ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING& TECHNOLOGY,NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech. Scheme of Examination & Syllabus 2022-23

ARTIFICIAL INTELLIGENCE

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AI501T	Machine Learning	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This course is intended ● Introduce Human learning aspects and Machine learning. ● Study primitives and methods in learning process by computer. ● Familiarize nature of problems solved with Machine Learning.	**Students will be able to** ● Learn fundamentals of machine learning. ● Device Supervised Classification strategies. ● Device Logistic Regression. ● Demonstrate Distance Based Models and Probability Based Models. And familiarize the concept of clusteringtechniques for real world applications. ● Apply Dimensionality Reduction and Association Rules.

Unit I : Introduction **[6Hrs]**

Introduction to Machine learning (ML), Need of Machine learning, Relationship between ML and human learning, Examples of Machine Learning Problems, Learning Process, Learning methods, Forms of learning, Training versus Testing, Characteristics of Machine learning tasks, Descriptive, Predictive and Prescriptive tasks ML Techniques: Supervised, Semi- Supervised, Unsupervised and Reinforcement Learning. Feature Selection Techniques in Machine Learning, Data Preprocessing operations and their requirements. Machine Learning Perspective of Data and Feature Engineering, Exploratory Data Analysis (EDA), Performance measures.

Unit II:Regression **[6Hrs]**

Regression: Correlation Coefficient, Pearson, Spearman and Kendall Correlation, Linear Regression, Simple Linear Regression, Multiple Linear Regression, Assessing performance of Regression- MSE, MAE, MAPE, R2 Score, Adjusted R2, Overfitting, Underfitting. Polynomial Regression, Multivariate Regression, Regression Diagnosis, Nonlinear Regression Regularization Methods: Ridge, LASSO, Elastic Net Regression.

Unit III:Supervised learning **[12Hrs]**

Classification: Binary Classification, Multi-Class Classification, Multi-Label Classification, Imbalanced Classification, Confusion Matrix, Classification Assessment- Precision, Recall, F1-Score and Accuracy. Machine Learning Algorithms based on Classification: Logistic Regression- Sigmoid Function, Finding Probalility, Data Model : Receiver Operating Characteristic (ROC),Area Under Curve (AUC), Decision Tree Classification- Entropy, Gini Index, Classification and Regression Trees.Distance Based Models: Neighbors and Examples, Nearest Neighbor Classification, Finding values of K, Distance Measures. Kernel Based
Models: Support Vector Machines, Linear SVM, RBF SVM, Sigmoid SVM, Polynomial SVM. Probability Based Models: Conditional Probability, Bayes Theorm, Naive Bayes Classification, Bayesian Regression.

Unit IV:Unsupervised learning **[6Hrs]**

K-means Clustering- Introduction to Clustering, Algorithm, Elbow Method, Sillhoutte Score Hierarchical Clustering- Dendrogram, Distance Measures, Ward method K-medoids Clustering, K-Propotype Clustering, DBSCAN, Performance Evaluation of Clustering, Real Life Example of Clustering

Unit V:Dimensionality reduction techniques **[6Hrs]**

Association Rules- Rules Mining, Support, Confidence, Lift, Conviction, Leverage, Apriori Algorithm, FP-Growth Algorithm. Dimensionality Reduction- Curse of Dimensionality, Normalization, Standardization, Eigen Vector and Values, Support Vector Decomposition, Principal Component Analysis, Factor Analysis.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Introduction to Machine Learning	EthemAlpaydin	2nd	PHI
2	Machine Learning: The Art and Science of Algorithms that Make Sense of Data,,	Peter Flach	1st	Cambridge University Press

		July 2024	1	Applicable for 2024-25
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Reference Books

S.N	Title	Authors	Edition	Publisher
1	Pattern Recognition and Machine Learning	C. M. Bishop	1st	Springer
2	Data Mining, Practical Machine Learning Tools and Techniques,	Ian H Witten, Eibe Frank, Mark A Hall	3rd	Elsevier

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ARTIFICIAL INTELLIGENCE

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AI501P	Machine Learning Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
This course is intended to • Apply theoretical knowledge in practical learning. • Develop programming skills. • Implement machine learning skills • Work with real world datasets.	**Students will be able to** • Learn the implementation procedures for the machine learning algorithms. • Apply appropriate data sets to the Machine Learning algorithms. • Identify and apply Machine Learning algorithms to solve real world problems. • Implement Supervise machine learning techniques • Demonstrate Unsupervised machine learning techniques

