SCHOOL OF ENGINEERING AND TECHNOLOGY

SRI PADMAVATI MAHILA VISVAVIDYALAYAM

(WOMEN'S UNIVERSITY)

TIRUPATI – 517502, ANDHRA PRADESH

Accredited by NAAC with 'A' Grade

ISO 9001:2021 Certified

Syllabus

for

Honors Degree Programme – R20

Department of Computer Science and Engineering

20CSTH01: INFORMATION SECURITY

Credits – 4 **Sessional Marks: 30**
L:T:P :: 3:1:0 **University Exam Marks: 70**

Course Objectives

To expose the students to the following:

1. The basics of security, its services, mechanisms and security model.
2. The concept of networking devices and various possible attacks.
3. Various methods and protocols to maintain E-mail security, and web security
4. Realize the structure and adverse effects of malicious software.
5. Appraise the current information auditing, assurance, and computer forensics systems and procedures.

Course Outcomes

After successful completion of course the student should be able to

CO1 Categorize various vulnerabilities of computers network systems as well as the different modes of attack.
CO2 Discover and design techniques to prevent security attacks.
CO3 Explore the emerging security services for Web and Email using Firewall, SSL, TLS, SET and PGP.
CO4 Analyse the propagation and disadvantages of malware.
CO5 Identify the need of information auditing and forensics security.

UNIT I

Information Security Fundamentals: Importance of Computer and Network Security –Security Trends, OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, A Model for Internetwork Security.

UNIT II

Network Security: Networking Devices (Layer1,2,3) – Different types of network layer attacks – Firewall (ACL, Packet Filtering, DMZ, Alerts and Audit Trials) – IDS and its types (Signature based, Anomaly based, Policy based, Honeypot based)– Malicious software.

UNIT III

E-Mail Security: Security services for E-mail-attacks possible through E-mail – establishing keys privacy-authentication of the source-Message Integrity-Non-Repudiation-Pretty Good Privacy, Transport Layer Security (TLS)

UNIT IV

Web Security: SSL/TLS Basic Protocol-computing the keys- client authentication-PKI as deployed by SSL Attacks fixed in v3- Exportability-Encoding-Secure Electronic Transaction (SET), Kerberos**.**

UNIT V

Information Auditing, Forensics Security and Assurance: Configuring Automatic Updates – Configuring Auditing – Performing Remote Management – Investigating Honeypots, Honeynets – Investigating an Attack.

Textbooks

1. William Stallings, "Network Security Essentials: Applications and Standards", Pearson Education, Limited, Global Edition, 2016.
2. Jason Andress, Steven Winterfield, "The Basics of Information Security", Syngress an Elsevier publication, Second Edition, 2013.

Reference Books

1. Peltier, Thomas R, "Information Security Fundamentals", CRC Press, Second Edition, 2014.
2. John R. Vacca, "Network and System Security", Syngress Media, 2010.
3. William Stallings, "Cryptography and Network Security", Pearson Education, Sixth Edition, 2013.

Course Outcomes – Program Outcomes – Program Specific Outcomes (CO-PO-PSO) Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	M	L	-	-	-	H	-	-	-	-	-	-	H	-	-
CO2	-	M	H	-	-	-	L	-	-	-	-	-	L	H	M
CO3	H	M	L	-	-	-	-	-	-	-	-	-	H	-	-
CO4	M	M	-	H	-	-	-	-	-	-	-	-	H	M	L
CO5	M	L	H	H	-	-	-	-	-	-	-		H	-	M

20CSTH02: BLOCK CHAIN TECHNOLOGIES

Credits: 4 **Sessional Marks: 30**
L:T:P :: 3:1:0 **University Examination Marks: 70**

Course Objectives

To expose the students to the following

1. Basics of Block chain technologies
2. Network of block chain, its various types, policies and applications.
3. Design, build, and deploy smart contracts and distributed applications,
4. Integrate ideas from blockchain technology into their own projects.
5. Cryptocurrency and corresponding regulations

Course Outcomes

After successful completion of course the student should be able to

CO1 Explain design principles of Bitcoin and Ethereum, Nakamoto consensus, verification protocol.
CO2 List and describe differences between proof-of-work and proof-of-stake consensus.
CO3 Interact with a blockchain system by sending and reading transactions.
CO4 Design, build, and deploy a distributed application.
CO5 Evaluate security, privacy, and efficiency of a given blockchain system.

