SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

(Engineering College), Vidisha, MP

(An autonomous Institute Affiliated to RGPV, Bhopal)

COMPUTER SCIENCE & ENGINEERING

Course Evaluation Scheme & Syllabus

VII SEM B.Tech.	Subject Code	Subject Name / Title	Maximum Marks Allotted						Contract Hrs.			Total Credits
			Theory			Practical						
			End Sem	Mid Sem Exam	Quiz/ Assignment	End Sem	Lab Work & Sessional	Total Marks	L	T	P	
	CS-1871(A)	OOAD	70	20	10	-	-	100	3	1	-	4

Prerequisite: Having Previous knowledge of Object Oriented Technology and Principle of Programming Languages.

Course Objectives: Throughout the course, students will be expected to demonstrate their understanding of Object oriented concepts with java by being able to do each of the following:

A) To understand Basic Fundamental concepts of Modeling Techniques.
B) To implement the Programs using Object oriented Concepts with Any Programming Language.
C) To introduce the CORBA, EJB, COM+, DCOM.
D) To understand UML

COURSE CONTENTS

UNIT-I :

Object Oriented Concepts and Modeling Techniques, Modeling, objects and classes, Relationships, Inheritance, Association, aggregation, Containers, Delegation, Metadata, Abstract methods and Classes. Object modeling, Dynamic modeling, Events, Status, Scenarios, Event hate diagrams, Operations, State diagrams, Functional Models, Dataflow diagrams, Constraints specification, Relation of object, Functional and Dynamic models.

UNIT-II :

Design Methodology, OMT methodology, Analysis, Overview of system design, Subsystem, concurrency, Common architectural frameworks designing algorithm, Design optimization, Implementation of control, Design of Associations, Object design, Class design, Comparison of design methodology with SASD, JSD and others.

UNIT-III :

Implementation,Programming style, Reusability, Extensibility, Programming in the large, Translating a design into an Implementation class definition, Object oriented Language features, Survey of object-oriented languages, Object storage and relation with database.

UNIT-IV :

Advanced Topics,Distributed objects, Components development, Introduction to Distributed object system like CORBA, EJB, COM+, DCOM, and other design architectures.

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Mr. Ajay Kumar Goyal Ms. Shaila Chugh Dr. Sunil Joshi Dr. Kanak Saxena

UNIT-V :

Static and Dynamic UML diagram. Class Diagram, Elaboration , Domain Model ,Finding conceptual classes and description classes ,Associations, Attributes, Domain model refinement ,Finding conceptual class ,Aggregation and Composition, Relationship between sequence diagrams and use cases. UML interaction diagrams , Collaboration diagram ,State machine diagram and Modeling , Activity diagram , Implementation Diagrams, Component and Deployment Diagrams,

Reference Books:

1.G. Booch, Object-Oriented Analysis and Design, Pearson Education.
2. J. Rumbaugh, Object-Oriented Modeling and Design, Pearson Education.

Course Outcomes: The students would be able to-

CO-1: Illustrate OO concepts and OO Modeling Techniques.
CO-2: Discuss about design methodology.
CO-3: Illustrate about domain models and conceptual classes.
CO-4: Compare and contrast various Distributed Object System.
CO-5: Demonstrate UML diagrams to implement OOAD paradigm.

COs and POs,PSOs Mapping:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO_{11}	PO_{12}	PSO1	PSO2
CO1	2		2	2										
CO2	1		2	2	1								2	2
CO3	2	2	2	2	2								2	2
CO4		1	2	2	1								2	2
CO5	2	2	2	2	1						1		2	2

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	CS-1871(B)	Embedded System	70	20	10	-	-	100	3	1	-	4

Prerequisite: Basic Knowledge of Programming Languages like C,C++ and Java.

Course Objectives:

Students completing this course will be well positioned to:

A) Discuss the major components that constitute an embedded system.

B) Implement small programs to solve well-defined problems on an embedded platform.

C) Develop familiarity with tools used to develop in an embedded environment

COURSE CONTENTS

UNIT I:

Introduction to Embedded Systems Embedded Systems Vs General Computing Systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Purpose of Embedded systems, Core of the Embedded system, Memory, Sensors and Actuators, Communication Interface, Embedded firmware, PCB and Passive Components, Characteristics and Quality attributes of a Embedded System.

UNIT II:

Design of Embedded Systems with 8bit Microcontrollers-8051 Factors for considering in selecting a Controller, designing with 8051 microcontroller Different addressing modes supported by 8051, Instruction set for 8051 microcontrollers. Fundamental issues in Hardware Software Co-Design, Computational models in Embedded Design.

UNIT III:

Embedded Hardware and Firmware Design and Development Analog andDigital Electronic components, VLSI and Integrated circuit design, Electronic Design Automation tools, PCB layout Design and its fabrication. Embedded firmware design approaches, Embedded firmware Development Languages, Programming in Embedded C Integration and testing of Embedded Hardware and Firmware, Safe and robust Design, Reliability, Faults, errors and Failure, Functional Design, Architecture Design, Prototyping.

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UNIT IV: Embedded System Development Environment Integrated Development Environment (IDE), Types of files Generated on Cross- Compilation, Disassembler / Decompiler, Simulators, Emulators and Debugging, Boundary Scan.

UNIT V:
Embedded Product Development Lifecycle (EDLC) and Trends in Embedded Industry: What is EDLC, Objectives of EDLC, Different phases of EDLC, EDLC Approaches-Linear or waterfall model, Iterative Model, Prototyping/Evolutionary Model, Spiral Model. Processor trends in Industry, Embedded OS Trends, Development Language Trends Open Standards, Frameworks and Alliances, Bottlenecks.

Reference Books:

1. Shibu, "Introduction to Embedded System", TMH
2. Barrett, "Embedded Systems: Design and Applications", Pearson Education.
3. Rajkamal, "Embeded System", TMH.
4. Vahid, Givargis, "Embedded System Design",Wiley.Balbno, "Embedded Micro Computer System", Cengage Learning.

