3	3	1	2	2	-	1	-	-	-	0	1
CO3	3	3	2	3	3	-	-	-	1	2	2	1
CO4	3	2	3	3	3	-	-	-	-	-	3	3
CO5	2	0	0	1	1	-	1	2	-	-	2	3
CO6	2	3	2	3	2	-	-	-	-	3	2	3



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IInd Year

Course Code: BCA 203 (A)

Course Title: Network Security and Cryptography

Syllabus (2019-20)

Credit: 2

40-44 Hours

Max. Marks: 100

End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction to security attacks - services and mechanism - introduction to cryptography - Conventional Encryption: Conventional encryption model - classical encryption techniques - substitution ciphers and transposition ciphers - cryptanalysis - steganography - stream and blockciphers - Modern Block Ciphers: Block ciphers principals - Shannon's theory of confusion and diffusion - fiestal structure - data encryption standard(DES) - strength of DES - differential and linearcrypt analysis of DES - block cipher modes of operations - triple DES - AES.
2	Confidentiality using conventional encryption - traffic confidentiality - key distribution - random number generation - Introduction to graph - ring and field - prime and relative prime numbers - modular arithmetic - Fermat's and Euler's theorem - primality testing - Euclid's Algorithm - Chinese Remainder theorem - discrete algorithms.
3	Principles of public key crypto systems - RSA algorithm - security of RSA - key management - Diffie-Hellman key exchange algorithm - introductory idea of Elliptic curve cryptography - Elgamel encryption - Message Authentication and Hash Function: Authentication requirements - authentication functions - message authentication code - hash functions - birthday attacks - security of hash functions and MACS.
4	MD5 message digest algorithm - Secure hash algorithm (SHA) Digital Signatures: Digital Signatures - authentication protocols - digital signature standards (DSS) - proof of digital signature algorithm - Authentication Applications: Kerberos and X.509 - directory authentication service - electronic mail security-pretty good privacy (PGP) - S/MIME.
5	IP Security: Architecture - Authentication header - Encapsulating security payloads - combining security associations - key management.
6.	Web Security: Secure socket layer and transport layer security - secure electronic transaction (SET) - System Security: Intruders - Viruses and related threads - firewall design principals - trusted systems.

Text/Reference Books

SN	Name of Books
1	W. Mao, "Modern Cryptography - Theory and Practice"
2	Charles P. Pfleeger, Shari Lawrence Pfleeger - Security in computing - Prentice Hall of India.



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA –IInd year

Course Code: BCA 204

Course Title: Data Structure and Algorithm

Course Objective:

1	To make students understand the idea of Data's structure and its internal functionalities
2	It will make learners understand the Big-O Notation
3	To give the understanding to learners the concept of Array
4	To present the types of array and its memory representation and its applications.

Couse Outcomes

CO 1	To be able to practically implement the data structures like stack, queue, array etc.
CO 2	To understand and implement different searching and sorting.
CO 3	Understand the need for Data Structures when building Applications.
CO 4	Able to walk through insert and delete for different data techniques.
CO 5	Improve programming skills.

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	2	-	-	-	-	-	-	-	-
CO2	2	3	2	2	-	-	-	-	-	-	-	-
CO3	3	3	2	1	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	2	3	3	3		-	-	-	-	-	-	-



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IInd Year
Course Code: BCA 204
Course Title: Data Structure and Algorithm
Syllabus (2022-23)

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Definition of data structure, data structure operations. Algorithms : Complexity, Time Space tradeoff, Complexity of Algorithms, Asymptotic Notations for Complexity of Algorithms, Sub algorithms, Variables, data.
2	Arrays, Linked Lists, Stacks and Queue 25 Hrs. Introduction, Linear arrays, Representation of linear arrays in memory, Address calculation of using row and column major ordering, Traversing linear arrays, Inserting and Deleting, Multidimensional arrays: Representation of Two-Dimensional arrays in memory, Pointers: Pointers arrays, Matrices, Sparse Matrices. Linear Lists: Linked Lists, Representation of Linear Lists in memory, Traversing a Linked List, Searching a linked List, Memory allocation: Garbage collection, overflow and underflow, Insertion into a linked list, Deletion from linked list, Circular linked lists, Doubly linked lists, Header linked lists. Stacks and Queue Stacks : Definition, Array representation of stacks, Linked representation of stacks, Polish notation, Evaluation of a Postfix Expression, Transforming Infix Expressions into Postfix Expressions. Queues : Definition, Array representation of Queues, Linked representation of Queues, Circular queues, Priority Queue and D-Queue.
3	Introduction and Definition of Trees, Tree Terminology, Binary Tree, Representing Binary Trees in Memory, Traversing Binary Tree: Preorder, In-order, Post-ordered traversal, Traversal algorithms using stacks, Headed nodes: Threads (definition only), Binary Search trees, Searching and Inserting in Binary Search trees, Deleting in a Binary search tree. AVL trees, m-trees and B-Trees (definition only).
4	Introduction, Graph theory terminology: Graph and multigraphs. Directed Graphs, Sequential representation of graphs: Adjacent matrix, Path matrix, Linked representations of a Graph, Operations on Graphs: Searching in a Graph, Inserting in a graph, Traversing a graph : Breadth- First search, Depth First search, Spanning tree (definition only).
5	Sorting, Bubble Sort, Insertion sort, Quick Sort, Selection sort, Merging, Merge-sort. Searching : Sequential and binary searches, Indexed search, Hashing Schemes

Text/Reference Books

SN	Name of Books
1	Robert Kruse, C.L Tondo and Bruce Leung, "Data Structure and Programming in C", Pearson Education.
2	Yedidyah Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, "Data Structure using C and C++", Pearson Education 2nd Edition.



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA –IInd year

Course Code: BCA 205

Course Title: Web Design and Multimedia

Session 2019-20

Course Objective:

1	Web design optimizes the creative talent of the individual and helps build attractive web pages
2	Design the Web Page using HTML ,CSS, Java Script
3	To implement server-side scripting and client-side scripting, using of Multimedia program
4	To make and identify how the project work in a industry .

Couse Outcomes

CO 1	1 design and develop dynamic, database-driven web applications using PHP.
CO 2	learn Server and Client-side validations on client server
CO 3	learn the Multimedia Tools and Animation
CO 5	Understand the concept of Web site Development

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	2	-	-	-	-	-	-	-	-
CO2	2	3	2	2	-	-	-	-	-	-	-	-
CO3	3	3	2	1	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	2	3	3	3		-	-	-	-	-	-	-



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IInd Year
Course Code: BCA 205
Course Title: Web Page Design and Multimedia
Syllabus (2019-22)

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Basics of Web Designing , Introduction to Web Page, Cookies, Search Engine, Browser ,client Server
2	Multimedia and its Applications, Graphics Animation Basics Tools.
3	Web Technologies , Introduction to Web Design & Applications, Computer Graphics
4	HTML CSS, JavaScript , Bootstrap ,Adobe Dreamweaver
5	Adobe Flash, Available Softwares for Graphic Designing, Animation Techniques

Text/Reference Books

SN	Name of Books
1	Web Designing Satish Jain BPB
2	Mastering in HTML CSS Java Scripting , Laura Lemby
3	Internet Web Page Design CBH



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA –IInd year
Course Code: BCA 206
Course Title: PHP
(Session 2021-22)

Course Objective:

1	The main objective of this course is to develop dynamic web pages..
2	To implement server-side scripting and client-side scripting.
3	Data base connectivity to develop dynamic web page.
4	To make and identify how the project work in a industry .