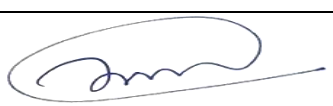
Sr. No.	List of Practical
1	Apply data preprocessing techniques to make data suitable for machine learning.
2	Train the model using a dataset sourced from the UCI ML repository. Then, use a portion of the same dataset as a test set to evaluate the accuracy of the model through linear regression.
3.	Collect the dataset from UCI ML repository. Separate the same data set as a test set to implement logistic regression techniques.
4.	Train the system using dataset obtained from UCI ML Repository. Use a partition of the same data as a test set to determine accuracy using KNN classifier.
5.	Use a dataset from the UCI ML repository to train the model. Then, evaluate the accuracy of the model by applying Naïve Bayes on a portion of the same dataset designated as the test set.
6.	Train the model using a dataset from the UCI ML repository. Then, access the accuracy by applying a decision tree on a partitioned portion of the same dataset as the test set.
7.	Use a dataset from the UCI ML repository to train the system. Then evaluate the accuracy by applying k-means clustering on a partitioned portion of the same dataset as the test set.
8.	Train the model using a dataset from the UCI ML repository. Then, assess the accuracy by applying DBSCAN clustering on a partitioned portion of the same dataset as the test set.
9	Apply SVD on a dataset obtained from the UCI ML repository.
10	Implement PCA on a dataset obtained from UCI ML repository.
OPEN ENDED PRACTICALS	
11	Implement the ANN algorithm on a dataset obtained from UCI ML repository.
12	Implement basic natural language processing techniques.

Text Books

Sr. No.	Title	Authors	Edition	Publisher
1.	Introduction to machine leanring	Ethem Alpaydin	2nd	PHI
2	Machine Learning: The Art and Science of Algorithms that Make Sense of Data.	Peter Flach	1st	Cambridge

Reference Books

Sr. No.	Title	Authors	Edition	Publisher
1	Pattern Recognition and Machine Learning	C.M. Bishop	1st	Springer
2.	Data Mining, Practical Machine Learning Tools and Techniques	Ian H Witten	3rd	Elsevier

		July 2024	1	Applicable for 2024-25
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ARISE & SHINE

B. Tech. Scheme of Examination & Syllabus 2022-23ARTIFICIAL INTELLIGENCE

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AI502T	Design and analysis of Algorithm	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This course is intended ● Analyze the asymptotic performance of algorithm ● Apply important algorithmic design paradigms and methods of analysis ● Solve simple to moderately difficult algorithmic problems arising in applications ● Able to demonstrate the hardness of simple NP-complete problems	**Students will be able to**· ● Illustrate different approaches for analysis and design of efficient algorithms and Analyze performance of various algorithms using asymptotic notations. ● Determine and Apply various divide & conquer strategies and greedy approaches for solving a given computational problem ● Demonstrate and Solve various real time problems using the concepts of dynamic programming ● Make use of backtracking and graph traversal techniques for solving real-world problems ● Recall and Classify the NP-hard and NP-complete problems

Unit Introduction	**[8Hrs]**
Definition of algorithms and brief explanation about the basic properties of algorithms Recurrence relations, solutions of recurrence relations using technique of characteristic equation, master theorem ,Asymptotic notations of analysis of algorithms, worst case, average case and best case, amortized analysis, application of amortized analysis, Bitonic sorting network.	
Unit II Greedy and Divide & Conquer Approach	**[8Hrs]**
Divide and conquer strategies: Binary search, Stressen's matrix multiplication algorithm, min-max algorithm. Greedy Approach: Application to job sequencing with deadlines problem, knapsack problem, optimal merge pattern, Huffman code, minimum cost spanning tree using Prim's and Kruskal's algorithm.	
Unit III Dynamic Programming	**[8Hrs]**
Dynamic Programming: Basic Strategy, Multistage graph (forward and backward approach), Longest Common Subsequence, Optimal Binary Search Tree, 0/1 Knapsack problems, Travelling Salesman problem, single source shortest path using, all pair shortest path using Floyd- Warshall algorithm	
Unit IV: Backtracking Algorithm	**[8Hrs]**
Basic Traversal and Search Techniques: Breadth first search and depth first search, connected components. Backtracking: Basic strategy, N-Queen Problem and their Analysis (4 & 8-Queen), graph coloring, Hamiltonian cycles.	
Unit V :Computational Complexity & Parallel Algorithm	**[8Hrs]**
NP-hard and NP-complete problems, basic concepts, non-deterministic algorithms, NPhard and NP-complete, Cook's theorem, decision and optimization problems, **Parallel Algorithm:-** Introduction,analysis,Parallel Algorithm - Models,Parallel Algo structure	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein	3rd	Prentice Hall of India
2	The Design and Analysis of Computer Algorithms",	Alfred V. Aho, John E. Hopcraft, Jeffrey D. Ullman	5th	Pearson education
3	Fundamentals of Computer Algorithms	Horowitz, Sahani, Rajsekharam	2nd	University Press

