UNDERGRADUATE DEGREE PROGRAM

Bachelor of Computer Application

University of Technology

Vatika Road, Jaipur Rajasthan 303903

UNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

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

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BCA . 1st Year Scheme

Sr. No.	Subject Name	Subject Code	Subject Type	Credit Point	Tot. Max Marks	Int. Min Marks	Int. Max Marks	Ext. Min Marks	Ext. Max Marks
1	Office Automation and IT Tools	BCA 101	Theoretical	4	100	8	20	32	80
2	Basic Mathematics	BCA 102	Theoretical	4	100	8	20	32	80
3	Operating System / Big Data Analytics	BCA 103 / BCA 103 (A)	Theoretical	4	100	8	20	32	80
4	Principles of Programming Language (through C)	BCA 104	Theoretical	4	100	8	20	32	80
5	Computer Organization	BCA 105	Theoretical	4	100	8	20	32	80
6	Web Technology / Data Science	BCA 106 / BCA 106 (A)	Theoretical	4	100	8	20	32	80
7	Technical Writing & Operating System Lab	BCA 151	Practical	2	100	20	50	20	50
8	C-Laboratory Lab	BCA 152	Practical	2	100	20	50	20	50
9	Office Automation Laboratory	BCA 153	Practical	2	100	20	50	20	50
10	Web Application Lab	BCA 154	Practical	2	100	20	50	20	50
				32	**1000**	**128**	**320**	**272**	**680**

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA 1st Year
Course Code: BCA 101
Course Tittle: 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

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BCA

BCA 1st Year

Course Code: BCA101

Course Tittle: office automation and IT Tools

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **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.

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BCA

BCA 1st Year
Course Code: BCA 102
Course Tittle: Basic Mathematics

Course Objective:

1	To develop a strong foundation in basic mathematical concepts essential for computer science.
2	To enhance problem-solving skills using algebraic techniques and calculus.
3	To introduce basic concepts of probability and statistics for data analysis.
4	To apply mathematical reasoning and logic to solve real-world problems.
5	To prepare students for advanced topics in mathematics relevant to computer application

Couse Outcomes

CO 1	Understand and apply fundamental algebraic concepts and operations.
CO 2	Solve problems using calculus concepts, including limits, derivatives, and integrals.
CO 3	Analyze data and interpret results using probability and statistics
CO 4	Apply mathematical reasoning to solve real-world problems in computer science contexts
CO 5	Develop critical thinking skills through the application of mathematical concepts.

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	2	3	2	-	-	-	-	-	-	-	-	-
CO4	3	2	3	1	-	-	-	-	-	-	-	-
CO5	2	2	2	-	1	-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 102

Course Tittle: Basic Mathematics

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	**Matrices and Determinants**- Definition and types of matrices operations of matrix, transpose of matrix. Determinants ,solution of linear equations by inverse matrix method and Cramer's Rule. 8 Hours
2	**Statistics and measures of central Tendency**-Data collection method, Graphical representation of frequency distribution. Mean, Median, Mode, Mean Deviation, Standard Deviation 8 Hours
3	**Set Theory and Relation -** Introduction to logic and propositions - Set operations and Venn diagrams .Definition of Relation and Types of Relations 8 Hours
4	**Function and Logic Proofs-** Definition ,Domain and range of function , types of functions proposition, conjunction,negation,De Morgan's Law, Tautolity and Contradiction 8 Hours
5	**Correlation and regression** -Correlation and its types, rank of correlation coefficient and regression analysis 4 Hour
6.	**Applications of Mathematics in Computer Science** - Mathematical models in computing - Case studies and problem-solving sessions . 4 Hours

Text/Reference Books

SN	Name of Books
1	Basic Mathematics , CBH
2	Fundamental of Basic Mathematics RBH
3	Basic Maths BPP Publication

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BCA

BCA 1st Year
Course Code: BCA 103
Course Tittle: 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	-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA 1st Year
Course Code: BCA 103
Course Tittle: Operating system

Syllabus

Credit: 2 **Max. Marks: 100**
40-44 Hours **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	Operatng System ,Firewall Publication
2	Fundamental of Operating system RBH
3	Operating system Satish Jain BPP Publication

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BCA

BCA 1st Year

Course Code: BCA 103(A)

Course Tittle: 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	-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 103 (A)

Course Tittle: Big Data Analytics

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **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

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BCA 1st Year

Course Code: BCA 104

Course Tittle: Principles of Programming Languages

Course Objective:

1	To understand the basic principles and concepts of programming languages.
2	To learn the syntax and semantics of the C programming language.
3	To explore different programming paradigms and their implementations in C.
4	To develop problem-solving skills using structured and modular programming techniques
5	To gain insight into the design and implementation of programming languages.

