Shri Vaishnav Vidyapeeth Vishwavidyalaya

Shri Vaishnav Institute of Information Technology

Choice Based Credit System (CBCS) in the light of NEP-2020

B.Tech. (CSE-Cloud and Mobile Computing/Artificial Intelligence/ FullStack Development & Blockchain-IBM)

SEMESTER V (2021-2025)

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 *				
BTCS501N	DCC	Theory Of Computation	60	20	20	-	-	3	1	0	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.

COURSE OBJECTIVES

1. The student will have ability to:
2. To introduce concepts in automata theory and theory of computation.
3. To identify different formal language classes and their relationships.
4. To design grammars and recognizers for different formal languages.

COURSE OUTCOMES

1. Upon completion of the subject, students will be able to:
2. Ability to relate practical problems to languages, automata, and computability.
3. Ability to demonstrate an increased level of mathematical sophistication.
4. Ability to apply mathematical and formal techniques for solving problems.

Syllabus:

UNIT–I **10 HOURS**

Introduction: Alphabets, Strings and Languages; Automata and Grammars, Deterministic finite Automata (DFA)-Formal Definition, Simplified notation: State transition graph, Transition table, Language of DFA, Nondeterministic finite Automata (NFA), NFA with epsilon transition, Language of NFA, Equivalence of NFA and DFA, Minimization of Finite Automata, Distinguishing one string from other, Myhill-Nerode Theorem.

UNIT–II **8 HOURS**

Regular Expression (RE): Definition, Operators of regular expression and their precedence, Algebraic laws for Regular expressions, Kleen's Theorem, Regular expression to FA, DFA to Regular expression, Arden's Theorem, Non Regular Languages, Pumping Lemma for regular Languages. Application of Pumping Lemma, Closure properties of Regular Languages, Decision properties of Regular Languages, FA with output: Moore and Mealy machine, Equivalence of Moore and Mealy Machine, Applications and Limitation of FA.

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BTCS501N	DCC	Theory Of Computation	60	20	20	-	-	3	1	0	4

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UNIT–III **9 HOURS**

Context Free Grammar (CFG) and Context Free Languages (CFL): Definition, Examples, Derivation, Derivation trees, Ambiguity in Grammar, Inherent ambiguity, Ambiguous to Unambiguous CFG, Useless symbols, Simplification of CFGs, Normal forms for CFGs: CNF and GNF, Closure properties of CFLs, Decision Properties of CFLs: Emptiness, Finiteness and Membership, Pumping lemma for CFLs.

UNIT–IV **7 HOURS**

Push Down Automata (PDA): Description and definition, Instantaneous Description, Language of PDA, Acceptance by Final state, Acceptance by empty stack, Deterministic PDA, Equivalence of PDA and CFG, CFG to PDA and PDA to CFG.

UNIT–V **8 HOURS**

Turing machines (TM): Basic model, definition and representation, Instantaneous Description, Language acceptance by TM, Variants of Turing Machine, TM as Computer of Integer functions, Universal TM, Church's Thesis, Recursive and recursively enumerable languages, Halting problem, Introduction to undecidability, undecidable problems about TM, NP hard and NP complete problem, Post correspondence problem (PCP), Modified PCP, Introduction to recursive function theory.

TEXT BOOKS:

1. Hopcroft and Ullman, "Introduction to Automata Theory, Languages and Computation", Pearson Education, 3rd edition, 2014
2. Peter Linz, "An Introduction to Formal Language and Automata", NarosaPub.House, 2011.
3. K.L.P Mishra & N.Chandrasekaran,"Theory of Computer Science", PHI Learning, 3rd edition, 2006

REFERENCES:

1. Martin J. C., "Introduction to Languages and Theory of Computations", TMH, 4th edition, 2010.
2. Papadimitriou, C. and Lewis, C. L., "Elements of the Theory of Computation", PHI, 1997.
3. Michael Sipser,"Introduction to Theory of Computation",Cengage Learning, 3rd edition,2013.

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

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

The student will have ability to:

1. Understood basic concepts of computer graphics.
2. Acquire knowledge about drawing basic shapes such as lines, circle ellipse, polygon.
3. Shall be able to perform processing of basic shapes by various processing algorithms /techniques.
4. Acquire knowledge about two and three dimensional transformations.
5. Shall be able to apply the transformation algorithms to the basic shapes.
6. Shall be able to perform Multimedia Operation.

