

BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY

(A Central University)

Vidya Vihar, Raebareli Road, Lucknow-226025



Satellite Campus

Teekarmafi, Amethi-227413

Syllabi

of

Three Years Full Time

Bachelor of Science -IT (B.Sc.-IT)

(Followed with Choice Based Credit System)

as per NEP 2020

w.e.f. the Session of 2022-2023

Date of Revision: 26.10.2022

DEPARTEMENT OF INFORMATION TECHNOLOGY

Detailed Syllabi

B.Sc.-IT

SEMESTER-I

Paper Code		BIT-101			
Paper Name		Introduction to Information Technology			
		L	T	P	Credit
		4	2	1	6
Unit - I	Basics of Computer and its Evolution: Definition of Computer, Data and Information, Characteristics of Computers, Advantages and Limitations of Computer, Different Generation of Computers, Application, Block diagram of Computer, Function of Different Units of Computer, Classification of Computers, Number Systems and their Inter-conversion.				
Unit - II	Processing Unit: Parts of processing unit and their working. Input and Output Devices: Keyboard, Mouse, Scanner, Touch Screen, Monitor, Printer, etc. Memory: Primary Memory, Secondary Memory, CD & DVD, flash memory.				
Unit –III	Computer Software: Software, Types of Software, Computer Languages, Compiler, Interpreter. Operating System: Introduction, Functions of operating system, Types of operating system.				
Unit –IV	Windows Operating Environment: Control Panel, Creating user, Setting Password, Screensaver, Background, Windows Accessories.				
Unit - V	Disk Operating System: DOS and its need, History, GUI and CUI, Directory and Sub-directory, Basic Internal and External Commands.				
Text Books: 1. R.K. Taxali : Introduction to Software Packages, GalgotiaPublicaions. 2. MS–Office 2003, Compiled by SYBIX. 3. MS–Office 2003, BPB Publications. 4. Introduction to Computer, P.K. Sinha. 5. Balagurusamy, Fundamental of Computer, TMH					

Paper Code		BIT-102			
Paper Name		Programming Principles and Algorithms			
		L	T	P	Credit
		4	2	1	6
Unit-I	Introduction to ‘C’ Language, Structures of ‘C’ Programming, Language Fundamentals, Character set, C Tokens, Keywords, Identifiers, Variables, Constant, Data Types, Comments, Operators, Types of operators.				
Unit-II	Expression, Statement and types of statements, Built-in Operators and function, Console based I/O and related built-in I/O function, printf(), scanf(), getch(), getchar(), putchar()				
Unit-III	Concept of header files, Preprocessor directives : #include, #define, Control structures, Decision making structures : If, If-else, Nested If –else, Switch, Loop Control structures, While, Do-while, for, Nested for loop, Other statements : break, continue, goto, exit,				
Unit-IV	Introduction to problem solving, Problem solving techniques, Trial & Error, Brain storming, Divide & Conquer, Steps in problem solving,				
Unit-V	Algorithms and Flowcharts (Definitions, Symbols), Characteristics of an algorithm, Conditionals in pseudo-code, Loops in pseudo code, Swapping, Functions, Basic types of function, Declaration and definition, Function call, Call by value, Call by reference, Scope of variables, Storage classes Recursion.				
Text Books:					
1. Programming in C Schaum Outlines Series.					
2. C Programming Stephen G. Kochan.					
3. Let Us C YashwantKanitkar					

Paper Code	BIT-103			
Paper Name (Open Elective 1)	Community Engagement			
	L	T	P	Credit
	0	0	0	0

Community Engagement shall be a non-creditable but compulsory part of curriculum. The same shall be evaluated by internal examiner, for which grade shall be awarded and the student is required to acquire minimum C grade for award of degree.

Students of the department will be required to do the following under the supervision and mentorship of designated faculty members for the purpose.

1. Visiting any nearby village or community school to provide basic knowledge of ICT for the betterment of the community.

OR

2. Organizing training programs in the University campus for students of the department on latest and up to date development related to IT.

OR

3. To arrange training and general awareness camp on ICT in schools/Colleges/Society nearby premises.

The concern faculty will evaluate each student based on the involvement and active participation in the community engagement services.

Paper Code		BIT-104			
Paper Name		Mathematics-I			
		L	T	P	Credit
		3	1	0	4
Unit-I	Set Theory, Relation: Element of set Methods of describing a set. Types of set. Operation on set- union, intersection and differences of set. Venn diagram, Statement problems, Associative laws, distributive laws, De-morgans law, duality, partitioning of sets. Basic definition of relation and types of relations, graphs of relations, properties of relations. (domain, range, inverse and Composite relations).				
Unit-II	Differentiation: Introduction to differentiation, derivative of a function of one variable, power functions, sum and product of two functions, function of a function, differentiation by method of substitution, maxima and minima.				
Unit-III	Integration: Indefinite Integral, Integration by substitution, Integration by parts, Integration by partial fractions, Definite Integral. Numerical Integration: Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule.				
Unit-IV	Statistics: Introduction to statistics, measures of central tendency - mean, median and mode, measures of dispersion, mean deviation, standard deviation and coefficient of variation.				
Unit-V	Matrix Algebra- Matrix algebra- Matrices, types of matrices, operations on matrices, determinants (without properties), minors, cofactors, adjoint and inverse of a matrix, Elementary transformations in a matrix Rank of a matrix, solution of simultaneous equations using Crammer's rule and matrix inversion method.				
Text Books:					
1. Text Book of Engineering Mathematics by N.P. Bali.					
2. Higher Engineering Mathematics by B.S. Grewal.					

Paper Code		AECC101			
Paper Name (Foundation course)		English Communication			
		L	T	P	Credit
		0	0	0	0
Unit - I	Introduction <ul style="list-style-type: none"> • Theory of Communication • Types and modes of Communication 				
Unit - II	Language of Communication <ul style="list-style-type: none"> • Verbal and Non-verbal (Spoken and Written) • Personal, Social and Business • Barriers and Strategies • Intra-personal, Inter-personal and Group communication 				
Unit –III	Reading and Understanding <ul style="list-style-type: none"> • Close Reading • Comprehension • Summary Paraphrasing • Analysis and Interpretation • Translation (from Indian language to English and vice-versa) • Literary/Knowledge Texts 				
Unit –IV	Writing Skills <ul style="list-style-type: none"> • Documenting • Report writing • Making notes • Letter writing 				