Couse Outcomes

CO 1	1 design and develop dynamic, database-driven web applications using PHP.
CO 2	learn Server and Client-side validations in PHP.
CO 3	learn Object Oriented PHP
CO 5	Understand the concept of Web site Development

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	2	-	-	-	-	-	-	-	-
CO2	2	3	2	2	-	-	-	-	-	-	-	-
CO3	3	3	2	1	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	2	3	3	3		-	-	-	-	-	-	-



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IInd Year
Course Code: BCA 206
Course Title: PHP
Syllabus(2021-22)

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction to Web Development: Introduction to web applications, Client Side Vs Server Side Scripting Web Servers: Local Servers and Remote Servers, Internet Information Server(IIS), Personal Web Server(PWS) Static website vs Dynamic website development, Introduction to PHP Framework, Basic PHP syntax, Data types in PHP, Variables, Constants, operators and Expressions, printing data on PHP page, Control statements: if, switch case, for, while, do while. Arrays: Initialization of an array, Types of Arrays, Array Functions, String: Formatting String for Presentation and Storage, Joining and Splitting String, Comparing String, Matching and replace Substring, patterns, basic regular expressions, String Functions. Functions: Defining and Calling Functions, Passing by Value and passing by references, Inbuilt Functions.
2	Object Oriented Programming in PHP: Object oriented concepts, Define a class and objects, Class attributes, Object properties ,Object methods ,constructors and destructors ,Class constants , Static method ,Inheritance ,Abstract classes ,Exception Handling ,Final keyword ,Implementing Interface.
3	Working With Forms: Forms controls properties, methods and events, retrieving form data with \$_POST, \$_GET and \$_REQUEST arrays, Super global variables, Super global array, importing user input, accessing user input, Combine HTML and PHP code, Using hidden fields, Redirecting the user, File upload and scripts, Validation-Server-side validation, Client-side validation (Java script)
4	Working with Database MYSQL: Steps for PHP and MYSQL Connection, Creating Tables, Inserting, deleting and updating data to a table, displaying returned data on Web pages, Finding the number of rows from table.
5	State Management: Cookies: Setting time in a cookie with PHP, Deleting a cookie, Query String: Working with the query string Session: Starting a session, Registering Session variables, working with session variables, destroying session, passing session Ids, encoding and decoding session variables

Text/Reference Books

SN	Name of 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



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA –IIIrd year

Course Code: BCA 301

Course Title: Cloud Computing

Session(2020-21)

Course Objective:

1	Identify the technical foundations of cloud systems architectures.
2	Analyze the problems and solutions to cloud application problems.
3	Apply principles of best practice in cloud application design and management.
4	Identify and define technical challenges for cloud applications and assess the importance.

Couse Outcomes

CO 1	Understand the fundamental principles of distributed computing.
CO 2	Understand how the distributed computing environments known as Grids can be built from lower level services.
CO 3	Understand the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing.
CO 4	Analyze the performance of Cloud Computing.
CO 5	Understand the concept of Cloud Security.

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	2	-	-	-	-	-	-	-	-
CO2	2	3	2	2	-	-	-	-	-	-	-	-
CO3	3	3	2	1	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	2	3	3	3		-	-	-	-	-	-	-



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IIIrd Year
Course Code: BCA 301
Course Title: Cloud Computing
Syllabus(2020-21)

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction: Historical development, Vision of Cloud Computing, Characteristics of cloud computing as per NIST, Migration into cloud, Cloud computing environments, Cloud services requirements, Cloud and dynamic infrastructure, Cloud Adoption and rudiments
2	Cloud Computing Architecture: Cloud Reference Model, Types of Clouds, Service Model of Cloud, Cloud Interoperability & Standards, Scalability and Fault Tolerance, Cloud Solutions: Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management. Cloud Offerings: Cloud Analytics, Testing Under Control, Virtual Desktop Infrastructure, Architectural Design of Compute & Storage Cloud
3	Cloud Management & Virtualization Technology: Resiliency, Provisioning, Asset management, Concepts of Map reduce, Cloud Governance, High Availability and Disaster Recovery. Virtualization: Fundamental concepts of compute, Implementation Level of Virtualization, Storage, Networking, Desktop and application virtualization. Virtualization benefits, server virtualization, Block and file level storage virtualization Hypervisor management software-VMware, KVM, Xen, Infrastructure Requirements, Virtual LAN (VLAN) and Virtual SAN (VSAN) and their benefits
4	Introduction to SOA: Fundamental SOA- Common Misperceptions about SOA- Common tangible benefits of SOA- Common pitfalls of adopting SOA. The Evolution of SOA:-from XML to Web services to SOA, Comparing SOA with N-tier architecture, The continuing evolution of SOA, The roots of SOA. Benefits of SOA, Principles of Service orientation , Service layers
5	Web Service: Service descriptions, WSDL, Messaging with SOAP, Service discovery, UDDI, Message Exchange Patterns, Orchestration, Choreography, WS Transactions. Service Oriented Analysis and Design , Service Modeling, Design standards and guidelines, Composition , WS-BPEL , WS-Coordination , WS-Policy , WS-Security, SOA support in J2EE

Text/Reference Books

SN	Name of Books
1	Barrie Sosinsky, " Cloud Computing Bible", Wiley., 2010
2	2. Tim Mather, "Cloud Security and Privacy", O'REILLY., 2009



UNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IIIrd Year
Course Code: BCA 305B
Course Title: Core Python Programming
Session 2021-22

Course Objective:

1	.Learn Syntax and Semantics and create Functions in Python.
2	.Handle Strings and Files in Python.
3	Understand Lists, Dictionaries and Regular expressions in Python.
4	Implement Object Oriented Programming concepts in Python.
5	Build Web Services and introduction to Network and Database Programming in Python.