Course Outcomes: The students would be able to
CO-1: Understanding of application and need of embedded computing system, embedded product development life cycle and development environment.
CO-2: Ability to design embedded hardware and firmware with different design tools and techniques.
CO-3: Understanding of functioning and use of microcontrollers.
CO-4: Ability to plan, design and develop embedded computing systems.
CO-5: Design Framework of EDLC

COs and POs,PSOs Mapping:

Cos	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	2	2	1		1						2	2	2
CO-2	2	2	2	1								2	1	1
CO-3	2	2	3	2								1	1	2
CO-4	2		2	2								2		
CO-5	1	2	2	2								2		

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	CS-1871(C)	Parallel Computing	70	20	10	-	-	100	3	1	-	4

Course Objectives: Students completing this course will be well positioned to:

A) understand challenges in efficient execution of large-scale parallel applications
B) employs an architecture independent view of the underlying platforms
C) cost-effective method for the fast solution of computationally large and data-intensive problems
D) Design algorithms for an abstract model.

COURSE CONTENTS

UNIT-I:

Parallel computing, scope of parallel computing, Abstract model of serial & parallel computation, pipelining, data parallelism, control parallelism, parallel computing design consideration, parallel algorithms & parallel architectures**.** Shared memory, distributed memory parallelism, Amdahl's law, speedup and efficiency, supercomputers.

UNIT-II:

MPI basics,point-to-point communication, collective communication, Synchronous/ asynchronous send/receive, algorithms for gather, scatter, broadcast, reduce. Network topologies, network evaluation metrics, communication cost, routing in interconnection networks,static and adaptive routing, process-to-processor mapping.

UNIT-III:

Scalability, Minimum Execution Time and Minimum Cost-Optimal Execution Time, Asymptotic Analysis of Parallel Programs, Other Scalability Metrics benchmarking, performance modeling, impact of network topologies, parallel code analysis and profiling. Introduction to parallel algorithms, parallel algorithm models, Decomposition Techniques, characteristics of tasks & interactions ,mapping techniques for load balancing, methods for containing interaction overheads.

UNIT-IV:

Programming Shared Address Space Platforms: Thread Basics, The POSIX Thread API, Thread Basics: Creation and Termination, Synchronization Primitives in Pthreads, Controlling Thread and Synchronization Attributes, Thread Cancellation, Composite Synchronization Constructs, Tips for Designing Asynchronous Programs, OpenMP: a Standard for Directive Based Parallel Programming

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UNIT-V:
Matrix multiplication, parallel Reduction, parallel sorting: bubble, quick sort, Graph algorithm: Minimum spanning tree (prim's algorithm), Search Algorithms for Discrete Optimization Problems Dynamic Programming.

References Books:

1)"Introduction to Parallel Computing" (2nd Edition) Ananth Grama ,George Karypis, Vipin Kumar , Anshul Gupta.
2) "Algorithms and Parallel Computing "(Wiley Series) Fayez Gebali .
3) " Scalable Parallel Computers" Kai Hwang, Zhiwei Xu .
4) "Introduction to parallel processing " M.Sasikumar , Dinesh shikhare, P. Ravi Prakash .
5) "Principles of Grid computing " P. Venkata Krishna, Ane's Student Edition .

Course Outcomes: The students would be able to-
CO-1: Conceptualize the parallel computing techniques.
CO-2: Understanding the parallel topologies with its functionalities.
CO-3: Analysis of the parallel algorithms techniques with load balancing.
CO-4: Articulate the shared address space problems.
CO-5: Analyze a problem, and identify, formulate and use the appropriate computing and engineering requirements for obtaining its solution

COs and POs,PSOs Mapping:

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	1	1	1									1	
CO-2	1	1	1	1									1	1
CO-3	1	1	1	2									1	2
CO-4	1	2	2	2	1								1	
CO-5	1	2	1	1	1								1	2

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	CS-1872(A)	Cloud Computing	70	20	10	-	-	100	3	1	-	4

Prerequisite: Knowledge of Discrete Mathematics,Computer network, and ACA.

Course Objectives:

A) To learn how to use Cloud Services.
B) To implement Virtualization
C) To implement Task Scheduling algorithms.
D) Apply Map-Reduce concept to applications.
E) To build Private Cloud.
F) Broadly educate to know the impact of engineering on legal and societal issues involved.

COURSE CONTENTS

UNIT I:

Defining a Cloud, Cloud Types – NIST model, Cloud Cube model, Deployment models (Public , Private, Hybrid and Community Clouds), Service models – Infrastructure as a Service, Platform as a Service, Software as a Service with examples of services/ service providers, Cloud Reference model and Characteristics, Architecture ,Infrastructure, Platforms, Communication Protocols, Connecting to the Cloud by Clients Services and Applications by Type IaaS, PaaS ,SaaS .

UNIT II :

Concepts of Abstraction and Virtualization (access, application, CPU, storage), Load Balancing : Mobility patterns (P2V, V2V, V2P, P2P, D2C, C2C, C2D, D2D), Network resources and Advanced (including Application Delivery Controller and Networks), Google Cloud as an example of use of load balancing, Hypervisors: Virtual machine technology and types, VMware vSphere Machine Imaging (including mention of Open Virtualization Format).Distinction between SaaS and PaaS (knowledge of Salesforce.com and Force.com), Application development Use of PaaS.

UNIT III:

Application frameworks Use of Google Web Services ,Google Applications Portfolio – Indexed search, Dark Web, Aggregation and disintermediation, Productivity applications and service, Adwords, Google Analytics, Google Translate, Google Toolkit (including introduction of Google APIs), major features of Google App Engine service. Use of Amazon Web Services Amazon Web Service components and services: Amazon Elastic Cloud, Amazon Simple Storage system, Amazon Elastic Block Store.

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UNIT IV:
Windows Azure platform: Microsoft's approach, architecture, and main elements, Windows Azure AppFabric, Content Delivery Network, SQL Azure, and Windows Live services, Types of services required in implementation – Consulting, Configuration, Customization and Support Cloud Management.The features of network management systems and related products cloud vendors, Monitoring of an entire cloud computing deployment stack, Lifecycle management of cloud services (six stages of lifecycle) .