UNIT I

Basics: Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete. Cryptography: Hash function, Digital Signature - ECDSA, Memory Hard Algorithm, Zero Knowledge Proof.

UNIT II

Blockchain: Introduction, Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public blockchain.

UNIT III

Distributed Consensus: Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, Sybil Attack, Energy utilization and alternate.

UNIT IV

Cryptocurrency: History, Distributed Ledger, Bitcoin protocols - Mining strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Name coin**.**

UNIT V

Cryptocurrency Regulation: Stakeholders, Roots of Bit coin, Legal Aspects-Crypto currency Exchange, Black Market and Global Economy. Applications: Internet of Things, Medical Record Management System, Domain Name Service and future of Blockchain.

Textbooks

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, "Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction ", Princeton University Press, 2016.

Reference Books

1. Daniel Drescher, “Blockchain Basics: A Non-Technical Introduction in 25 Steps”, Apress Publication, First Edition, 2017.

2. Andreas M. Antonopoulos, "Mastering Bitcoin: Unlocking Digital Crypto Currencies", O'Reilly Media, First Edition, 2014
3. Imran Bashir, "Mastering Blockchain – Distributed Ledgers, Decentralization and Smart Contracts", Packt Publishing Ltd, Second Edition, 2017.
4. Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System", White Paper Publications, 2008.

Course Outcomes – Program Outcomes – Program Specific Outcomes (CO-PO-PSO) Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	H	L	-	-	-	-	-	-	-	-	-	-	H	-	L
CO2	L	-	M	H	-	-	-	-	-	-	-	-	H	-	-
CO3	M	-	-	H	-	L	-	-	-	-	-	-	M	H	-
CO4	-	L	H	-	M	-	-	-	-	-	-	-	H	M	-
CO5	L	-	H	-	-	M	-	-	-	-	-	-	H	L	-

20CSTH03: SENTIMENT ANALYSIS

Credits – 3 **Sessional Marks: 30**
L:T:P ::2:1:0 **University Exam Marks: 70**

Course Objectives

To expose the students to the following:

1. The objective is to study concepts of Sentiment analysis and opinion mining.
2. Sentiment analysis and opinion mining is the field of study that analyzes people's opinions, sentiments, evaluations, attitudes, and emotions from written language.
3. It is one of the most active research areas in natural language processing and is also widely
4. studied in data mining, Web mining, and text mining.

Course Outcomes

After successful completion of course the student should be able to

CO1 Gain knowledge in the concepts of Sentiment analysis
CO2 Understand the sentiment Classification Using Supervised Learning
CO3 Analyse the Basic Rules of Opinions and Aspect Extraction
CO4 Identify Preferred Entities and Existing Opinion Retrieval Techniques
CO5 Represent different Types of Spam and Supervised Spam Detection

UNIT I

Sentiment Analysis Applications, Sentiment Analysis Research, Sentiment Analysis Research, and Opinion Spam Detection.

Problem of Sentiment Analysis: Problem Definitions, Opinion Summarization, Different Types of Opinions, Subjectivity and Emotion, Author and Reader Standing Point.

UNIT II

Sentiment Classification Using Supervised Learning, Sentiment Classification Using Unsupervised Learning, Sentiment Rating Prediction, Cross-Domain Sentiment Classification, Cross-Language Sentiment Classification

Sentence Subjectivity: Subjectivity Classification, Sentiment Classification, Dealing with Conditional Sentences, Dealing with Sarcastic Sentences, Cross-language Subjectivity and Sentiment Classification, Using Discourse Information for Sentiment Classification

UNIT III

Basic Rules of Opinions and Compositional Semantics, Aspect Extraction, Identifying Resource Usage Aspect, Simultaneous Opinion Lexicon Expansion and Aspect Extraction, Grouping Aspects into Categories, Entity, Opinion Holder and Time Extraction, Word Sense Disambiguation.