Couse Outcomes

- CO 1 Examine Python syntax and semantics and be fluent in the use of Python flow control and functions
- CO 2 Demonstrate proficiency in handling Strings and File Systems
- CO 3 Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
- CO 4 Interpret the concepts of Object-Oriented Programming as used in Python.
- CO 5 Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	2	-	-	-	-	-	-	-	-
CO2	3	3	2	2	-	-	-	-	-	-	-	-
CO3	2	2	2	1	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	2	3	3	3		-	-	-	-	-	-	-



UNIVERSITY OF TECHNOLOGY, JAIPUR

MCA

BCA IIIrd Year
Course Code: BCA 305B
Course Title: Core Python Programming
Syllabus (2021-22)

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Python Basics, Objects- Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types Numbers - Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions, Related Modules Sequences - Strings, Lists, and Tuples, Mapping and Set Types
2	FILES: File Objects, File Built-in Function [open()], File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules, Related Modules Exceptions: Exceptions in Python, Detecting and Handling Exceptions, Context Management,*Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, *Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and the sys Module, Related Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules
3	Regular Expressions: Introduction, Special Symbols and Characters, Res and Python Multithreaded Programming: Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module, Related Modules
4	GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs WEB Programming: Introduction, Web Surfing with Python, Creating Simple Web Clients, Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI Application Advanced CGI, Web (HTTP) Servers
5	(DB-API), Object Relational Managers (ORMs), Related Modules

Text/Reference Books	
SN	Name of Books
1	Think Python, Allen Downey, Green Tea Press
2	. Introduction to Python, Kenneth A. Lambert,
3.	Python Programming: A Modern Approach, VamsiKurama

POSTGRADUATE DEGREE PROGRAM



Master of Computer Application

New Introduce Course Year 2023-24



University of Technology
Vatika Road, Jaipur Rajasthan 303903



Program Outcomes (POs)

PO 1 :	Fundamental Knowledge: Apply knowledge of computing fundamentals, mathematics, and domain-specific principles to solve complex problems.
PO 2 :	Problem Analysis: Analyze and define computing requirements for the solution of a given problem..
PO 3 :	Design and Development: Design, develop, and implement software applications using appropriate programming languages and methodologies.
PO 4 :	Database Management: Utilize database management systems for data storage, retrieval, and manipulation.
PO5 :	Web Development: Create and maintain dynamic web applications using contemporary web technologies
PO 6:	Networking Concepts: Understand and apply basic networking concepts and protocols in practical scenarios.
PO 7:	Software Testing: Conduct testing and debugging of software applications to ensure functionality and quality.
PO 8:	Ethical Practices: Recognize and apply ethical practices in computing, including security, privacy, and intellectual property considerations.
PO 9:	Communication Skills: Communicate effectively in written and verbal forms with diverse audiences.
PO 10:	Team Collaboration: Work collaboratively in teams, demonstrating leadership and interpersonal skills.
PO 11:	Emerging Technologies: Stay updated on current trends and emerging technologies in the field of computer applications.
PO 12:	Project Management: Understand project management principles and apply them in software development projects.

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Program Specific Outcomes (PSOs)

PSO 1	Application Development: Design and implement robust software applications using various programming languages and development tools.
PSO 2	Data Analysis: Analyze and interpret data using database management systems, and apply relevant techniques for data handling.
PSO 3	Web Technologies: Develop responsive and interactive web applications using front-end and back-end technologies.
PSO 4	Mobile Application Development: Create mobile applications using modern frameworks and tools suitable for different platforms.
PSO 5	Cybersecurity Practices: Understand and implement fundamental cybersecurity practices to protect information systems from threats.

Program Education Outcomes (PEOs)

PEO 1 :	Technical Competence: Graduates will possess a strong foundation in computer science concepts and practical skills, enabling them to develop and maintain software applications effectively.
PEO 2 :	Problem-Solving and Innovation: Graduates will exhibit critical thinking and creativity in analyzing and solving complex problems using technological solutions.
PEO 3 :	Communication and Teamwork: Graduates will demonstrate effective communication skills and the ability to work collaboratively in diverse teams within professional environments..
PEO 4 :	Ethical Awareness: Graduates will understand the ethical implications of technology use and practice responsible behavior in their professional endeavors.
PEO 5:	Lifelong Learning: Graduates will be committed to continuous learning and professional development to adapt to changing technologies and industry trends



MCA 1st Semester
Course Code: MCA 105
Course Title: Database System
Session 2020-21

Course Objective:

1	Knowledge of database design.
2	A general understanding of database, design and dependency
3	Understanding of different types of databases
4	Knowledge of databases on the internet
5	Application on enhanced database

Couse Outcomes

CO 1 Understand the basic concepts of database management systems

CO 2 Apply SQL to find solutions to a broad range of queries

CO 3 Apply normalization techniques to improve database design.

CO 4 Analyze a given database application scenario to use ER model for conceptual design of the database

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-
CO4	2	2	3	1	-	-	-	-	-	-	-	-
CO5	2	2	2	-	1	-	-	-	-	-	-	-



MCA 1st Semester
Course Code: MCA 105
Course Title: Database System

Syllabus(2020-21)

Credit: 3
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction Overview of DBMS, Database System v/s File System, Architecture of DBMS, Data models, Entity Relationship Diagram, Types of Keys, Integrity Rules, Data Dictionary, Normalization (1NF, 2 NF, 3NF, BCNF, 4NF, 5NF), inclusion dependencies, loss less join decompositions, Codd's Rules
2	Transaction Management Transactions: Concepts, ACID Properties, States Of Transaction, Serializability, Conflict & View Serializable Schedule, Checkpoints, Deadlock Handling
3	Database Querying & Concurrency Control Relational Algebra, Set Operations, Relational Calculus, Steps In Query Processing, Algorithms For Selection, Sorting And Join Operations, Understanding Cost Issues In Queries, Query Optimization, Transformation Of Relational Expressions, Query Evaluation Plans Concurrency Control: Locks Based Protocols, Time Stamp Based Protocols, Validation Based Protocol, Multiple Granularity, Multi-version Schemes
4	Recovery System & Security Failure Classifications, Recovery & Atomicity, Log Base Recovery, Recovery with Concurrent Transactions, Shadow Paging, Failure with Loss of Non-Volatile Storage, Recovery From Catastrophic Failure, Introduction to Security & Authorization, Introduction to emerging Databases- OODBMS, ORDBMS, Distributed database, Multimedia database, Special database- limitations of conventional databases, advantages of emerging databases
5	SQL and PL/SQL Introduction to SQL: Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators, Tables, views and indexes, Constraints, Group By and Having Clause, Order By Clause, Queries and sub queries, Functions, PL/SQL basics, blocks, architecture, variables, constants, attributes, character set, PL/SQL control structure, data types, conditional and

Text/Reference Books

SN	Name of Books
1	Ragurama Krishnan, Johannes Gehrke, Data base Management Systems, 3 rd Ed., TMH.
2	C.J.Date, Introduction to Database Systems, 8 th Ed. , Pearson
3	Abraham Silberschatz, Henry F Korth, S. Sudarshan, Data base System Concepts, 5 th Ed., McGraw Hill.



MCA-Ist Year (Second Semester)
Course Title: C++ and Algorithm and Data Structure
Course Code:- MCA 201
Session 2019-20

Course Objective:

1	To make students understand the idea of Data's structure and its internal functionalities
2	It will make learners understand the Big-O Notation
3	To give the understanding to learners the concept of Array
4	To present the types of array and its memory representation and its applications.

Couse Outcomes

CO 1 To be able to practically implement the data structures like stack, queue, array etc.

CO 2 To understand and implement different searching and sorting.

