SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
DEPARTMENT OF IT

Semester/Year		VII/IV		Program		B.Tech – IT					
Subject Category	DC	Subject Code:	IT 701	Subject Name	Software Testing and Quality						
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
ES	MS	Assignment	Quiz	ES	LW	Quiz		L	T	P	
60	20	10	10	30	10	10	150	3	0	2	4

Prerequisites:

Basic knowledge of programming skills and data structures.

Course Objective:

1. To introduce Software testing principles.
2.To introduce knowledge of testing techniques and levels of testing
3.To understand Automation and Quality Metrics.
4.To Quality Assurance tools and Models.
5. To introduce Quality Assurance trends.

UNITs	Descriptions	Hrs.
I	Testing as an engineering activity, Role of process in software quality, Testing as a process, Basic definitions, Software testing principles, The tester's role in a software development organization, Origins of defects, Defect classes, The defect repository and test design, Defect examples, Developer / Tester support for developing a defect repository.	8
II	Testing techniques and levels of testing: Using White Box Approach to Test design - Static Testing Vs. Structural Testing, Code Functional Testing, Coverage and Control Flow Graphs, Using Black Box Approaches to Test Case Design, Random Testing, Requirements based testing, Decision tables, State-based testing, Cause-effect graphing, Error guessing, Compatibility testing, Levels of Testing -Unit Testing, Integration Testing, Defect Bash Elimination. System Testing - Usability and Accessibility Testing, Configuration Testing, Compatibility Testing.	8
III	Automation and Quality Metrics Software Test Automation, Skills needed for Automation, Scope of Automation, Design and Architecture for Automation, Requirements for a Test Tool, Challenges in Automation Tracking the Bug, Debugging. Testing Software System Security - Six-Sigma, TQM - Complexity Metrics and Models, Quality Management Metrics, Availability Metrics, Defect Removal Effectiveness, FMEA, Quality Function Deployment, Taguchi Quality Loss Function, Cost of Quality.	8
IV	Quality Assurance tools and Models SQA basics, Components of the Software Quality Assurance System, software quality in business context, planning for software quality assurance, product quality and process quality, software process models, 7 QC Tools and Modern Tools. Models for Quality Assurance, ISO-9000 series, CMM, CMMI, Test Maturity Models, SPICE, Malcolm Baldrige Model- PCMM.	8
V	Quality Assurance trends; Software Process- PSP and TSP, OO Methodology, Clean-room software engineering, Defect Injection and prevention, Internal Auditing and Assessments, Inspections &	8

	Walkthroughs, Case Tools and their Affect on Software Quality.	
Total Hours		40

Course Outcomes:

CO1. Test the software by applying testing techniques to deliver a product free from bugs.
CO2. Investigate the scenario and to select the proper testing technique.
CO3. Explore the test automation concepts and tools and estimation of cost, schedule based on standard metrics.
CO4. Understand how to detect, classify, prevent and remove defects.
CO5. Choose appropriate quality assurance models and develop quality.

Text Book & Reference Books-

1. Srinivasan Desikan, Gopalaswamy Ramesh,Software Testing: Principles and Practices Pearson.
2. Daniel Galin, Software Quality Assurance: From Theory to Implementation, Pearson Addison Wesley.
3. Aditya P. Mathur, Foundations of Software Testing, Pearson.
4. Paul Ammann, Jeff Offutt, Introduction to Software Testing, Cambridge University Press.
5. Paul C. Jorgensen, Software Testing: A Craftsman's Approach, Auerbach Publications.

List/Links of e-learning resource

- https://archive.nptel.ac.in

Modes of Evaluation and Rubric

The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.

CO-PO Mapping:

COs	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_1	PO_{11}	PO_{12}	PSO1	PSO2
CO-1		2			2							2	1	2
CO-2	2	3		2	1						1	2	3	3
CO-3	2	3	3	2								2	2	2
CO-4	2	2		2								2	3	3
CO-5	2	2	2									2	3	3

Suggestive list of experiments:

1.To determine the nature of roots of a quadratic equations, its input is triple of +ve integers (say x,y,z) and values may be from interval[1,100] the program output may have one of the following:- [Not a Quadratic equations, Real roots, Imaginary roots, Equal roots] Perform BVA.
2. To determine the type of triangle. Its input is triple of +ve integers (say x,y,z) and the values may be from interval[1,100].The program output may be one of the following [Scalene, Isosceles, Equilateral, Not a Triangle].Perform BVA
3. Perform robust case testing on Problem No. 1.
4. Perform robust case testing on Problem No. 2.
5. Create a test plan document for any application (e.g. Library Management System)
6. Experiment: Study of Any Testing Tool (Win Runner)
7. Experiment: Study of Any Test Management Tool (QA Complete)
8. Experiment: Automate the Test cases using Test Automation tool(using QA Complete)
9. Experiment: Learn how to raise and report Bugs using Bug tracking tool (Bugzilla,Jira using QA Complete)
10. Experiment: Study of any open source testing tool (Web Performance Analyzer/O STA).