UNIT IV

Problem Definitions, Identify Comparative Sentences, Identifying Preferred Entities. Web Search vs. Opinion Search, Existing Opinion Retrieval Techniques

UNIT V

Types of Spam and Spamming, Supervised Spam Detection, Unsupervised Spam Detection, Group Spam Detection. Quality as Regression Problem, Other Methods

Textbooks

1. Bing Liu, "Sentiment Analysis Mining Options, Sentiments and Emotions", Cambridge University Press, 2015.
2. Bing Liu, "Sentiment Analysis and Opinion Mining", Morgan and Claypool Publishers, 2012

Reference Books

1. Erik Cambria, Dipankar Das, Sivaji Bandyopadhyay, "A Practical Guide to Sentiment Analysis", Springer Publications, 2017.

Course Outcomes – Program Outcomes – Program Specific Outcomes (CO-PO-PSO) Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	H	-	-	-	-	-	-	-	-	-	-	-	H	-	-
CO2	L	H	-	-	-	-	-	-	-	-	-	-	H	-	-
CO3	-	H	-	-	-	-	-	-	-	-	-	-	H	-	-
CO4	-	H	L	-	-	-	-	-	-	-	-	-	-	H	-
CO5	-	-	H	L	-	-	-	-	-	-	-	-	-	H	-

20CSTH04: REGRESSION MODELLING STRATEGIES

Credits: 3 **Sessional Marks: 30**
L:T:P :: 2:1:0 **University Examination Marks: 70**

Course Objectives

To expose the students to the following:

1. The basic concepts of Regression Models, Choice of the Model, Model uncertainty/ Data-driven Model Specification.
2. General Aspects of Fitting Regression Models
3. The Bayesian Methods for Missing Data.
4. Design Multivariable Modelling Strategies
5. Develop model by using freely available R Design package and re-sampling to estimate a model's performance on new data.

Course Outcomes

After successful completion of course the student should be able to

CO1 Acquire knowledge in Linear Regression and non-linear Regression Models
CO2 Familiar with modern methods for fitting multivariable regression models:
   a. accurately
   b. in a way the sample size will allow, without overfitting
   c. uncovering complex non-linear or non-additive relationships
   d. testing for and quantifying the association between one or more predictors and the response, with possible adjustment for other factors
CO3 Validate models for predictive accuracy and to detect overfitting
CO4 Interpret fitted models using both parameter estimates and graphics
CO5 Critique the literature to detect models that is likely to be unreliable

UNIT I

Introduction: Hypothesis Testing, Estimation and Prediction, Uses of Predictive Multivariable Modelling, Misunderstandings about Prediction vs. Classification, Planning for Modelling, Choice of the Model, Model uncertainty/ Data-driven Model Specification.

UNIT II

General Aspects of Fitting Regression Models: Notation for Multivariable Regression Models, Model Formulations, Interpreting Model Parameters, Relaxing Linearity Assumption for Continuous Predictors, Recursive Partitioning, Assessment of Model Fit.

UNIT III

Missing Data: Types of Missing Data, Prelude to Modelling, Strategies for Developing an Imputation Model, Single Conditional Mean Imputation, Predictive Mean Matching, Multiple Imputation, Diagnostics, Bayesian Methods for Missing Data.

UNIT IV

Multivariable Modelling Strategies: Pre-specification of Predictor Complexity Without Later Simplification, Checking Assumptions of Multiple Predictors Simultaneously, Variable Selection, over fitting and Limits on Number of Predictors, Shrinkage, Collinearity, Data Reduction, Comparing Two Models, Summary: Possible Modelling Strategies.

UNIT V

Describing, Resampling, Validating, and Simplifying the Model: Describing the Fitted Model, The Bootstrap, Model Validation, Bootstrapping Ranks of Predictors, Simplifying the Final Model by Approximating it using Full Models.