CO 3 Understand the need for Data Structures when building Applications.

CO 4 Able to walk through insert and delete for different data techniques.

CO 5 Improve programming skills.

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	2	-	-	-	-	-	-	-	-
CO2	2	3	2	2	-	-	-	-	-	-	-	-
CO3	3	3	2	1	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	2	3	3	3		-	-	-	-	-	-	-



MCA Ist Year (Second Semester)
Course Code: MCA 203
Course Title: Data Structures
Syllabus

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction Object Oriented C++ , Concept of OOPS, Basic data structures such as arrays, linked list, stack, trees and queues and Their applications, linked and sequential representation Basic Terminology, Elementary Data Organization, Data Structure operations. Preliminaries of algorithm, Algorithm analysis and Complexity.Stack Implementation of stack, operations on stack. Applications of stack: Conversion of infix- 8 Hours
2	Queues Implementation of queues, Operations on Queue, Types of Queues - Circular queue, D-queue and Priority Queue. Linked List Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, insertion and deletion to/from Linked Lists,insertion and deletion Algorithms, Doubly linked list, Header lists, circular lists, sorted lists. 8 HOURS
3	Trees Basic terminology and definitions. Array and Linked Representation of Binary trees, Traversing Binary trees. Binary Search Trees: Binary Search Tree (BST), Traversal, Insertion and Deletion in BST, and Introduction to balanced BST (AVL Trees) 8 HOURS
4	Trees Basic terminology and definitions. Array and Linked Representation of Binary trees, Traversing Binary trees. Binary Search Trees: Binary Search Tree (BST), Traversal, Insertion and Deletion in BST, and Introduction to balanced BST (AVL Trees) 8 HOURS
5	Trees Basic terminology and definitions. Array and Linked Representation of Binary trees, Traversing Binary trees. Binary Search Trees: Binary Search Tree (BST), Traversal, Insertion and Deletion in BST, and Introduction to balanced BST (AVL Trees) 8 HOURS

Text/Reference Books	
SN	Name of Books
1	Tannenbaum, "Data Structure Using C++",
2	AnanyLevitin, "Introduction to the Design and Analysis of Algorithms",
3.	Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms",



MCA-Ist Year (Second Semester)
Course Title: Computer Oriented Numerical and Method
Course Code:- MCA 202 (2019-20)

Course Objective:

1	This course attempts to familiarize students with much needed concepts from numerical analysis.
2	The numerical techniques offer computational frameworks to solve real-life problems.
3	A good grounding of these concepts is essential for better understanding of topics such as Mobile Communications, Performance Modeling of Computer Networks,
4	s, Soft Computing, Pattern Recognition, Image Processing, Data Mining

Couse Outcomes

- CO 1 An ability to apply knowledge of mathematics, science and engineering
- CO 2 An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- CO 3 An ability to function on multidisciplinary teams. identify, formulates, and solves engineering problems.
- CO4 An understanding of professional and ethical responsibility. An ability to communicate effectively. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.



MCA Ist Year (Second Semester)
Course Code: MCA 202
Course Title: Computer Oriented Numerical and Method
Syllabus 2019-20

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Number System, Conversion of Numbers, Representation of numbers, Floating point representation, Arithmetic operations with Normalized Floating point Numbers, consequences of normalization, pitfalls in computing.
2	Approximation and Errors Significant digits, Types of errors, absolute and relative error.
3	Roots of Nonlinear Equations Introduction, Methods of Solution, Iterative Methods, Bisection method, False position method, Netwon-Raphson method, Secant method, Rate of convergence of iterative methods.
4	Solution of simultaneous algebraic Equations Gauss elimination method, Pivoting, ill-conditioned systems, Gauss-Seidel iterative method, Convergence of Iteration methods.
5	Polynomial Interpolation Introduction, Polynomial Forms, Linear interpolation, Lagrange interpolation, Newton interpolation, Difference table, Forward and backward difference table.
6	Numerical Integration Trapezoidal Rule, Simpson's 1/3 rule, Simpson's 3/8 rule.

Reference Books :-

1. Balagurusamy, E., Numerical Methods, Tata McGraw Hill, 1999.
2. Rajaraman V., Computer Oriented Numerical Methods, 3rd Edition, Prentice Hall India, New Delhi, 1998.



MCA-Ist Year (Second Semester)
Course Title: Python Programming
Course Code:- MCA 205
Session (202-21)

Course Objective:

1	Learn Syntax and Semantics and create Functions in Python.
2	Handle Strings and Files in Python.
3	Understand Lists, Dictionaries and Regular expressions in Python.
4	Implement Object Oriented Programming concepts in Python.
5	Build Web Services and introduction to Network and Database Programming in Python.

Couse Outcomes

- CO 1 Examine Python syntax and semantics and be fluent in the use of Python flow control and functions
- CO 2 Demonstrate proficiency in handling Strings and File Systems
- CO 3 Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
- CO 4 Interpret the concepts of Object-Oriented Programming as used in Python.
- CO 5 Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	2	-	-	-	-	-	-	-	-
CO2	3	3	2	2	-	-	-	-	-	-	-	-
CO3	2	2	2	1	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	2	3	3	3		-	-	-	-	-	-	-



MCA Ist Year (Second Semester)
Course Code: MCA 205
Course Title: Python Programming
Syllabus (2020-21)

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Python Basics, Objects- Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types Numbers - Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions, Related Modules Sequences - Strings, Lists, and Tuples, Mapping and Set Types
2	FILES: File Objects, File Built-in Function [open()], File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules, Related Modules Exceptions: Exceptions in Python, Detecting and Handling Exceptions, Context Management,*Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, *Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and the sys Module, Related Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules
3	Regular Expressions: Introduction, Special Symbols and Characters, Res and Python Multithreaded Programming: Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module, Related Modules
4	GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs WEB Programming: Introduction, Web Surfing with Python, Creating Simple Web Clients, Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI Application Advanced CGI, Web (HTTP) Servers
5	(DB-API), Object Relational Managers (ORMs), Related Modules

Text/Reference Books	
SN	Name of Books
1	Think Python, Allen Downey, Green Tea Press
2	. Introduction to Python, Kenneth A. Lambert,
3.	Python Programming: A Modern Approach, VamsiKurama



MCA-Ist Year (Second Semester)
Course Title: Business Informatics
Course Code:- MCA 206
Session (2020-21)

Course Objective:

1	- identify basic concepts of business informatics, - identify computer and communications equipment, and provide examples for each type of computer equipment.
2	-describe basic procedures and methods used in the renovation of business processes,
3	identify basic concepts of database management, - identify any such entities and attributes, and relationships between entities
4	- identify the types of e-payments and their characteristics
5	identify basic concepts in the management of information resources

Couse Outcomes

- CO 1 Student will be able to: - find appropriate providers of computer and communications equipment and applications, - draw a process diagram and - draw the ER diagram
- CO 2 Student will be able to assess the appropriateness of certain types of equipment and applications for each case under consideration.
- CO 3 Student will be capable of awareness of possible ethical, social and legal implications/threats of the use of ICT in terms of individuals, firms and society.