Recommendation by Board of studies on	
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Department of IT

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
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DEPARTMENT OF IT

Semester/Year		VII/IV		Program			B.Tech – IT				
Subject Category	DE-4	Subject Code:		IT 702 (A)	Subject Category		Distributed System				
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks Quiz				Theory Quiz
ES	MS	Assignment	Quiz	ES	LW	Quiz		L	T	P	
60	20	10	10	-	-	-	100	3	1	0	4

Prerequisites:

1. Basic knowledge of "Operating Systems"and "Computer Organization & Architecture"

Course Objective:

1. This course provides an insight into Distributed systems.
2. Topics include- Peer to Peer Systems, Transactions and Concurrency control, Security and Distributed shared memory.

UNITs	Descriptions	Hrs.
I	Characterization of Distributed Systems-Introduction, Examples of Distributed systems, Resource sharing and web, challenges, System models -Introduction, Architectural and Fundamental models, Networking and Internetworking, Interprocess Communication, Distributed objects and Remote Invocation-Introduction, Communication between distributed objects, RPC, Events and notifications, Case study-Java RMI.	8
II	Operating System Support- Introduction, OS layer, Protection, Processes and Threads, Communication and Invocation, Operating system architecture, Distributed File Systems-Introduction, File Service architecture.	8
III	Peer to Peer Systems–Introduction, Napster and its legacy, Peer to Peer middleware, Routing overlays, Overlay case studies-Pastry, Tapestry, Application case studies-Squirrel, OceanStore. Time and Global States-Introduction, Clocks, events and Process states, Synchronizing physical clocks, logical time and logical clocks, global states, distributed debugging. Coordination and Agreement-Introduction, Distributed mutual exclusion, Elections, Multicast communication, consensus and related problems.	8
IV	Transactions and Concurrency Control-Introduction, Transactions, Nested Transactions, Locks, Optimistic concurrency control, Timestamp ordering. Distributed Transactions-Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.	8
V	Replication-Introduction, System model and group communication, Fault tolerant services, Transactions with replicated data. Distributed shared memory, Design and Implementation issues, Consistency models.	8
Total Hours		40

Course Outcomes:

CO1: Ability to understand Transactions and Concurrency control.
CO2: Ability to understand Security issues.
CO3: Understanding Distributed shared memory.
CO4: Ability to design distributed systems for basic level applications.

Text Book & Reference Books-

1. Distributed Systems Concepts and Design, G Coulouris, J Dollimore and T Kindberg, Fourth Edition, Pearson Education.
2. Distributed Systems, S.Ghosh, Chapman & Hall/CRC, Taylor & Francis Group, 2010.
3. Distributed Systems – Principles and Paradigms, A.S. Tanenbaum and M.V. Steen, Pearson Education.
4. Distributed Computing, Principles, Algorithms and Systems, Ajay D. Kshemakalyani and Mukesh Singhal, Cambridge, rp 2010.

List/Links of e-learning resource

- https://archive.nptel.ac.in

Modes of Evaluation and Rubric

The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.

CO-PO Mapping:

COs	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_1	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	3	2	3	1							2	3	
CO-2		3	3	2	3									
CO-3	2	3	3	3	2									
CO-4		2	3	3										

Suggestive list of experiments:

Recommendation by Board of studies on	
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Department of IT

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
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DEPARTMENT OF IT

Semester/Year		VII/IV		Program		B.Tech – IT				
Subject Category	DE-4	Subject Code:	IT 702 (B)	Subject Name	Internet Technology					

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
ES	MS	Assignment	Quiz	ES	LW	Quiz		L	T	P	
60	20	10	10	-	-	-	100	3	1	-	4

Prerequisites:

Knowledge of Computer Networks and Computer Programming.