Couse Outcomes

CO 1	Understand the fundamental concepts of programming languages and their classification.
CO 2	Demonstrate proficiency in writing and debugging C programs..
CO 3	Apply programming concepts such as control structures, functions, and data types in C
CO 4	Analyze and implement algorithms using C programming techniques.
CO 5	Evaluate programming language design choices and their impact on software development.

COs and POs Mapping

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

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 103

Course Tittle: Principles of Programming Languages

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	Introduction to Programming Languages - Definition and characteristics - Language classifications: procedural, functional, and object oriented 4 Hours
2	Overview of C Language - Syntax and structure of C - Data types and variables 6 Hours
3	Control Structures - Conditional statements (if, switch) - Looping constructs (for, while, do-while) 8 Hours
4	Functions and Modular Programming 6 - Function declaration, definition, and calling - Scope and lifetime of variables 6 Hours
5	Arrays and Strings - One-dimensional and multi-dimensional arrays - String handling functions in C **6** Hour
6.	Pointers and Dynamic Memory Management - Understanding pointers and their applications - Dynamic memory allocation (malloc, calloc, free) 6 Hours
7	Data Structures in C - Introduction to structures and unions - Basic data structures: stacks and queue 6 Hours
8	Error Handling and File I/O 4 - Types of errors and debugging techniques - File handling in C (file operations) 4 Hours

Text/Reference Books	
SN	**Name of Books**
1	Programming in C Language Balaguruswamy
2	Let us 'C" Yashwant Kantikar
3	Programming in C Satish Jain BPP Publication

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 105

Course Tittle: Computer Organization

Course Objective:

1	To understand the fundamental concepts of computer organization and architecture.
2	To learn about data representation and number systems.
3	To explore the organization of the CPU, memory, and I/O systems
4	To analyze instruction sets and machine language programming.
5	To gain insights into performance evaluation and optimization techniques..

Couse Outcomes

CO 1	Explain the fundamental concepts and components of computer organization.
CO 2	Describe data representation methods and number systems
CO 3	Analyze the architecture and organization of the CPU and memory.
CO 4	Evaluate instruction sets and understand machine-level programming concepts
CO 5	Assess the performance of computer systems and explore optimization techniques.

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	-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 105

Course Tittle: Principles of Programming Languages

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	**Introduction to Computer Organization** - Definition and significance - Basic structure of computer systems 4 Hours
2	**Data Representation**- Number systems: binary, octal, decimal, hexadecimal - Data types and their representations 6 Hours
3	**CPU Organization** - CPU architecture and functions - Registers, ALU, and control unit 8 Hours
4	**Memory Organization** - Types of memory: RAM, ROM, cache - Memory hierarchy and addressing modes 8 Hours
5	**Instruction Sets and Machine Language** - Instruction types and formats - Assembly language basics . **6** Hour
6.	**Input/Output Organization** - I/O devices and their interfaces - Interrupts and DMA 6 Hours
7	**Performance Evaluation** - Measuring performance: benchmarks and metrics - Optimization techniques 4 Hours
8	**Emerging Trends in Computer Organization** - Parallel processing and multi-core architectures - Future directions in computer organization 4 Hours

Text/Reference Books	
SN	**Name of Books**
1	Computer Organization BPB
2	Basic Computer Organization PK Sinha BPB
3	Computer Organization CBH

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BCA

BCA 1st Year

Course Code: BCA 106

Course Tittle: Web Technology

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	-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 106

Course Tittle: Web Technology

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **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 s 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 Colete eference: HTML & XHTML.
2	Mastering HTML 4.0 by DeborahS.Ray an EricJ.Ray From BPB
3	Internet and web technology by Raj Kamal, TMH Publication
4	The Complete Reference Java Scripts,, TataMcGraw – Hill

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BCA

BCA 1st Year
Course Code: BCA 106(A)
Course Tittle: Data Science

Course Objective:

1	An understanding of how the nature of the data collection, the data itself, and the analysis.
2	processes relate to the kinds of inferences that can be drawn
3	Understand the limitations of data sets based on their contents and provenance
4	Knowledge of data organization, management, preservation, and reuse
5	Knowledge of what statistical analysis techniques to choose, given particular demands of inference and available data

Couse Outcomes

CO 1	Students will learn how to explore new data sets.
CO 2	Implement a comprehensive set of machine learning algorithms from scratch.
CO 3	Master all the components of a predictive model, such as data pre-processing, feature engineering, model selection, performance metrics and hyper parameter optimization.