Paper Code		BITOE-101			
Paper Name (Open Elective 1)		Basics of IT			
		L	T	P	Credit
		3	0	1	4
Unit - I	Definition, Block diagram along with computer components, Characteristics & classification of computers, Hardware & software, Types of software, Operating System, Types of operating system, Functions of operating system, Examples of operating system, Lab session.				
Unit - II	Input and Output devices, Memory, Primary and secondary memory, Types of primary memory, Storage devices. Lab session.				
Unit –III	Processor, CPU, Fundamentals of Computer Networks. Lab session.				
Unit –IV	Concept of Algorithm, Techniques for designing algorithms, Flowchart, Pseudo-code. Lab session.				
Unit - V	Programming Languages, Assembler, Compiler, Interpreter, Program Writing and execution. Lab session.				
Text Books:					
1. R.K. Taxali : Introduction to Software Packages, GalgotiaPublicaions.					
2. MS–Office 2003, Compiled by SYBIX.					
3. MS–Office 2003, BPB Publications.					
4. Introduction to Computer, P.K. Sinha.					
5. Balagurusamy, Fundamental of Computer, TMH					

Detailed Syllabi

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SEMESTER-II

Paper Code		BIT-201			
Paper Name		Introduction to C Programming			
Periods per week		L	T	P	Credit
		4	2	1	6
Unit-I	Logic Development Tools: Data Representation, Flow Charts, Problem Analysis, Decision Tree, Decision Table, Pseudo Code and Algorithm Fundamentals: Character Set, Identifiers and Key Words, Data Types, Constants, Variables, Expressions, Statements, Symbolic Constants. Lab sessions.				
Unit-II	Operators and Expressions: Arithmetic Operators, Unary Operators, Relational and logic Operators, Assignment and Conditional Operators, Library functions. Data Input and Output: Preliminaries, single character Input, single character output, entering input data, more about scan function, writing output data more about print functions, gets and puts functions, interactive programming. Lab sessions.				
Unit-III	Control Statements: Preliminaries While, Do-While and For statements, Nested loops, If-else, Switch, Break – Continue statements. Functions: Brief overview, defining, accessing function, passing arguments to a function, specifying argument data types, function prototypes, recursion. Lab sessions.				
Unit-IV	Arrays: Defining and processing as array, passing array to a function, multi – dimensional arrays. Strings: String declaration, string functions and string manipulation. Pointers: Fundamentals, pointer declaration, passing pointers to a functions, pointer and one dimension arrays, operation on pointers, pointers & multi–dimensional arrays, passing functions to other functions, more about declarations. Lab sessions.				
Unit-V	Structures & Unions: Defining and processing a structure, user defined data types, structures and pointers, passing structures to functions, self referential structure, unions. Data Files: Opening, closing, creating and processing of data files. Lab sessions.				
Text Books: 1. Programming in C Schaum Outlines Series. 2. C Programming Stephen G. Kochan. 3. Let Us C Yashwant Kanitkar					

Paper Code		BIT-202			
Paper Name		Introduction to SAD			
Periods per week		L	T	P	Credit
		4	2	1	6
Unit-I	System Planning and Analysis: Introduction to systems development life cycle and role of different stages.				
Unit-II	Requirement analysis, Problem definition, Feasibility Study and its importance. Information Gathering Tools, Cost Benefit Analysis, Role and Responsibilities of System Analyst.				
Unit-III	System Design: Input/output Design, Modular and Structured Design, Tools for structured design and system design considerations.				
Unit-IV	System Implementation: System testing, Quality assurance, Documentation tools, Managing system implementation.				
Unit-V	System Testing: Introduction to testing and its types System Maintenance: Concept of maintenance and its importance, types of maintenance				
Text Books:					
1. Information Systems : Analysis and Design - A Modern Approach to Systems DevelopmentRam Bansal					
2. Systems Analysis and DesignElis M.Awad					
3. Analysis and Design of Information SystemsV. Rajaraman					

Paper Code		BIT-203			
Paper Name		Enterprise Resource Planning			
Periods per week		L	T	P	Credit
		4	2	1	4
Unit I	ERP-Introduction; Advantages; ERP and Business – value creation; Integrated Information Management;				
Unit II	Enterprise and ERP, Business modelling; Integrated data model. To ERP or not to ERP – Strategic Options; Benefits of ERP: Quantifiable,Intangible; P&G;				
Unit III	Risks: People, process, Technology, Implementation, Operational and Managerial risks. Introduction to ERP related technologies; Functional modules of ERP software.				
Unit IV	Implementation of ERP: Life cycle; Implementation methodologies, transition strategies; People involved in implementation.				
Unit V	Success and failure in implementation – factors. Operation and Maintenance of an ERP system.				
Text Books:					
1. ERP in practice – Vaman - TMH					
2. Daniel E.O’Leary, Enterprise Resource Planning Systems, Cambridge University Press, 2002.					
3. Ellen Monk, Bret Wagner, Concepts in Enterprise resource planning, Cengage learning, Third edition, 2009.					

Paper Code		AECC201			
Paper Name (Foundation course)		Environmental Studies			
		L	T	P	Credit
		0	0	0	0
Unit - I	Introduction to Environmental Studies <ul style="list-style-type: none"> • Multidisciplinary nature of environmental studies • Scope and importance; Concept of sustainability and sustainable development. 				
Unit - II	Natural Resources: Renewable and Non-renewable Resources <ul style="list-style-type: none"> • Land resources and land use change; Land degradation, soil erosion and desertification. • Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. • Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). • Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies. 				
Unit –III	Environmental Pollution <ul style="list-style-type: none"> • Environmental Pollution: Types, causes, effects and controls; Air, water, soil and noise pollution. • Industrial Pollution and bioremediation. • Solid waste management: Control measures of urban and industrial waste. • Pollution case studies. • Environmental Policies. • Global Warming and Climate Change. • Disaster Management. 				

Paper Code		BITOE-201			
Paper Name (Open Elective 2)		Applications of IT Tools			
		L	T	P	Credit
		3	0	1	4
Unit - I	Introduction of MS Office. Working with MS-Word Basic Features Working with MS-Word Text formatting Lab session.				
Unit - II	Working with MS-Word Image formatting Working with MS-Word Graphics Lab session.				
Unit –III	Working with MS-Excel features such as: <ul style="list-style-type: none">• Conditional Formatting.• PivotTables.• Paste Special.• Add Multiple Rows.• Absolute References.• Print Optimisation.• Extend formula across/down.• Flash Fill. Lab session.				
Unit –IV	Working with MS-PowerPoint features such as: <ul style="list-style-type: none">• Presenter View - new behind-the-scenes tools.• Slide Zoom - zoom in on a diagram, chart, or graphic.• Slide Navigator - switch slides in or out of sequence. Lab session.				
Unit - V	Exercise based presentation MS Word MS Excel MS Powerpoint Lab session.				
Text Books: <ol style="list-style-type: none">1. R.K. Taxali : Introduction to Software Packages, GalgotiaPublicaions.2. MS–Office 2003, Compiled by SYBIX.3. MS–Office 2003, BPB Publications.4. Introduction to Computer, P.K. Sinha.5. Balagurusamy, Fundamental of Computer, TMH					