Reference Books

S. N	Title	Authors	Edition	Publisher
1	Fundamentals of Algorithms",	Brassard, Bratley	1st	Prentice Hall
2	Design and Analysis of Algorithms	Parag Dave, Himanshu Dave	2nd	Pearson Education

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ARTIFICIAL INTELLIGENCE

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AI502P	Design and analysis of Algorithm Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
This course is intended to • Analyze the asymptotic performance of algorithm • Apply important algorithmic design paradigms and methods of analysis • Solve simple to moderately difficult algorithmic problems arising in applications • Able to demonstrate the hardness of simple NP-complete problems	**Students will be able to** • Illustrate different approaches for analysis and design of efficient algorithms and Analyze performance of various algorithms using asymptotic notations. • Determine and Apply various divide & conquer strategies and greedy approaches for solving a given computational problem. • Demonstrate and Solve various real time problems using the concepts of dynamic programming. • Make use of backtracking and graph traversal techniques for solving real-world problems. • Recall and Classify the NP-hard and NP-complete problems.

Sr. No.	List of Practical
1	To study and understand the time and space complexity of an algorithm using asymptotic notations.
2	Write a program to implement Binary search algorithm.
3.	Write a program to find Minimum Cost Spanning Tree of undirected graph using Prim's algorithm.
4.	Write a program to implement Traveling Salesperson problem to find the optimal solution.
5.	Write a program to implement Dijkstra's algorithm for the Single source shortest path problem.
6.	Write a program to implement the BFS and DFS algorithm for a graph.
7.	Write a program implement backtracking algorithm for the N-queens Problem.
8.	To study the fundamentals of computational complexity theory and its complexity classes such as P, NP, NP-Hard, and NP-Complete.
OPEN ENDED PRACTICALS	
9	To develop and implement a parallel algorithm for the graph coloring problem using the backtracking approach.
10	Micro-Project.

Text Books

Sr. No.	Title	Authors	Edition	Publisher
1.	Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein	3rd	Prentice Hall of India
2	The Design and Analysis of Computer Algorithms	Alfred V. Aho, John E. Hopcraft, Jeffrey D. Ullman	1st	Pearson education

Reference Books

Sr. No.	Title	Authors	Edition	Publisher
1	Fundamentals of Algorithms	Brassard, Bratley	1st	Prentice Hall
2.	Design and Analysis of Algorithms	Parag Dave, Himanshu Dave	2nd	Pearson education

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ARISE & SHINE

B. Tech. Scheme of Examination & Syllabus 2022-23ARTIFICIAL INTELLIGENCE

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AI503T	Operating System	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
● To learn the fundamentals of Operating Systems. ● To learn the mechanisms of OS to handle processes and threads and their communication. ● To learn the mechanisms involved in memory management in contemporary OS. ● To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols. ● To know the components and management aspects of concurrency management	● Analyze the structure of OS and basic architectural components involved in OS design. ● Analyze and design the applications to run in parallel either using process or thread models of different OS. ● Comprehend the various device and resource management techniques for time sharing and distributed systems. ● Learn the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system. ● Interpret the mechanisms adopted for file sharing in distributed Applications.

Unit I -	**[8Hrs]**
Operating System Overview-Process description & Control: Operating System Objectives and Functions, The Evolution of Operating Systems, Major Achievements, Developments Leading to Modern Operating Systems:What is a Process?Process States, Process Description, Process Control.	
Unit II	**[7Hrs]**
Threads, SMP, and Microkernel- Processes and Threads, Symmetric Multiprocessing (SMP), Microkernel, Solaris Thread and SMP Management, Virtual Memory: hardware and control structures, Operating System Software.	
Unit III	**[7Hrs]**
Multiprocessor and Real-Time Scheduling- Multiprocessor Scheduling, Real-Time Scheduling, Linux Scheduling, process Scheduling, Distributed Operating System: Motivation, Types of Network-based OS, Network structure	
Unit IV	**[7Hrs]**
Distributed File system- Background, Naming and transparency, Remote File Access, State full and Stateless services. Distributed Synchronization: Event Ordering, Mutual Exclusion, Atomicity, Concurrency Control, Deadlock Handling, Election algorithm and Reaching agreement	
Unit V	**[7Hrs]**
File Management- Overview, file Organization and access, file directories, File sharing, Record blocking, secondary storage management, File System Security, **Case Study:** Linux system,UNIX system etc	