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	-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA 1st Year

Course Code: BCA 106(A)

Course Tittle: Data Science

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	Data Science Concept Data science:- definition of data, data types, meaning of variables, wholeness of data analyt ics, data processing chain, data distributions, Paths to data science, data mining, data warehousing, difference between database and data warehouse, advices for new data scientists, introduction to cloud, artificial intelligence, Machine learning, applications in real world, learning approaches: supervised, unsupervised. 8 Hours
2	Introduction to data science tools A day in the life of a data science person, R versus Python, Data science tools and technology, Regression. Data Science in Business Companies start in data science, real world examples and applications, Tips for recruiting data science people, "The Final Deliverable", "The Report Structure", Data science careers and additional case studies. 8 Hours
3	Introduction to Big data, big data technologies, management of big data. Data Science People Things data science people say, "What Makes Someone a Data Scientist?", 6 Hours
4	Data Visualization Basic principles, ideas and tools for data visualization, types of charts: line graph, pie chart, scatter plot, bar graphs, create your own visualization of a complex dataset6 8 Hours
5	Data Science and Ethical Issues Discussions on privacy, security, ethics A look back at Data Science, Next-generation data scientists. **6** Hour

Text/Reference Books

SN	Name of Books
1	Dr. Anil Maheshwari, "Data Analytics", McGraw Hil E
2	Jake Vander Plas "python data science handbook
3	Allen B. Downey "Think Python"
4	Hadley Wickham "Advanced R"

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA . 2 nd Year Scheme

Sr. No.	Subject Name	Subject Code	Subject Type	Credit Point	Tot. Max Marks	Int. Min Marks	Int. Max Marks	Ext. Min Marks	Ext. Max Marks
1	OBJECT Oriented programming	BCA 201	Theoretical	4	100	8	20	32	80
2	Data Base Management System	BCA 202	Theoretical	4	100	8	20	32	80
3	Software Engineering	BCA 203	Theoretical	4	100	8	20	32	80
4	Android Application Development / Data Structure	BCA 204 / Bca 204(A)	Theoretical	4	100	8	20	32	80
5	Cloud Computing	BCA 205	Theoretical	4	100	8	20	32	80
6	PHP / Mongo DB	BCA 206 / BCA 206 (A)	Theoretical	4	100	8	20	32	80
7	Object Oriented Programming Lab	BCA 251	Practical	2	100	20	50	20	50
8	Data Base Management System Lab	BCA 252	Practical	2	100	20	50	20	50
9	Data Structure Lab	BCA 253	Practical	2	100	20	50	20	50
10	PHP Lab	BCA 254	Practical	2	100	20	50	20	50
				32	**1000**	**128**	**320**	**272**	**680**

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA –IInd year

Course Code: BCA 201

Course Tittle: Object Oriented Programming Through C++

Course Objective:

1	Fundamentals of OOP: To understand the core concepts of object-oriented programming and its advantages over procedural programming.
2	C++ Programming: To gain proficiency in C++ syntax and semantics, including data types, control structures, and functions.
3	Class Design: To learn how to design and implement classes and objects, including constructors and destructors.
4	Inheritance and Polymorphism: To explore the concepts of inheritance, method overriding, and polymorphism in C++.
5	Practical Application: To develop practical applications using C++ that demonstrate the principles of OOP.

Course Outcomes

CO 1	Understand and apply OOP principles in software design.
CO 2	Write and debug C++ programs utilizing core C++ constructs.
CO 3	Design and implement classes and objects in C++.
CO 4	Use inheritance and polymorphism to create extensible and reusable code.
CO 5	CO5 Develop a complete software application using C++.