UNIT V:
Cloud security concerns, boundary, service boundary , data Security, Brokered cloud storage access, Storage location and tenancy, encryption, and auditing and compliance Identity management. Service Oriented Architecture, message-based transactions, Protocol stack for an SOA architecture, Event-driven SOA, Enterprise Service Bus, cloud transactions, functionality mapping, Application attributes, service attributes, System abstraction and Cloud Bursting, Cloud APIs, Cloud storage definition – Manned and Unmanned ,Cloud mail services Google Gmail, Mail2Web, Windows Live Hotmail, Yahoo mail.

Text Book:
1. Cloud Computing Bible by Barrie Sosinsky, Wiley India Pvt. Ltd, 2013.

Reference Books:
1. Cloud Computing – Second Edition by Dr. Kumar Saurabh, Wiley India
2. Mastering Cloud Computing by Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, McGraw Hill Education (India) Private Limited, 2013
3. Cloud computing: A practical approach, Anthony T. Velte, Tata Mcgraw-Hill
4. Cloud Computing, Miller, Pearson
5. Building applications in cloud: Concept, Patterns and Projects, Moyer, Pearson

Course Outcomes: The students would be able to-
CO-1: Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
CO-2: Describe importance of virtualization along with their technologies and compare various load balancing algorithm.
CO-3: Describe and analyze the key components of Google and Amazon web service and apply them to solve problems on the cloud.
CO-4: Describe the key components of Microsoft azure platform and cloud management on azure.
CO-5: Explain major security and privacy problems in the cloud and how they are addressed with the security mechanisms

COs and POs,PSOs Mapping:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	2	2							1			2	2	2
CO-2	2	2		1								1	1	2
CO-3	2	3		1	2							2	2	3
CO-4	2	3		1	2							2	2	3
CO-5	1	1						2				1	2	

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	CS-1872(B)	Digital Image Processing	70	20	10	-	-	100	3	1	-	4

Prerequisite : 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.

COURSE CONTENTS

UNIT I:

Digital Image Fundamentals: A simple image model, Sampling and Quantization. Relationship between pixels. Imaging geometry. Image acquisition systems, Different types of digital images.

UNIT II :

Image Transformations Introduction to Fourier transforms, Discrete Fourier transforms, Fast Fourier transform, Walsh transformation, Hadmord transformation, Discrete Cosine Transformation.

UNIT 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.

UNIT 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.

UNIT V:

Mathematical Morphology Binary, Dilation, crosses, Opening and closing, Simple methods of representation, Signatures, Boundary segments, Skeleton of a region, Polynomial approximation.

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References 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.

Course Outcomes: The students would be able to

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.

COs and POs,PSOs 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	1		1						2	2	1
CO-2	2	2	2	1								2	1	1
CO-3	2	2	3	2								1	1	2
CO-4	2	2	2	2								1	1	1
CO-5	1	2	2	2								2		

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	CS-1872(C)	Wireless Networks	70	20	10	-	-	100	3	1	-	4

Course Objectives:

To provide an overview of Wireless Communication networks and its applications in communication engineering, enable students to understand the contribution of Wireless Communication networks to overall technological growth, make them understand related terminology, principles, devices, schemes, concepts, algorithms and different methodologies used in Wireless Communication Networks.

COURSE CONTENTS

UNIT I:

Introduction of Wireless Networks: Different Generations of Wireless Networks. Characteristics of the Wireless Medium: Radio Propagation Mechanisms, Path Loss Modeling and Signal Coverage, Effect of Multipath and Doppler, Channel Measurement and Modeling Techniques.

UNIT II:

Network Planning: Introduction, Wireless Network Topologies, Cellular Topology, Cell Fundamentals Signal to Interferences Radio Calculations, Network Planning for CDMA Systems. Wireless Network Operations**:** Mobility Management, Radio Resources and Power Management.

UNIT III:

Multiple Division Techniques: FDMA, TDMA, CDMA, OFDM, SDMA. Comparison of Multiple Division Techniques, Modulation Techniques – AM, FM, FSK, PSK, QPSK, QAM, 16QAM Mobile Data Networks: Introduction, Data Oriented CDPD Network, GPRS, EDGE and High Data Rates, SMS in GSM, Mobile Application Protocols.

UNIT IV:

Introduction to Wireless LAN: Evolution of WLAN, Wireless Home Networking, Technologies for Home Area Network (HAN), Overview of IEEE 802.11, Reference Architecture, PHY and MAC Layer, Wireless ATM, HIPERLAN.

UNIT V:

Standards: IEEE 802.15 WPAN, HomeRF, Bluetooth, Interference between Bluetooth and 802.11, Adhoc Networks, Introduction to 2G, 3G, LTE (4G), and 5G networks.

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Reference Books:

1. Kaveh Pahlavan, Prashant Krishnamurthy, “principles of Wireless Networks”, PHI.
2. Qing- An Zeng, Dharma Prakash Agrawal, “Introduction to Wireless and Mobile Systems”, CENGAGE Learning.
3. Sumit Kasera, Nishit Narang, A P Priyanka, “2.5 G Mobile Networks: GPRS and EDGE”, TMH
4. Dr. Kamilo Feher, “Wireless Digital Communications”, PHI.
5. Jochen Schiller, “Mobile Communications”, PEARSON.

Course Outcomes: The students would be able to-

CO-1: Analyze traffic theories, mobile radio propagation, channel coding, and cellular concepts.
CO-2: Define the wireless network technologies and their operations with power management.
CO-3: Compare and contrast multiple division techniques and mobile Communication systems,
CO-4: Define the IEEE 802.11 WLAN and ATM networks.
CO-5: Explain and differentiate between technologies and standards like 2G-5G networks.