Text Books

Sr.No	Title	Authors	Edition	Publisher
1	Operating System Concepts	Avi Silberschatz, Peter Baer Galvin, Greg Gagne	9th	John wiley & Sons
2	Operating Systems: Internals and Design Principles	William Stallings,	8th	Pearson Education Limited

Reference Books

Sr.No	Title	Authors	Edition	Publisher
1	Operating systems - A concept based Approach	D.M. Dhamdhere	3rd	Tata McGraw
2	Introduction to Operating Systems Concepts	P.C.P. Bhatt	3rd	PHI

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ARTIFICIAL INTELLIGENCE

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AI504T (i)	PE1-Human Computer Interaction	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This course is intended to provide ● The students for basic understanding of Human Computer Interaction. ● students for understanding the novel design and tools for building HCI applications ● Understanding human psychology and context aware processing. ● The research issues in HCI. Future Trends in HCI and its importance in different fields.	**Students will be able to** ● Concepts and Fundamentals of HCI, different kinds of interaction scenarios and design process. ● Use of Tools and models for implementing the HCI applications. ● Comprehend Human Interaction. ● Application Case Studies using HCI Tools ● Know the latest Research Trends in Human Computer Interaction.

Unit I- Interactive system design	**[6Hrs]**
Introduction, Course objective and overview, Historical evolution of the field, Interactive system design- Concept of usability - definition and elaboration, HCI and software engineering, GUI design and aesthetics, Prototyping techniques	
Unit II – Model-based Design and evaluation	**[8Hrs]**
Basic idea, introduction to different types of models, GOMS family of models (KLM and CMN-GOMS),Fitts' law and Hick-Hyman's law, Model-based design case studies	
Unit III-Guidelines & Empirical research methods in HCI	**[11Hrs]**
Guidelines - Shneiderman's eight golden rules, **Norman's seven principles**, Norman's model of interaction, Nielsen's ten heuristics with example of its use, Heuristic evaluation, Contextual inquiry, Cognitive walkthrough. Empirical research methods - Introduction (motivation, issues, research question formulation techniques) ,Experiment design and data analysis (with explanation of one-way ANOVA).	
Unit IV- Dialog Design,Task modeling and analysis	**[6Hrs]**
Dialog Design- Introduction to formalism in dialog design, design using FSM (finite state machines), State charts and (classical) Petri Nets in dialog design. **Task modeling and analysis-** Hierarchical task analysis (HTA), Engineering task models and Concur Task Tree (CTT)	
Unit V- Cognitive architecture, OOP, Design -Case Studies	**[8Hrs]**
Cognitive architecture-Introduction to CA, CA types, relevance of CA in IS design, Model Human Processor (MHP). OOP-Introduction, OOM- Object Oriented Modeling of User Interface Design. Design -Case Studies- Multi-Key press Hindi Text Input Method on a Mobile Phone, GUI design for a mobile phone based Matrimonial application, Employment Information System for unorganized construction workers on a Mobile Phone.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Human Computer Interaction	Alan Dix et al.	1st	Pearson, 2004.

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2	Designing the User Interface: Strategies for Effective HCI	Ben Shneiderman et al.	6th	Pearson, 2016.

Reference Books

S.N	Title	Authors	Edition	Publisher
1	The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies and Emerging Applications	Andrew Sears and Julie A. Jacko,	3rd Edition	CRC Press, New York 2012.
2	HCI Beyond the GUI: Design for Haptic, Speech, Olfactory and other Nontraditional Interfaces	Philip Kortum	2nd Edition	Morgan Kaufmann Inc., Originally Published by Elsevier, 2008.

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ARTIFICIAL INTELLIGENCE

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AI504T (ii)	PE1- Edge AI	3	-	-	3	30	70	100

Course Objective	Course Outcome
This course is intended to provide ● To learn the concepts and principles of Edge AI ● To develop Edge AI models and algorithms ● To apply Edge AI frameworks and tools to solve real-world problems ● To deploy and integrate Edge AI solutions with cloud and other systems ● To evaluate the performance and effectiveness of Edge AI solution.	**Students will able to:** ● Describe the concept of Edge AI and explain its advantages, limitations, and ethical implications. ● Develop and evaluate Edge AI models and algorithms for classification, prediction, and optimization. ● Select and apply appropriate Edge AI frameworks and tools for developing and deploying Edge AI models. ● Design, deploy, and integrate Edge AI solutions with cloud and other systems, and evaluate their security, performance, and scalability.