COs and POs Mapping

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

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA IInd Year

Course Code: BCA 201

Course Tittle: Object Oriented Programming through C++

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	**Introduction to OOP** Concepts of OOP, Advantages of OOP, C++ Overview, Basic Syntax, Data Types, Operators 6Hours
2	**Classes and** Objects Class Definition, Access Specifiers, Constructors and Destructors, Member Functions, Static Members 8Hours
3	**Inheritance Types of Inheritance**, Base and Derived Classes, Virtual Functions, Function Overriding 8Hours
4	**Polymorphism** Compile-Time and Run-Time Polymorphism, Function Overloading, Operator Overloading 6 Hours
5	**Advanced Features of C++** Friend Functions, Templates, Exception Handling, Standard Template Library (STL) **8** Hours
6.	**Practical Applications and Projects** Software Development Life Cycle (SDLC), Project Work, Code Review, Documentation 8 Hours

Text/Reference Books

SN	Name of Books
1	Object Oriented Programming in C++ Balaguruswamy
2	Let us 'C++" Yashwant Kantikar
3	Programming in C++ Satish Jain BPP Publication

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA
BCA –IInd year
Course Code: BCA 202
Course Tittle: Data Base Management System

Course Objective:

1	the objective of the course is to present an introduction to database management system.
2	An emphasis on how to organize
3	Database A maintain and retrieve - efficiently.
4	To solve different level of industry problems
5	. Hands-on Project Development: To provide practical experience through projects that apply database design

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 SQL to find solutions to a broad range of queries
CO 4	Apply normalization techniques to improve database design
CO 5	Analyse 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	2	3	1	2	-	-	-	-	-	-	-	-
CO2	2	3	2	2	-	-	-	-	-	-	-	-
CO3	3	3	2	1	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	2	3	3	3		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA IInd Year

Course Code: BCA 202

Course Tittle: Database Management System

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	Basic Concepts: A Historical perspective, File Systems vs. DBMS, Characteristics of the Data Base Approach, Abstraction and Data Integration, Database users, Advantages and Disadvantages of DBMS, Implication of Database approach. Data Base Systems Concepts and Architecture: Schemas and Instances, DBMS architecture and Data Independence, Data base languages & Interfaces, DBMS functions and component modules. Entity Relationship Model: Entity Types, Entity Sets, Attributes & Keys, Relationships, Relationship Types, Roles and Structural Constraints, Design issues, weak entity types, ER Diagrams. Design of an E-R Database Schema, Reduction of an E-R Schema to Tables.
2	Relational Data Model: Relational model concepts, Integrity constraints over Relations, Relational Algebra - Basic Operations. Conventional Data Models: An overview of Network and Hierarchical Data Models. Relational Data Base Design: Functional Dependencies, Decomposition, Desirable properties of decomposition, Normal forms based on primary keys (1 NF, 2 NF, 3 NF and BCNF). RDBMS: Terminology, The 12 Rules (Codd's Rule) for an RDBMS
3	Understanding SQL I-: Data Types, Creating Tables, Creating a Table with data from Another table, Inserting Values into a Table, Updating Column(s) of a Table, Deleting Row(s) from a Table, Dropping a Column, Querying database tables, Conditional retrieval of rows, Working with Null Values, Matching a pattern from a table, ordering the result of Query Aggregate Functions, Grouping the Result of a Query, creation and deletion of Views, Managing privileges with Grant and Revoke Command, COMMIT and ROLLBACK,Functions: Character Functions, Date Functions, Group Functions
4	Understanding SQL-II: Querying Multiple Tables using Equi-Joins, Cartesian Joins, Outer Joins, Self-Joins, SET Operators: Union, Intersect, Minus; Introduction to User Defined Exceptions, Database Trigger, types of triggers, dropping triggers, storage for triggers
5	Transaction management and Concurrency control Transaction management: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks),Time stamping methods, optimistic methods, database recovery management

Text/Reference Books

SN	Name of Books
1	Elmasri & Navathe: Fundamentals of Database systems, 3rd Edition, Addison Wesley,
2	Korth & Silberschatz : Database System Concept, 4th Edition, McGraw Hill International Edition
3	Ivan Bayross : SQL, PL/SQL-The Program Language of ORACLE, BPB Publication,

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA –IInd year

Course Code: BCA 203

Course Tittle: 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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IInd Year

Course Code: BCA 202

Course Tittle: SOFTWARE ENGINEERING

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **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.

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA –IInd year

Course Code: BCA 203 A

Course Tittle: Android application Development

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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA IInd Year
Course Code: BCA 203 A
Course Tittle: Android Application Development
Syllabus

Credit: 2 **Max. Marks: 100**
40-44 Hours **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)

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA –IInd year

Course Code: BCA 204

Course Tittle: Data Structure

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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IInd Year

Course Code: BCA 204

Course Tittle: Data Structure

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **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 Tress 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 Final 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.