MCA Ist Year (Second Semester)
Course Code: MCA 206
Course Title: Business Informatics
Syllabus 2020-21

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Business Environment and Dependence on IT Introduction to Business Informatics, Organizational Structure and Design, Dependence on Technology, Integrating Technology with Business Environment, IT and Corporate Strategy, Sustaining a Competitive Edge through application of IT in Management Functions. 8 Hours
2	E-Commerce Definition, Objectives, Components, Advantages and disadvantages, Scope, ECommerce Models, E-Commerce Opportunities for Industries, Growth of ECommerce, e-Commerce Applications- E-Marketing, E-Customer Relationship Management, E-Supply Chain Management, E-Governance, E-Buying, E-Selling, E-Banking, E-Retailing. 8 Hours
3	E-Payments and Security issues in E-Commerce Introductions, Special features, Types of E-Payment Systems (EFT, E-Cash, ECheque, Credit/Debit Card, Smart Card, Digital Tokens and Electronic Purses/ Wallets), Security risk of E-Commerce, Types of threats, Security Tools, Cyber Laws, Business Ethics 8 Hours
4	ERP Introduction, Needs and Evolution of ERP Systems, ERP Domain, ERP Benefits, ERP and Related Technologies, Relevance to Data Warehousing and Data Mining, ERP Drivers, Evaluation Criterion for ERP product, ERP Life Cycle: Adoption decision, Acquisition, Implementation, Use & Maintenance, Evolution and Retirement Phases, ERP Units, ERP Success & Failure Factors 8 Hours
5	Information Systems Introduction, Categories of System: Open, Closed, Physical, Abstract, Dynamic, Static etc., Types of Information Systems: TPS, MIS, DSS, OLAP, OLTP, Expert System, Internet Based Systems, Learning Management Systems, Business Process 8 Hours

Text/Reference Books

SN	Name of Books
1	Dr. K Abirami Devi & Dr. M Alagammai, "E-Commerce Essentials"
2	Kenneth C. Laudon, Karol Traver, "E-Commerce 2014"
3.	Electronic Commerce and Risk by Daniel



MCA-IInd Year (Third Semester)
Course Title: Java Technologies
Course Code:- 301
Session 2019-20

Course Objective:

1	Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
2	Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3	Be aware of the important topics and principles of software development
4	Be able to use the Java SDK environment to create, debug and run simple Java programs

Couse Outcomes

- CO 1 Able to solve real world problems using OOP techniques.
- CO 2 Able to understand the use of abstract classes.
- CO 3 Able to solve problems using java collection framework and I/o classes.
- CO 4 Able to develop multithreaded applications with synchronization
- CO 5 Able to develop applets for web applications..

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	2	-	-	-	-	-	-	-	-
CO2	2	3	2	2	-	-	-	-	-	-	-	-
CO3	3	3	2	1	-	-	-	-	-	-	-	-



CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	2	3	3	3		-	-	-	-	-	-	-

MCA IInd Year (Third Semester)
Course Code: MCA 301
Course Title: Java Programming
Syllabus

Credit: 2
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction to Java, OOP in Java, Characteristics of Java, Fundamental Programming Structures in Java, Abstract Class, Interfaces, Defining Methods, Inheritance, Overloading, Overriding, Packages, Exception Handling, Threads, Thread Life-Cycle
2	Need of J2EE, J2EE Architecture, J2EE APIs, J2EE Containers. Web Application Basics, Architecture and Challenges of Web Application, Servlet Life Cycle, Developing and Deploying Servlets, Exploring Deployment Descriptor (web.xml), Handling Request and Response, Initializing a Servlet. Servlet Chaining, Session Tracking and Management
3	The JDBC Connectivity Model, Types of JDBC Drivers., Basic steps to JDBC, setting up a connection to database, Creating and executing SQL statements, Result Set and Result Set Metadata Object, Accessing Database.
4	Java Server Pages Basic JSP Architecture, Life Cycle of JSP, JSP Tags & Expressions, JSP Implicit Objects, JSP Directives, Tag Libraries, Using JDBC with JSP, Accessing a Database, Adding a Form, Updating the Database.
5	Introduction to Spring Overview of Spring Framework- Inversion of Control / Dependency Injection Concepts, Aspect Oriented Programming - concept, Spring MVC Architecture, Bean Factory and Application Context, Attaching and Populating beans, Injecting data through setters and constructors, Listening on events, Publishing events, Spring MVC Layering, Dispatcher Servlet, Writing a Controller, DAO, Models, Services, Spring Configuration File, Error handling Strategy.

**Text/Reference Books**

SN	Name of Books
1	"Java: The Complete Reference", , McGraw-Hill
2	Marty Hall and Larry Brown, "Core Servlets and Java Server Pages", 2 nd Edition, 2003.
3.	MertCaliskan, KenanSevindik, Rod Johnson, Jorgen Holler, "Beginning Spring",

MCA IInd Year 3rd Semester
Course Code: MCA 304
Course Title: Information Security
Session 2020-21

Course Objective:

1	The goal of this course is for students to maintain an appropriate level of awareness, knowledge and skill on the disciplines of technology
2	The students will learn techniques used to detect, respond to, and prevent network intrusions
3	The course bear a strong adherence to computer based technological skills and capabilities, and thereby resulting in efficiency to handle a variety of issues related to Information and Cyber Security in any organization
4	Apply important algorithmic design paradigms and methods of analysis

Couse Outcomes

- CO 1 Upon successful completion of this course, students will be able to: Analyze and evaluate the cyber security needs of an organization. Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.
- CO 2 Diagnose and investigate cyber security events or crimes related to computer systems and digital evidence.
- CO 3 Protect data and respond to threats that occur over the Internet and locally.



COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-	-	1
CO4	3	2	3	1	2	-	-	-	-	-	-	2
CO5	2	2	3	1	2	-	-	-	-	-	-	2

MCA IInd Year 3rd Semester
Course Code: MCA 304
Course Title: Information Security

Syllabus (2020-21)

Credit: 3
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

S N	CONTENTS
1	Introduction to Information Security: Attacks, Vulnerability, Security Goals, Security Services and mechanisms. Conventional substitution and transposition ciphers, One-time Pad, Block cipher and Stream Cipher, Steganography. Classical Encryption Techniques
2	Symmetric and Asymmetric Cryptographic Techniques: DES, AES, RSA algorithms. Hash Functions Message Authentication & Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Birthday Attacks, Security of Hash Function & MACS, MD5 Message Digest Algorithm, Secure Hash Algorithm (SHA), Digital Signatures: Digital Signatures, Authentication Protocol, Digital Signature Standard (DSS), Proof Of Digital Signature Algorithm
3	Program Security: No malicious Program errors – Buffer overflow, Incomplete mediation, Time-of-check to Time-of- use Errors, Viruses, Trapdoors, Salami attack, Man-in-the- middle attacks, Covert channels.