Course Objective:

A) To develop an understanding of the technological foundations of the Internet and core Internet protocols (TCP/IP, SMTP, FTP, Telnet, ICMP, RSS, and HTTP);

B) To understand client/server relationships in the context of the Internet and intranets;

C) To identify important Internet content and graphics formats and understand the access issues they present users and the software they require;

D) To develop a framework for evaluating web resources and designs;

UNITs	Descriptions	Hrs.
I	History and scope of The Internet, Principles of internetworking, Connecting devices- Repeaters, Bridges, Routers, Gateways. IP Addressing- Classful IP addressing and Classless IP Addressing, Concept of sub netting & super netting . Special addresses .	8
II	**Network Layer Protocols**- Forwarding Techniques for an IP Packet, Packet format of IP Protocol, ARP, RARP, Proxy ARP, Brief explanation of Internet Control Message Protocol (ICMP) and Internet Group Management Protocol (IGMP).	8
III	**Transport Layer Protocols-** Concept of Process-To-Process Communication, Brief explanation of User Datagram Protocol (UDP) & Transmission Control Protocol(TCP) , Connection Establishment & Connection Termination in TCP, Sliding Window Protocol, Congestion control in TCP,TCP Timers, SCTP.	8
IV	**Routing Protocols-** INTRA and INTER Domain Routing, Distance Vector Routing, Link State Routing, Path Vector Routing, RIP, OSPF, BGP, Multicasting- Multicast Link State Routing, Multicast Distance Vector Routing.	8
V	**Upper Layer Protocols-** Domain Name System (DNS), BOOTP ,DHCP , TELNET, FTP, TFTP, SMTP ,SNMPMobile IP, Fault management, Fault management functions	8
Total Hours		40

Course Outcomes:

The students would be able to-

CO-1: Develop a fundamental understanding of principles of Internetworking and characteristics ofconnecting Devices and IP addressing.

CO-2: Describe the Network layer protocol such as IP, ARP, RARP, ICMP and IGMP.

CO-3: Explain the role of transport layer, and analyze the role and services of transport layer protocol suchas TCP and UDP.

CO-4: Distinguish between various routing techniques such as distance vector and link state routingtechniques.

CO-5: Examine working of upper layer protocol.

Text Book & Reference Books-

1. TCP/IP Protocol Suite by Behrouz A.Forouzan..
2. Internetworking with TCP/IP By Douglas E. Comer.
3. Computer Networks by Andrew S. Tanenbaum

List/Links of e-learning resource

- https://archive.nptel.ac.in

Modes of Evaluation and Rubric

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CO-PO Mapping:

COs	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_1	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	2	2										3	
CO-2	3	3	2		1		1			2		2	2	2
CO-3	3	2	1		2		2			2		3	2	2
CO-4	3	3	2	2	2	2	2			2		2	2	3
CO-5	3	3							1	1		1	2	

Suggestive list of experiments:

Recommendation by Board of studies on	
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Department of IT

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DEPARTMENT OF IT

Semester/Year		VII/IV		Program		B.Tech – IT					
Subject Category	DE-4	Subject Code:		IT 702 (C)	Subject Name	Blockchain Technology					
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
ES	MS	Assignment	Quiz	ES	LW	Quiz		L	T	P	
60	20	10	10	-	-	-	100	3	1	0	4

Prerequisites:

Basic Knowledge of mathematics.

Course Objective:

1) Technology behind blockchain
2) Emerging trends in blockchain .
3) Real-world applications of block chain

UNITs	Descriptions	Hrs.
I	Introduction to Blockchain Technology: Basic ideas behind block chain, how it is changing the landscape of digitalization, introduction to cryptographic concepts, Hashing, public key cryptosystems, private vs public block chain and use cases, Hash Puzzles	8
II	Blockchain Fundamentals: Basic architecture of Blockchain, different terminologies associated, Characteristics of Block chain, Types of networks, Introducing Smart contract concept in Blockchain.	8
III	Components of Blockchain: Core components of Blockchain, Types of Block chains; Blockchain Protocol, Permission & Permission less Block chains,	8
IV	Digital Ledger: Short History of Money and Trust, Bitcoin Mechanics, Introduction to Ethereum, Introduction to Hyperledger, Hyperledger Fabric and its architecture, Hyperledger Composer Emerging Trends in Blockchain: Cloud-based block chain, Multi chain, Geth , Stellar , Ripple, R3 Corda, Blockchain API, Blockchain Sandboxes	8
V	Block Chain Use Cases: Supply Chain Management, Finance, Health Care, Internet of Things (IoT), Remittance, Land Records, Voting and election, Loyalty Programs, Go Green (Renewable Energy)	8
Total Hours		40