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA –IInd year

Course Code: BCA 205

Course Tittle: Cloud Computing

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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IInd Year

Course Code: BCA 205

Course Tittle: Cloud Computing

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **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

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA –IInd year

Course Code: BCA 206

Course Tittle: PHP

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 Devlopement

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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IInd Year

Course Code: BCA 206

Course Tittle: PHP

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **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

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA –IInd year

Course Code: BCA 206 A
Course Tittle: Mongo DB

Course Objective:

1	Provide an overview of MongoDB, its NoSQL Nature
2	applications in Mongo DB database management.
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	Lean basic MongoDB functions and its implementation
CO 2	Implement various types of operations in MongoDB.
CO 3	Implement the concepts of limit records and sort records.
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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA IInd Year

Course Code: BCA 206A

Course Tittle: Mongo DB

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	Introduction & Overview of MongoDB Introduction & Overview of Mongo DB Objectives Design Goals. The Mongo Shell JSON Introduction JSON Structure Mongo DB Installation
2	Installing Tools Overview of Blog Project. Swig, Express Node Packaged Modules (npm) CRUD Operation in MongoDB CRU (Creating, Reading & Updating Data) Mongo Shel Query Operators Update Operators and a Few Commands
3	Data Modeling Schema Design Pattern Case Studies & Tradeoffs Storage Classes Automatic Storage Class Static Storage Class External Storage Class Register Storage Class Indexing and Performance Considerations Performance Using Indexes, Monitoring and Understanding Performance in Sharded Environments.
4	Aggregation Framework Goals the Use of the Pipeline Comparison with SQL Facilities.
5	MongoDB Replication Application Engineering Drivers Impact Of Replication And Shading On Design And Development.

Text/Reference Books	
SN	**Name of Books**
1	MongoDB: The Definitive Guide author Kristina Chodorow Edition 2013
2	MongoDB in Action Kyle Banker, Peter Bakkum, Shaun Verch, Douglas Garrett, Tim Hawkin Edition 2016

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA –IInd year

Course Code: BCA 206 A

Course Tittle: Mongo DB

Course Objective:

1	Provide an overview of MongoDB, its NoSQL Nature
2	applications in Mongo DB database management.
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	Lean basic MongoDB functions and its implementation
CO 2	Implement various types of operations in MongoDB.
CO 3	Implement the concepts of limit records and sort records.
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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA –III[rd] year

Course Code: BCA 301

Course Tittle: Data Structure(Using C/C++)

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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA III[rd] Year

Course Code: BCA 301

Course Tittle: Data Structure(Using C/C++)

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **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 Tress 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 Final 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.

BCA –III[rd] year

Course Code: BCA 302

Course Tittle: System Design Concept

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

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	Students should be able to identify the need for engineering approach to software development and various processes of requirements analysis for software engineering problems.
CO 2	Analyze various software engineering models and apply methods for design and development of software projects.
CO 3	Work with various techniques, metrics and strategies for Testing software projects.
CO 4	Identify and apply the principles, processes and main knowledge areas for Software Project Management
CO 5	Proficiently apply standards, CASE tools and techniques for engineering software projects

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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA IIIrd Year
Course Code: BCA 302
Course Tittle: System Design and Concept
Syllabus

Credit: 2 **Max. Marks: 100**
40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	Introduction to System Design Concept ,Steps for approaching this System Design Tutorial
2	Basics of System Design, Methodology and Tools using in system Design ,Scalability in System Design,SDLC ,Models
3	System Requirements, Analysis, Detail Design Report, Feasibility Analysis ,Cost Benefit Analysis.
4	Data Flow Diagram, Rules for DFD, Types of DFD , Advantage and disadvantage of DFD, Level DFD, Context Diagram .
5	ERD Model, Sprial Model, Waterfall model, Structure Chart, Structure English , Decision Table, Decision Tree, Testing and its Types.
6	Software Training, Assurance, Security , Installation

Text/Reference Books	
SN	**Name of Books**
1	"Systems Analysis and Design" by Alan Dennis and Barbara Haley Wixom
2	"Design Patterns: Elements of Reusable Object-Oriented Software" by Erich Gamma, Richard Helm,
3.	System Design and Analysis , Awad

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

Course Title: Networking Technologies

Course Objective:

1	To understand the basic concepts of data communication, layered model, protocols and interworking between computer networks and switching components in telecommunication systems.
2	Discuss the nature, uses and implications of internet technology.
3	To. understand the functioning of Frame Relay, ATM.
4	An overview of security issues related to data communication in networks

Couse Outcomes

CO 1	Understand the basics of data communication, networking, internet and their importance.
CO 2	Analyse the services and features of various protocol layers in data networks.
CO 3	Differentiate wired and wireless computer networks
CO 4	Analyze TCP/IP and their protocols.
CO 5	Recognize the different internet devices and their functions.