COURSE OUTCOMES:

1. Upon completion of the subject, students will be able to:
2. Understood basic concepts of computer graphics.
3. Acquire knowledge about drawing basic shapes such as lines, circle ellipse, polygon and shall be able to perform processing of basic shapes by various processing algorithms /techniques.
4. Acquire knowledge about two and three dimensional transformations and shall be able to apply the transformation algorithms to the basic shapes.
5. Shall have the basic knowledge of windowing and clipping and shall be able to apply various algorithms of clipping.
6. Acquire knowledge about Visible Surface Detection methods, Illumination Models and Surface Rendering
7. Acquire knowledge to apply advanced techniques such as fractals, introduction to open GL and Multimedia Systems.

UNIT I

Introduction to Computer Graphics:- What is Computer Graphics?, Computer Generated

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pictures usage, Elements of Pictures created in Computer Graphics Graphics display devices,Graphics input primitives and Devices.

Introduction to openGL:- Getting started Making pictures, Drawing basic primitives Simple interaction with mouse and keyboard

UNIT II

Points and Lines, Antialiasing

Line Drawing Algorithm:-DDA line drawing algorithm,parallel drawing algorithm Bresenham's drawing algorithm with example.

Circle and Ellipse generating algorithms:-Mid-point Circle algorithm with exampleMid-point Ellipse algorithmMid-point Ellipse algorithm with example

Parametric Cubic Curves:-Bezier curvesB-Spline curves

Filled Area Primitives:-Scan line polygon fill algorithm, Pattern fill algorithmInside-Outside Tests, Boundary fill algorithms, Flood fill algorithms

UNIT III

2D Geometric Transformations
Basic transformation, Matrix representation and Homogeneous Coordinates Composite transformationOthertransformations.Transformation between coordinated systems.Window to Viewport coordinate transformation,

Clipping operations – Point clipping, Line clipping:-Cohen – Sutherland line clipping Liang – Barsky line clippingMidpoint subdivision

Polygon Clipping-Sutherland – Hodgeman polygon clippingWeiler – Atherton polygon

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clipping.3D object representation methods B-REP , sweep representations, CSG
Basic transformations-Translation, Rotation, Scaling

Other transformations-Reflection,Rotation about an arbitrary axis Composite transformations Projections – Parallel and Perspective 3.D clipping

UNIT IV

3D Geometric Transformations and 3D Viewing Classification of Visible Surface Detection algorithm:-Translation,Rotation, Scaling

Other transformations:-Reflection,Rotation about an arbitrary axis Composite transformations Projections,Back Surface detection method Depth Buffer method Scan line method BSP tree method, Area Subdivision method.

UNIT V

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 .

TEXT BOOKS:

1. Sinha and Udai , "Computer Graphics", Tata McGraw Hill
2. Parekh “Principles of Multimedia” Tata McGraw Hill
3. Prabhat k Andleigh, KiranThakral , “Multimedia System Design “ PHI Pub.
4. Donald Hearn and M.P. Becker “Computer Graphics” Pearson Pub.

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

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REFERENCES:

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

LIST OF EXPERIMENTS:

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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BTIBM503N	DCC	Cloud Security	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 Objectives:

1. To understand Cloud concepts, introduction to IBM cloud,
2. To understand ISO 27017-Cloud Security, PCI
3. To Understand DSS Controls
4. To Understand Flips Levels and Learners will be able
5. To Understand how to work on containerization concept using Docker as a Tool and will work on Kubernetes.

Course Outcomes:

After the successful completion of this course students will be able to:

1. Set Cloud computing security guidelines set forth by ISO, NIST, ENISA and Cloud Security Alliance (CSA).
2. Design Cloud security architectures that assure secure isolation of compute, network and storage infrastructures/
3. Comprehensive data protection, end-to-end identity and access management
4. Monitoring and auditing processes and compliance with industry and regulatory mandates.
5. Fundamentals of cloud computing architectures based on current standards, protocols, and best practices

Syllabus:

Unit 1

- Cloud security model
- Introduction of IBM cloud
- Network parameters and cryptography

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BTIBM503N	DCC	Cloud Security	60	20	20	30	20	3	0	2	4

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Unit 2

- FIPS
- Management plan implementation
- What is forensic science
- Gap analysis
- Risk terminology
- The CSA STAR component and supply chain