COs and POs,PSOs Mapping:

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	1				2		1					2	1
CO-2	3	3		2	3		3				1		2	
CO-3	3	2	2									3		3
CO-4	2		1	2	1		2				2		2	1
CO-5	2	3											2	

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	CS-1873(A)	Dataware Housing and Data Mining	70	20	10	-	-	100	3	-	-	3

Prerequisites: Concepts in data base management systems and information retrieval.

Course Objective:

To provide students with knowledge, advanced skills and understanding of Data Warehousing, components, design principles and modelling. This course will also provide students with in depth concepts in knowledge discovery, data mining, different data mining algorithms and classification techniques.

COURSE CONTENTS

UNIT I:

Data Warehousing: Introduction to Data warehousing, needs for developing data Warehouse, Data warehouse systems and its Components, Design of Data Warehouse, Dimension and Measures, Data Marts:-Dependent Data Marts, Independents Data Marts and Distributed Data Marts, Conceptual Modelling of Data Warehouses, Star Schema, Snowflake Schema, Fact Constellations. Multidimensional Data Model and Aggregates.

UNIT II:

OLAP: Characteristics of OLAP System, Motivation for using OLAP, Multidimensional View and Data Cube, Data Cube Implementations, Data Cube Operations, Guidelines for OLAP Implementation, Difference between OLAP and OLTP, OLAP Servers: ROLAP, MOLAP, HOLAP Queries.

UNIT III:

Data Mining: Introduction to Data Mining, Knowledge Discovery, Data Mining Functionalities, Data Mining System categorization and its Issues. Data Processing: Data Cleaning, Data Integration and Transformation. Data Reduction, Data Mining Statistics, Guidelines for Successful Data Mining.

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UNIT IV:

Association Rule Mining: Introduction, Basic, The Task and a Naïve Algorithm, Apriori Algorithms, Improving the efficiency of the Apriori Algorithm, Apriori-Tid, Direct Hasing and Pruning (DHP), DynamicItemset Counting (DIC), Mining Frequent Patterns without Candidate Generation(FP-Growth),Performance Evaluation of Algorithms.

UNIT V:

Classification: Introduction, Decision Tree, The Tree Induction Algorithm,Split Algorithms Based on Information Theory, Split Algorithm Based on the Gini Index, Overfitting and Pruning, Decision Trees Rules, Naïve Bayes Method. Cluster Analysis: Introduction, Desired Features of Cluster Analysis, Types of Cluster Analysis Methods: Partitional Methods, Hierarchical Methods, Density-Based Methods, Dealing with Large Databases, Quality and Validity of Cluster Analysis Methods.

Reference Books:

1. Arun K. Pujari, "Data Mining Techniques", University Press.
2. Berson, "Data Warehousing and Data Mining and OLAP", TMH
3. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Elsevier Pub.

Course Outcomes: The students would be able to-

CO1: Explain the functionality of the various data warehousing models and components.
CO2: Apply data pre- processing techniques on different datasets.
CO3: Evaluate the performance of different association rules and classification techniques.
CO4: Compare different association rule mining techniques.
CO5: Identify different advance Classification and Clustering data mining techniques.

COs and POs,PSOs Mapping:

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	1											2	1
CO-2	3	3		2	3								2	
CO-3	3	2	2	3	2								3	3
CO-4	2		1	2	1								2	1
CO-5	2	3		1									2	

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			End Sem	Mid Sem Exam	Quiz/ Assign ment	End Sem	Lab Work & Sessional	Total Marks	L	T	P	
	CS-1873(B)	Natural Language Processing	70	20	10	-	-	100	3	-	-	3

Course Objective:

A) To tag a given text with basic Language processing features,
B) Design an innovative application using NLP components.
C) Implement a rule based system to tackle morphology/syntax of a Language.
D) Design a tag set to be used for statistical processing keeping an application .

COURSE CONTENTS

UNIT I :
INTRODUCTION
Natural Language Processing tasks in syntax, semantics, and pragmatics – Issues - Applications - The role of machine learning - Probability Basics –Information theory – Collocations -N-gram Language Models - Estimating parameters and smoothing - Evaluating language models.

UNIT II :
MORPHOLOGY AND PART OF SPEECH TAGGING
Linguistic essentials - Lexical syntax- Morphology and Finite State Transducers - Part of speech Tagging - Rule-Based Part of Speech Tagging - Markov Models - Hidden Markov Models – Transformation based Models - Maximum Entropy Models. Conditional Random Fields

UNIT III:
SYNTAX PARSING
Syntax Parsing - Grammar formalisms and treebanks - Parsing with Context Free Grammars - Features and Unification -Statistical parsing and probabilistic CFGs (PCFGs)-Lexicalized PCFGs.

UNIT IV:
SEMANTIC ANALYSIS
Representing Meaning – Semantic Analysis - Lexical semantics –Word-sense disambiguation - Supervised – Dictionary based and Unsupervised Approaches - Compositional semanticsSemantic Role Labeling and Semantic Parsing – Discourse Analysis.

UNIT-V:
APPLICATIONS

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Mr. Ajay Kumar Goyal Ms. Shaila Chugh Dr. Sunil Joshi Dr. Kanak Saxena

Named entity recognition and relation extraction- IE using sequence labeling-Machine Translation (MT) - Basic issues in MT-Statistical translation-word alignment- phrase-based translation .

Reference Books:

1. Daniel Jurafsky and James H. Martin Speech and Language Processing (2nd Edition),Prentice Hall;
2 edition, 2008 2. Foundations of Statistical Natural Language Processing by Christopher D. Manning and Hinrich Schuetze, MIT Press, 1999
3 Steven Bird, Ewan Klein and Edward Loper Natural Language Processing with Python, O'Reilly Media; 1 edition, 2009

Course Outcomes: The students would be able to

CO-1: Define approaches to syntax and semantics in NLP.

CO-2: Realize approaches to discourse, generation, dialogue and summarization within NLP.

CO-3: Illustrate current methods for statistical approaches to machine translation.

CO-4: Realize machine learning techniques used in NLP, including hidden Markov models and probabilistic context-free grammars, clustering .