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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA IIIrd Year
Course Code: BCA 303
Course Tittle: Networking Technology
Syllabus

Credit: 2 **Max. Marks: 100**
40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	Introduction to System Design Overview of System Design, Importance, System Development Life Cycle (SDLC) 6 and Point-ToPoint Networks; Network Topology and their various Types; Types of Networks: LAN, MAN, WAN; Server Based LANs & Peer-to-Peer LANs; Communications Types: Synchronous, Asynchronous; Modes of Communication: Simplex, Half Duplex, Full Duplex; Protocols Network Models Design Issues of the Layer, Protocol Hierarchy, ISO-OSI Reference Model : Functions of each Layer, Various Terminology used in Computer Network, Connection-Oriented & Connectionless Services, Internet (TCP/IP) Reference Model, Comparison of ISO-OSI and TCP/IP Model
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	Data Communications and Networks- 2nd edition -Achyut S Godbole- and Atul Kahate Tata McGraw-Hill
2	Computer Networking - James F. Kurose & Keith W. Ross- PEARSON
3.	Data Communications & Networking – 5th Edition- B A Forouzan- Tata McGraw-Hill.

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

Course Code: BCA 304
Course Tittle: Java Technologies

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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA III[rd] Year
Course Code: BCA 304
Course Tittle: Java Programming
Syllabus

Credit: 2 **Max. Marks: 100**
40-44 Hours **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 ImplicitObjects, 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", 2nd Edition, 2003.
3.	MertCaliskan, KenanSevindik, Rod Johnson, Jurgen Holler, "Beginning Spring",

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

Course Code: BCA 304
Course Tittle: E-Commerce

Course Objective:

1	To gain strong knowledge on basic commerce courses
2	To understand the unique features of e-Commerce environment.
3	To impart entrepreneurial capabilities required for e-businesses.
4	To encourage overall academic development of students to pursue higher studies or to take up employment.

Couse Outcomes

CO 1	Enhance commerce and e-commerce knowledge
CO 2	Development of e-Commerce skills
CO 3	Competent to work in Virtual environment
CO 4	Expertise on e-Commerce technology and accounting application
CO 5	Develop Employability skills to be successful in the virtual business environment

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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA III[rd] Year
Course Code: BCA 305
Course Tittle: E-Commerce
Syllabus

Credit: 2 **Max. Marks: 100**
40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	History of E-commerce and Indian Business Context: E-Commerce –Emergence of the Internet – Emergence of the WWW – Advantages of E-Commerce – Transition to E-Commerce in India – The Internet and India – E-transition Challenges for Indian Corporate. Business Models for Ecommerce: Business Model – E-business Models Based on the Relationship of Transaction Parties - E-business Models Based on the Relationship of Transaction Types.
2	Enabling Technologies of the World Wide Web: World Wide Web – Internet Client-Server Applications –Networks and Internets – Software Agents – Internet Standards and Specifications – ISP. E-Marketing: Traditional Marketing – Identifying Web Presence Goals – Online Marketing – E-advertising – E-branding.
3	E-Security: Information system Security – Security on the Internet – E-business Risk Management Issues – Information Security Environment in India. Legal and Ethical Issues : Cyber talking – Privacy is at Risk in the Internet Age – Phishing – Application Fraud – Skimming – Copyright – Internet Gambling – Threats to Children.
4	e-Payment Systems: Main Concerns in Internet Banking – Digital Payment Requirements – Digital Token-based e-payment Systems – Classification of New Payment Systems – Properties of Electronic Cash – Cheque Payment Systems on the Internet – Risk and e-Payment Systems – Designing e-payment Systems – Digital Signature – Online Financial Services in India - Online Stock Trading
5	Information systems for Mobile Commerce: What is Mobile Commerce? – Wireless Applications –Cellular Network – Wireless Spectrum – Technologies for Mobile Commerce – Wireless Technologies –Different Generations in Wireless Communication – Security Issues Pertaining to Cellular Technology. Portals for E-Business: Portals – Human Resource Management – Various HRIS Modules.