Detailed Syllabi

B.Sc.-IT

SEMESTER-III

Paper Code		BIT-301			
Paper Name		Software Engineering			
Periods per week		L	T	P	Credit
		4	2	1	6
Unit-I	Introduction, what is software engineering? Software Development Life Cycle, Requirements Analysis, Software Design, Coding, Testing, Maintenance etc.				
Unit-II	Software Requirement Specification, Waterfall Model, Prototyping Model, Iterative Enhancement Model, Spiral Model, Role of Management in Software Development, Role of Metrics and Measurement, Problem Analysis, Requirement Specification, Validation, Metrics, Monitoring and Control				
Unit-III	System Design, Problem Partitioning, Abstraction, Top-down and bottom-up design, Structured Approach, Functional v/s Object-Oriented Approach, Design specification & verification, metrics, Monitoring & Control Coding, Top-down & Bottom-up, Structured Programming, Information Hiding, Programming Style, Internal Documentation, Verification, Metrics, Monitoring & Control.				
Unit-IV	Testing, Levels of Testing- Functional Testing, Structural Testing, Test Plan, Test Cases Specification, Reliability assessment.				
Unit-V	Software Project Management, Cost Estimation, Project Scheduling, Staffing, Software Configuration Management, Quality Assurance, Project Monitoring, Risk Management.				
Text Books:					
1. Software Engineering- A Practitioners Approach, R. Pressman, McGraw Hill					
2. An Integrated Approach to Software Engineering, Pankaj Jalote, Narosa					
3. Software Engineering: A Practitioners' Approach, R. A. Khan & A. Agarwal					
4. Mall B, Fundamentals of Software Engineering, Prentice Hall India Learning Private Limited					

Paper Code		BIT-302			
Paper Name		Data Structure using C			
Periods per week		L	T	P	Credit
		4	2	1	6
Unit-I	Basic Data Structure: Introduction to elementary Data Organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time – Space trade-off between Algorithms. Arrays: Array Defined, Representing Arrays in Memory, Various Operations on Linear Arrays, Multidimensional Arrays.				
Unit-II	Linked Lists Types of Linked Lists, Representing Linked Lists in Memory, Advantages of using Linked Lists over Arrays, Various Operations on Linked Lists, Doubly Linked List, Circular Linked List. Stacks: Description of STACK structure, Implementation of Stack using Arrays and Linked Lists, Applications of Stacks – Converting Arithmetic expression from infix notation to polish and their subsequent evaluation.				
Unit-III	Queues: Description of queue structure, Implementation of queue using arrays and linked lists, Description of priorities of queues, Types of Queues, Application of Queue.				
Unit-IV	Trees: Description of Tree Structure and its Terminology, Types of Tree, Tree representation in Memory, Binary Search tree, Traversing a Binary Tree, Huffman Tree, AVL Tree, Rotation in AVL Tree, B Tree. Graphs: Description of Graph Structure, Implement Graphs in Memory using Adjacency Matrix, Path Matrix.				
Unit-V	Sorting and Searching: Sorting Algorithms, Bubble Sort, Insertion Sort, Selection Sort, Merge Sort, Quick Sort, Searching Algorithms, Linear Search and Binary Search.				
Text Books: 1. Data Structures and Algorithms Made Easy by Narasimha Karumanchi 2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein. Introduction to Algorithms. McGraw-Hill, 2001. 3. Donald E. Knuth. The Art of Computer Programming, Volumes 1-3. Addison-Wesley Professional, 1998. 4. S.B. Kishor Data Structures, Edition 3. Das Ganu Prakashan, Nagpur, 2008					

Paper Code		BIT-303			
Paper Name		Basics of Cyber Security and IT Laws			
Periods per week		L	T	P	Credit
		3	1	0	4
Unit-1	Basic Principles and Acquisition of Intellectual Property Rights: Focus on the: Philosophical Aspects of Intellectual Property Laws, Basic Principles of Patent Law, Patent Application procedure, Drafting of a Patent Specification, Understanding Copyright Law, Basic Principles of Trade Mark, Basic Principles of Design Rights, International Background of Intellectual Property				
Unit-2	Information Technology Related Intellectual Property Rights Computer Software and Intellectual Property-Objective, Copyright Protection, Reproducing, Defences, Patent Protection. Database and Data Protection-Objective, Need for Protection, UK Data Protection Act, 1998,US Safe Harbor Principle, Enforcement. Protection of Semi-conductor Chips-Objectives Justification of protection, Criteria, Subject-matter of Protection, WIPO Treaty, TRIPs, SCPA. Domain Name Protection-Objectives, domain name and Intellectual Property, Registration of domain names, disputes under Intellectual Property Rights, Jurisdictional Issues, and International Perspective.				
Unit-3	Patents (Ownership and Enforcement of Intellectual Property) Patents-Objectives, Rights, Assignments, Defences in case of Infringement Copyright-Objectives, Rights, Transfer of Copyright, work of employment Infringement, Defences for infringement Trademarks-Objectives, Rights, Protection of good will, Infringement, Passing off, Defences. Designs-Objectives, Rights, Assignments, Infringements, Defences of Design Infringement.				
Unit-4	Enforcement of Intellectual Property Rights - Civil Remedies, Criminal Remedies, Border Security measures. Practical Aspects of Licencing – Benefits , Determinative factors, important clauses, licensing clauses.				
Unit-5	Cyber Law: Basic Concepts of Technology and Law : Understanding the Technology of Internet, Scope of Cyber Laws, Cyber Jurisprudence Law of Digital Contracts : The Essence of Digital Contracts, The System of Digital Signatures, The Role and Function of Certifying Authorities, The Science of Cryptography Intellectual Property Issues in Cyber Space: Domain Names and Related issues, Copyright in the Digital Media, Patents in the Cyber World. Rights of Netizens and E-Governance : Privacy and Freedom Issues in the Cyber World, E-Governance, Cyber Crimes and Cyber Laws.				
Text Books:					
1. Peter Weill , Jeanne Ross —IT Governance: How Top Performers Manage IT					
2. Decision Rights for Superior Resultsl					
3. Jeanne W. Ross —Enterprise Architecture As Strategy: Creating a Foundation for Business Executionl					
4. Peter Weill —IT Savvy: What Top Executives Must Know to Go from Pain to Gain					