4	Security in Networks: Threats in networks, Network Security Controls – Architecture, Encryption, Content Integrity, Strong Authentication, Access Controls, Wireless Security, Honeypots, Traffic flow security, Firewalls – Design and Types of Firewalls, Personal Firewalls, IDS, Email Security – PGP, S/MIME
5	Administering Security: Security Planning, Risk Analysis, Organizational Security policies. Legal Privacy and Ethical Issues in Computer Security: Protecting Programs and data, Information and the law, Rights of Employees and Employers, Software failures, Computer Crime, Ethical issues in Computer Security, case studies of Ethics.

Text/Reference Books	
SN	Name of Books
1	William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall, 4th edition, 2010
2	Michael T. Goodrich and Roberto Tamassia, Introduction to Computer Security, Addison Wesley, 2011.
3	Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone, Handbook of Applied Cryptography, CRC Press, 2011..

MCA 3rd Semester
Course Code: MCA 305
Course Title: Mobile Application Development
Session 2020-21

Course Objective:

1	Understanding of an open source and Linux-based Operating System for mobile devices such as smart phones and tablet computers.
2	Knowledge and ability to implement application development for mobile devices
3	Getting programming experience of Android application development on either of the following operating systems –
4	Apply important algorithmic design paradigms and methods of analysis

Couse Outcomes



- CO 1 know the components and structure of mobile application development frameworks for Android based mobiles;
- CO 2 design and implement the user interfaces of mobile applications;.
- CO 3 implement fragments and location based services in Android application;

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-	-	1
CO4	3	2	3	1	2	-	-	-	-	-	-	2
CO5	2	2	3	1	2	-	-	-	-	-	-	2

MCA 3rd Semester
Course Code: MCA 305
Course Title: Mobile Application Development

Syllabus (2020-21)

Credit: 3
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
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1	INTRODUCTION. Introduction to mobile applications, Market and business drivers for mobile applications, Difficulties in Mobile Development, Mobile Myths, When to Create an App, Types of Mobile App. Design Constraints for mobile applications, both hardware and software related, Architecting mobile applications, user interfaces for mobile applications, touch events and gestures
2	ADVANCED DESIGN Designing applications with multimedia and web access capabilities. Integration with GPS and social media networking applications, accessing applications hosted in a cloud computing environment, Design patterns for mobile applications, Understanding Application users, Information Design, Achieving quality constraints
3	TECHNOLOGY I ANDROID Establishing the development environment Android architecture Android Application Structure, Emulator, Android virtual device, UI design, Fragments, Activity, Services, broadcast receiver, Intents/Filters, Content provider-SQLite Programming, SQLite open, Helper, SQLite Database, Interaction with server side applications
4	Advanced ANDROID Using Google Maps, GPS and Wi-Fi Integration, Android Notification, Audio Manager, Bluetooth, Camera and Sensor Integration, Sending SMS, Phone Calls, Publishing Android Application. Introduction to KOTLIN
5	TECHNOLOGY II IOS Introduction to Objective C iOS features UI implementation Touch frameworks Data persistence using Core Data and SQLite, Action and Outlets, Delegates and Storyboard, Location aware applications using Core Location and Map Kit, Integrating calendar and address book with social media application Using Wifi iPhone marketplace.

Text/Reference Books

SN	Name of Books
1	Reto Meier, Ian Lake, "Professional Android, 4th Edition", Wiley, 2018.
2	Neil Smyth "Android studio 2.2 Development Essentials 7th Edition" Payload Media 2017.
3	Paul Deitel, Harvey Deitel, Abbey Deitel and Michel Morgano, "Android for Programmers an App-Driven Approach", Pearson, 2012.

MCA 3rd Semester
Course Code: MCA 306
Course Title: Big Data
Session 2020-21

Course Objective:



1	The aim of this course is to provide depth knowledge about Big data Technologies and tools used for Big data.
2	The students will learn to implement and work on tools to handle large volume of data in parallel and distributed environments. Retrieval and analysis of unstructured data are done using NOSQL database
3	Examine application of very large clusters of COTS computing systems for solving large data problems
4	Gain experience with NoSQL systems and Hadoop through hands-on projects.

Couse Outcomes

- CO 1 Perform data gathering of large data from a range of data sources
- CO 2 Critically analyze existing Big Data datasets and implementations, taking practicality, and usefulness metrics into consideration.
- CO 3 Understand the role of statistics in the analysis of large of datasets.

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-	-	1
CO4	3	2	3	1	2	-	-	-	-	-	-	2
CO5	2	2	3	1	2	-	-	-	-	-	-	2



MCA 3rd Semester
Course Code: MCA 306
Course Title: Big Data

Syllabus (2020-21)

Credit: 3
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

S N	CONTENTS
1	Understanding Big Data: Introduction, Need, Importance of Big data, Classification of Digital Data, Four Vs, Drivers for Big data, Big data Terminology, Industry examples and Top Challenges Facing Big Data, Responsibilities of data scientists, Technology Challenges for Big data, Convergence of key trends, Big data Architecture. Big data Applications: Healthcare, Finance, Advertising, Marketing, Transportation, Education, Government, Cyber Security etc.
2	Web Analytics: Big data and Marketing, fraud and big data, risk and big data, credit risk management, big data and algorithmic trading, Open-source technologies, cloud and big data, Crowd Sourcing Analytics, inter and trans firewall analytics.
3	Hadoop Ecosystem: Introduction to Hadoop, Features of Hadoop, Hadoop Versions, Hadoop Architecture, Introduction to Data Management and Data Access tools: Data Management using Flume, Oozie, Zookeeper; Hive, Pig, Avro, SQOOP for data access. Introduction to Data Processing and Data Storage tools: MapReduce, YARN, HDFS, HBase.
4	HDFS: HDFS concepts, Name Node, Design working of Hadoop distributed file system (HDFS). MapReduce: Introduction, MapReduce workflows, Split, map, combine, scheduling, shuffle and sort YARN. Problems & examples in MapReduce
5	NO SQL Data Management: Problem with Relational Database Systems. Introduction to NOSQL, Advantages of NOSQL, SQL versus NOSQL. Aggregate data models, key-value and document data models, relationships, graph databases, schema less databases.

Text/Reference Books

SN	Name of Books
1	ArshdeepBahga, Vijay Madiseti, "Big Data Analytics: A Hands-On Approach", VPT, 2018
2	EMC Education Services, " Data Science and Big Data Analytics: Discovering, Analyzing, Visualizingand Presenting Data", 2015
3	Anil Maheshwari, " Big Data", McGraw-Hill; Second edition, 2019



MCA 4th Semester
Course Code: MCA 402
Course Title: Machine Learning

Course Objective:

1	To understand the basic theory underlying machine learning
2	To be able to formulate machine learning problems corresponding to different applications.
3	To understand a range of machine learning algorithms along with their strengths and weaknesses.