Text/Reference Books

SN	Name of Books
1	David Whiteley , “E-Commerce Strategy, Technologies and Applications”, Tata McGraw Hill, 2001.
2	Ravi Kalakota, Andrew B Whinston, “Frontiers of Electronic Commerce”, Pearson 2006, 12th Impression..
3.	MertCaliskan, KenanSevindik, Rod Johnson, Jurgen Holler, “Beginning Spring”,

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

Course Code: BCA 306 A
Course Tittle: ASP.NET

Course Objective:

1	To get the practical knowledge of ASP.NET
2	To develop website using visual studio web development environment.
3	To know the framework architecture of .NET
4	To work with disconnected architecture of ADO.NET and can store and retrieve data easily from database.

Couse Outcomes

CO 1	Describe Object Oriented Programming concepts like Inheritance and Polymorphism in C# programming language.
CO 2	Interpret and Develop Interfaces for real-time applications.
CO 3	Build custom collections and generics in C#.
CO 4	Expertise in a Web technology
CO 5	Develop Employability skills to be successful in the Web 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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA IIIrd Year
Course Code: BCA 305
Course Tittle: Core Python Programming
Syllabus

Credit: 2 **Max. Marks: 100**
40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	Introduction to .Net Technologies: Introduction to Web Technologies. HTML Basics, Scripts. Sample Programs. Advantages and Disadvantages of Client-side and Server-side Scripts. Overview of Client-side Technologies and Server-side Technologies.
2	Introduction to C#:Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Control Structures-Methods, Arrays, Strings, Structures, Enumerations. OOPS with C#: Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading Delegates, Events, Errors and Exceptions.
3	Introduction to VB.NET: Introduction VB.NET -IDE – Creating a shortcut to start VB.NET. Maneuverings the Toolbar Auto-hide, Docking and Undocking, Placing and Resizing the Windows, Forms, Properties Window and Solution Explorer. Writing and Event Procedure. Execution Basic Keywords. Data Types. VB.NET statements. Conditional statements: If Else, Select Case, Switch and Choose Loops: Do, For Next, For Each Next, While loop. Arrays.
4	Application Development on .NET:C#.NET: Building Windows Applications, VB.NET: Windows Forms. Working with Controls, Timer, Picture-box, Group-box, Combo-box, Horizontal and Vertical Scrollbar, Numeric-up-down, Track-bar, and Progress-bar. Subroutines and Functions in VB.NET. Database applications
5	ADO .NET Connectivity: Introduction to ADO.NET, ADO vs ADO.NET. Architecture: Data reader, Data adopter, Accessing Data with ADO.NET. Programming Web Applications with Web Forms. ASP .NET applications with ADO.NET.

Text/Reference Books

SN	Name of Books
1	ASP.NET Developer's Guide Publisher: McGraw Hill By Gerg Buczek
2	Pro ASP.NET 4.5 in C#, A press Publication, Freeman, Adam, MacDonald, Matthew, Szpuszta, Mario
3.	Programming Microsoft® LINQ in Microsoft .NET Framework 4 - Marco Russo and Paolo Pialorsi

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

Course Code: BCA 306 B
Course Tittle: PHP

Course Objective:

1	To get the practical knowledge of ASP.NET
2	To develop website using visual studio web development environment.
3	To know the framework architecture of .NET
4	To work with disconnected architecture of ADO.NET and can store and retrieve data easily from database.

Couse Outcomes

CO 1	Describe Object Oriented Programming concepts like Inheritance and Polymorphism in C# programming language.
CO 2	Interpret and Develop Interfaces for real-time applications.
CO 3	Build custom collections and generics in C#.
CO 4	Expertise in a Web technology
CO 5	Develop Employability skills to be successful in the Web 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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA IIIrd Year
Course Code: BCA 305
Course Tittle: Core Python Programming
Syllabus