Paper Code		BIT-304(A)			
Paper Name (Elective-1)		Concepts of Internet Programming			
Periods per week		L	T	P	Credit
		3	1	0	4
Unit-I	BASIC NETWORK AND WEB CONCEPTS Internet standards – TCP and UDP protocols – URLs – MIME – CGI – Introduction to SGML.				
Unit-II	JAVA PROGRAMMING Java basics – I/O streaming – files – Looking up Internet Address - Socket programming – client/server programs – E-mail client – SMTP - POP3 programs – web page retrieval – protocol handlers – content handlers - applets – image handling - Remote Method Invocation.				
Unit-III	SCRIPTING LANGUAGES HTML – forms – frames – tables – web page design - JavaScript introduction – control structures – functions – arrays – objects – simple web applications				
Unit-IV	DYNAMIC HTML Dynamic HTML – introduction – cascading style sheets – object model and collections – event model – filters and transition – data binding – data control – ActiveX control – handling of multimedia data				
Unit-V	SERVER SIDE PROGRAMMING Servlets – deployment of simple servlets – web server (Java web server / Tomcat / Web logic) – HTTP GET and POST requests – session tracking – cookies – JDBC – simple web applications – multi-tier applications.				
Text Books: 1. Deitel, Deitel and Nieto, “Internet and World Wide Web – How to program”, Pearson Education Publishers, 2000. 2. Elliotte Rusty Harold, “Java Network Programming”, O’Reilly Publishers, 2002					
REFERENCES 1. R. Krishnamoorthy & S. Prabhu, “Internet and Java Programming”, New Age International Publishers, 2004. 2. Thomno A. Powell, “The Complete Reference HTML and XHTML”, fourth edition, Tata McGraw Hill, 2003. 3. Naughton, “The Complete Reference – Java2”, Tata McGraw-Hill, 3rd edition, 1999.					

Paper Code		BIT-304(B)			
Paper Name (Elective Paper I)		Basics of Data Mining & Warehouse			
Periods per week		L	T	P	Credit
		3	1	0	4
Unit-I	Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining. Data Preprocessing: Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.				
Unit-II	Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining.				
Unit-III	Concepts Description : Characterization and Comparison : Data Generalization and Summarization- Based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Class Comparisons: Discriminating between Different Classes, Mining Descriptive Statistical Measures in Large Databases.				
Unit-IV	Mining Association Rules in Large Databases : Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.				
Unit-V	Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Back propagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy. Cluster Analysis Introduction : Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.				
Text Books: 1. S. Prabhu , N. Venkatesan“Data Mining & Warehousing – New Age International – First Edition”, New Delhi 2006. 2. Sam Anahory , Dennis Murray, “Data Warehousing in real world – Pearson Education”, New Delhi 2004. 3. Pieter Adriaans ,DolfZantinge, “Data Mining – Pearson education”, New Delhi 2005. 4. Alex Berson, Stephen J.Smith”Data Warehousing, Data mining & OLAP – Tata McGraw Hill Publications”, New Delhi 2004.					

Paper Code		BIT-304(C)			
Paper Name (Elective-1)		Fundamentals of IoT			
Periods per week		L	T	P	Credit
		3	1	0	4
Unit-I	Introduction to Internet of Things, Characteristics of IoT, Physical design of IoT, Functional blocks of IoT, Sensing, Actuation, Basics of Networking, Communication Protocols, Sensor Networks.				
Unit-II	Machine-to-Machine Communications, Difference between IoT and M2M, Interoperability in IoT, Introduction to Arduino Programming, Integration of Sensors and Actuators with Arduino,				
Unit-III	Introduction to Python programming, Introduction to Raspberry Pi, Interfacing Raspberry Pi with basic peripherals, Implementation of IoT with Raspberry Pi				
Unit-IV	Implementation of IoT with Raspberry Pi, Introduction to Software defined Network (SDN), SDN for IoT, Data Handling and Analytics,				
Unit-V	Cloud Computing, Sensor-Cloud, Smart Cities and Smart Homes, Connected Vehicles, Smart Grid, Industrial IoT, Case Study: Agriculture, Healthcare, Activity Monitoring				
Text Books:					
1. "The Internet 'of Things: Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press)					
2. “Make sensors”: Terokarvinen, kemo, karvinen and villey valtokari, 1st edition, maker media,2014.					
3. "Internet of Things: A Hands-on Approach", by Arshdeep Bahga and Vijay Madisetti					
REFERENCE BOOKS:					
1. Vijay Madisetti, Arshdeep Bahga, “Internet of Things: A Hands-On Approach”					
2. Waltenequs Dargie,Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice"					
3.Beginning Sensor networks with Arduino and Raspberry Pi – Charles Bell, Apress					

Detailed Syllabi

B.Sc.-IT

SEMESTER-IV

BBAU

Paper Code		BIT-401			
Paper Name		Java Programming			
Periods per week		L	T	P	Credit
		4	2	1	6
Unit-I	The Origin of Java- Java's Lineage (Ancestry), The Creation of Java, Java and Internet, Java's Magic: The Byte-code, The Java Features, The Java Environment, Java Program Development, Object Oriented Programming in Java, Java Program Structure and Java's Class Library. Java is Strongly Typed Language, The Simple Data Types, Literal, Variables, Type Conversion and Casting, Automatic Type, Promotion in Expressions, Java Operators, and Operator Precedence, Making Decisions, Logical Operations, The SWITCH statement, Variable Scope, Loops, Jump Statements				
Unit-II	Defining Classes- Introduction to a Class, Defining Classes, Defining Methods, Constructors, CreatingObjects of a Class, Assigning Object Reference Variables, variable this, Defining andUsing a Class, Automatic Garbage Collection. Arrays and Strings- Arrays, Arrays of Characters, String Handling Using String Class, String Handling UsingStringBuffer Class, Operations on Immutable Strings, Operations on Mutable Strings. Extending Classes and Inheritance- Encapsulation, Using Existing Classes, Class Inheritance, Choosing Base Class, AccessAttributes, Polymorphism, Multiple Levels of Inheritance, Abstraction through Abstract Classes, Using Final Modifier, and The Universal Super-class – Object Class				
Unit-III	Interfaces- Defining an Interface, Implementing Interfaces, ApplyingInterfaces, and Multiple Inheritance using Interfaces. Exception Handling- The Idea behind Exceptions, Types of Exceptions, Dealing with Exceptions, ExceptionObjects, Defining Your Own Exceptions. Multithreading Programming- Introduction of Java Thread, Creating Multiple Threads, Thread Priorities,Synchronization, Inter-thread Communication, Deadlocks.				
Unit-IV	Input and Output- Files and Directories, Character Streams, Buffered Character Streams, The Print WriterClass, Byte Streams, Random Access Files. Applets- An Overview Of Applets, The Life Cycle Of An Applet, The Graphics Class, Colors, Text,Applet Dimensions, Applets In Web Page, The Applet Class, The AppletContext Class,Images, Threads, Double Buffering				
Unit-V	Handling Events in Java- Two Event Handling Mechanisms, The Delegation Event Model, The Event HandlingProcess, Event Classes, Sources of Events, Event Listener Interfaces, Using the DelegationEvent Model, Adapter Classes Working with Graphics , Texts & Abstract Window Toolkit- Working with Graphics, Working with Color, Setting the Paint Mode, Working with Fonts,Managing Text Output Using FontMetrics, Exploring Text and Graphics, Labels, Buttons,Canvases, Check Boxes, Check Box Groups, Choices, Text Fields and Text Areas, Lists,Scroll Bars, Layout Managers, Border Layout, Grid Layout and Inserts, Panels, Windowsand Frames, Menus and Menu Bars, Dialogs and File Dialogs				
Text Books:					
1. Java EE 6 for Beginners, Sharanam Shah, Vaishali Shah, SPD (Unit II to VI)					
2. Core Java Vol. II – Advanced Features, Cay S. Horstmanns, Gary Coronell, Eight Edition,					