Course Outcomes:

CO-1: Understand the basic concepts, principles and applications of block chain.
CO-2: Understand basic architecture of Block chain, Characteristics of Block chain.
CO-3: Explain Core components of Block chain, Types of Block chains; Blockchain Protocol.
CO-4: Compare the working of different block chain platforms.
CO-5: Analyse the importance of block chain in finding the solution to the real-world problems

Text Book & Reference Books-

1. Artemis Caro, ―Blockchain: The Beginners Guide to Understanding the Technology BehindBitcoin& Crypto currency‖.

2. Scott Marks, ―Blockchain for Beginners: Guide to Understanding the Foundation and Basics of the Revolutionary Blockchain Technology‖, Create Space Independent Publishing Platform.

3. Mark Watney, ―Blockchain for Beginners.

4. Alwyn Bishop, ―Blockchain Technology Explained.

List/Links of e-learning resource

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Modes of Evaluation and Rubric

The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.

CO-PO Mapping:

COs	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_1	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	3	2	3	1							2	3	1
CO-2		2	3	2	3									
CO-3	2	1	2	3	2								1	
CO-4		2	3	2								1		2
CO-5	2		2		2				1				1	

Suggestive list of experiments:

Recommendation by Board of studies on	
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Department of IT

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
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DEPARTMENT OF IT

Semester/Year	VII/IV	Program	B.Tech -IT
Subject Category: DE-5	Subject Code: IT 703 (A)	Subject Name	Information and Storage Retrieval

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
ES	MS	Assignment	Quiz	ES	LW	Quiz		L	T	P	
60	20	10	10	-	-	-	100	3	1	0	4

Prerequisites:

Basic knowledge of DBMS

Course Objective:

1. To understand the concept of indexing.
2. To get acquainted with different types of vocabulary control devices.
3. To get an insight into the provisions in a thesaurus and methodology of its constructions with reference application of computers.
4. To recognize different tools and techniques associated with the artificial intelligences based subject indexing systems.
5. To explore the strengths and weaknesses of different indexing techniques

UNITs	Descriptions	Hrs.
I	Cataloguing & Subject Indexing: Principles of Subject Cataloguing: Assigning Subject Heading Using Library of Congress Subject Heading & Sears List of Subject Heading Etc. Pre-& Post Co-Ordinate Indexing & Citation Indexing	8
II	Indexing Languages & Vocabulary Control: Indexing Languages: Types & Characteristics Vocabulary Control: Tools of Vocabulary Control Structure & Construction of an IR Thesaurus, Design and Development of IR Thesaurus Trends In Indexing Assigned Indexing Practice Derived Indexing Practice Formulation of Search Strategy Search Engines Federated Search Aggregators Subject Gateways	8
III	Information Retrieval: IR Models, Basic Models, Models Based On Theory, Tools And Recent Models; Search Strategies: Evaluation of Information Retrieval Systems; Trends In IR Models	8
IV	New Trends: Semantic Web, OWL (Ontology Web Language), Data Storage and Data Management – Features and contribution of AI (ML + DL), IoT in Intelligent Data Management.	8
V	Abstract & Abstracting: Concept, Purpose & Its Usefulness: Characteristics of Good Abstract Types Abstracting Procedure Standards & Guidelines For Preparing Abstract Automatic Abstracting	8
Total Hours		40

Course Outcomes:

CO1: Acquire knowledge on concepts and terminologies in Information Processing and Retrieval Theory.
CO2: Understand and apply various Indexing systems and Bibliographic Description

Standards.
CO3: Apply search strategies to locate and retrieve required information.
CO4: Differentiate the past, present and current practice of Information and Data Storage and Retrieval tools and techniques.
CO5: Understand the marketable value of information products and services.
CO6: Applies the principles, approaches and methods of marketing in the Library Environment.

Text Book & Reference Books-

1. Foskett (AC). The Subject Approach to Information. 4th Ed. London: Bingley, 1982.
2. Chowdhary (GG). Introduction to Modern Information Retrieval. 2nd Ed. London: Facet Publishing, 2003. Gopinath (MA). Construction of Depth Version of Classification: A Manual. New Delhi. Wiley Eastern Limited, 1986.
3. Gorman (GE) Ed. Meta Data Application for Management, London, Facet Publishing, 2003.
4. Harter (Stephen P.). Online Information Retrieval: Concept, Principles and Techniques, Orlando, Academic Press, 1978.
5. Hepas (ITS). Information Retrieval: Computational and Theoretical Aspects. New York, Academic Press. 1978.

