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Choice Based Credit System (CBCS) in Light of NEP-2020
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SEMESTER-III

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTCS301N	DCC	Discrete Structures	60	20	20	--	--	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

Course Educational Objectives (CEOs):

The student will have ability to:

1. Provide the fundamentals of formal techniques for solve the problems in computational domain and algorithm development.
2. Apply appropriate mathematical and statistical concepts and operations to interpret data and to solve problems
3. Formulate and evaluate possible solutions to problems, and select and defend the chosen solutions
4. Construct graphs and charts, interpret them, and draw appropriate conclusions.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.
The students will be able to:

1. Understand the notion of mathematical thinking, mathematical proofs, and algorithmic thinking, and be able to apply them in problem solving.
2. Define sets and perform operations and algebra on sets.
3. Demonstrate an understanding of relations and functions and be able to determine their properties.
4. Analyze logical propositions via truth tables.
5. Write an argument using logical notation and determine if the argument is or is not valid.

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6. Understand some basic properties of graphs and related discrete structures and be able to relate these to practical examples.
7. Model problems in Computer Science using graphs and trees.
8. Be able to use effectively algebraic techniques to analyze basic discrete structures and algorithms.
9. Draw hasse diagram and identify lattice.
10. Understand generating functions and recurrence relation.

Syllabus:

UNIT I **10HRS**

Set Theory

Definition of Sets, Venn Diagrams, complements, Cartesian products, power sets, counting principle, cardinality and countability (Countable and Uncountable sets), pigeonhole principle. Relation: Definition, types of relation, domain and range of a relation, pictorial representation of relation, properties of relation, partial ordering relation. Function: Definition and types of function, composition of functions, recursively defined functions.

UNIT II **9 HRS**

Propositional logic

Proposition logic, basic logic, logical connectives, truth tables, tautologies, contradiction, normal forms(conjunctive and disjunctive), modus ponens and modus tollens, validity, predicate logic, universal and existential quantification. Notion of proof: proof by implication, converse, inverse, contrapositive, negation, and contradiction,proof by using truth table.

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UNIT III **9HRS**

Graph Theory

Terminology Graph Representation Graph isomorphism; Connectedness; Various graph properties; Euler & Hamiltonian graph; shortest paths algorithms. Trees: Terminology; Tree traversals; prefix codes; Spanning trees; Minimum spanning trees.

UNIT IV **8 HRS**

Algebraic Structure

Binary composition and its properties definition of algebraic structure; Groupoid, Semi group, Monoid Groups, Abelian Group, properties of groups, Permutation Groups, Sub Group, Cyclic Group, Rings and Fields (definition and standard results).

UNIT V **9 HRS**

Posets, Hasse Diagram and Lattices

Introduction, ordered set,well ordered set, Hasse diagram of partially,Lattices, properties of Lattices, bounded and complemented lattices.Generating functions, Solution by method of generating functions.Recurrence Relation and Generating Function: Introduction to Recurrence Relation, Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions.

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

Text Books:

1. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill, 8th Edition, 2021.
2. Seymour Lipschutz, M.Lipson, "Discrete Mathemataics" Tata McGraw Hill, 4thEdition, 2021.
3. C.L.Liu,D. P. Mohapatra "Elements of Discrete Mathematics" Tata McGraw-Hill Edition, 4th Edition, 2017

References:

1. Trembley, J.P &Manohar; "Discrete Mathematical Structure with Application CS", McGraw Hill, 1st Edition, 2017
2. Biswal,"Discrete Mathematics & Graph Theory", PHI, 4thEdition, 2015.

