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Choice Based Credit System (CBCS) in the light of NEP-2020
B.Tech Computer Science and Engineering-Mobile Applications-Apple Authorized Training Center
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	-	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 2exceed more than 10 marks

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

COURSE OUTCOMES
Upon completion of the subject, students will be able to:
1. Ability to relate practical problems to languages, automata, and computability.
2. Ability to demonstrate an increased level of mathematical sophistication.
3. 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,

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FA with output: Moore and Mealy machine, Equivalence of Moore and Mealy Machine, Applications and Limitation of FA.

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, Closureproperties 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

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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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BTCS502 N	DCC	Introduction to Artificial Intelligence	60	20	20	30	20	3	0	2	4

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COURSE OBJECTIVES
The student will have ability to:
1. Know how computer systems adapt, evolves and learn.
2. To gain expertise in one of fastest growing areas of Computer Science that covers topics related to human intelligence and its applications in industry, defense, healthcare, agriculture and many other areas.
3. Provides a rigorous, advanced, and professional graduate-level foundation in Artificial Intelligence

COURSE OUTCOMES
Upon completion of the subject, students will be able to:
1. Build intelligent agents for search and games.
2. Solve AI problems through programming with Python.
3. Learning optimization and inference algorithms for model learning
4. Design and develop programs for an agent to learn and act in a structured environment.

SYLLABUS

UNIT–I
10 HOUR

Introduction: Concept of AI, history, current status, scope, agents, environments, Problem Formulations, Review of tree and graph structures, State space representation, Search graph and Search tree.

UNIT–II
9 HOURS

Search Algorithms: Random search, Search with closed and open list, Depth first and Breadth first search, Heuristicsearch, Best first search, A* algorithm, Game Search.

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BTCS502N	DCC	Introduction to Artificial Intelligence	60	20	20	30	20	3	0	2	4

UNIT–III

8 HOURS

Probabilistic Reasoning: Probability, conditional probability, Bayes Rule, Bayesian Networks-representation, construction and inference, temporal model, hidden Markov model.

UNIT–IV

7 HOURS

Markov Decision process: MDP formulation, utility theory, utility functions, value iteration, policy iteration and partially observable MDPs.

UNIT–V

8 HOURS

Reinforcement Learning: Passive reinforcement learning, direct utility estimation, adaptive dynamic programming, temporal difference learning, active reinforcement learning- Q learning.

TEXT BOOKS:

1. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach" , 3rd Edition, Prentice Hall.
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill.
3. Trivedi, M.C., "A Classical Approach to Artificial Intelligence", Khanna Publishing House, Delhi.
4. Saroj Kaushik, "Artificial Intelligence", Cengage Learning India, 2011.
5. David Poole and Alan Mackworth, "Artificial Intelligence: Foundations for Computational Agents", Cambridge University Press 2010.

WEBSITES FOR REFERENCE:

1. https://nptel.ac.in/courses/106105077
2. https://nptel.ac.in/courses/106106126
3. https://aima.cs.berkeley.edu
4. https://ai.berkeley,edu/project_overview.html (for Practicals)

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BTCS502 N	DCC	Introduction to Artificial Intelligence	60	20	20	30	20	3	0	2	4

LIST OF PRACTICALS:

1. Write a programme to conduct uninformed and informed search.
2. Write a programme to conduct game search.
3. Write a programme to construct a Bayesian network from given data.
4. Write a programme to infer from the Bayesian network.
5. Write a programme to run value and policy iteration in a grid world.
6. Write a programme to do reinforcement learning in a grid world.
7. Mini Project work.

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BTCS503N	DCC	Cyber and Network Security	60	20	20	30	20	3	0	2	4

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COURSE OBJECTIVES:

The student will have ability:

1. To gain a fundamental knowledge of Cyber crime and Network Security.
2. To gain a fundamental understanding of a Cyber-attack and Challenges in identify and prevent them from occurring.
3. To gain a fundamental knowledge of Tools and Methods used in Cyber crime for prevention.
4. To understand the need of Cyber law and the fundamental concepts of Cyber Forensic.
5. To provide the fundamental skills and understanding needed to identify Cyber Security threats.

COURSE OUTCOMES:

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

1. Identify physical points of vulnerability in simple networks and security needs of an organization.
2. Evaluate the Legal Perspective of Cyber crime and Cyber Security.
3. Formulate, update and communicate short- and long-term organizational cyber-security strategies and policies.
4. Troubleshoot, maintain and update an enterprise-level information security system.
5. Investigate the Cybercrime with the help of Cyber Forensic.