Paper Code	BIT-402			
Paper Name	Industrial Tour/ Minor Project-I			
Periods per week	L	T	P	Credit
	4	2	1	6
<p>The project should be undertaken preferably individually who will jointly work and implement the project. The candidate will select a project with the approval of the Guide and submit the name of the project with a synopsis of the proposed work of not more than 02 to 08 pages within one month of the starting of the semester. The candidate is expected to complete detailed system design, analysis, data flow design, procurement of hardware and/or software, implementation of a few modules of the proposed work during the semester VI as a part of the term work submission in the form of a joint report.</p> <p>Candidate will submit the completed project work to the department at the end of Semester VI as mentioned below.</p> <ol style="list-style-type: none"> 1. The workable project. 2. The project report in the bound journal complete in all respect with the following : - <ol style="list-style-type: none"> i) Problem specifications. ii) System definition – requirement analysis. iii) System design – dataflow diagrams, database design iv) System implementation – algorithm, code documentation v) Test results and test report. vi) In case of object oriented approach – appropriate process be followed. <p>The project report should contain a full and coherent account of your work. Although there will be an opportunity to present the work verbally, and demonstrate the software, the major part of the assessment will be based on the written material in the project report. One can expect help and feedback from the project guide, but ultimately it's the candidates own responsibility. The suggestive structure of a project report should be guided by your subject coordinator in selecting the most appropriate format for your project. The work assessment will be done jointly by internal and external examiners appointed by CA.</p>				

Paper Code		BIT- 403			
Paper Name		Fundamentals of Operating Systems			
Periods per week		L	T	P	Credit
		3	1	0	4
UNIT I	Introduction Architecture, Goals & Structures of O.S, Basic functions, Interaction of O. S. & hardware architecture, System calls, Batch, multiprogramming. Multitasking, time sharing, parallel, distributed & real -time O.S.				8 Lectures
UNIT II	Process Management Process Concept, Process states, Process control, Threads, Uni-processor Scheduling: Types of scheduling: Preemptive, Non pre-emptive, Scheduling algorithms: FCFS, SJF, RR, Priority, Thread Scheduling, Real Time Scheduling. System calls like ps, fork, join, exec family, wait.				8 Lectures
UNIT III	Concurrency control Concurrency: Principles of Concurrency, Mutual Exclusion: S/W approaches, H/W Support, Semaphores, pipes, Message Passing, signals, Monitors, Classical Problems of Synchronization: Readers-Writers, Producer Consumer, and Dining Philosopher problem. Deadlock: Principles of deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, System calls like signal, kill.				8 Lectures
UNIT IV	Memory Management Memory Management requirements, Memory partitioning: Fixed and Variable Partitioning, Memory Allocation: Allocation Strategies (First Fit, Best Fit, and Worst Fit), Fragmentation, Swapping, and Paging. Segmentation, Demand paging Virtual Memory: Concepts, management of VM, Page Replacement Policies (FIFO, LRU, Optimal, Other Strategies), Thrashing.				8 Lectures
UNIT V	I/O management & Disk scheduling: I/O Devices, Organization of I/O functions, Operating System Design issues, I/O Buffering, Disk Scheduling (FCFS, SCAN, C-SCAN, SSTF), RAID, Disk Cache.				8 Lectures
Reference Books:					
1. Operating System Concepts, 9th edition Peter B. Galvin, Greg Gagne, Abraham					
2. Silberschatz, John Wiley & Operating Systems 5th Edition, William Stallings, Pearson Education India					
3. Modern Operating Systems -By Andrew S. Tanenbaum (PHI)					

Paper Code		BITOE-404			
Paper Name (Open Elective-III)		Fundamentals of ERP			
Periods per week		L	T	P	Credit
		3	1	0	4
Unit-I	Introduction to ERP and survey of ERP market: ERP Concept, ERP Benefits, ERP Features, Conceptual Model of ERP, The Evolution of ERP, The Structure of ERP, Business Process Reengineering, Introduction to Data ware Housing, Introduction to Data Mining, Introduction to OLAP, Market dynamics; Functionality of ERP packages.				
Unit-II	Architecture of an ERP package: Two-tier Architecture, Three-tier Client/ServerArchitecture; computing infrastructure for ERP, On-Demand Utility Computing for ERP Systems.				
Unit-III	Business process re-engineering: Methodology of a BPR project implementation, Application of BPR, Implementation Procedure of BPR; Business process modeling: Business model, Enterprise business processes, business process diagrams, Business process modeling tools. Introduction to various business modules in ERP for example Finance - Manufacturing - Human Resource - Plant Maintenance - Materials Management - Quality Management - Sales and Distribution.				
Unit-IV	ERP Implementation: Full/Partial Implementation, ERP Implementation Life Cycle, Role of SDLC/SSAD, Object Oriented Architecture, Hidden costs, Vendors, Consultant Employees, Human Resource, Critical success and failure factors, Implementation issues,				
Unit-V	ERP MARKET:ERP Market Place - SAP AG - PeopleSoft - Baan Company - JD Edwards World Solutions Company - Oracle Corporation - QAD - System Software Associates. Introduction to ERP in the Indian Market, Effective utilization in the India’s context. ERP’s critical success & failure factors.				
Text Books:					
1. Sumner, “Enterprise Resource Planning”, Pearson Education.					
2. Alexis Leon, “ERP Demystified”, Tata McGraw Hill.					
3. Rahul V. Altekar “Enterprise wide Resource Planning”, Tata McGraw Hill,					
4. Vinod Kumar Garg and Venkitakrishnan N K, “Enterprise Resource Planning – Concepts and Practice”, PHI					
5. Joseph A Brady, Ellen F Monk, Bret Wagner, “Concepts in Enterprise Resource Planning”, Thompson Course Technology.					