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BTCS302N	DCC	Analysis & Design of Algorithms	60	20	20	30	20	3	0	2	4

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Course Educational Objectives (CEOs):

The student will have ability to:
COURSE OBJECTIVE

1. To learn the algorithm analysis techniques.
2. To critically analyze the efficiency of alternative algorithmic solutions for the same problem
3. To understand the limitation of algorithm power.
4. To understand different algorithm design techniques.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

1. Define the basic concepts of algorithms and analyze the performance of algorithms.
2. Explain different standard algorithm design techniques, namely, divide & conquer,
3. Greedy, dynamic programming, backtracking and branch & bound.
4. Demonstrate standard algorithms for fundamental problems in Computer Science.
5. Design algorithms for a given problem using standard algorithm design techniques.
6. Analyze and compare the efficiency of various algorithms of a given problem.
7. Identify the limitations of algorithms in problem solving.
8. To identify the types of problem, formulate, analyze and compare the efficiency of Algorithms.

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Syllabus:

UNIT I **10HRS**

Algorithms Designing: Algorithms, Analyzing Algorithms, Asymptotic Notations, Heap Sort, Sorting and Searching Algorithms and their Analysis in terms of Space and Time Complexity.

Divide and Conquer:

General Method, Binary Search, Merge Sort, Quick Sort, Selection Sort, Strassen's Matrix Multiplication Algorithms.

UNIT II **9HRS**

Greedy Method: General Method, fractionalKnapsack Problem, Job Sequencing with Deadlines, Minimum-Cost Spanning Tree - Prim's and Kruskal's algorithm, Single Source Shortest Paths.

UNIT III **8HRS**

Dynamic Programming: General Method, Optimal Binary Search Trees, O/1 Knapsack, multistage graph, Traveling Salesperson Problem, All Pairs Shortest Paths.

UNIT IV **7HRS**

Backtracking: General Method, 8-Queens Problem, Graph Coloring, Hamiltonian Cycles, Sum of Subsets.

Branch and Bound: GeneralMethod, O/1 Knapsack Problem, Traveling Salesperson Problem.

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UNIT V **8HRS**

NP Hard and NP Complete Problems: Basic Concepts, Cook's Theorem, NP Hard Graph and NP Scheduling Problems, Some Simplified NP Hard Problems.

Text Books:

1. Ellis Horowitz and Sartaj Sahni, "Fundamental of Computer Algorithms", 2nd Edition, Galgotia Publication, 2001.

References:

1. Thomas H Cormen, Charles E Leiserson and Ronald L Rivest "Introduction to Algorithms",3rd Edition, MIT Press. 2009.
2. Donal E Knuth, "Fundamentals of Algorithms: The Art of Computer Programming" Vol l,3rd Edition, Pearson Educatio, 1997.
3. Goodman, S.E. &Hedetnieni,"Introduction to Design and Analysis of Algorithm", Tata McGraw Hill, 1977.
4. S. Dasgupta, C. H. Papadimitriou, and U. V. Vazirani,"Algorithms",Tata McGraw Hill, 2006.
5. J.E Hopcroft, J.D Ullman, "Design and analysis of algorithms" TMH Publication.

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List of Practical:

1. Write a program for Iterative and Recursive Binary Search.
2. Write a program for Merge Sort.
3. Write a program for Quick Sort.
4. Write a program for Strassen's Matrix Multiplication.
5. Write a program for minimum spanning trees using Kruskal's algorithm.
6. Write a program for minimum spanning trees using Prim's algorithm.
7. Write a program for single sources shortest path algorithm.
8. Write a program for Floyd-Warshal algorithm.
9. Write a program for traveling salesman problem.
10. Write a program for Hamiltonian cycle problem.

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BTCS303N	DCC	Computer Graphics and Multimedia	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Course Educational Objectives (CEOs):

The student will have ability to:

1. Understood basic concepts of computer graphics.
2. Extract the various computer graphics hardware and display technologies.
3. Evaluate various algorithms for scan conversion and filling of basic objects and their comparative analysis.
4. Acquire knowledge about drawing basic shapes such as lines, circle, ellipse, polygon.
5. Remembering knowledge about two- and three-dimensional transformations.
6. Analyze the line and polygon clipping algorithms of the basic shapes.
7. Understood the various Multimedia Operation and file formats.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills, and attitudes.