SYLLABUS

UNIT–I

10 HOURS

Computer Security Concepts,The OSI Security Architecture, Security Attacks, Security Services, Security mechanism, Fundamental Security Design Principles, Attack Surface and Attack trees, A Model for Network Security.

Introduction to Cyber crime, Cyber crime and Information Security, Classification of Cyber crimes,Cyber crime: The Legal Perspective, Cyber crime: An Indian Perspective.

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UNIT–II

9 HOURS

Introduction to Cyber offence, How Criminal plan the attack, Social Engineering, Cyber stalkin, Cyber café and cyber crime, Botnets: The fuel of cybercrime, Attack vector, cloud computing.
Cyber crime: Mobile and Wireless devices, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Setting for Mobile Devices, Authentication Service Security, Attack on Mobile Phones.

UNIT–III

8 HOURS

Tools and Methods Used in Cyber crime, Proxy Server and Anonymizers, Phishing and Identity Theft, Password Cracking, Keylogger and Spyware, Virus and Worms, Trojan Horse and Backdoors, Steganography DoS and DDoS Attacks, SQL Injection, Buffer Overflow, Attack on Wireless Networks.

UNIT–IV

7 HOURS

Cyber crime and the Legal Landscape around the World, Why Do We Need Cyber laws, The Indian IT Act, Challenges to Indian Law and Cybercrime Scenario in India, Information Technology Act, Digital Signature and the IT Act, Cybercrime and Punishment.
Introduction to Cyber Forensics, Historical Background of Cyber Forensics, Cyber Forensics and Digital Evidence, Forensic Analysis of E-Mail, Digital Forensic Life Cycle, Approaching Computer Forensic Investigation, Relevance of OSI Model to Computer Forensic, Challenges in Computer Forensic.

UNIT–V

8 HOURS

Network Access Control and Cloud Security, Transport- Level Security, Wireless Network Security, Electronic Mail Security, IP Security.

TEXT BOOKS:

1. William Stallings, “Cryptography and Network Security: Principles and Practice”,7th Edition

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Pearson,2017
2. Sunit Belapure, Nina Godbole "Cyber Security",1st edition, Wiley Publication, 2011

REFERENCES:

1. Carl Endorf, Eugene Schultz, Jim Mellander "Intrusion Detection & Prevention", 1st Edition, TMH, 2007
2. Neal, Krawetz, Introduction to Network Security,1st Edition ,Cengage Learning,2006
3. Atul Kahate,"Cryptography and Network Security",McGraw Hill,2009
4. Charlie Kaufman, Radia Perlman, Mike Speciner, Michael Speciner, " Network Security -Private communication in a public world" ,2nd Edition,TMH,2002
5. Fourozon, "Cryptography & Network Security" 4th Edition ,TMH,2005
6. Mayank Bhushan "Fundamentals of Cyber Security",1st Edition , BPB Publication,2017
7. Gaurav Gupta, Sarika Gupta "Information Security and Cyber Laws",1st Edition, Khanna Book Publishing,2011.

LIST OF PRACTICALS:-

1. Study of different wireless network components and features of any one of the Mobile Security Apps.
2. Study of the features of firewall in providing network security and to set Firewall Security in windows.
3. Steps to ensure Security of any one web browser (Mozilla Firefox/Google Chrome)
4. Study of different types of vulnerabilities for hacking a websites / Web Applications.
5. Analysis the Security Vulnerabilities of E-commerce services.
6. Analysis the security vulnerabilities of E-Mail Application

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BTCSMA 501N	SEC	Design Pattern & UI Testing in IOS	60	20	20	30	20	3	0	2	4

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Course Objectives:

1. To impart knowledge of Swift and Apple iOS application Design and Development.
2. To provide students with the skills necessary to develop an iOS App from scratch to deploying it on the Apple Store.
3. To provide UI test tests a specific user interaction with the application's UI. Automated testing.

Course Outcomes:

At the end of the course the students will be able to: -

1. With iOS as the platform, students will learn Object- oriented programming, Design Patterns.
2. With iOS as the platform, students will learn Type Systems, Functional Language features, user interface design, best practices in programming, and problem analysis.
3. With UI test tests a specific user interaction with the application's UI. Automated testing can, and should, be performed at both the unit test and UI test levels.

Syllabus:

UNIT I **10 Hours**

Understanding design patterns, getting used to Xcode, creating the sports Store app, creating design pattern: object template pattern, prototype pattern, singleton pattern, object pool pattern, builder pattern, Target Action patten in Swift/iOS.