Unit 3

- Key data function
- Access process and share
- Data dipression in the cloud security
- Threats to storage types: ✓ Gateway encryption key storage in cloud ✓ Containerization data deidentification ✓ Anonymization ✓ DLP, DRM, SDN ✓ Data protection risk

Unit 4

- Key regulations for CSP Facilities
- BIA
- Phases and methodologies
- Threat modelling
- Software supply chain management

Unit 5

- Federated identity management
- WS federation
- O Auth 2.0
- Open id connect
- Database activity monitor
- Cloud secured development lifecycle
- Open web aap security project
- DRS performance monitoring
- IDS

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BTIBM503N	DCC	Cloud Security	60	20	20	30	20	3	0	2	4

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TEXT/REFERENCE BOOKS:

1. IBM notes
2. Cloud Computing Security: John R. Vacca
3. Cloud Security: A Comprehensive Guide to Secure Cloud
4. Computing: Russell Dean Vines, Ronald L. Kurtz

EXPERIMENT LIST

1. Configuring IBM Cloud account and create an application using Cloud Foundry Service on IBM Cloud.
2. Deploying an application on IBM Cloud using CLI
3. Deploying an application on IBM Cloud using Git
4. Implementation of containerization using Docker
5. Create a text to speech service using Node-Red
6. Create a Language Translator service using Node-Red
7. How to create I'd in salesforce Developer
8. Deploying and Create Object in Salesforce
9. Securing a web application with single sign-on
10. Configuring Identity and Access management service on cloud environment.

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BTIBM504N	DCC	Reactive Architecture	60	20	20	30	20	3	0	2	4

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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.

Course Objectives:

The student will have ability to:

1. To learn the fundamentals of reactive architecture.
2. To understand where and why reactive systems are applicable.
3. To gain knowledge about Akka ToolKit.

Course Outcomes:

Upon completion of the subject, students will be able to:

1. To describe the detailed structure of reactive systems.
2. To describe reactive manifesto and reactive principles.
3. To understand Actor model, props in Akka tool kit.
4. To implement reactor pattern in node js.

Syllabus:

UNIT I

Why Reactive : What is the problem that Reactive Architecture is attempting to solve,How does unresponsive software impact its users,What is the goal of Reactive Architecture. Reactive Principles,An introduction to the Reactive Manifesto, An explanation of the Reactive Principles

UNIT II

Reactive Toolbox : MultiThreading,The Reactor Pattern,The MultiReacter Pattern,Actor Model,Introduction to Akka Tool Kit,Akka Actor System,Props,Child Actor,Send Actor,Stop Actor,Reply Messages ,Forward Messages.

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BTIBM504N	DCC	Reactive Architecture	60	20	20	30	20	3	0	2	4

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UNIT III

Reactive Systems vs Reactive Programming- What are Reactive Systems, What is ReactiveProgramming, How are Reactive Systems related to Reactive Programming, The Actor Model and its relationship to Reactive Systems.

UNIT IV

Putting Your Reactive Toolbox to Work-
Going from Services to Systems: Being Message Driven
Distributed Infrastructure
Orchestrated Cloud Infrastructure
Reactive Meets Machine Learning

UNIT V

Apache Kafta in Reactive Architecture: Asynchronous messaging backbone, Message retention and data persistence, Decoupling, Backpressure, Backpressure in Kafka Consumers, Backpressure in Alpakka Kafka Connector, Backpressure in MicroProfile Reactive Messaging

Text books:

IBM Coursware

Reference Books:

IBM Courseware

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BTIBM511N	DSE	Big Data Technologies	60	20	20	30	20	3	0	2	4

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Course Objectives:

The objective of this course is to teach students about:

1. Big Data and its importance in business world.
2. Focused on conceptualization and summarization of big data trivial data versus big data
3. Big data computing technologies, Watson studio
4. Understand the challenges posed by distributed applications and how ZooKeeper is designed to Handle.

Course Outcomes:

At the end of the course, students shall be able to:

1. Develop an understanding of the complete open-source Hadoop ecosystem and its near term future direction.
2. Understand the functions and features of HDP.
3. Understand the MapReduce model v1 and review java code.

Syllabus:

UNIT-I

Introduction to Big Data: Develop an understanding of the complete open-source Hadoop ecosystem and its near term future directions, compare and evaluate the major Hadoop distributions and their ecosystem components both their strengths and their limitations, hands-on experience with key components of various big data ecosystem components and roles in building a complete big data, solution to common business problems.