R Software: The R -Modelling Language, User-Contributed Functions, The rms Package, Other Functions.

Textbook

1. Frank E Harrell Jr, "Regression Modelling Strategies", Springer Publications, Second Edition, 2016.

Reference Book

1. Douglas C. Montgomery, Elizabeth A. Peck, G. Geoffrey Vining, "Introduction to Linear regression Analysis", Wiley publication, Fifth Edition, 2012.

Course Outcomes – Program Outcomes – Program Specific Outcomes (CO-PO-PSO) Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	H	M	-	L	-	-	-	-	-	-	-	-	H	-	-
CO2	-	M	H	-	-	-	M	-	-	-	-	-	-	H	M
CO3	-	-	-	H	-	M	-	M	-	-	-	-	M	H	-
CO4	-	-	-	-	-	-	-	-	M	H	-	-	M	H	-
CO5	-	-		H	M	L	-	-	-	-	-	-	M	-	H

20CSTH05: FUZZY LOGIC AND KNOWLEDGE BASED SYSTEMS

Credits: 3 **Sessional Marks: 30**
L:T:P :: 2:1:0 **University Examination Marks: 70**

Course Objectives

To expose the students to the following
1. Crisp set and fuzzy set theory
2. Methods of fuzzy logic.
3. Recognize fuzzy logic fuzzy inference systems
4. Applications on Fuzzy logic membership function and fuzzy inference systems
5. Neural Networks and Genetic Algorithms

Course Outcomes

After successful completion of course the student should be able to
CO1 Comprehend the concepts of feed forward neural networks
CO2 Analyse the various feedback networks.
CO3 Understand the concept of fuzziness involved in various systems and fuzzy set theory.
CO4 Comprehend the fuzzy logic control and adaptive fuzzy logic and to design the fuzzy control using genetic algorithm.
CO5 Analyse the application of fuzzy logic control to real time systems.

UNIT I

Introduction To Fuzzy Logic Principles: Basic concepts of fuzzy set theory, operations of fuzzy sets, properties of fuzzy sets, Crisp relations, Fuzzy relational equations, operations on fuzzy relations, fuzzy systems, propositional logic, Inference, Predicate Logic, Inference in predicate logic, fuzzy logic principles, fuzzy quantifiers, fuzzy inference, fuzzy rule based systems, fuzzification and defuzzification types.

UNIT II

Advanced Fuzzy Logic Applications: Fuzzy logic controllers, principles, review of control systems theory, various industrial applications of FLC adaptive fuzzy systems, fuzzy decision making, Multi objective decision making, fuzzy classification, means clustering, fuzzy pattern recognition, image processing applications, syntactic recognition, fuzzy optimization.

UNIT III

Membership Functions: Features of the Membership Function, Standard Forms and Boundaries, Fuzzification, Membership Value Assignments, Intuition, Inference, Rank Ordering, Angular Fuzzy Sets, Neural Networks, Genetic Algorithms, Inductive Reasoning.

UNIT IV

Introduction To Artificial Neural Networks: Fundamentals of neural networks, model of an artificial neuron, neural network architectures, Learning methods, Taxonomy of Neural network architectures, Standard back propagation algorithms, selection of various parameters, variations Applications of back propagation algorithms.

UNIT V

Recent Advances: Fundamentals of genetic algorithms, genetic modeling, hybrid systems, integration of fuzzy logic, neural networks and genetic algorithms, nontraditional optimization techniques like ant colony optimization, Particle swarm optimization and artificial immune systems, applications in design and manufacturing.

Textbooks

1. S. Rajasekaran, G. A. Vijayalakshmi Pai, "Neural Networks, fuzzy logic and genetic algorithms", Prentice Hall Publications, 2017.
2. Timothy J. Ross, "Fuzzy Logic with Engineering Applications", McGraw Hill, 2011.