The students will be able to

1. Apply basic concepts of computer graphics.
2. Able to perform processing of basic shapes by various processing algorithms /techniques.
3. Design two and three-dimensional graphics.
4. Analyze all the types of clipping algorithms for line and polygon.

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5. Apply the acquire knowledge about Visible Surface Detection methods, Illumination Models and Surface Rendering.
6. Able to perform various types of color model implication.
7. Acquire knowledge to apply advanced techniques such as fractals, introduction to open GL and Multimedia Systems.

Syllabus:

UNIT I **9HRS**

Introduction to Computer Graphics, Applications of computer graphics, Display devices, Random and Raster scan systems, CRT color monitors,Beam Penetration CRT, The Shadow - Mask CRT, DVST, Graphics input devices, Graphics software and standards.

UNIT II **10HRS**

Points and Lines,DDA line drawing algorithm, Bresenham's drawing algorithm, Mid-point Circle drawing algorithm, Mid-point circle drawing algorithm, Mid-point Ellipse drawing algorithm, Parametric Cubic Curves: - Bezier and B-Spline curves, Filled Area Primitives: -Scan line polygon fill algorithm, Pattern fill algorithm Inside-Outside Tests, Boundary fill algorithms, Flood fill algorithms

UNIT III 10**HRS**

2D transformation: Translation, Rotation, Scaling, Shearing, Reflection. Inverse Transformation, Homogenous coordinate system, Matrices Transformation, Composite Transformation.

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3D transformations: translation, rotation, scaling. Parallel & Perspective Projection, Types of Parallel & Perspective Projection.Composite transformations Projections, Back Surface detection method Depth Buffer method Scan line method BSP tree method, Area Subdivision method.

UNIT IV **8HRS**

Windowing & Clipping: World Coordinate System, Screen Coordinate System, Viewing Transformation, Line Clipping, Cohen Sutherland, Midpoint Line clipping algorithms, Polygon Clipping: Sutherland –Hodgeman, Weiler-Atherton algorithms.
Basic Illumination Model, Diffuse reflection, Specular reflection, Phong Shading Gourand shading, ray tracing, color models like RGB, YIQ, CMY, HSV.

UNIT V **9HRS**

Multimedia System: An Introduction, Multimedia hardware, Multimedia System Architecture. Data & File Format standards. i.e RTF, TIFF, MIDI, JPEG, DIB, MPEG, Audio: digital audio, MIDI, processing sound, sampling, compression. Video: Avi, 3GP, MOV, MPEG, compression standards, compression through spatial and temporal redundancy. Multimedia Authoring.

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Textbooks:

1. John F. Hughes, Andries Van Dam, Morgan Mc Guire ,David F. Sklar , James D. Foley, Steven K. Feiner and Kurt Akeley ,"Computer Graphics: Principles and Practice", , 3rd Edition, Addison-Wesley Professional,2013.
2. Donald Hearn and Pauline Baker M, "Computer Graphics", Prentice Hall, New Delhi, 2007.

References:

1. .Computer Graphics, C Version, 2e Paperback – 2002
2. Foley, Vandam, Feiner, Huges, "Computer Graphics: Principles & Practice", Pearson Education, second edition 2003.
3. Judith Jeffcoate, "Multimedia in practice technology and Applications", PHI, 1998.
4. David F Rogers, "Procedural elements for Computer Graphics", Tata McGraw Hill, Second Edition.
5. Foley, VanDam, Feiner and Hughes, "Computer Graphics Principles & Practice in C", Second edition, Pearson Education.
6. David Hillmaa, "Multimedia Technology & Applications, Delmar, 1998

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List of Practical:

1. Implement DDA Line Drawing algorithm
2. Implement Bresenham's line drawing algorithm.
3. Implement Mid-Point circle drawing algorithm.
4. Implement Mid-Point ellipse drawing algorithm.
5. Implement cubic Bezier curve.
6. Implement a menu-driven program for 2D transformations.
7. Implement Line clipping algorithm using Cohen-Sutherland
8. Implement Polygon Clipping using Sutherland Hodgeman.
9. Implement Scan line fill algorithm.
10. Study of Multimedia and Program for Flash.