UNIT-II

Hadoop and HDFS: The basic need for a big data strategy in terms of parallel reading of large data files and internode network speed in a cluster, Hadoop Distributed File System (HDFS),

function of the NameNode and DataNodes in a Hadoop cluster, files are stored and blocks

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BTIBM511N	DSE	**Big Data Technologies**	**60**	**20**	**20**	**30**	**20**	**3**	**0**	**2**	**4**

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("splits") are replicated. Hive, Sqoop

UNIT-III

Introduction to Hortonworks and its components

Apache Ambari: The purpose of Apache Ambari in the HDP stack, the overall architecture of Ambari and Ambari' relation to other services and components of a Hadoop cluster, the functions of the main components of Ambari, initiating start and stop services from Ambari Web Console.

Overview about Hortonworks Data Platform – HDP: The functions and features of HDP, the IBM value-add components, what IBM Watson Studio is, a brief description of the purpose of each of the value-add components

UNIT-IV

Data Processing and Management

MapReduce and YARN: MapReduce model v1, the limitations of Hadoop 1 and MapReduce, review the Java code required to handle the Mapper class, Reducer class and the program driver needed to access MapReduce, the YARN model, compare Hadoop 2/YARN with Hadoop 1

UNIT-V

ZooKeeper, Slider, and Knox: The challenges posed by distributed applications and how ZooKeeper is designed to handle them, the role of ZooKeeper within the Apache Hadoop infrastructure and the realm of Big Data management, the generic use cases and some real-world scenarios for ZooKeeper, the ZooKeeper services that are used to manage distributed systems, use the ZooKeeper CLI to interact with ZooKeeper services

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TEXT BOOKS:

1. Introduction to Infosphere BigInsights, IBM Career Education
2. Changing Business with Data Insight, IBM Career Education
3. Big Insights Analytics for Business Analysts, IBM Career Education

4. Tom White," Hadoop: The Definitive Guide Paperback – 2015" Shroff Publishers & Distributers Private Limited - Mumbai; Fourth edition (2015).
5. V. K. Jain (Author)," Big Data and Hadoop" Khanna Publishers; 1 edition (1 June 2015)

REFERENCE BOOKS:

1. Big Data: A Revolution That Will Transform How We Live, Work, and Think; Kenneth Cukier, Viktor Mayer-Schönberger; Mariner Books; Edition (2014)
2. Big Data: Using Smart Big Data, Analytics and Metrics to Make Better; Bernard Marr; Wiley; Edition 1st (2015)
3. Hadoop For Dummies, Dirk deRoos, For Dummies, 2014
4. Cohen et al."MAD Skills: New Analysis Practices for Big Data", 2009
5. Ullman, Rajaraman, Mining of Massive Datasets, Chapter 2
6. Stonebraker et al., "MapReduce and Parallel DBMS's: Friends or Foes?", Communications of the ACM, January 2010.
7. Dean and Ghemawat, "MapReduce: A Flexible Data Processing Tool", Communications of the ACM, January 2010.

LIST OF PRACTICALS:

1. Installing Hadoop, configure HDFS, Install Zookeeper , Pig Installation, Sqoop Installation, Hbase Installation
2. Configuring Hadoop
3. Running jobs on Hadoop
4. Working on HDFS
6. Hadoop streaming
7. Creating Mapper function using python.

Chairperson	Chairperson	Controller of Examination	Joint Registrar
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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University E	Teachers Assessment *				
BTIBM511N	**DSE**	**Big Data Technologies**	**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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8. Creating Reducer function using python
9. Python iterator and generators.
10. Twitter data sentimental analysis using Flume and Hive
11. Business insights of User usage records of data cards
12. Wiki page ranking with hadoop
13. Health care Data Management using Apache Hadoop ecosystem

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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 *				
BTDSE511N	DSE	Simulation and Modeling	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 Objectives:

The student will have ability to:

1. Introduce students to the simulation and modeling techniques.
2. Provide a way for students with opportunities to develop basic simulation and modelling.
3. Introduce concepts of modeling layers of society's & industrial real-world problems.
4. Build tools to view and control simulations and their results.