Reference Books

1. Zurada J.M. "Introduction to Artificial Neural Systems", Jaico publishing house, 2004**.**
2. Klir.G, Yuan B.B. "Fuzzy Sets and Fuzzy Logic", Prentice Hall of India Private Limited, 1997.
3. Gen, M. and R. Cheng "Genetic algorithm and engineering design", John Wiley Publications, 1997
4. Laurance Fausett, "Fundamentals of Neural Networks", Prentice Hall, 1992

Course Outcomes – Program Outcomes – Program Specific Outcomes (CO-PO-PSO) Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	H	-	M	-	-	-	-	L	-	-	-	-	M	-	-
CO2	L	M	H	-	-	-	-	-	-	-	-	-	-	-	-
CO3	H	-	-	-	L	-	H	-	-	-	-	-	M	-	-
CO4	-	M	M	-	-	-	-	-	-	-	-	-	H	-	-
CO5	-	-	H	H	-	-	-	-		-	-	-	M	-	-

20CSTH06: COMPUTER VISION

Credits: 3 **Sessional Marks: 30**
L:T:P :: 2:1:0 **University Examination Marks: 70**

Course Objectives

To expose the students to the following:

1. Image processing techniques for computer vision.
2. Shape and region analysis of an image.
3. Hough Transform and its applications to detect lines, circles, ellipses.
4. Three-dimensional image analysis techniques and motion analysis.
5. Some applications imparting computer vision algorithms.

Course Outcomes

After successful completion of course the student should be able to

CO1 Understand fundamental Image processing techniques required for computer vision.
CO2 Perform shape analysis and boundary tracking techniques.
CO3 Implement chain codes and other region descriptors.
CO4 Use Hough Transform for line, circle, and ellipse detections.
CO5 Apply 3D vision techniques.
CO6 Device Motion related techniques.
CO7 Develop applications using computer vision techniques.

UNIT I

Image Processing Foundations: Review of image processing techniques classical filtering operations thresholding techniques edge detection techniques corner and interest point detection mathematical morphology texture.

UNIT II

Shapes And Regions: Binary shape analysis connectedness object labeling and counting size filtering distance functions skeletons and thinning deformable shape analysis boundary tracking procedures active contours shape models and shape recognition centroidal profiles handling occlusion boundary length measures boundary descriptors chain codes Fourier descriptors region descriptors moments.

UNIT III

Object Recognition: Line detection Hough Transform (HT) for line detection foot-of-normal method line localization line fitting RANSAC for straight line detection HT based circular object detection accurate centre location speed problem ellipse detection Case study: Human Iris location hole detection generalized Hough Transform (GHT) spatial matched filtering GHT for ellipse detection object location GHT for feature collation.

UNIT IV

3d Vision And Motion: Methods for 3D vision projection schemes shape from shading photometric stereo shape from texture shape from focus active range finding surface representations point-based representation volumetric representations 3D object recognition 3D reconstruction introduction to motion triangulation bundle adjustment translational alignment parametric motion spline based motion optical flow layered motion.

UNIT V

Applications: Application: Photo album Face detection Face recognition Eigen faces Active appearance and 3D shape models of faces Application: Surveillance foreground-background separation particle filters Chamfer matching, tracking, and occlusion combining views from multiple cameras human gait analysis Application: In-vehicle vision system: locating roadway road markings identifying road signs locating pedestrians.

Textbooks

1. D. L. Baggio., "Mastering OpenCV with Practical Computer Vision Projects", Packt Publishing, 2012.
2. E. R. Davies, "Computer & Machine Vision", Academic Press, Fourth Edition, 2012.
3. Jan Erik Solem, "Programming Computer Vision with Python: Tools and algorithms for analyzing images", O'Reilly Media, 2012.
4. Mark Nixon and Alberto S. Aquado, "Feature Extraction & Image Processing for Computer Vision", Third Edition, Academic Press, 2012.