CO-5: Use unsupervised methods, log-linear and discriminative models, and the EM Algorithm as applied within NLP.

COs and POs,PSOs Mapping:

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	1	1	1	1							2	1	2
CO-2	2	1	1	1	1							1	1	2
CO-3	2	1	1	3	2								1	
CO-4	2	2	2	2	1							2		2
CO-5	2	2	1	1										

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	CS-1873(C)	Data Compression	70	20	10	-	-	100	3	-	-	3

Course Objectives:

A) Data compression is grounded in information theory,and there are many fundamental algorithms.Information transmission and storage tasks.

B) Discuss the heoretical underpinnings of data compression and cover many Fundamental algorithms.

COURSE CONTENTS

UNIT-I:

Introduction To Data Compression, The Data Compression Lexicon, With A History The Two Kingdoms, Data Compression Modeling,Coding, The Dawn Age, Coding An improvement Modeling, Statistical Modeling, Ziv & Lempel LZ77 LZ78, Lossy Compression, Programs to Know. Minimum Redundancy Coding The Sahnnon-Fano Algorithm.

UNIT-II:

The Huffman Algorithm, Prototypes, Huffman Code, Counting the Symbols, Saving the Counts, Building the Tree, Using the tree **,**Adaptive Huffman Coding Adaptive Coding, Updating Huffman Tree, swapping, The Algorithm, Enhancement, Escape Code, Overflow Bonus, Rescaling Bonus, Initialization of the Array, Compress Main Program, Expand Main Program, Encoding Symbol, Decoding Symbol

UNIT-III:

Huffman One Better: Arithmetic Coding Difficulties, Arithmetic Coding: A Step Forward, Practical Matters, A Complication, Decoding, Where's the Beef Dictionary-Based Compression An Example, Static vs. Adaptive, Adaptive Methods, A Representative Example, Israeli Roots, History, ARC: MS-DOS Dictionary Dictionary Compression, Danger Ahead-Patents, Conclusion.

UNIT-IV:

Sliding Window Compression,The Algorithm, Problems with LZ77, An Encoding Problem, LZSS compression, Data structures, A balancing Act Greedy vs. Best Possible. The expansionRoutine,Improvements.Speech Compression,Digital Audio Concepts, Fundamentals, Sampling Variables, PC-Based sound,Lossless Compression of Sound, Problems and Results, Loss compression, Silence Compression, Other Techniques.

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UNIT-V: Lossy Graphics Compression,Enter Compression, Statistical And Dictionary Compression Methods Lossy Compression Differential Modulation Adaprive Coding, A Standard that Works:JPEG, JPEG Compression Discrete Cosine Transform, DCT Specifics,Implementing DCT. Matrix Multiplication, Cpmtomied Improvements,Output Of The DCT, Quantization, Selecting A Qualtization Matrix. Sample Program, Input Format, Initialization, Forward DCT Routine, Write DCT Data(),File Expansion, Read DCT Data(),Inverse DCT.

Reference Books:

1. "Data Compression", Mark Nelson
2. "Data Compression", Khalid shayood, Morgon Kaufmann
3. "Data Compression : The Complete Reference", David Saloman, Springer

Course Outcomes: The students would be able to

CO-1: Identify the important issuesin data compression.
CO-2: Differentiate and compare variety of data compression techniques.
CO-3: Apply techniques for compression of binary programmes,data,sound andimage.
CO-4: Learn techniques for modelling data and the issues relating to modelling.
CO-5: Analyse and implement DCT for compression.

COs and POs,PSOs 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	1		1						1	1	1
CO-2	2	2	2	1								1	1	1
CO-3	2	2	3	2								1	1	1
CO-4	2	2	2	2									1	1
CO-5	1	2	2	2										

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	CS-1874(A)	Artificial Intelligence	70	20	10	-	-	100	3	-	-	3

Prerequisites: Basic Knowledge of algorithms**.**

Course Objectives:

A) Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem.

B) Review of classical problem solving: search and forward and backward chaining.

C) Formalize a given problem in the language/framework of different AI methods (e.g., as a search problem, as a constraint satisfaction problem, as a planning problem etc.

COURSE CONTENTS

UNIT-I:

Introduction-History of AI, Applications of AI, Types of AI, Future of AI, Types of agents, Characteristics of Intelligent Agents, Structure of agents and its functions,
Problem solving approach to typical AI problems, AI Techniques

UNIT-II:

Heuristic Search Techniques-Hill climbing, Best-First-Search,
Knowledge Representation-Approaches to Knowledge Representation, Representing Knowledge Using Rules, Issues in Knowledge Representation, Predicate Logic-Resolution.

UNIT-III:

Symbolic Reasoning under Uncertainty- Introduction to Non-monotonic Reasoning, Logics for Non-monotonic Reasoning.
Statistical Reasoning-Probability and Bay's Theorem, Certainty Factors and Rule-Base Systems, Bayesian Networks, Dempster-Shafer Theory, Fuzzy Logic. Weak Slot-And-Filler Structure

UNIT-IV:

Planning-Components of a planning system, Conditional planning, Continues planning, Multi agent planning, Nonlinear Planning Using Constraint Posting, Hierarchical Planning, Reactive Systems **Learning**-Learning from observations, Knowledge in learning, Statistical learning methods, Reinforcement learning

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UNIT-V:
Developments Process, Knowledge Acquisition.
Introduction to Prolog, Syntax and Numeric Function, Basic List Manipulation Functions in Prolog, Functions, Predicates and Conditional, Input, Output and Local Variables, Iteration and Recursion, Property Lists and Arrays, LISP and other AI Programming Languages.