Course Outcomes:

On completion of the subject, students will be able to:

1. Characterize a given engineering system in terms of its essential elements, that is, purpose, parameters, constraints, performance requirements, subsystems, interconnections and environmental context.
2. Develop a modeling strategy for a real-world engineering system, which considers prediction and evaluation against design criteria, and integrates any required sub-system models.
3. Assess and select a model for an engineering system taking into consideration its suitability to facilitate engineering decision making and predicted advantages over alternative models.
4. Interpret the simulation results of an engineering system model, within the context of its capabilities and limitations, to address critical issues in an engineering project.
5. Fundamentals and techniques for designing and using simulation, modeling, and optimization algorithms with applications in system performance modeling, business infrastructure modeling, and distributed and parallel computing. An introduction to advanced complex systems models.

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BTDSE511N	**DSE**	**Simulation and Modeling**	**60**	**20**	**20**	**30**	**20**	**3**	**0**	**2**	**4**

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SYLLABUS

UNIT–I
INTRODUCTION
Introduction to simulation & modeling, advantages and disadvantages of simulation, application areas in communication, computer and software design, systems and systems environment, components of a system, discrete and continuous systems, model of a system, types of models, discrete-event simulation, steps in a simulation study. Simulation Examples- Simulation of queueing systems, on-demand and inventory systems, simulation for reliability analysis, Introduction to GPSS.

UNIT–II
COMPUTER BASED SYSTEM SIMULATION:
Types of System Simulation, Monte Carlo Method, comparison of analytical and Simulation methods, Markov Model, Numerical Computation techniques for Continuous and Discrete Models, Distributed Lag Models, Cobweb Model. Continuous System models, Analog and Hybrid computers, Digital-Analog Simulators, Continuous system simulation languages, Hybrid simulation, Real Time simulations.

UNIT III
INTRODUCTION TO QUEUING THEORY
Characteristics of queuing system, Poisson's formula, birth-death system, equilibriumof queuing system, analysis of M/M/1 queues. Introduction to multiple server Queue models M/M/c Application of queuing theory in manufacturing and computer system, FSM, Petri-net Model.

UNIT–IV
VERIFICATION AND VALIDATION
Verification of Simulation Models, Calibration and Validation of Models, Validation of Model Assumptions , Validating Input & Output Transformations, Design of simulation experiments,

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UNIT–V

SIMULATION TOOLS

Simulation Tools – Model Input – High level computer system simulation – CPU – Memory, Simulation – Comparison of systems via simulation – Simulation Programming techniques, Development of Simulation models, General Purpose Simulation Package-MATLAB, ARENA, EXTEND, Study of SIMULA, DYNAMO

TEXT BOOKS:

1 Gordon G., System simulation, PHI Learning

2.Singh V.P System Simulation and Modeling NEW AGE INTERNATIONAL, PUBLISHERS

3.Taha H, Operations Research; PHI.

4.Payer, T., Introduction to system simulation, McGraw Hill.

5.Spriet JA; Computer Aided Modeling and Simulation, Academic Press INC; USA

REFERENCES:

1. J K Sharma, Operations Research Theory and Application, Pearson Education Pvt Ltd, 2 Edition

Banks J; Hand book of Simulation; John Wiley.

2.Law AM and Kelton WD; Simulation Modeling and Analysis; TMH

LIST OF EXPERIMENTS:

1. Simulate CPU scheduling algorithm using queueing system.
2. Simulate multiplexer using queuing system.
3. Simulate Network congestion control algorithms using Petri-net Model.
4. Simulate disk scheduling algorithms Petri-net Model.
5. Verification and validation of Petri-net Model.
6. Simulate a Manufacturing shop and write a program in GPSS.
7. Simulate Telephone system model and write a program in SIMSCRIPT.
8. Graphical Simulation and Modeling using MATLAB.
9. Study of SIMULA.
10. Study of DYNAMO.

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CODE	ORY		THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTDSE512N	DSE	Software Testing and Quality Assurance	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 Objectives:

The student will have ability to:

1. Develop a skill in developing good quality in the software product.
2. Develop methods and procedures for software development that can scale up for large systems and that can be used to consistently produce high-quality software at low cost and with a small cycle time
3. Learn systematic approach to the operation, maintenance, and retirement of software.
4. Learn how to use available resources to develop software, reduce cost of software and how to maintain quality of software
5. Methods and tools of testing and maintenance of software

Course Outcomes:

Upon completion of the subject, students will be able to:

1. Apply approach of Software Testing & QA concepts.
2. Apply modern software testing processes in relation to software development and project management.
3. Create test strategies and plans, design test cases prioritize and execute them.
4. Manage defects within a project.
5. Contribute to efficient delivery of software solutions and implement improvements in the software development processes.