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B.Sc.-IT

SEMESTER-V

Paper Code		BIT-501			
Paper Name		Software Testing			
Periods per week		L	T	P	Credit
		4	2	0	6
Unit-I	Introduction to quality, software quality, fundamentals of software testing, VV model of testing				
Unit-II	Functional Testing: Boundary value Testing, Equivalence class testing, Decision Table based testing, Retrospection.				
Unit-III	Structural Testing: Path Testing, Data Flow Testing, Retrospection, Levels of Testing, Integration Testing, System Testing, Interaction Testing				
Unit-IV	Object Oriented Testing: Issues, Class Testing, Object Oriented Integration Testing, Object Oriented System Testing				
Unit-V	Testing Process: Planning, Metrics and Reports, Quantitative and Qualitative Analysis, Improvements.				
Text Books:					
1. Software Testing Concepts & Practics, R A Khan, Narosa Publication					
2. Software Testing Principles, Techniques and Tools, M.G. Limaye, TMH, (Unit- I and VI)					
3. Software Testing A Craftman’s Approach, Second Edition, Paul					

Paper Code		BIT-502 (A)			
Paper Name (Elective Paper-II)		Requirement Engineering			
Periods per week		L	T	P	Credit
		4	2	0	6
Unit-I	Framework for Requirements Engineering, Requirements Engineering activities – Elicitation, Analysis, Validation, Documentation, Management, Rationale for Requirements Engineering and the problems with requirements, The importance of requirements planning and estimating				
Unit-II	Requirements Elicitation- Knowledge types – tacit and non-tacit, Elicitation techniques, Interviews, Workshops, Observation, Formal/informal Shadowing,				
Unit-III	Focus groups, Prototyping, Scenarios, Document Analysis, Special purpose records, Questionnaires, Understanding the applicability of techniques.				
Unit-IV	Requirements Documentation- Documentation styles and levels of definition Requirements Catalogue, Identifier, Name Description, Acceptance criteria,				
Unit-V	Requirements Analysis- Prioritizing and packaging requirements for delivery organizing requirements, Ensuring well-formed requirements, Prototyping requirements, and verifying requirements.				
Text Books:					
1. Requirements Engineering: Fundamentals, Principles, and Techniques by Klaus Pohl					
2. Requirements Engineering: A Good Practice Guide by Ian Sommerville, Pete Sawyer					

Paper Code		BIT-502 (B)			
Paper Name (Elective Paper-II)		Network Security			
Periods per week		L	T	P	Credit
		4	2	0	6
Unit-I	Computer Security : Introduction, Need for security, Principles of Security, Types of Attacks Cryptography : Plain text and Cipher Text, Substitution techniques, Caesar Cipher, Mono-alphabetic Cipher, Polygram, Polyalphabetic Substitution, Play fair, Hill Cipher, Transposition techniques, Encryption and Decryption, Symmetric and Asymmetric Key Cryptography, Steganography, Key Range and Key Size, Possible Types of Attacks				
Unit-II	Symmetric Key Algorithms and AES: Algorithms types and modes, Overview of Symmetric key Cryptography, Data Encryption Standard (DES), International Data Encryption Algorithm (IDEA), RC4, RC5, Blowfish, Advanced Encryption Standard (AES)				
Unit-III	Asymmetric Key Algorithms, Digital Signatures and RSA: Brief history of Asymmetric Key Cryptography, Overview of Asymmetric Key Cryptography, RSA algorithm, Symmetric and Asymmetric key cryptography together, Digital Signatures, Knapsack Algorithm, Some other algorithms (Elliptic curve cryptography, Megamall, problems with the public key exchange)				
Unit-IV	Digital Certificates and Public Key Infrastructure (PKI): Digital Certificates, Private Key Management, The PKIX Model, Public Key Cryptography Standards (PKCS), XML, PKI and Security, Hash functions, Key Redistribution, Bloom's Scheme, Daffier-Hellman Key Redistribution, Kerberos, Daffier-Hellman Key Exchange, The Station-to-station Protocol.				
Unit-V	Network Security, Firewalls and Virtual Private Networks: Brief Introduction to TCP/IP, Firewalls, IP Security, Virtual Private Networks (VPN), Intrusion Internet Security Protocols: Basic concepts, Secure Socket Layer (SSL), Transport Layer Security (TLS), Secure Hyper Text Transfer Protocol (SHTTP), Time Stamping Protocol (TSP), Secure Electronic Transaction (SET), SSL vs. SET, 3-D Secure Protocol, Electronic Money, E-mail Security, Wireless Application Protocol (WAP) Security, Security in GSM, Security in 3G. User Authentication and Kerberos: Authentication basics, Passwords, Authentication Tokens, Certificate-based Authentication, Biometric Authentication, Kerberos, Key Distribution Center (KDC) , Security Handshake Pitfalls, Single Sign On (SSO) Approaches				
Text Books: 1. Cryptography and Network Security by AtulKahate, 2nd Edition, Tata McGrawHill 2. Cryptography and Network Security by William Stallings, Fifth Edition, Pearson Education. 3. Cryptography: Theory and Practice by Douglas Stinson, CRC Press, CRC Press LLC.					

Paper Code		BIT-502 (C)			
Paper Name (Elective Paper –II)		Computer Graphics			
Periods per week		L	T	P	Credit
		4	2	0	6
Unit-I	Introduction: what is computer graphics? Elements of graphics workstation, Video Display Devices- Raster, Random, Input devices, Graphics Software Coordinate Representations, Fundamental problems in Geometry, Plotters, printers, digitizers, Light pens etc, Active & Passive graphics devices; Computer graphics software.				
Unit-II	Scan Conversion: Points & lines, Line drawing algorithms; DDA algorithm, Bresenham’s line algorithm, Circle generation algorithm; Ellipse generating algorithm; scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm..				
Unit-III	2D Transformation: Basic transformations: translation , rotation, scaling ; Matrix representations & homogeneous coordinates, transformations between coordinate systems; reflection shear; Transformation of points, lines , parallel lines, intersecting lines. Viewing pipeline, Window to viewport co-ordinate transformation, clipping operations, point clipping, line clipping, clipping circles, polygons & ellipse.				
Unit-IV	3D Transformation: 3D transformations: translation, rotation, scaling & other transformations. Rotation about an arbitrary axis in space, reflection through an arbitrary plane; general parallel projection transformation; clipping, viewport clipping, 3D viewing.				
Unit-V	Curves and Hidden Surface: Curve representation, surfaces , designs , Bezier curves , B-spline curves, end conditions for periodic B-spline curves, rational B-spline curves, Depth comparison, Z-buffer algorithm, Back face detection, BSP tree method, the Printer’s algorithm, scan-line algorithm; Hidden line elimination, wire frame methods , fractal - geometry.				
Text Books:					
1. Computer Graphics, Donald Hearn & M. Pauline Baker, PHI					
2. Computer Graphics by Hill Jr					
3. Computer Graphics, Steven Harrington, McGraw-Hill					