List/Links of e-learning resource

- https://archive.nptel.ac.in

Modes of Evaluation and Rubric

The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.

CO-PO Mapping:

COs	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_1	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	3	2	3	1							2	3	
CO-2		3	3	2	3									
CO-3	2	3	3	3	2							2	2	2
CO-4		2	3	3								3	3	3
CO-5		3	2	3								3	3	3
CO-6														

Suggestive list of experiments:

Recommendation by Board of studies on	
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Department of IT

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
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DEPARTMENT OF IT

Semester/Year		VII/IV		Program		B.Tech – IT				
Subject Category	DE-5	Subject Code:	IT 703 (B)	Subject Name	Optimization Technique					

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
ES	MS	Assignment	Quiz	ES	LW	Quiz		L	T	P	
60	20	10	10	-	-	-	100	3	1	0	4

Prerequisites:

Knowledge of Computer Programming Language and data structures.

Course Objective:

A) The focus of the course is on convex optimization though some techniques will be covered for non-convex function optimization too.

B) After an adequate introduction to linear algebra and probability theory, students will learn to frame engineering minima maxima problems in the framework of optimization problems.

UNITs	Descriptions	Hrs.
I	Mathematical preliminaries Linear algebra and matrices. Vector space, Eigen analysis. Elements of probability theory. Elementary multivariable calculus.	8
II	Linear Programming Simplex method, Introduction to linear programming model, Duality, Karmarkar's method.	8
III	Unconstrained optimization Conjugate direction and quasi-Newton methods, Gradient-based methods , One-dimensional search methods	8
IV	Constrained Optimization Lagrange theorem. FONC, SONC, and SOSC conditions.	8
V	Projection methods, KKT conditions, Non-linear constrained optimization models Nonlinear problems.	8
Total Hours		40

Course Outcomes:

CO-1: To implement optimization algorithms and model engineering minima/maxima problems as optimization problems.
CO-2: To understand the theory of optimization methods and algorithms developed for solving various types of optimization problem.
CO-3: To apply the mathematical results and numerical techniques of optimization theory to concrete Engineering problems.
CO-4: To study equality constraint.
CO-5: Explain the fundamental knowledge of Non-linear constrained optimization.

Text Book & Reference Books-

1. An introduction to Optimization by Edwin P K Chong, Stainslaw Zak.
2. Nonlinear Programming by Dimitri Bertsekas

List/Links of e-learning resource

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Modes of Evaluation and Rubric

The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.

CO-PO Mapping:

COs	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_1	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	3	2	3	1							2	3	1
CO-2		2	3	2	3									
CO-3	2	1	2	3	2								1	
CO-4		2	3	2								1		2
CO-5	2		2		2				1				1	

Suggestive list of experiments:

Recommendation by Board of studies on	
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Department of IT

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DEPARTMENT OF IT

Semester/Year		VII/IV		Program		B.Tech – IT					
Subject Category	DE-5	Subject Code:		IT 703 (C)	Subject Name	Computer Vision					
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
ES	MS	Assignment	Quiz	ES	LW	Quiz		L	T	P	
60	20	10	10	-	-	-	100	3	1	0	4

Prerequisites:

Basic Knowledge of algorithms, Discrete Mathematics

Course Objective:

1 Understand the computer imaging systems.
2. Understand the Pattern Analysis.
3. Understand the Classifiers.

UNITs	Descriptions	Hrs.
I	Overview, computer imaging systems, lenses, Image formation and sensing, Image analysis, pre-processing and Binary image analysis.	8
II	Edge detection, Edge detection performance, Hough transform, corner detection Segmentation, Morphological filtering, Fourier transform.	8
III	Feature extraction, shape, histogram, color, spectral, texture, using CV IP tools, Feature analysis, feature vectors, distance /similarity measures, data pre-processing.	8
IV	Pattern Analysis: Clustering: K-Means, K-Medoids, Mixture of Gaussians Classification: Discriminant Function, Supervised, Unsupervised, Semi-supervised.	8
V	Classifiers: Bayes, KNN, ANN models; Dimensionality Reduction: PCA, LDA, ICA, and Non-parametric methods. Recent trends in Activity Recognition, computational photography, Biometrics.	8
Total Hours		40

Course Outcomes:

CO1: Identify basic concepts, terminology, theories, models and methods of computer vision.
CO2: Describe basic methods of computer vision related to multi-scale representation.
CO3: Understanding edge detection of primitives, stereo, motion and object recognition.
CO4: Developed the practical skills necessary to build computer vision applications.
CO5:To have gained exposure to object and scene recognition..