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Course Educational Objectives (CEOs):

The student will have ability to:

1. Understand the general overview of the concepts and fundamentals of computer networks.
2. Understand the various components required to build different networks.
3. Familiarize the students with the standard models for the layered approach to communication between machines in a network and the protocols of the various layers.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

1. Understanding basic computer network technology.
2. Understand the functions of each layer in the OSI and TCP/IP reference model.
3. Obtain the skills of subnetting and routing mechanisms
4. Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.

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Syllabus:

UNIT I **9HRS**

Introduction: Importance of Computer Networks, Classifications & Types. Layered Architecture: Protocol hierarchy, Interfaces and Services, Connection Oriented &Connection less Services, ISO- OSI Reference Model, TCP/IP model overview, comparison of TCP/IP and ISO-OSI reference model.

UNIT II **9HRS**

Data Link Layer &MAC Sublayer: Need, Services Provided, Design issues, Elementary data link protocols: simplex protocol, A simplex stop and wait protocol for an error-free channel, A simplex stop and wait protocol for noisy channel. Sliding Window protocols: A one-bit sliding window protocol, A protocol using Go-Back-N, A protocol using Selective Repeat, MAC Addressing, Binary Exponential Back-off (BEB) Algorithm, Distributed Random Access Schemes/Contention Schemes: for Data Services (ALOHA and Slotted- ALOHA), CSMA, CSMA/CA, CSMA/CD.

UNIT III **9HRS**

Network Layer: Need, Services Provided, Design Issues, Routing Algorithms and types of Routing Algorithm, IPv4, IPv6, Classful and classless Addressing, Subnetting, Supernetting.

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UNIT IV **10HRS**

Transport Layer: Need, Design Issues, Multiplexing and Demultiplexing, transport layer services, UDP,UDP Header Format, Principles of reliable data transfer, TCP,Connection Management, TCP Flow Control, TCP Congestion Control, TCP Header Format, TCP Timer Management, SCTP.

UNIT V **8HRS**

Session layer: Overview, Authentication, Session layer protocols, **Presentation layer:** Overview, Data conversion, Encryption and Decryption, Presentation layer protocols (LPP, Telnet, X.25 packet Assembler/Disassembler), **Application Layer:** Domain name system, SNMP, Electronic Mail; the World WEB, HTTP, FTP.

Text Books:

1. Andrew S Tanenbaum, Computer Networks, 6th Edition, Pearson Education, 2016.

References:

1. Behrouz A.Forouzan, TCP/IP-Protocol suite, 4th edition, McGraw-Hill, 2010.
2. William Stallings, Data and Computer Communication, 10th edition Pearson, 2014.
3. Comer, Internet working with TCP/IP Volume one, Addison-Wesley, 2015.
4. W. Richard Stevens, TCP/IP Illustrated, Volume 1, 2nd Edition Addison-Wesley Professional Computing Series.

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTIT301N	DCC	Computer Networks	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

LIST OF EXPERIEMNTS:

1. Demonstrate Different Types of Network Equipment's.
2. Color coding standard of CAT 5, 6, 7 and crimping of cable in RJ-45.
3. LAN installations and Configurations.
4. Experiment with basic Network configuration commands.
5. Write a program for error detection and correction technique.
6. Write a program for framing.
7. Write a program for routing algorithm.
8. Socket Programming.
9. Study about different network simulators.
10. Establish and simulate peer to peer network using packet tracer.
11. Simulate LAN using hub and switch and discuss pros and cons of hub.
12. Router configuration using packet tracer.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTDSE311N	DSE	Information Theory and Coding	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

Course Educational Objectives (CEOs):

The student will have ability to:

1. Students should be able to calculate the information content of a random variable from its probability distribution relate condition and marginal entropies of variables interims of their coupled probabilities.
2. Channel capacities and properties using Shannon's Theorems construct efficient client codes for data on imperfect communication channels generalize the discrete concepts to continuous signals on continuous channels understand.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

1. Students will be introduced to the basic notions of information and channel capacity.
2. Derive equations for entropy mutual information and channel capacity for all types of channels.
3. Design a digital communication system by selecting an appropriate error correcting codes for a particular application.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTDSE311N	DSE	Information Theory and Coding	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

Syllabus:

UNIT I **9HRS**

Introduction of Information Theory: Introduction, Measure of information, Average information content of symbols in long independent sequences, Average information content of symbols in long dependent sequences. Mark off statistical model for information source, Entropy and information rate of mark off source.

UNIT II **9HRS**

Source Coding: Encoding of the source output, Shannon‟s encoding algorithm. Communication Channels, Discrete communication channels, Continuous channels.

Fundamental Limits on Performance: Source coding theorem, Huffman coding, Discrete memory less Channels, Mutual information, Channel Capacity.

UNIT III **9HRS**

Channel: Channel coding theorem, Differential entropy and mutual information for continuous ensembles, Channel capacity Theorem Introduction.

Introduction to Error Control Coding: Types of errors, examples, Types of codes Linear Block Codes: Matrix description, Error detection and correction, Standard arrays and table look up for decoding.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTDSE311N	DSE	**Information Theory and Coding**	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

UNIT IV **8HRS**

Cyclic Codes: Binary Cycle Codes, Algebraic structures of cyclic codes, Encoding using an (n-k) bit shift register, Syndrome calculation. BCH codes. RS codes, Golay codes, Shortened cyclic codes, Burst error correcting codes. Burst and Random Error correcting codes.

UNIT V **7HRS**

Convolution Codes: Convolution Codes, Time domain approach. Transform domain approach.

Text Books:

1. Information Theory, Coding and Cryptography, Ranjan Bose, TMH, III edition, 2017

References:

1. Digital Communications Glover and Grant, Pearson Ed. 2nd Ed 2008.
2. Information Theory and Coding, K. N. Hari Bhat, D. Ganesh Rao, Cengage, 2017.
3. Digital and analog communication systems, K. Sam Shanmugam, Wiley,1996.
4. Digital communication, Simon Haykin, Wiley, 2003.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTDSE312N	DSE	Essentials of E - Commerce	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

Course Educational Objectives (CEOs):

The student will have ability to:

1. Understanding the fundamental concepts of E-Commerce.
2. Understand structured E-Payment Systems.
3. Understand e-Readiness & Ecommerce Security.
4. Knowledge of basic Security of E-Commerce.
5. Understand E-Governance& Models.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to:

1. Students will understand basics E-Commerce & E-Governance.
2. Students would be able to analyze the concept of electronic market and market place
3. Students will understand e-Readiness&Ecommerce Security.
4. Understand the e-business concepts, models and infrastructure.
5. Willcome up with online business ideas and will be motivated to apply what they learned
6. Students would be able to understand the legal and security issues.
7. Learn how e-business concepts are applied to different fields, such as: education, banking, tourism etc.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTDSE312N	DSE	Essentials of E - Commerce	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Syllabus:

UNIT I **10HRS**

Introduction To E-Commerce: The Scope of E-Commerce, Commercial Use Of The Internet, Emergence of World Wide Web, Electronic Data Exchange-Business, E-Commerce In India, E-Commerce Opportunities For Industries, B2C,B2B,C2C,C2B Models, Advantages and Disadvantages of E-Commerce.

UNIT II **9HRS**

Electronic Payments Overview of Electronics payments, Overview, The SET protocol, Payment Gateway, Digital Token based Electronics payment System, magnetic strip card, E-Checks, Smart Cards, Credit Card, Debit Card based EPS, Emerging financial Instruments, Home Banking, Online Banking.