Reference books

1. R. Szeliski, "Computer Vision: Algorithms and Applications", Springer 2011.
2. Simon J. D. Prince, "Computer Vision: Models, Learning, and Inference", Cambridge University Press, 2012.
3. https://nptel.ac.in/courses/106/105/106105216

Course Outcomes – Program Outcomes – Program Specific Outcomes (CO-PO-PSO) Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	H	-	L	-	-	-	-	-	-	-	-	-	H	-	L
CO2	-	H	-	M	-	-	-	-	-	-	-	-	H	-	-
CO3	-	H	-	M	-	-	-	-	-	-	-	-	H	-	-
CO4	L	-	-	H	-	-	-	-	-	-	-	-	M	-	-
CO5	-	L	-	H	-	-	-	-	-	-	-	-	H	M	L
CO6	-	L	-	H	-	-	-	-	-	-	-	-	H	L	L
CO7	M	-	-	-	H	-	-	-	-	-	-	-	H	M	L

20CSTH07: SOFTWARE QUALITY ASSURANCE

Credits: 3 **Sessional Marks: 30**
L:T:P :: 2:1:0 **University Examination Marks: 70**

Course Objectives

To expose the students to the following:

1. Evaluate software processes and provide project staff with feedback about non-compliance issues.
2. The concepts and methods required for effective and efficient SQA.
3. The software quality assurance, metrics, defect prevention techniques
4. The techniques for quality assurance and applying for applications
5. The basics of testing, test planning & design and test team organization
6. Various types of tests in the life cycle of the software product.

Course Outcomes

After successful completion of course the student should be able to

CO1 Create test strategies and plans, design test cases, prioritize and execute them.
CO2 Manage incidents and risks within a project.
CO3 Contribute to efficient delivery of software solutions and implement improvements in the software development processes.
CO4 Critically evaluate alternative standards, models and techniques aimed at achieving quality assurance in a variety of software.
CO5 Identify defect prevention techniques and software quality assurance metrics.
CO6 Apply techniques of quality assurance for typical applications

UNIT I

Quality Management & Review Techniques: What is Software Quality, Quality Dimensions, The SQ Dilemma, Achieving Software Quality Software Defects, Defect amplification and removal, Review Metrics and their use, Informal Reviews, Formal technical reviews, Review reporting and record keeping

UNIT II

Software Quality Assurance: Elements of SQA, SQA Task, Goals and Metrics, Formal Approaches to SQA, Statistical SQA, Software Reliability, The ISO 9000 Quality Standards, The SQA Plan.

UNIT III

Software Testing Strategies: The Strategic Approach for ST, Verification and Validation, Organizing for Software Testing, Criteria for Completing of Testing, Strategic Issues.

UNIT IV

System Testing: Recovery Testing, Security Testing, Stress Testing, Performance Testing, Deployment Testing, The Art of Debugging, White box testing, Basis Path Testing, Central Structure Testing, Black box Testing.

UNIT V

The software quality challenge: The uniqueness of software quality assurance, Software quality – definition, Software quality assurance – definition and objectives, Software quality assurance and software engineering, Product operation software quality factors, Product transition software quality factors.

Textbooks

1. P. Ammann and J. Offutt, "Introduction to Software Testing", Cambridge University Press, 2018.
2. Milind Limaye, "Software Quality Assurance", TMH, New Delhi, 2011
3. Y. Laporte Alain, "Software Quality Assurance", Claude Publications, 2018
4. Mauro Pezze, Mic, "Software Testing and Analysis: Process, Principles and Techniques", 2018

Reference Books

1. Kshira sagar Naik, Priyadarshi Tripathy, "Software Testing and Quality Assurance-Theory and Practice", John Wiley & Sons Inc, 2008.
2. Jeff Tian, "Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement", John Wiley & Sons, Inc., Hoboken, New Jersey. 2005.
3. Daniel Galin, "Software Quality Assurance - From Theory to Implementation", Pearson Education Ltd UK, 2004
4. Milind Limaye, "Software Quality Assurance", TMH, New Delhi, 2011.