UNIT II **9 Hours**

The Structural Pattern: Adapter pattern, Bridge pattern, Decorator pattern, Composition pattern, Facade pattern, Fly weight pattern, Proxy pattern, Delegation pattern.

UNIT III **8 Hours**

Architecture Pattern: The Model/View/Controller Pattern, MVVM, MVP, VIPER.

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BTCSMA 501N	SEC	Design Pattern & UI Testing in IOS	60	20	20	30	20	3	0	2	4

UNIT IV **9 Hours**

Testing: Testing basics, Performance testing, UI testing, app and Library tests, XCTest—the Xcode Testing Framework. Writing Test Classes and Methods, Running Tests and Viewing Results.

UNIT V **8 Hours**

Debugging Tests: Test Debugging Workflow, Test Specific Debugging Tools, Code Coverage, Enable Code Coverage, Automating the Test Process.

Text Books:

1. "Pro Design pattern in Swift" Adam Freeman. 2019
2. Design Patterns in Swift 5: Learn How to Implement the Gang of Four Design Patterns Using Swift 5. Karoly Nyisztor. 2018
3. App Architecture: iOS Application Design Patterns in Swift, Chris Eidhof, Matt Gallagher, 2019
4. IOS Unit Testing by Example Book by Jon Reid. 2018
5. Test-Driven IOS Development with Swift Book by Dominik Hauser.

Reference Books:

1. Design Patterns in Swift: A Different Approach to Coding with Swift - iOS. Vamshi Krishna.
2. Advanced iOS App Architecture, René Cacheaux & Josh Berlin, 2019
3. Test iOS Apps with UI Automation, O'Reilly 2019

List of experiment:

1. Create the sample project in Xcode.
2. Crate a clone app Similar to SportStore app.
3. Develop the project using object template pattern.
4. Develop the project using prototype pattern.
5. Develop the project using singleton pattern.
6. Create an app following the Adapter pattern, Bridge pattern.
7. Create an app following the Facade pattern, FLyweight pattern.
8. Create Target & Action design Pattern in iOS.
9. Create Delegation Pattern in iOS.

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BTCSMA 501N	**SEC**	**Design Pattern & UI Testing in IOS**	**60**	**20**	**20**	**30**	**20**	**3**	**0**	**2**	**4**

10. Experiments with MVC (Model/View/Controller) approach for design pattern.
11. Create MVVM, MVP Pattern design view.
12. Create Viper Pattern design view.
13. LeaICT International Conference Brochurern how XCtest manages test cases.
14. Learn to enable code coverage and generate the results.
15. Add test for existing code

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BTCS504N	**DSE**	**Internet Of Things**	**60**	**20**	**20**	**30**	**20**	**3**	**0**	**2**	**4**

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COURSE OBJECTIVES
The objective of this course is to impart necessary and practical knowledge of components of Internet of Things and develop skills required to build real-life IoT based projects.

COURSE OUTCOMES
Upon completion of the subject, students will be able to:
1. Understand internet of Things and its hardware and software components
2. Interface I/O devices, sensors & communication modules
3. Remotely monitor data and control devices
4. Develop real life IoT based projects.

SYLLABUS:

UNIT–I
10 HOURS

Introduction to IoT: Architectural Overview, Design principles and needed capabilities, IoT Applications, Sensing, Actuation, Basics of Networking, M2M and IoT Technology Fundamentals-Devices and gateways, Data management, Business processes in IoT, Everything as a Service (XaaS), Role of Cloud in IoT, Security aspects in IoT.

UNIT–II
9 HOURS

Elements of IoT: Hardware Components- Computing (Arduino, Raspberry Pi), Communication, Sensing, Actuation, I/O interfaces.
Software Components- Programming API's (using Python/Node.js/Arduino) for Communication Protocols-MQTT, ZigBee, Bluetooth, CoAP, UDP, TCP.

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UNIT–III

8 HOURS

IoT Application Development: Solution framework for IoT applications- Implementation of Device integration, Data acquisition and integration.

UNIT–IV

7 HOURS

Device data storage: Unstructured data storage on cloud/local server, Authentication, authorization of devices.