UNIT III **8HRS**

E-readiness, e-government readiness, e-Framework, step & issues, application of data warehousing and data mining in e-government, e-Advertising Techniques: Banners, Sponsorships, Portals, Online Coupons, Case studies: NICNET-role of nationwide networking in e-governance, E-seva

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTDSE312N	DSE	Essentials of E - Commerce	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

UNIT IV **7HRS**

E-Commerce Security: Security on the internet, E-commerce security issues, Cryptography, Digital Signature & Authentication protocol, Digital Certificates. Online Security Challenges and approach to e-government security, security for server computers, communication channel security, security for client computers. Information security environment in India.

UNIT V **8HRS**

E-Government, theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

Text Books:

2. V. Rajaraman, “Essentials of E-Commerce Technology”, PHI Learning Private Limited
3. C.S.R. Prabhu, “E-governence: concept and case study”, PHI Learning Private Limited.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTDSE312N	DSE	Essentials of E - Commerce	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

References:.

1. Gary P. Schneider, "E-commerce", Cengage Learning India. 9th Edition
2. Hanson and Kalyanam, "E-Commerce and Web Marketing", Cengage Learning.
3. P.T. Joseph, "E-Commerce An Indian Perspective", PHI Learning Private Limited.
4. J. Satyanarayan, "E-government: The science of the possible", PHI Learning Private Limited.
5. David Whiteley, "E-commerce study, technology and applications", TMH.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTDSE313N	DSE	Modern Computing Hardware	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

Course Educational Objectives (CEOs):

1. To learn the concept of memory and its types along with HDD/SDD.
2. To learn the input/output components presents on the motherboard.
3. To learn different modes of power supply to the PC and it's troubleshooting.
4. To learn the concept of BIOS.
5. To learn the device drivers and peripherals attached to the PC board.

Course Outcomes (COs):

Upon completion of the course, students will be able:

1. To understand the hierarchy of the Memory used for PC and its applications.
2. To understand the use and working of I/O components.
3. To understand the principles behind the power supply and its usage.
4. To understand the BIOS concept and its configuration.
5. To understand the use and requirement of peripherals and their device drivers.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTDSE313N	DSE	Modern Computing Hardware	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

UNIT I **8 HRS**

Hardware Organization : Motherboards, Chipset and Controllers, Types of processors (Intel Core i3/ i5 /i7 /i9 & AMD) and their compatibility with motherboards, USB Ports, HDMI, DVI, Interconnection between units, Graphic cards**.**

UNIT II **6HRS**

Memory& Storage Devices: Introduction to memory, classification of Memory and its use, Overview Memory chips and Modules, and its working principle and Trouble shooting of Memory. DVD & Blue-Ray Disk, Hard Disk Drives, Solid-State Drives, USB Flash Drives.

UNIT III **4 HRS**

Power Supply: Working of SMPS, On-Line/Off-Line/Line-Interactive/uninterrupted power supplies (UPS), CMOS, Lithium-ion battery, basic principle of working their importance and maintenance.

UNIT IV **4 HRS**

Basic Input/output System: Concept of BIOS. Function of BIOS, software interrupts, testing and initialization, configuring the system.

UNIT V **6 HRS**

Peripherals & Device Drivers: Input devices: Wireless Keyboard & Mouse, Light-Pen, Touch Screen, HD web camera, Barcode Reader, Output devices: Touch Screen Monitor, 3D Printer, Projector, Software drivers for various devices and their role**.**

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTDSE313N	DSE	Modern Computing Hardware	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

Text Books:

1. Craig Zacker & John Rourtre, PC Hardware- The complete reference, First Edition, TMH, 2017
2. Mike Meyers, Introduction to PC Hardware and Troubleshooting, 1st edition, McGraw Hill Education, 2017

References:

1. Stephen Bigelow, Bigelow's Troubleshooting, Maintaining & Repairing PCs, 5 edition, McGraw Hill Education, 2017
2. Vikas Gupta, Comdex Hardware and Networking Course Kit: Revised & Upgraded, Dreamtech Press, 2014
3. Dan Gookin, Troubleshooting and Maintaining Your PC All–in–One For Dummies, 3rd edition, John Wiley & Sons, 2017
4. Robert Bruce Thompson, Barbara Fritchman Thompson, Building the Perfect PC, 3 edition, O′Reilly, 2010
5. B. Govindarajalu, IBM PC and CLONES: Hardware, Troubleshooting and Maintenance McGraw Hill Education, 2nd Edition 2002.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTIT307N	SEC	Introduction to Core Java	0	0	0	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks`

Course Educational Objectives (CEOs):

The student will have ability to:

1. Understand Java Environment for application development.
2. Understand Programing using Object Oriented Technology.
3. Develop computer program to solve specific problems with high performance.
4. Create debug and run java standalone applications.
5. Understand the concept of Exception handling and Multithreading.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

8. Design new applications using object oriented methodologies.
9. Explore various system libraries.
10. Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.
11. Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes..
12. Design Data base connectivity program for simple problems.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTIT307N	SEC	Introduction to Core Java	0	0	0	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks`

Syllabus:

UNIT I **12HRS**

Introduction to Java: Java's magic, The Byte code,Java Development Kit (JDK), Java Buzzwords, Object oriented programming, Simple Java programs, Data types, variables and arrays, Operators, Control Statements.

UNIT II 8**HRS**

Classes, Inheritance, Packages and Interfaces: Classes: Classes fundamentals,Declaring objects, Constructors, this keyword, garbage collection. Inheritance: inheritance basics, using super, creating multi level hierarchy, method overriding.Packages, Access Protection, Importing Packages, Interfaces.

UNIT III **7HRS**

Exceptions handling and Multi threading: Exception , Exceptions and Errors ,Types of Exception, Control Flow in Exceptions, Use of Try, Catch, Finally, Throw, Throws in Exception Handling, In-Built and User Defined Exceptions,Checked and Un Checked Exceptions.

UNIT IV **8HRS**

Understanding Threads, Needs of Multi-Threaded Programming ,Thread Life Cycle, Thread Priorities ,Synchronizing Threads,

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTIT307N	SEC	Introduction to Core Java	0	0	0	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks`

UNIT V **8HRS**

The Java Library: String Handling, Exploring Java.Lang, Java.Util – The Collection Framework, Exploring Java.IO.

Text Books:

1. E. Balagurusamy, "Programming with java A Primer", Fourth Edition, Tata McGraw Hill, 2009

References:

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
2. Introduction to Java programming, By Y.DanielLiang,Pearson Publication.
3. SouravSahay, Object Oriented Programming with C++ , Oxford University Press,2006
4. Herbert Schildt, "The Complete Reference Java", Ninth Edition, McGraw Hill, 2014
5. Bert Bates, Kathy Sierra, "Head First Java", 2nd Edition, O' Reilly, 2005

List of Practical:

1. Write a program to show concept of Class in Java?
2. Write a program showing Type Casting
3. Write a program showing Different type of inheritance
4. Write a program showing Different types of Polymorphism
5. Write a program showing Encapsulation
6. Write a program showing Abstraction
7. Write a program showing interface.

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BTIT307N	SEC	Introduction to Core Java	0	0	0	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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8. Write a program showing abstract class.
9. Write a program showing inner class.
10. Write a Multithreaded program
11. Write a program showing Checked and Unchecked Exception .

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTCSMOB301N	SEC	Mobile App Development III - iOS	--	--	--	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks`

Course Educational Objectives (CEOs):

The student will have ability to:

1. To describe the basic tools and techniques to develop an iOS application.
2. To illustrate the fundamental concepts of application development for iOS with Swift programming language.
3. To design the user interface (UI) and user's interaction for iOS application.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills, and attitudes.