Reference Books:

1. Artificial Intelligence -By Elaine Rich And Kevin Knight (2nd Edition) Tata McGraw-Hill
2. Introduction to Prolog Programming By Carl Townsend.
3. "PROLOG Programming For Artificial Intelligence" -By Ivan Bratko(Addison-Wesley)
4. "Programming with PROLOG" —By Klocksin and Mellish.
5. "Artificial Intelligence" (Fifth Edition) -By George F Luger, Pearson Education.
6. "Artificial Intelligence" (Second Edition}-By Stuart Russell and Peter Norvig, Pearson Education.
7. Artificial Intelligence Application Programming, Tim Jones, Wiley India
   "Artificial Intelligence and Expert Systems" -By D.W Patterson

Course out Comes: Students would be-
CO-1: Able to remember applications of AI and Techniques
CO-2: Able to understand the knowledge representation
CO-3: Able to analysis the concepts of reasoning.
CO-4: Able to understand concept of planning and learning.
CO-5: Able to apply and evaluate AI Techniques using Prolog and LISP**.**

COs and POs,PSOs Mapping:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO-1	3	1											2	
CO-2	2		1	1	1					2				
CO-3	3	3		2										
CO-4	3			2										
CO-5	3	2	3	1	2		2							2

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	CS-1874(B)	Human Computer Interaction	70	20	10	-	-	100	3	-	-	3

Prerequisites: Experience in programming, Software engineering.

Course Objectives:

Define a suitable programme of user involvement that treats users ethically and fairly.

COURSE CONTENTS

UNIT I :

Introduction The human, the computer, The interaction, Paradigms, Usability of Interactive Systems, Guidelines, Principles, and Theories

UNIT II:

Design Process- Interaction design basics, HCI in the software process, Design rules, Implementation support, Evaluation techniques, Universal design, User support

UNIT III:

Models and Theories Cognitive models, Socio-organizational issues and stakeholder requirements, Communication and collaboration models, Task analysis, Dialogue notations and design, Models of the system, Modeling rich interaction

UNIT IV:

Interaction Styles- Direct Manipulation and Virtual Environments, Menu Selection, Form Filling and Dialog Boxes, Command and Natural Languages, Interaction Devices, Collaboration and Social Media Participation

UNIT V:

Design Issues- Quality of Service, Balancing Function and Fashion, User Documentation and Online Help, Information Search, Information Visualization Outside the Box- Group ware, Ubiquitous computing and augmented realities, Hypertext, multimedia, and the world wide web.

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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. , Addison-Wesley. (2007)

Course Outcomes: The students would be able to

CO-1: Ability to design, develop and implement quality user interfaces by using tools & techniques available.

CO-2: Define key terms used in interaction design and explain key theories used in the design of interactive products.

CO-3: Explain the importance of iteration, evaluation and prototyping in interaction

CO-4: Evaluate an interactive product using suitable techniques

CO-5: Design, implement and evaluate effective and usable graphical computer interfaces.

COs and POs,PSOs Mapping:

COs	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	3	2	1			2					1	1	1
CO-2	2	2	2	1								1	1	
CO-3	2	2	3	2								1	1	1
CO-4	2	2	2	2									1	1
CO-5	1	2	2	2										2

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	CS-1874(C)	Enterprise Resource Planning	70	20	10	-	-	100	3	-	-	3

Prerequisite: Knowledge of Management Information System.

Course Objectives: The objectives of this Course are

A) To provide a contemporary and forward-looking on the theory and practice of Enterprise Resource Planning Technology.

B) To focus on a strong emphasis upon practice of theory in Applications and Practical oriented approach.

C) To train the students to develop the basic understanding of how ERP enriches the business organizations in achieving a multidimensional growth.

D) To aim at preparing the students technological competitive and make them ready to self-upgrade with the higher technical skills.

COURSE CONTENTS

UNIT I:

Evolution through Payroll system, Inventory Control system, Materials Requirement Planning (MRP I) system, Manufacturing Resource Planning (MRP II) system, their advantages and disadvantages. Definition and Concept of ERP, Business reasons for rise and popularity of ERP system - Benefits of an ERP system. Evolution through Payroll system, Inventory Control system, Materials Requirement Planning (MRP I) system, Manufacturing Resource Planning (MRP II) system, Their advantages and disadvantages. Definition and Concept of ERP, Business reasons for rise and popularity of ERP system - Benefits of an ERP system

UNIT II:

Evolution of computer generations (hardware and software) – Operating systems, File systems to Database Management systems, Communication Networks. Enabling of ERP systems by IT evolution. Client-Server based architecture, Multi-Tier architecture – Presentation layer, Application layer, and Database layer (On-line Transaction Processing – OLTP). Brief discussion on Extended ERP systems - Web-enabled ERP architecture, Service-Oriented Architecture and Cloud Computing.

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UNIT III:
Single vendor versus Best-of Breed ERP implementation, Big Bang versus Phased (by module/ site) implementation, Using ERP of Application Service Provider (ASP). Planning different aspects (Economic viability, Senior Management commitment, Resource requirements, Change management etc.), Understanding requirements and Process preparation – Gap analysis and Business Process Engineering, User Acceptance criteria, Design, Configuration, Customization (difference between Configuration and Customization, advantages and disadvantages), Extensions, Data migration, End-user training, User Acceptance, Going live, Roll-out. Differences between ERP implementation life cycle and Custom Software development phases.

UNIT IV:
Top Management Commitment and Steering Committee meetings. Change Management, Risks and Challenges in ERP.A typical Support Cycle (Planning, Stabilization, Ongoing and Upgrade phases). Post-implementation Review of ERP systems – measures of review . System maintenance and ERP system maintenance. Software upgrade (patch, release, version). Security and Access control of ERP systems. Service-oriented Architecture (SOA): Enterprise SOA layers – Business processes, Business services, Components and Integration services, Advantages and Drawbacks of SOA, When to use SOA, Difference between multi-layered Client-server architecture and SOA.

UNIT V:
Basic awareness of Net Weaver from SAP, Web sphere from Oracle and .Net from Microsoft. Enterprise Application Integration (EAI): Basic understanding of the concept, Types of EAI (levels) User Interface, Method (logic), Application Interface, Data. EAI architecture– Typical framework (Business Processes, Components & Services, Messaging service and Transport service. Mention of some of the leading EAI vendors – IBM, Microsoft, Oracle, SAP, TIBCO. Radio Frequency Identification (RFID) and ERP: awareness of RFID technology, Benefits of RFID integrated with ERPs. M-Commerce: basic concept and applications, difference with E-Commerce, benefits of integration with ERPs. Technology transformation to SOA, more E-Commerce features, Growing mobile applications, Economical and Easy models of ERP deployment etc.