SYLLABUS

UNIT–I

BASIC CONCEPTS: Basic Testing Vocabulary, Quality Assurance versus Quality Control, The Cost of Quality, Software Quality Factors, Software Defect, The Multiple Roles of the Software Tester(People Relationships), Scope of Testing, Testing Constraints, Various software development Life cycles (SDLC), Independent Testing, QA Process, Levels of Testing, The “V” Concept of Testing.

COURSE CODE	CATEG	COURSE NAME	TEACHING & EVALUATION SCHEME	L	T	P	C

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UNIT–II

WHITE BOX TESTING: White box testing techniques - Statement coverage - Branch Coverage - Condition coverage - Decision/Condition coverage - Multiple condition coverage - Dataflow coverage - Mutation testing - Automated code coverage analysis.

UNIT–III

BLACK BOX TESTING: Black box testing techniques - Boundary value analysis - Robustness testing - Equivalence partitioning -Syntax testing - Finite state testing - Levels of testing – Unit testing- Integration Testing

UNIT–IV

SYSTEM TESTING - Functional testing-non-Functional testing-acceptancetesting-performance testing –Factors and Methodology for Performance testing, Regression testing-Methodology for Regression-testing.Five Views of Software Quality, McCall's Quality Factors and Criteria, Quality Factors, Quality Criteria, Relationship between Quality Factors and Criteria, Quality Metrics, Quality Characteristics, Software Quality Standard

UNIT–V

ADVANCE SOFTWARE TESTING METHOD (OBJECT ORIENTED TESTING): Syntax testing - Finite State testing - Levels of testing - Unit, Integration and System Testing. Challenges - Differences from testing non-OO Software - Class testing strategies - State-based Testing Software quality Assurance: ISO 9000; CMM and Test Management Issues; Quality Assurance personnel Issues.

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BTDSE512N	**DSE**	**Software Testing and Quality Assurance**	**60**	**20**	**20**	**30**	**20**	**3**	**0**	**2**	**4**

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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. KshirasagarNaik&PriyadarshiTripathy, "Software Testing & Quality Assurance", A JOHN WILEY & SONS, INC. Publication.
2. R S. Pressman ,"Software Engineering: A Practitioner's Approach", Sixth edition 2006, McGraw-Hill.
3. Waman S.Jawadekar,"Software Enginerring", TMH
4. Sommerville,"Software Enginerring",Pearson Education.
5. "IBM CE-Enablement Program- Essentials of Software Engineering (OOAD & SW Lifecycle)", IBM Careeer Education

REFERENCES:

1. KshirasagarNaik&PriyadarshiTripathy, "Software Testing & Quality Assurance", A JOHN WILEY & SONS, INC. Publication.
2. R S. Pressman ,"Software Engineering: A Practitioner's Approach", Sixth edition 2006, McGraw-Hill.
3. Waman S.Jawadekar,"Software Enginerring", TMH
4. Sommerville,"Software Enginerring",Pearson Education.
5. http://www.softwaretestinghelp.com/online-software-testing-course-syllabus/
6. https://amizone.net/AdminAmizone/WebForms/Academics/NewSyllabus/1217201473127725.pdf
7. http://www.tutorialspoint.com/uml/

LIST OF EXPERIMENTS:

1. Design test cases using Boundary value analysis by taking quadratic equation problem.
2. Design test cases using Equivalence class partitioning taking triangle problem.
3. Design test cases using Decision table taking triangle problem.
4. Design independent paths by calculating cyclometer complexity using date problem.
5. Design independent paths by taking DD path using date problem.
6. Design the test cases for login page of AMIZONE.
8. Manual Testing for PAN card verification.
9. Generate test case for ATM machine.

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BTDSE512N	**DSE**	**Software Testing and Quality Assurance**	**60**	**20**	**20**	**30**	**20**	**3**	**0**	**2**	**4**

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10. Overview of Testing process using Rational Robot.
11. Write a script to record verification point using Rational Robot (For GUI testing of single click on window OS).
12. Write a script to record verification point for Clip Board and alphanumeric values using Rational Robot.

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME		L	T	P	E D I
			THEORY	PRACTICAL				

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BTIT507N	**SEC**	**Programming with Python**	**0**	**0**	**0**	**60**	**40**	**0**	**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.

Course Objectives:

1. To develop proficiency in creating based applications using the Python Programming Language.
2. To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
3. To be able to do testing and debugging of code written in Python.
4. To be able to draw various kinds of plots using PyLab.
5. To be able to use generators for generating series like fibonacci.