Couse Outcomes

- CO 1 Appreciate the importance of visualization in the data analytics solution
- CO 2 Apply structured thinking to unstructured problems.
- CO 3 Learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory

COs and POs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-	-	1
CO4	3	2	3	1	2	-	-	-	-	-	-	2
CO5	2	2	3	1	2	-	-	-	-	-	-	2



MCA 4th Semester
Course Code: MCA 402
Course Title: Machine Learning

Syllabus

Credit: 3
40-44 Hours

Max. Marks: 100
End Term Exam: 3 Hours

SN	CONTENTS
1	Introduction Machine Learning – Machine Learning Foundations, Overview, Applications, Types of Machine Learning – Basic Concepts in Machine Learning – Examples of Machine Learning, Perspectives/Issues in Machine Learning, AI vs. Machine Learning
2	Supervised Learning Introduction, Linear Models of Classification – Linear Regression – Logistic Regression – Bayesian Logistic Regression – Probabilistic Models Neural Network-Feed Forward Network Functions – Error Back Propagation – Regularization – Bayesian Neural Networks – Radial Basis Function Networks, Ensemble Methods – Random Forest – Bagging – Boosting
3	Unsupervised Learning Clustering – K-Means Clustering – EM (Expectation Maximization) – Mixtures of Gaussians EM algorithm in General – The Curse of Dimensionality – Dimensionality Reduction – Factor Analysis – Principal Component Analysis – Probabilistic PCA – Independent Component Analysis
4	Probabilistic Graphical Models Directed Graphical Models – Bayesian Networks – Exploiting Independence Properties – From Distributions to Graphs – Examples – Markov Random Fields – Inference In Graphical Models – Learning – Naïve Bayes Classifiers – Markov Models – Hidden Markov Models. Undirected graphical Models – Conditional Independence Properties
5	Advanced Learning Basic Sampling Method – Monte Carlo, Reinforcement Learning-Introduction-The Learning Task, and Elements of Reinforcement Learning. Computer Vision: Applications of Computer Vision Using Machine Learning: Speech Processing, Natural Language Processing..

Text/Reference Books

SN	Name of Books
1	Stephen MarsLand, “Machine Learning-An Algorithmic Perspective”, CRC Press, 2009
2	Kevin P. Murphy, “Machine Learning: A Probabilistic Perspective”, MIT Press, 2012
3	M. Gopal, “Applied MACHINE LEARNING”, McGraw-Hill, 2018



POSTGRADUATE PROGRAM

Master of Commerce

New Introduce Course Year 2023-24



University of Technology

Vatika Road, Jaipur

Rajasthan 303903



Course Outcomes (COs)
M.Com - 2nd Year (ABST)
Paper Name- Goods & Service Tax MABST 201
Students will be able to:
Explain GST structure and components (CGST, SGST, IGST).
Analyze GST invoicing and payment provisions.
Compute GST liability and input tax credit.
Prepare GST reports and statements.
Evaluate GST impact on business decisions.
Course Outline (CO)
Understand GST Concepts and Framework
Analyze GST Provisions and Implications
Develop Skills in GST Computation and Compliance
Apply GST Planning and Optimization Techniques
Demonstrate GST Communication and Documentation Skills
Detailed Syllabus
Define GST and its objectives, Explain GST structure and components (CGST, SGST, IGST), Identify GST benefits and challenges.
Explain GST registration and compliance procedures, Analyze GST invoicing and payment provisions, Identify GST exemptions and exceptions.
Compute GST liability and input tax credit, Prepare GST returns and filing procedures. Conduct GST audit and assessment.
Identify GST planning opportunities, Apply GST optimization strategies, Evaluate GST impact on business decisions.
Communicate GST information effectively, Prepare GST reports and statements, Maintain GST documentation and records.
Recommended Books



1. "Goods and Services Tax" by B. K. Sharma
2. "GST Law and Practice" by R. K. Jain
3. "GST Handbook" by Taxmann
4. GST Act, 2017
5. GST Rules and Regulations
6. CBIC (Central Board of Indirect Taxes and Customs) notifications and circulars

Course Outcomes (COs)

M.Com - 1st Year (ABST)

Paper Name- Research Methodology & Advanced Business Statistics [MABST 103]

Students will be able to:

CO 1	Understand Research Concepts and Methodologies
CO 2	Develop Research Skills
CO 3	Apply Research Ethics
CO 4	Communicate Research Findings
CO 5	Apply Statistical Concepts

Course Outline (CO)

1	Introduction to Research
2	Research Design
3	Data Analysis and Interpretation
4	Qualitative Research Methods
5	Research Ethics and Limitations

Detailed Syllabus

Module-1	Introduction to Research: Definition and scope of research, Types of research (quantitative, qualitative), Research process and methodology
Module-2	Research Design : Types of research designs (experimental, survey), Sampling methods and techniques, Data collection methods
Module-3	Data Analysis and Interpretation : Statistical analysis (descriptive, inferential), Data visualization and presentation, Research report writing
Module-4	Qualitative Research Methods: Case study research, Content analysis, Focus group discussion
Module-5	Research Ethics and Limitations : Research ethics and morality, Research limitations and biases



Recommended Books

Research Methodology:

1. "Research Methodology" by C. R. Kothari
2. "Business Research Methods" by D. R. Cooper
3. "Research Methods for Business Students" by M. N. K. Singh
4. "Qualitative Research Methods" by R. K. Yin

Advanced Business Statistics:

1. "Business Statistics" by J. N. D. Gupta
2. "Statistical Methods for Business and Economics" by D. G. Reep
3. "Statistical Analysis for Business Decision-Making" by M. C. Shukla
4. "Business Statistics and Analytics" by J. W. Tukey

GRADUATE DEGREE PROGRAM

BBA

New Introduce Course Year 2023-24



University of Technology
Vatika Road, Jaipur
Rajasthan 303903



BBA 1st Year
Course Code: BBA 106
Course Title: Computer Fundamentals for Managers

Syllabus

Credit: 4

Max.Marks:100
EndTermExam:3

UNIT	CONTENT
I	Introduction to computers and related Terminology (Basic Information only) (a) Hardware CPU-(Motherboard, Microprocessor, (The intel) Pentium III AMD and Cyrix), MMX Technology, System Clock, Address Bus, Data Bus (PCI & EISA) cache Memory Processing Speed, Expansion Slots (Video Controller, Sound cards, SCSI, Network card), Memory-(Unit RAM, ROM, EDO RAM, SD RAM), Input and output Devices-Keybord The Standard Keyboard layout) Mouse Printers (Dot-Matrix, Ink-jet, Laser Jet) Microphone, Speakers, Modem, Scanner, Digital Cameras) Storage Devices Diskette Drive (Types, Density, Formatting Boot Record FAT Folder Directory) Hard Disk Drive CD ROM Drive, (C.D/rom Speeds) CD-R Drive, DVD Rom Drive, Tape Drive (b) Software-Introduction to Programming Languages, systems software (Operating system and utilities) Application Software (Word Processors Spreadsheet, DBMS.. Presentation Graphics, Browsers Personal Information Managers) Introduction to Multilingual word processors (c) Communications and Connectivity-Data Communication system. Data transmission (Serial Parallel, bandwidth, protocols) E-Mail FAX Voice and video messaging, video conferencing, Online services user connection (types) Networking of Computers [Local Area Network, Client server LAN, WAN) Using the network, The Internet and the web.
II	2 Operating System (Working Knowledge at Common Users Level Only) Overview of important DOS commands, windows 98: Installation scandisk, Control Panel, Taskbar Toolbars, Display setting (Background Wallpaper Screensaver, Desktop themes) Files and Folder management, Windows Explorer, Finding Files and Folders, Formatting Disks and Copying files, Printer Settings, Modem Installation Mouse Installation. Adding and Removing Programmes, Active Desktop Concepts, Winzip and its applications Norton Antivirus and its use. Use of calculators. Paintbrush, Winmap MPEG player and Window help.