UNIT–V

8 HOURS

IoT Case Studies: IoT case studies and mini projects based on Industrial automation, Transportation, Agriculture, Healthcare, Home Automation

TEXT BOOKS:

1. Vijay Madisetti, Arshdeep Bahga, İnternet of Things, “A Hands on Approach”, University Press.
2. Dr. SRN Reddy, Rachit Thukral and Manasi Mishra, “Introduction to Internet of Things: A practical Approach”, ETI Labs.
3. Pethuru Raj and Anupama C. Raman, “The Internet of Things: Enabling Technologies, Platforms, and Use Cases”, CRC Press
4. Jeeva Jose, “Internet of Things”, Khanna Publishing House, Delhi.
5. Adrian McEwen, “Designing the Internet of Things”, Wiley.
6. Raj Kamal, “Internet of Things: Architecture and Design”, McGraw Hill.
7. CunoPfister, “Getting Started with the Internet of Things”, O Reilly Media.

LIST OF PRACTICALS:

1. Familiarization with Arduino/Raspberry Pi and perform necessary software installation.
2. To interface LED/Buzzer with Arduino/Raspberry Pi and write a program to turn ON LED for 1 sec after every 2 seconds.
3. To interface Push button/Digital sensor (IR/LDR) with Arduino/Raspberry Pi and write a program to turn ON LED when push button is pressed or at sensor detection.

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4. To interface DHT11 sensor with Arduino/Raspberry Pi and write a program to print temperature and humidity readings.
5. To interface motor using relay with Arduino/Raspberry Pi and write a program to turn ON motor when push button is pressed.
6. To interface OLED with Arduino/Raspberry Pi and write a program to print temperature and humidity readings on it.
7. To interface Bluetooth with Arduino/Raspberry Pi and write a program to send sensor data to smartphone using Bluetooth.
8. To interface Bluetooth with Arduino/Raspberry Pi and write a program to turn LED ON/OFF when '1'/'0' is received from smartphone using Bluetooth.
9. Write a program on Arduino/Raspberry Pi to upload temperature and humidity data to thingspeak cloud.
10. Write a program on Arduino/Raspberry Pi to retrieve temperature and humidity data from thingspeak cloud.
11. To install MySQL database on Raspberry Pi and perform basic SQL queries.
12. Write a program on Arduino/Raspberry Pi to publish temperature data to MQTT broker.
13. Write a program on Arduino/Raspberry Pi to subscribe to MQTT broker for temperature data and print it.
14. Write a program to create TCP server on Arduino/Raspberry Pi and respond with humidity data to TCP client when requested.
15. Write a program to create UDP server on Arduino/Raspberry Pi and respond with humidity data to UDP client when requested.

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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;
***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.Introduce students to the simulation and modeling techniques.
2. Provide a way for students with opportunities to develop basic simulation and modeling
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,
2. parameters, constraints, performance requirements, subsystems, interconnections and environmental context.
3. 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.
4. Assess and select a model for an engineering system taking into consideration its suitability to
5. facilitate engineering decision making and predicted advantages over alternative models.
6. 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.
7. Fundamentals and techniques for designing and using simulation, modeling, and optimization.
8. algorithms with applications in system performance modeling, business infrastructure modeling, and distributed and parallel computing. An introduction to advanced complex systems models.

SYLLABUS

UNIT–I

10 HOURS

INTRODUCTION

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

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

9 HOURS

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

8 HOURS

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

7 HOURS

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

UNIT–V

8 HOURS

SIMULATION TOOLS

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

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 Taha H, Operations Research; PHI.
3. Payer, T., Introduction to system simulation, McGraw Hill.
4. 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
2. Banks J; Hand book of Simulation; John Wiley.
3. 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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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

10 HOURS

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,

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

Testing Constraints, Various software development Life cycles (SDLC), Independent Testing, QA Process, Levels of Testing, The "V" Concept of Testing.

UNIT–II

9 HOURS

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

8 HOURS

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

7 HOURS

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

8 HOURS

ADVANCE SOFTWARE TESTING METHOD (OBJECT ORIENTED TESTING): Syntax testing - Finite State testing - Levels of testing - Unit, Integration and System Testing. Challenges -

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

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.

TEXT BOOKS:

1. 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.

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

5. Design independent paths by taking DD path using date problem.
6. Design the test cases for login page of AMIZONE.
7. Manual Testing for PAN card verification.
8. Generate test case for ATM machine.
9. Overview of Testing process using Rational Robot.
10. Write a script to record verification point using Rational Robot (For GUI testing of single click on window OS).
11. Write a script to record verification point for Clip Board and alphanumeric values using Rational Robot.