Text Book & Reference Books-

1. "Human Computer Interaction" by Alan Dix, Janet Finlay , ISBN :9788131717035, Pearson Education (2004).
2. "Designing the User Interface - Strategies for Effective Human Computer Interaction", by Ben Shneiderman ISBN: 9788131732557, Pearson Education (2010).
3. Usability Engineering: Scenario-Based Development of Human-Computer Interaction ,

by Rosson, M. and Carroll, J. (2002).

4. The Essentials of Interaction Design, by Cooper, et al. , Wiley Publishing(2007).
5. The Resonant Interface: HCI Foundations for Interaction Design , by Heim, S. , AddisonWesley. (2007)

List/Links of e-learning resource

- https://archive.nptel.ac.in

Modes of Evaluation and Rubric

The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.

CO-PO Mapping:

COs	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_1	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	3	2	3	1							2	3	1
CO-2		2	3	2	3									
CO-3	2	1	2	3	2								1	
CO-4		2	3	2								1		2
CO-5	2		2		2				1				1	

Suggestive list of experiments:

Recommendation by Board of studies on	
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Department of IT

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
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DEPARTMENT OF IT

Semester/Year		VII/IV		Program			B.Tech – IT				
Subject Category	Proj	Subject Code:		IT 704		Subject Name	Major Project Prelim				
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
ES	MS	Assignment	Quiz	ES	LW	Quiz		L	T	P	
-	-	-	-	60	20	20	100	0	0	4	2

Prerequisites:

Knowledge of Computer Programming Language and MATLAB

Course Objective:

A) To study the image fundamentals and mathematical transforms necessary for image processing.
B) To study the image enhancement techniques.
C) To study image restoration procedures.
D) To study the image compression procedures.

UNITs	Descriptions	Hrs.
I	Digital Image Fundamentals: A simple image model, Sampling and Quantization. Relationship between pixels. Imaging geometry. Image acquisition systems, Different types of digital images.	8
II	Image Transformations Introduction to Fourier transforms, Discrete Fourier transforms, Fast Fourier transform, Walsh transformation, Hadmord transformation, Discrete Cosine Transformation.	8
III	Image Enhancement Filters in spatial and frequency domains, Histogram based processing. Image subtraction, Averaging, Image smoothing, Nedion filtering, Low pass filtering, Image sharpening by High pass filtering.	8
IV	Image Encoding and Segmentation Encoding: Mapping, Quantizer, Coder. Error free compression, Lossy Compression schemes. JPEG Compression standard. Detection of discontinuation by point detection, Line detection, edge detection, Edge linking and boundary detection, Local analysis, Global processing via Hough transforms and graph theoretic techniques.	8
V	Mathematical Morphology Binary, Dilation, crosses, Opening and closing, Simple methods of representation, Signatures, Boundary segments, Skeleton of a region, Polynomial approximation	8
Total Hours		40

Course Outcomes:

CO-1: Ability to apply principles and techniques of digital image processing in applications related to design and analysis of digital imaging systems. CO-2: Ability to analyze and implement image processing algorithms to real problems. CO-3: Gaining of hands-on experience in using software tools for processing digital images. CO-4: Interpret image segmentation and representation techniques. CO-5: Apply Mathematical Morphology using Polynomial approximation.

Text Book & Reference Books-

1. Rafael C Gonzalez, Richard E Woods 3rd Edition, Digital Image Processing Pearson.
2. Sonka, Digital Image Processing & Computer Vision, Cengage Learning.
3. Jayaraman, Digital Image Processing, TMH.
4. Pratt, Digital Image Processing, Wiley India.
5. Annadurai, Fundamentals of Digital Image Processing, Pearson Education.

List/Links of e-learning resource

- https://archive.nptel.ac.in

Modes of Evaluation and Rubric

The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end

semester practical examination.

CO-PO Mapping:

COs	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_1	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	3	2	3	1							2	3	1
CO-2		2	3	2	3									
CO-3	2	1	2	3	2								1	
CO-4		2	3	2								1		2
CO-5	2		2		2				1				1	

Suggestive list of experiments:

Recommendation by Board of studies on	
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Department of IT