Reference Books:

1. Enterprise Resource Planning – A Managerial Perspective by D P Goyal, Tata McGraw Hill Education, 2011.
2. Enterprise Resource Planning by Ashim Raj Singla, Cengage Learning, 2008
3. Enterprise Resource Planning, 2nd Edition by Alexis Leon, Tata McGraw Hill Education, 2008

Course Outcomes: The students would be able to

CO-1: Make basic use of Enterprise software, and its role in integrating business functions
CO-2: Analyze the strategic options for ERP identification and adoption.
CO-3: Design the ERP implementation strategies.
CO-4: Create reengineered business processes for successful ERP implementation.
CO-5: Deploy model of ERP.

COs and POs,PSOs Mapping:

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	1	1	1	1							2	1	2
CO-2	2	1	1	1	1							1	1	2
CO-3	2	1	1	3	2						3		1	
CO-4	2	2	2	2	1							2		2
CO-5	2	2	1	1							3			

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	CS-1875(A)	Machine Learning	70	20	10	-	-	100	3	-	-	3

Course Objectives

A) To introduce students to the basic concepts and techniques of Machine Learning.
B) To become familiar with regression methods, classification methods, clustering methods.
C) To become familiar with Dimensionality reduction Techniques.

COURSE CONTENTS

UNIT-I :
Definition of learning systems. Goals and applications of machine learning. designing a learning system: training data, concept representation, function approximation. well posed learning problems, perspective & issues in machine learning ,The concept learning task. Concept learning as search through a hypothesis space. General- to- specific ordering of hypothesis. FIND- S ,candidate elimination algorithm

UNIT-II:
Introduction, Decision tree representation, appropriate problems for decision tree learning, basic decision tree algorithm, hyper space search in decision tree learning, issues in decision tree learning .Probability theory and Bayes rule. Naive Bayes learning algorithm.

UNIT III:
Parameter smoothing. Generative vs. discriminative training. Logistic regression. Bayes nets and Markov nets for representing dependencies. Introduction, K- nearest neighbour learning, case based learning, radial basis functions.

UNIT IV:
Learning from unclassified data. Clustering. Hierarchical Agglomerative Clustering. k- means partitional clustering. Expectation maximization (EM) for soft clustering. Semi- supervised learning with EM using labeled and unlabelled data.

UNIT V:
Introduction, neural network representation , problems for neural network learning, perceptrons ,multilayer network & Back propagation Algorithm. Introduction, genetic operators, genetic programming, models of evolution & learning, parallelizing genetic algorithm.

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Reference Books:

1. Tom M. Mitchell. "Machine Learning" McGraw-Hill, 2297.
2. P. Langley. "Elements of Machine Learning" Morgan Kaufmann Publishers, Inc. 2296.
3. Ethem Alpaydin "Introduction to machine learning ".

Course Outcomes: The students would be able to

CO-1: Gain knowledge about basic concepts of Machine Learning.
CO-2: Identify machine learning techniques suitable for a given problem
CO-3: Solve the problems using various machine learning techniques
CO-4: Apply Dimensionality reduction techniques.
CO-5: Design application using machine learning techniques

COs and POs,PSOs Mapping:

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	2	1	1	1	1							2	1	2
CO-2	2	1	1	1	1							1	1	2
CO-3	2	1	1	3	2						3		1	
CO-4	2	2	2	2	1							2		2
CO-5	2	2	1	1							3			

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	CS-1875(B)	Optimization Technique	70	20	10	-	-	100	3	-	-	3

Course Objectives:

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.

COURSE CONTENTS

UNIT I:

Mathematical preliminaries Linear algebra and matrices. Vector space, Eigen analysis. Elements of probability theory. Elementary multivariable calculus.

UNIT II:

Linear Programming Simplex method, Introduction to linear programming model, Duality, Karmarkar's method.

UNIT III:

Unconstrained optimization Conjugate direction and quasi-Newton methods, Gradient-based methods , One-dimensional search methods .

UNIT IV:

Constrained Optimization Lagrange theorem. FONC, SONC, and SOSC conditions.

UNIT V:

Projection methods, KKT conditions, Non-linear constrained optimization models Nonlinear problems

Reference Books:

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

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Course Outcomes: The students would be able to

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.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	2		1	1								2	
CO-2	3	2	2		1								1	1
CO-3	3	2	2	3									2	
CO-4					2								2	2
CO-5			3					2					2	

COs and POs,PSOs Mapping:

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			Theory			Practical						
			End Sem	Mid Sem Exam	Quiz/ Assignment	End Sem	Lab Work & Sessional	Total Marks	L	T	P	
	CS-1875(C)	Robotics	70	20	10	-	-	100	3	-	-	3

Prerequisites: Computer Programming and Problem Solving

Course Objectives.

A) To develop the student's knowledge in various robot structures and their workspace.

B) To develop student's skills in performing spatial transformations associated with rigid body motions.

C) To develop student's skills in perform kinematics analysis of robot systems

D) To provide the student with knowledge of the singularity issues associated with the operation of robotic systems

COURSE CONTENTS

UNIT I:

INTRODUCTION

Robot anatomy-Definition, law of robotics, History and Terminology of RobotiCSE-Accuracy and repeatability of Robotics-Simple problems. Specifications of Robot-Speed of Robot-Robot joints and links-Robot classifications-Architecture of robotic systems-Robot Drive systems Hydraulic, Pneumatic and Electric system**.**

UNIT II:

END EFFECTORS AND ROBOT CONTROLS

Mechanical grippers-Slider crank mechanism, Screw type, Rotary actuators, cam type-Magnetic grippers-Vacuum grippers-Air operated grippers-Gripper force analysis-Gripper design-Simple problems-Robot controls-Point to point control, Continuous path control, Intelligent robot-Control system for robot joint-Control actions-Feedback devices-Encoder, Resolver, LVDT-Motion Interpolations-Adaptive control.