III	Application Software (Working Knowledge at common users Level only) (a) Word Processing Software-MS Word Entering, Editing and formatting text document formats page size and orientation, Headers and Footers, Columns and sections page layout) Spelling and Grammar checkers. Thesaurus Find and Replace Cut and Paste. Tables and formatting tables Mails More Style and Templates
IV	(b) Spreadsheet Programme- MS Excel Entering Data, labels Values Dates Formulas Cell reference Formats Functions Templates Charts and Maps Analysing data in a spreadsheet. DBMS--- Microsoft Access Database, Entering data into the database Creating Database tables editing data, Viewing Record, Shorting record, Querying a database, generating reports.
V	Computer Programming: Algorithm development-step in programmer development problem identification task analysis, Data analysis GIGO Outputs and Inputs Pseudo codes Algorithms, Flow Charting Programmed coding testing and debugging Programming (Using C Language) Data Types, Variables and constants, Expressions, Operators and assignments statement control statement console I/O Arrays functions Dynamics data structure in C-pointers, Structures and Unions and user defined variables. File Handling. The C-preprocessor C-standard Library and Header files. Simple Programming exercise

BBA 1st Year

Course Code: BBA 103

Course Title: Legal Aspects of Indian Business Business Communication

Syllabus

Credit: 6

Max.Marks:100

EndTermExam:3

UNIT	CONTENT
I	Law of contract: Nature of contract, Classifications, Offer and Acceptance, Capacity to contract. Free Consent, Consideration, Legality of object, Agreement declared void, Performance of Contract, Discharge of Contract, Remedies for breach of contract.
II	Special Contract: Indemnity, Guarantee, Agency.
III	Sale of Goods Act: Formation of Contract of sale, Goods and their classification, price conditions & warranties, Passing of property in goods, Performance of contract of sale, Unpaid seller, sale by auction.
IV	Negotiable Instruments Act: Definition of Negotiable Instruments, Features, Promissory note, Bill of Exchange & cheque, Holder & Holder in due course, Crossing of cheque, Types of crossing. Dishonors of cheque.
V	Indian Companies Act: Meaning & Nature of company, Lifting of Corporate



	veil: Functions, Duties, Liabilities and Right of Promoters: Procedure of Registration: Contents and alteration of Memorandum and Articles of Association, Prospectus, Statement in lieu of Prospectus. Directors: Power and Duties, Appointment and Removal of Directors, Appointment and Role of company secretary
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Text/Reference Books	
SN	Name of Books with Publishers
1	Avtar Singh-Company Law (Estern Books Co. Lucknow)
2	Gulshan and Kapoor-Business Law.
3	Avtar Singh--- Mercantile Law (Estern Books Co. Lucknow)
4	M.J Matthew Commercial Law (RBSA, Jaipur)
5	M>J Matthew-Company Law (RBSA, Jaipur)
6	Majumdar and Kapoor-Company Law and Practice (Taxman New Delhi)

BBA 2st Year
Course Code: BBA 204
Course Title: BUSINESS FINANCE

Syllabus

Credit: 6

Max.Marks:100
EndTermExam:3

UNIT	CONTENT
I	Environment of Business Finance: Finance Concept, Finance & other discipline, Business Financing, Corporate Finacing. Financial Forecasting, Fundamentals of Stock market
II	Perspective of Finance: Financial Management-meaning, objectives, scope and functions, functional areas of Financial management, Financial Decisions, Role of CFO
III	Financial Planning & Forecasting. Financial Planning: meaning, characteristics, Capitalizations: under capitalization and over capitalization. Financial forecasting: meaning, tools of Financial forecasting, Cost of Capital, Capital Budgeting
IV	Working Capital Management: Theory of working capital management, Management of cash and marketable securities, Receivables Management, Inventory Management
V	Techniques of Financial Analysis: Analysis of financial Statements: Statement of change in Financial position Funds Flow Analysis Cash Flow Analysis, Cash Volume Profit Analysis, Financial Analysis through leverages

Text/Reference Books	
SN	Name of Books with Publishers



1	Khan, M.Y. & Jain P.K., Financial Management: Text & Problems, New Delhi: Tata McGraw- Hill
2	Chandra, Prasanna Financial Management-Theory & Practice Management Tata McGraw-Hil
3	Kulkarni P.V.& Satyaprasad, B.G. Financial Management-A Conceptual Approach Mumbai- Himalaya Publishing House
4	Pandey, I.M., Financial Management, New Delhi: Vikas Publishing House
5	Vanhorne, James C., Financial Management & Policy New Delhi: Prentice Hall of India
6	Kishore, Ravi M., Financial Management with Problems & Solutions, New Deh, Taxmann
7	Block & Hert, Foundation of Financial Management

BBA 3st Year
Course Code: BBA 302
Course Title: Indian Management Thought and Business Leaders

Syllabus

Credit: 6

Max.Marks:100
EndTermExam:3

UNIT	CONTENT
I	Spirituality and Management- Concept of Spirituality, Indian Ethos and Values, Role of Values in Management, Western Values vis a vis Indian Values, Applications of Yoga in Management- Personality Development, Meditation and Management of stress.
II	Indian Epics and Management- Dimensions of Vedic Management, Bhagwad Gita, Ramayan, Kautilaya's Arthshastra.
III	Indian Thinkers- Swami Vivekanand, Mahatama Gandhi. S.K. Chakraborty, C.K. Prahlad.
IV	Indian Business Leaders: JRD Tata, Ram Krishan Bajaj. G D Birla, Dhirubhai Ambani.
V	Indian Business Leaders: Narayana Murthy, Azim Premji, Lakshmi Mittal, Sunil Bharti Mittal.

Text/Reference Books	
SN	Name of Books with Publishers
1	Chakraborty, S.K. and Bhattachary... Pradip: Human Values, New Age International (P) Limited Publishers.
2	Saneev, Rinku and Khanna, Parul. Ethics and Values in Business Management, Ane Books Pvt. Ltd.
3	Khanna, S.: Vedic Management, Taxman Publications (P) Ltd.
4	Bhavad Gita as Viewed by Swami Viveka, anda: Vedanta Press & Bookshop.
5	Rajgopalachari, C.: Ramayan, Bhartiya Vidya Bhawan