Paper Code		BIT-502(D)			
Paper Name (Elective Paper –II)		E-Commerce			
Periods per week		L	T	P	Credit
		4	2	0	6
Unit-I	Electronic Commerce: Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications. Consumer Oriented Electronic commerce - Mercantile Process models.				
Unit-II	Electronic payment systems: Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Inter Organizational Commerce: EDI, EDI Implementation, Value added networks.				
Unit-III	Intra Organizational Commerce: Work Flow, Automation Customization and internal Commerce, Supply chain Management. Corporate Digital Library:Document Library, digital Document types, corporate Data Warehouses.				
Unit-IV	Advertising and Marketing: Information based marketing, Advertising on Internet, on-line marketing process, market research. Consumer Search and Resource Discovery: Information search and Retrieval, Commerce Catalogues, Information Filtering.				
Unit-V	Need for Security, Firewall, Cryptography, Secret Key Encryption, Private Key Encryption, Digital Signatures Miscellaneous: E-mails, Search Engines, Education, and Entertainment				
Text Books:					
1. Kalakata, Whinston, “Frontiers of electronic commerce”, Pearson.					
2. Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, “E-Commerce fundamentals and applications”, John Wiley.					
3. S.Jaiswal, “E-Commerce”, Galgotia.					
4. B.Bhaskar, “Electronic Commerce”, 3rdedition, TMH.					
5. Bajaj and Nag, “E-Commerce the cutting edge of Business”, TMH					

Paper Code	BIT-504			
Paper Name	Minor Project-II			
Periods per week	L	T	P	Credit
	2	0	4	4
<p>The project should be undertaken preferably individually who will jointly work and implement the project. The candidate will select a project with the approval of the Guide and submit the name of the project with a synopsis of the proposed work of not more than 02 to 08 pages within one month of the starting of the semester. The candidate is expected to complete detailed system design, analysis, data flow design, procurement of hardware and/or software, implementation of a few modules of the proposed work during the semester VI as a part of the term work submission in the form of a joint report.</p> <p>Candidate will submit the completed project work to the department at the end of Semester VI as mentioned below.</p> <ol style="list-style-type: none"> 1. The workable project. 2. The project report in the bound journal complete in all respect with the following : - <ol style="list-style-type: none"> i) Problem specifications. ii) System definition – requirement analysis. iii) System design – dataflow diagrams, database design iv) System implementation – algorithm, code documentation v) Test results and test report. vi) In case of object oriented approach – appropriate process be followed. <p>The project report should contain a full and coherent account of your work. Although there will be an opportunity to present the work verbally, and demonstrate the software, the major part of the assessment will be based on the written material in the project report. One can expect help and feedback from the project guide, but ultimately it's the candidates own responsibility. The suggestive structure of a project report should be guided by your subject coordinator in selecting the most appropriate format for your project. The work assessment will be done jointly by internal and external examiners appointed by CA.</p>				

Paper Code		BIT - 505			
Paper Name		Report Writing and Seminar			
Periods per week		L	T	P	Credit
		2	0	4	4
UNIT I	Defining the Features of Technical Writing & Presentations Principles of a Technical Report · Know Your Audience, Purpose and Length of Report Understand the cornerstones of a presentation· Define the various purposes of presentations and plan the correct structure.				
UNIT II	Plan and Structure: Writing & Speaking with Purpose· Headings, Chapters and sections · Running headers and footers · Types of reports and templates to use · Main Idea and Arranging Details in Logical Sequence · Writing styles & techniques · Focus on your audience’s needs · Word choice, tone, and what to include.				
UNIT III	Audience Awareness & Editing · Use correct grammar and punctuation to avoid common errors in reports & oral presentations · Create a professional, readable and visually attractive report & oral presentation · Follow a three-step editing process Style of Writing & Use of Graphics · Writing Clear Sentences and paragraphs · Remove Jargon, Redundancy and Wordiness · Kinds of graphics and their messages · Suitability for placement in a graphic representation.				
UNIT IV	Group Practice and Interactive Session · Spotting common language problems (lengthy and confusing sentence structures, weak vocabulary, etc) · Editing Content, Logic and Language in speech & writing · Guided writing practice with examples (Participants are to bring along their reports for group learning, editing and discussion) · Drafting – the mindset to avoid writer’s block · Checking your own reports and presentations · Giving and receiving constructive feedback – what makes a review effective?				
UNIT V	From Written Report to Verbal Presentation · Gather, analyse, organize and deliver technical information meaningfully · Use rhetorical devices and elements of persuasion to engage your audience.				
Reference Books:					
1. Sharma, S., Raman, M. (2015). Technical Communication: Principles and Practice. India: Oxford University Press.					
2. Effective Communication Skills. (2016). India: KHANNA Publishers.					
3. Lata, P., Kumar, S. (2015). Communication Skills, Second Edition. India: Oxford University Press.					

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B.Sc.-IT

SEMESTER-VI

BBAU

Paper Code	BIT-601			
Paper Name	Major Project Report			
Credits	L	T	P	Credit
	0	0	24	12
<p>The project should be undertaken preferably individually or by the group of maximum 3 Students who will jointly work and implement the project. The candidate/group will select a project with the approval of the Guide and submit the name of the project with a synopsis of the proposed work of not more than 02 to 08 pages within one month of the starting of the semester. The candidate/ group is expected to complete detailed system design, analysis, data flow design, procurement of hardware and/or software, implementation of a few modules of the proposed work during the semester VI as a part of the term work submission in the form of a joint report.</p> <p>Candidate/group will submit the completed project work to the department at the end of Semester VI as mentioned below.</p> <ol style="list-style-type: none"> 1. The workable project. 2. The project report in the bound journal complete in all respect with the following : - <ol style="list-style-type: none"> i) Problem specifications. ii) System definition – requirement analysis. iii) System design – dataflow diagrams, database design iv) System implementation – algorithm, code documentation v) Test results and test report. vi) In case of object oriented approach – appropriate process be followed. <p>The project report should contain a full and coherent account of your work. Although there will be an opportunity to present the work verbally, and demonstrate the software, the major part of the assessment will be based on the written material in the project report. One can expect help and feedback from the project guide, but ultimately it's the candidates own responsibility. The suggestive structure of a project report should be guided by your subject coordinator in selecting the most appropriate format for your project. The work assessment will be done jointly by internal and external examiners appointed by CA.</p>				

Paper Code	BIT-602			
Paper Name	Presentation and Comprehensive Viva			
Credits	L	T	P	Credit
	0	0	16	08
<p>Presentation based on Major project guided by a faculty member internal or external or both. The presentation should be undertaken preferably individually or by the group of maximum 3 Students who will jointly work and implement the project. The candidate/group will prepare a power point presentation of not more than 15 slides as per schedule given by concern faculty.</p> <p>The candidate/ group is expected to explain the complete detailed system design, analysis, data flow design, procurement of hardware and/or software, implementation of a few modules of the proposed work in his presenattaion.</p> <p>The project presenatation should contain a full and coherent account of your work. Although there will be an opportunity to present the work verbally, and demonstrate the software, the major part of the assessment will be based on the comprehensive viva. One can expect help and feedback from the project guide, but ultimately it's the candidates own responsibility. The suggestive structure of a project presentation should be guided by your subject coordinator in selecting the most appropriate format for your project. The work assessment will be done jointly by internal and external examiners appointed by CA.</p>				

BBAU SATELLITE CENTRE, AMETHI

DEPARTMENT OF IT

List of Open Electives

Seminar	Subject Code	Subject Name	Credit	Evaluation Sessional + End Sem Exam
Semester-I	BITOE-101	Basics of IT	4	30+70=100
Semester-II	BITOE-201	Applications of IT Tools	4	30+70=100
Semester-IV	BITOE-404(A)	Fundamentals of ERP	4	30+70=100

Note: Students of the other Department will be permitted to adopt open elective papers.