Credit: 2 **Max. Marks: 100**
40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	Introduction to .Net Technologies: Introduction to Web Technologies. HTML Basics, Scripts. Sample Programs. Advantages and Disadvantages of Client-side and Server-side Scripts. Overview of Client-side Technologies and Server-side Technologies.
2	Introduction to C#:Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Control Structures-Methods, Arrays, Strings, Structures, Enumerations. OOPS with C#: Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading Delegates, Events, Errors and Exceptions.
3	Introduction to VB.NET: Introduction VB.NET -IDE – Creating a shortcut to start VB.NET. Maneuverings the Toolbar Auto-hide, Docking and Undocking, Placing and Resizing the Windows, Forms, Properties Window and Solution Explorer. Writing and Event Procedure. Execution Basic Keywords. Data Types. VB.NET statements. Conditional statements: If Else, Select Case, Switch and Choose Loops: Do, For Next, For Each Next, While loop. Arrays.
4	Application Development on .NET:C#.NET: Building Windows Applications, VB.NET: Windows Forms. Working with Controls, Timer, Picture-box, Group-box, Combo-box, Horizontal and Vertical Scrollbar, Numeric-up-down, Track-bar, and Progress-bar. Subroutines and Functions in VB.NET. Database applications
5	ADO .NET Connectivity: Introduction to ADO.NET, ADO vs ADO.NET. Architecture: Data reader, Data adopter, Accessing Data with ADO.NET. Programming Web Applications with Web Forms. ASP .NET applications with ADO.NET.

Text/Reference Books

SN	Name of Books
1	ASP.NET Developer's Guide Publisher: McGraw Hill By Gerg Buczek
2	Pro ASP.NET 4.5 in C#, Apress Publication, Freeman, Adam, MacDonald, Matthew, Szpuszta, Mario
3.	Programming Microsoft® LINQ in Microsoft .NET Framework 4 - Marco Russo and Paolo Pialorsi

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA –III[rd] year

Course Code: BCA 306 B

Course Tittle: PHP

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		-	-	-	-	-	-	-

JNIVERSITY OF TECHNOLOGY, JAIPUR

BCA

BCA III Year
Course Code: BCA 306 B
Course Tittle: PHP
Syllabus

Credit: 2 **Max. Marks: 100**
40-44 Hours **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

JNIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA –IIIrd year

Course Code: BCA 306 C

Course Tittle: Linux Shell Programming

Course Objective:

1	To understand and make effective use of Linux utilities and shell scripting language to solve problems
2	To implement in C some standard Linux utilities like mv,cp,ls etc…
3	To Develop the skills the necessary for systems programming including file system programming, process and signal management and intercrosses communication
4	To develop the basic skills required to write network programs using sockets.

Couse Outcomes

CO 1	List the basic commands of Unix operating system and use them in Linux environment (Ubuntu, fedora etc.)
CO 2	Understand commands related to process control and apply them to manage processes.
CO 3	Understand the concepts of control structure, loops, case and functions in shell programming and apply them to create shell scripts
CO 5	Associate the concepts of arrays with Linux and apply them to create, compile and execute C programs in Linux terminal

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		-	-	-	-	-	-	-

NIVERSITY OF TECHNOLOGY, JAIPUR
BCA

BCA –IIIrd year

Course Code: BCA 306 C

Course Tittle: Linux Shell Programming

Syllabus

Credit: 2 **Max. Marks: 100**

40-44 Hours **End Term Exam: 3 Hours**

SN	CONTENTS
1	Linux introduction and file system - Basic Features, Different flavors of Linux. Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell. Linux File system Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces. Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down process.
2	Essential linux commands Understanding shells, Processes in linux - process fundamentals, connecting processes with pipes, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron commands, kill, ps, who, sleep, Printing commands, touch, file related commands - wc, cut, dd, etc. Mathematical commands- bc, expr. Creating and editing files with vi & vim editor.
3	System administration: Common administrative tasks, configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, file security & Permissions, becoming super user using su. Getting system information with uname, host name, disk partitions & sizes, users, kernel. Backup and restore files, installing and removing packages with rpm command. KDE & Gnome graphical interfaces.
4	Shell programming- Basic of shell programming, Various types of shell available in Linux, comparisons between various shells, shell programming in bash, read command, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automate system tasks. Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Filter using regular expressions – grep, egrep, and sed.
5	Basic networking administration: Setting up a LAN using Linux, choosing peer to peer vs client/server model, setting up an Ethernet Lan, configuring host computers, checking Ethernet connecting, connecting to Internet, common networking administrative tasks, configuring Ethernet, initializing Ethernet Interface, ifconfig, netstat and netconfig commands, TCP/IP network, DNS services, routing using Linux Installation & Administration of mail server, ftp server and Apache web server.

Text/Reference Books

SN	Name of Books
1	Linux System Programming, Robert Love, O'Reilly, SPD
2	Advanced Programming in the UNIX environment, 2nd Edition, W.R.Stevens, Pearson Education..
3	UNIX Network Programming, W.R. Stevens, PHI. UNIX for Programmers and Users, 3rd Edition, Graham Glass, King Ables, Pearson Education