The students will be able to

1. Define key programming terms relevant to Swift and iOS programming.
2. Describe the process of creating an iOS application.
3. Demonstrate programming best practices in Swift.
4. Select the appropriate UI primitives, persistent storage, user interactions, to develop the working iOS application from the concept.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTCSMOB301N	SEC	Mobile App Development III - iOS	--	--	--	30	20	0	0	2	1

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Syllabus:

UNIT–I **10HRS**

Introduction: Introduction to iOS, Mobile application development, Overview of iOS platform, setting up Xcode & tools, MVC design pattern.
Interface Builder Basics: Common system views, Interface Builder Storyboards, project options, default project, create a new project with label and a greet function.

UNIT–II **9HRS**

Introduction to UIKit: Common system views configuration, Label(UILabel),Image view,Text view,Scroll view, Table view, Toolbars(UIToolbar), Navigation bars, tab bars, Controls, Button, Segmented controls, Sliders, Switches, Date pickers, UIKit User Interface Catalog, Displaying data: Content mode, Unexpected Clipping.

UNIT–III **8HRS**

Auto Layout and Stack Views: Layout for multiple sizes, Why Auto Layout?, Create alignment constraints, create size constraints, Resolve constraint issues, Safe area layout guide ,resolve constraint warnings, Constraints between siblings, Stack views,stack view attributes, Size classes.

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UNIT–IV **7HRS**

App Anatomy and Life Cycle: App life Cycle, break down the delegate, Protocols methods: Did Finish Launching, Will Resign Active, Did Enter Background, Will Enter Foreground, Did Become Active, Will Terminate.
View Controller life Cycle: viewDidLoad, viewWillappear , viewDidappear, viewWillDisappear.

UNIT–V **8HRS**

User Interactivity and Advanced UI Concepts: Gestures, Extensions, Delegation, Protocols, Closures, Handling Touches.
Basic iOS Animations: Timer, view based animations, UI dynamics , Alerts, Actions Sheets, Notifications, Segues.
Persistence and Documents: User defaults, Core data, property list, Archiving and Codable, File system, File Manager & CloudKit, Working with the web.

Text Books:

1. Matthew Mathias, John Gallagher, Swift Programming: The Big Nerd Ranch Guide 2nd edition, 2015.
2. Matt Neuberg , iOS 12 Programming Fundamentals with Swift, OReilly; 5th edition.
3. App Development with Swift (as available on iBook Store)

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References:

1. Paris Buttfield-Addison, Jonathon Manning , Tim Nugent Learning Swift: Building Apps for macOS, iOS, and Beyond, O'Reilly Media, Inc., 3rd ed, 2018.
2. Jon Hoffman, Mastering Swift 4, Packt Publishing Limited ,4th edition,2017.
3. Vandad Nahavandipoor. iOS 11 Swift Programming Cookbook, O'Reilly Media, 2017
4. S. Yamacli, Beginner's Guide to iOS 11 App Development Using Swift 4: Xcode, Swift and App Design Fundamentals,(1e), USA: CreateSpace Independent Publishing Platform, 2017.

List of Practical:

Perform Experiments on each Topic at least 20 Experiments are suggest to Cover the Syllabus.

1. Create an Hello world App.
2. Create an App Using Labels and Buttons.
3. Create an Calculator App using Textviews , Labels and Buttons to perform different mathematical operations.
4. Create an App to demonstrate ImageViwer.
5. Create an App to demonstrate Scrollview.
6. Create an App to demonstrate Tableview.
7. Create an App to demonstrate Toolbar.
8. Create an App to demonstrate Slider.
9. Create an App to demonstrate Switches.
10. Create an App to demonstrate DatePicker.
11. Create an App Using Auto Layout.
12. Create an App Using Constraints.

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13. Create an App to demonstrate Lifecycle of an App.
14. Create an App to demonstrate ViewController Lifecycle.
15. Create an App to demonstrate User Interactivity and Advanced UI Concepts.
16. Create different apps using Timer, Alerts, Actions Sheets and Notifications.
17. Create different apps using view-based animations, UI dynamics and Segues.
18. Create different apps using File system, File Manager & CloudKit.
19. Design and Implement an App.