Course Outcomes:

Upon completion of this course, the student will be able apply technical knowledge and perform specific technical skills, including:

1. Ability to create robust applications using the Python programming language.
2. Ability to test and debug applications written using the Python programming language.
3. Ability to create applications for solving computational problems using the Python Programming Language.

SYLLABUS

UNIT–I

Introduction to Python: The basic elements of Python, Branching programs, Strings and Input, Iteration. Functions, Scoping and Abstraction: Functions and Scoping, Specifications, Recursion, Global variables, Modules, Files.

UNIT–II

Testing and Debugging: Testing, Debugging. Structured Types, Mutability and Higher order Functions: Tuples, Lists and Mutability, Functions as Objects, Strings, Tuples and Lists, Dictionaries.

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	ORY		THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTIT507N	SEC	Programming with Python	0	0	0	60	40	0	0	2	4

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

Exceptions and assertions: Handling exceptions, Exceptions as a control flow mechanism, Assertions. Classes and Object oriented Programming: Abstract Data Types and Classes, Inheritance, Encapsulation and information hiding.

UNIT–IV

Some simple Algorithms and Data Structures: Search Algorithms, Sorting Algorithms, Hashtables. Plotting and more about Classes: Plotting using PyLab, Plotting mortgages and extended examples.

UNIT–V

Dynamic Programming: Fibonacci sequence revisited, Dynamic programming and the 0/1 Knapsack algorithm, Dynamic programming and divide and conquer.

TEXT BOOKS:

1. John V Guttag. “Introduction to Computation and Programming Using Python”, Prentice Hall of India
2. Allen Downey, Jeffrey Elkner and Chris Meyers "How to think like a Computer Scientist, Learning with Python", Green Tea Press.
3. Mark Lutz "Learning Python" O'Reilly Media; 5 edition.
4. David Beazley "Python Cookbook, Third edition" O'Reilly Media

REFERENCES:

1. Python Essential Reference, 4th Edition Addison-Wesley Professional.
2. Mark Lutz "Programming Python: Powerful Object-Oriented Programming "David Beazley "Python Cookbook" Third edition, O'Reilly Media

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BTIT507N	**SEC**	**Programming with Python**	**0**	**0**	**0**	**60**	**40**	**0**	**0**	**2**	**4**

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LIST OF EXPERIMENTS:

1. Write a Python Program to Print Hello world!
2. Write a Program to Add Two Numbers.
3. Write a Program to Find the Square Root.
4. Write a Program to Calculate the Area of a Triangle.
5. Write a Program to Solve Quadratic Equation.
6. Write a Program to Swap Two Variables.
7. Write a Program to Generate a Random Number.
8. Write a Program to Convert Kilometers to Miles.
9. Write a Program to Convert Celsius To Fahrenheit.
10. Write a Program to check if a number is positive, negative or zero.
11. Write a Program to Check if a Number is Odd or Even.
12. Write a Program to Check Leap Year.
13. Write a Program to Find the Largest Among Three Numbers.
14. Write a Program to Check Prime Number.
15. Write a Program to Print all Prime Numbers in an Interval.
16. Write a Program to Find the Factorial of a Number.
17. Write a Program to Display the multiplication Table.
18. Write a Program to Print the Fibonacci sequence.
19. Write an English sentence with understandable semantics but incorrect syntax. Write another English sentence which has correct syntax but has semantic errors.
20. Create a program that prompts the user for several gallons of gasoline. Reprint that value along with its conversion equivalent number of liters.
21. Write a program that allows a user to enter his or her two favourite foods. The program should then print out the name of a new food by joining the original food names together.
22. Write a Tipper program where the user enters a restaurant bill total. The program should then display two amounts: a 15 percent tip and a 20 percent tip.
23. Write a Car Salesman program where the user enters the base price of a car. The program should add on a bunch of extra fees such as tax, license, dealer prep, and destination charge. Make tax and license a percent of the base price. The other fees should be set values. Display the actual price of the car once all the extras are applied.

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BTIT507N	**SEC**	**Programming with Python**	**0**	**0**	**0**	**60**	**40**	**0**	**0**	**2**	**4**

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24. Create a program with a function that calculates the area of a circle by taking a radius from the user.

25. Write your own sum function called my Sum that takes a list as a parameter and returns the accumulative sum.