Paper Code	BITOE-101			
Paper Name (Open Elective 1)	Basics of IT			
	L	T	P	Credit
	3	0	1	4
Objective: <ul style="list-style-type: none">To familiarize the student with basic concepts of computer and its component.To allow the students to understand the fundamental input and output devices and its functions.				
Learning Outcomes: <p>Students will be able to:</p> <ul style="list-style-type: none">Understand the basic terminology used in computer system.Understand the logic and flowchart design etc.				
Unit - I	Definition, Block diagram along with computer components, Characteristics & classification of computers, Hardware & software, Types of software, Operating System, Types of operating system, Functions of operating system, Examples of operating system, Lab session.			
Unit - II	Input and Output devices, Memory, Primary and secondary memory, Types of primary memory, Storage devices. Lab session.			
Unit –III	Processor, CPU, Fundamentals of Computer Networks. Lab session.			
Unit –IV	Concept of Algorithm, Techniques for designing algorithms, Flowchart, Pseudo-code. Lab session.			
Unit - V	Programming Languages, Assembler, Compiler, Interpreter, Program Writing and execution. Lab session.			
Text Books: <ul style="list-style-type: none">6. R.K. Taxali : Introduction to Software Packages, GalgotiaPublicaions.7. MS–Office 2003, Compiled by SYBIX.8. MS–Office 2003, BPB Publications.9. Introduction to Computer, P.K. Sinha.10. Balagurusamy, Fundamental of Computer, TMH				

Method of Teaching: Lecture/Tutorials/Labs etc

Method of Assessment weightage: (i) Internal Assessment - 30%

(ii) End Semester Exam - 70 %

Paper Code		BITOE-201			
Paper Name (Open Elective 2)		Applications of IT Tools			
		L	T	P	Credit
		3	0	1	4
Objective: <ul style="list-style-type: none">To familiarize the student with basic features of MS Office.To allow the students to understand the fundamental functions applicable to working with MS Word, Excel and Power Point presentation.					
Learning Outcome: Students will be able to: <ul style="list-style-type: none">Create documentation in well format.Create data sheets in computer system.Create presentation using basic and advance tools.					
Unit - I	Introduction of MS Office. Working with MS-Word Basic Features Working with MS-Word Text formatting Lab session.				
Unit - II	Working with MS-Word Image formatting Working with MS-Word Graphics				
Unit –III	Working with MS-Excel features such as: <ul style="list-style-type: none">Conditional Formatting.PivotTables.Paste Special.Add Multiple Rows.Absolute References.Print Optimisation.Extend formula across/down.Flash Fill. Lab session.				
Unit –IV	Working with MS-PowerPoint features such as: <ul style="list-style-type: none">Presenter View - new behind-the-scenes tools.Slide Zoom - zoom in on a diagram, chart, or graphic.Slide Navigator - switch slides in or out of sequence. Lab session.				
Unit - V	Exercise based presentation MS Word MS Excel MS PowerPoint Lab session.				
Text Books: <ol style="list-style-type: none">R.K. Taxali : Introduction to Software Packages, Galgotia Publications.MS–Office 2003, Compiled by SYBIX.MS–Office 2003, BPB Publications.Introduction to Computer, P.K. Sinha.Balagurusamy, Fundamental of Computer, TMH					

Method of Teaching: Lecture/Tutorials/Labs etc

Method of Assessment weightage: (i) Internal Assessment - 30%

(ii) End Semester Exam - 70 %

Paper Code		BITOE-404			
Paper Name (Open Elective-III)		Fundamentals of ERP			
Periods per week		L	T	P	Credit
		3	1	0	4
Unit-I	Introduction to ERP and survey of ERP market: ERP Concept, ERP Benefits, ERP Features, Conceptual Model of ERP, The Evolution of ERP, The Structure of ERP, Business Process Reengineering, Introduction to Data ware Housing, Introduction to Data Mining, Introduction to OLAP, Market dynamics; Functionality of ERP packages.				
Unit-II	Architecture of an ERP package: Two-tier Architecture, Three-tier Client/ServerArchitecture; computing infrastructure for ERP, On-Demand Utility Computing for ERP Systems.				
Unit-III	Business process re-engineering: Methodology of a BPR project implementation, Application of BPR, Implementation Procedure of BPR; Business process modeling: Business model, Enterprise business processes, business process diagrams, Business process modeling tools. Introduction to various business modules in ERP for example Finance - Manufacturing - Human Resource - Plant Maintenance - Materials Management - Quality Management - Sales and Distribution.				
Unit-IV	ERP Implementation: Full/Partial Implementation, ERP Implementation Life Cycle, Role of SDLC/SSAD, Object Oriented Architecture, Hidden costs, Vendors, Consultant Employees, Human Resource, Critical success and failure factors, Implementation issues,				
Unit-V	ERP MARKET:ERP Market Place - SAP AG - PeopleSoft - Baan Company - JD Edwards World Solutions Company - Oracle Corporation - QAD - System Software Associates. Introduction to ERP in the Indian Market, Effective utilization in the India’s context. ERP’s critical success & failure factors.				
Text Books:					
1. Sumner, “Enterprise Resource Planning”, Pearson Education.					
2. Alexis Leon, “ERP Demystified”, Tata McGraw Hill.					
3. Rahul V. Altekhar “Enterprise wide Resource Planning”, Tata McGraw Hill,					
4. Vinod Kumar Garg and Venkitakrishnan N K, “Enterprise Resource Planning – Concepts and Practice”, PHI					
5. Joseph A Brady, Ellen F Monk, Bret Wagner, “Concepts in Enterprise Resource Planning”, Thompson Course Technology.					

Method of Teaching: Lecture/Tutorials/Labs etc

Method of Assessment weightage: (i) Internal Assessment - 30%

(ii) End Semester Exam - 70 %