UNIT III:

ROBOT TRANSFORMATIONS AND SENSORS

Robot kinematiCSE-Types- 2D, 3D Transformation-Scaling, Rotation, Translation- Homogeneous coordinates, multiple transformation-Simple problems. Sensors in robot – Touch sensors-Tactile sensor – Proximity and range sensors – Robotic vision sensor-Force sensor-Light sensors, Pressure sensors.

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UNIT IV:

ROBOT CELL DESIGN AND APPLICATIONS

Robot work cell design and control-Sequence control, Operator interface, Safety monitoring devices in Robot-Mobile robot working principle, actuation using MATLAB, NXT Software Introductions-Robot applications Material handling, Machine loading and unloading, assembly, Inspection, Welding, Spray painting and undersea robot.

UNIT V:

MICRO/NANO ROBOTICS SYSTEM

Micro/Nanorobotics system overview-Scaling effect-Top down and bottom up approach-Actuators of Micro/Nano robotics system-Nanorobot communication techniques-Fabrication of micro/nano grippers-Wall climbing micro robot working principles-Biomimetic robot-Swarm robot-Nanorobot in targeted drug delivery system.

Reference Books

1. S.R. Deb, Robotics Technology and flexible automation, Tata McGraw-Hill Education., 2009
2. Mikell P Groover & Nicholas G Odrey, Mitchel Weiss, Roger N Nagel, Ashish Dutta, Industrial Robotics, Technology programming and Applications, McGraw Hill, 2012
3. Richard D. Klafter, Thomas .A, Chri Elewski, Michael Negin, Robotics Engineering an Integrated Approach, Phi Learning., 2009.
4. Francis N. Nagy, Andras Siegler, Engineering foundation of Robotics, Prentice Hall Inc., 2287.
5. P.A. Janaki Raman, Robotics and Image Processing an Introduction, Tata McGraw Hill Publishing company Ltd., 2295.

Course Outcomes: The students would be able to-

CO-1: Learn the math and computational methods necessary to model and solve kinematic problems involving robot manipulators and mobile robots .

CO-2: Familiarize with the most common robot sensors and understand fundamental sensor Processing algorithms and their engineering trade-offs.

CO-3: Explore the computational challenges inherent in fundamental mobile robotic tasks (e.g. localization, mapping, motion planning) .

CO-4: Develop simple robot control systems integrating perception, planning.

CO-5: Discuss Micro/Nano robotics system.

COs and POs,PSOs Mapping:

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	2	1	2	1	2							2	1	2
CO-2	2	1	1	1	3							1	1	2
CO-3	2	1	2	3	2						3		1	
CO-4	2	2	2	2	3				2			2	2	2
CO-5	2	2	1	1	3						3		3	

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SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

(Engineering College), Vidisha, MP

(An autonomous Institute Affiliated to RGPV, Bhopal)

COMPUTER SCIENCE & ENGINEERING

Course Evaluation Scheme & Syllabus

VII SEM B.Tech.	Subject Code	Subject Name / Title	Maximum Marks Allotted						Contract Hrs.			Total Credits
			Theory			Practical						
			End Sem	Mid Sem Exam	Quiz/ Assignment	End Sem	Lab Work & Sessional	Total Marks	L	T	P	
	CS-1876	MATLAB	-	-	-	30	20	50	-	-	2	1

Course Objectives: The student should be made to:

A) Be familiar with the MATLAB GUI and basic tool boxes
B) Be exposed to vector and matrix operations
C) Be familiar with arithmetic, logical and relational operations on matrix

LIST OF EXPERIMENTS

1. Introduction to SDK of MATLAB
2. Basic Syntax and scalar arithmetic operations and calculations
3. Working with formulas
4. Arithmetic operations in matrix data
5. Matrix operations (Inverse, Transpose)
6. Reading an image file
7. Reading from and writing to a text file
8. Introduction to toolboxes
9. Data visualization and plotting
10. Relational operators in data
11. Logical operation in data
12. Loops in MATLAB
13. Computing Eigen value for a matrix
14. Random number generation - Montecarlo methods

Reference Books:

1. Holly Moore, " MATLAB for Engineers" Third Edition – Pearson Publications
2. Stephen J. Chapman, "MATLAB Programming for Engineers" Fourth Edition – Thomson learning.

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	CS-1878	Major Project Prelim	-	-	-	100	50	150	-	-	4	2

Procedure:

a) Each defined project needs to be from Industry/Research organization/Govt.organization/socio-technical issues.

b) Project identification should be based on Analysis carried out by the students after completion of B.E Semester 6th Examination but before starting of the 7th Semester.

c) Problem definition for the project needs to be submitted by every student in the first week of the 7th Semester to his/her college.

d) Each definition will be evaluated based on merit in the beginning of the 7^{th} semester itself by the College.

Facilitation:

You may contact your Major Project In charge co-ordinator/Faculty /Department Head for skilful Analysis .

Guidelines for the Students:

1. The project work will be in-house industry project, where student need to implement project related to any domain of industry like education, legal, manufacturing, design, pharmaceutical, Ecommerce, etc.

2. Students are required to get approval of project definition from the department.

3. After approval of project definition students are required to report their project work weekly to respective internal guide.

4. Maximum 4 students can allow working in particular project group.

5. The students are required to identify their project within two weeks of the commencement of the classes and they are required to follow all the rules and instructions issued by department.

6.

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Each student or student group would work under the guidance of the Faculty from the College. In case any problem/other issue arises for the smooth progress of Inter Departmental project work discovery/Practical Training, it should be immediately brought to the notice of the major project in charge co-ordinator/Faculty.

7. The students are required to submit **Project synopsis Pre-report** to their Head of the Department with the remarks of guide in their College during **Eighth week** of the semester.

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