Course Outcomes – Program Outcomes – Program Specific Outcomes (CO-PO-PSO) Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	H	-	-	-	-	-	L	-	-	-	-	M	-	-
CO2	-	-	H	-	-	-	-	L	-	-	-	-	M	-	-
CO3	-	L	-	-	-	-	H	-	-	-	-	-	M	-	-
CO4	-	-	M	-	H	-	-	-	-	-	-	-	M	-	-
CO5	-	-	L	-	H	-	-	-	-	-	-	-	M	-	-
CO6	-	-	-	-	-	-	-	H	-	-	-	-	-	L	-

20CSTH08: AGILE SOFTWARE DEVELOPMENT

Credits: 3 **Sessional Marks: 30**
L:T:P :: 2:1:0 **University Exam Marks: 70**

Course Objectives

To expose the students to the following:

1. The basic concepts and the principles of Agile process methods
2. The Agile and Scrum Principles
3. The Communication, Planning and Estimation of Agile Product Management
4. The basic issues Agile Risk Management and Testing.
5. Explore tools in Agile Development

Course Outcomes

After successful completion of course the student should be able to

CO1 Gain knowledge in fundamental principles and practices of Agile.
CO2 Implement the principles and practices of agile software development on a project.
CO3 Acquire the knowledge on Agile product management
CO4 Development of Agile principles and testing techniques
CO5 Explore the Agile review and tools related to Agile Development

UNIT I

Agile Software Development: Basics and Fundamentals of Agile Process Methods, Values of Agile, Principles of Agile, stakeholders, Challenges

Lean Approach: Waste Management, Kaizen and Kanban, add process and products add value. Roles related to the lifecycle, differences between Agile and traditional plans, differences between Agile plans at different lifecycle phases. Testing plan links between testing, roles and key techniques, principles, understand as a means of assessing the initial status of a project/ How Agile helps to build quality

UNIT II

Agile and Scrum Principles: Agile Manifesto, Twelve Practices of XP, Scrum Practices, Applying Scrum. Need of scrum, working of scrum, advanced Scrum Applications, Scrum and the Organization, scrum values

UNIT III

Agile Product Management: Communication, Planning, Estimation Managing the Agile approach Monitoring progress, Targeting and motivating the team, managing business involvement, Escalating issue. Quality, Risk, Metrics and Measurements, Managing the Agile approach Monitoring progress, Targeting and motivating the team, managing business involvement and Escalating issue

UNIT IV

Agile Requirements: User Stories, Backlog Management.

Agile Architecture: Feature Driven Development**.**

Agile Risk Management: Risk and Quality Assurance, Agile Tools

Agile Testing: Agile Testing Techniques, Test-Driven Development, User Acceptance Test

UNIT V

Agile Review: Agile Metrics and Measurements, The Agile approach to estimating and project variables, Agile Measurement, Agile Control: the 7 control parameters. Agile approach to Risk, The Agile approach to Configuration Management, The Atern Principles, Atern Philosophy, the rationale for using Atern, Refactoring, Continuous integration, Automated Build Tools

Scaling Agile for large projects: Scrum of Scrums, Team collaborations, Scrum, estimate a Scrum Project, Track Scrum Projects, Communication in Scrum Projects, Best Practices to Manage Scrum.

Laboratory Work: Exploring the tools related to Agile Development and approached and develop small projects using this technology

Textbooks

1. Robert C. Martin, "Agile Software Development", Principles, Patterns, and Practices", Pearson New International Edition, August, 2013
2. Robert C. Martin, "Agile Software Development, Principles, Patterns, and Practices", Alan Apt Series 2011.

Reference Books

1. Succeeding with Agile: Software Development Using Scrum, Pearson, 2010

Course Outcomes – Program Outcomes – Program Specific Outcomes (CO-PO-PSO) Mapping

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CO1	L	H	-	-	-	-	-	-	-	-	-	-	H	-	-
CO2	-	-	-	H	L	-	-	-	-	-	-	-	-	H	-
CO3	H	-	-	-	-	-	-	-	-	-	-	-	H	-	-
CO4	-	-	-	H	-	-	-	-	-	-	-	-	-	-	H
CO5	-	-	-	L	H	-	-	-	-	-	-	-	H	-	-