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BTCSMA502N	SEC	Mobile Application Development-V	-	-	-	-	100	-	-	4	2

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Course Objectives:

1. To describe the advance tools and techniques to develop an iOS application.
2. To illustrate the advanced concepts of application development for iOS with Swift programming language.
3. To design complex applications and user's interaction for iOS application.
4. To learn Best practices of App designing and prototyping.

Course Outcomes:

At the end of the course the students will be able to: -

1. Implement applications based on MVC.
2. Implement Protocols, Extensions and Clousers in iOS applications.
3. Create complex applications using ScrollView and TableView.
4. Implement Web based applications.
5. Demonstrate programming best practices in Swift and able to select the appropriate human interface, App Icon, launch screen, color to develop the working iOS application from the concept.

Syllabus:

UNIT-I **9 Hours**

Protocols and Model-View-Controller

Protocols: CustomStringConvertible, Equatable, Comparable, Codable, Creating a protocol, Delegation.

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BTCSMA502N	SEC	Mobile Application Development-V	-	-	-	-	100	-	-	4	2

Model-View-Controller: Pattern, Model objects, Model object Communication, Views, Views Communication, Controllers: View controllers, Model controllers, Helper controllers; Controller Communication, Project organization.

UNIT-II **10 Hours**

Scroll Views and Table Views

Scroll Views: UIScrollView, Scroll viewsScroll views in Interface Builder: Define scroll view frame, Add constraints, Define content view using stack view, Programmatic constraints, Keyboard issues, Content insets, Scroll indicator, Scroll View family.

Table Views: UITableView, Types, Table view controllers, Table view styles, Table view cells, UITableViewCell properties, Index paths, Arrays and table views, Cell dequeueing, Table view protocols, Table view data source, Table view delegate, Reload data, Intermediate Table Views.

UNIT-III **9 Hours**

System View Controllers

System View Controllers: Apple system view controllers, Activity view controller, SFSafariViewController, Alert controllers. Access the camera: UIImagePickerController, Permission; Send email: Verify whether mail can be sent, MFMailComposeViewController, mailComposeController.

UNIT-IV **10 Hours**

Closures, Extensions and App Personality

Closures: Passing closures as arguments, Syntactic sugar, Collection functions using closures: Map, Filter, Reduce; Extensions: Adding computed properties, Adding instance or type methods, Organizing code.

App Personality: The human interface, App icon design, App in locations, App icon size, App icon files, Best practices: Launch screen, Color, Animation, Typography, Branding and styling.

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BTCSMA502N	SEC	Mobile Application Development-V	-	-	-	-	100	-	-	4	2

Prototyping: Simple is best, Define the problem, Create a user persona, Create a feature set, Make, show, learn, workflows and visuals, Formalize a prototype, user interviews, Iterate.

UNIT-V **10 Hours**

Saving Data and Working with the Web, Decoding JSON

Saving Data: Encoding and decoding with Codable, App sandbox, Writing data to a file, Documents directory, Reading the data, Saving and reading an array of model data.

Working with the Web: HTTP and URLSession, The Basics, Query parameters, HTTP methods, HTTP headers, HTTP body, Create a URL, Create and execute a network request, Work with an API, Modify a URL with URL components.

Working with the Web -Decoding JSON: JSON, The basics, Convert JSON data to Swift types, Decoding into custom model objects, Update the request completion handler, Concurrency.

Text Books:

1. Develop in Swift Data Collections. (as available on Apple Book Store)
2. Develop in Swift Fundamentals.
3. Jon Hoffman ,Mastering Swift 5: Deep dive into the latest edition of the Swift programming language, 5th Edition
4. Matthew Mathias, John Gallagher, Swift Programming: The Big Nerd Ranch Guide 2nd edition, 2015.
5. Matt Neuberg , iOS 12 Programming Fundamentals with Swift, OReilly; 5th edition.

Reference Books:

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. Vandad Nahavandipoor. iOS 11 Swift Programming Cookbook, O'Reilly Media, 2020

List of Practicals:

Complete All the Lab Exercises, playgrounds and projects given in student material of Develop in swift Data Collections.

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BTCSMA502N	SEC	Mobile Application Development-V	-	-	-	-	100	-	-	4	2

1. Write a program to implement different protocols.
2. Create an App by following MVC guidelines.
3. Create an App to demonstrate Scrollview and its features
4. Create an App to demonstrate Tableview and its features.
5. Create different Apps featuring different System View.
6. Write a program to demonstrate Closures.
7. Write a program to demonstrate Extensions.
8. Create an App to store and read data from a file.
9. Create an App to demonstrate HTTP request and response.
10. Create an App to demonstrate JSON encoding and decoding.

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