Unit I Introduction to Edge AI: **[8Hrs]**

Definition and concept of Edge AI, Edge devices and sensors,Edge computing platforms and architectures,Advantages and limitations of Edge AI,Edge AI vs Cloud AI,Applications of Edge AI,Edge AI market trends and future directions,Ethical considerations of Edge AI.

Unit II Edge AI Models and Algorithms: **[8Hrs]**

Overview of Edge AI models and algorithms,Supervised learning for Edge AI,Unsupervised learning for Edge AI,Reinforcement learning for Edge AI,Edge AI algorithms for classification,Edge AI algorithms for prediction,Edge AI algorithms for optimization, Evaluation metrics for Edge AI models and algorithms.

Unit III Edge AI Frameworks and Tools: **[8Hrs]**

Overview of Edge AI frameworks and tools,Comparison of Edge AI frameworks,TensorFlow Lite for Edge AI,OpenCV for Edge AI,Edge AI toolkits for developing and deploying Edge AI models,Edge AI data preprocessing techniques,Edge AI model compression and optimization,Edge AI model deployment on edge devices.

Unit IV Edge Ai Deployment and Integration **[8Hrs]**

Edge AI deployment strategies and architectures,Edge AI integration with cloud and other systems,Edge AI securityand privacy considerations,Edge AI interoperability and compatibility,Edge AI data management and governance,Edge AI performance monitoring and optimization,Edge AI fault tolerance and reliability,Edge AIscalability and extensibility.

Unit V AI Edge Applications: **[8Hrs]**

Smart home and building automation using Edge AI,Industrial automation and predictive maintenance using Edge AI,Autonomous vehicles and drones using Edge AI,Healthcare and medical applications using Edge AI,Retail and customer engagement using Edge AI,Agriculture and farming using Edge AI,Energy and utilities using Edge AI,Public safety and emergency management using Edge AI.

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FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AI504T(iii)	PE1- Internet of Things	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This course is intended ● To Identify the components of IoT ● To learn the Architecture of IoT ● To impart necessary and practical ● To comprehend the knowledge of components of Internet of Things ● To develop skills required to build real-life IoT based projects	**Students will be able to** ● Describe general concepts of Internet of Things (IoT). ● Characterize building block of IoT and role of wired and wireless network. ● Carry out Interfacing of I/O devices, sensors & communication modules. ● Develop system for remotely monitor data and control devices. ● Implement real life IoT based projects.

Unit I	**[10Hrs]**
Introduction to Internet of Things : Architectural Overview, Design principles and needed capabilities, IoT Applications, Sensing, Actuation, Basics of Networking, M2M and IoT Technology Fundamentals- Devices and gateways, Data management, Business processes in IoT, Everything as a Service(XaaS), Role of Cloud in IoT, Security aspects in IoT	
Unit II	**[9Hrs]**
IoT Architecture: Architectural and building block of IoT Networking and Communication – Wired & Wireless connectivity and technology – IoT and Wireless Sensor Network- NFC, RFID, ZigBee.	
Unit III	**[11Hrs]**
Elements of IoT- Hardware Components: Computing (Arduino, Raspberry Pi), Communication, Sensing, Actuation, I/O interfaces. **Software Components:** Programming API's (using Python/Node.js/Arduino) for Communication Protocols-MQTT, ZigBee, Bluetooth, CoAP, UDP, TCP.	
Unit IV	**[10Hrs]**
IoT Application Development Solution framework for IoT applications- Implementation of Device integration, Data acquisition and integration, Device data storage- Unstructured data storage on cloud/local server, Authentication, authorization of devices	
Unit V	**[8Hrs]**
SDN & IoT applications Introduction to SDN, Fog Computing, IoT application case studies:Smart Cities and Smart Homes, Connected Vehicles, Smart Grid, Industrial IoT, Agriculture, Healthcare, Activity Monitoring, IoT in India: Smart India projects, Challenges in IoT	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Internet of Things, "A Hands on Approach"	Vijay Madisetti, Arshdeep Bahga	1st	University Press
2	Introduction to Internet of Things: A practical Approach	Dr. SRN Reddy, Rachit Thukral and Manasi Mishra	1st	ETI Labs

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Rethinking the Internet of Things: A Scalable Approach to Connecting Everything	Francis daCosta	1st	Apress Publications

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Text Books:

S.No	Tilte	Author	Edition	Publisher
1.	“Edge Computing for IoT	Rajkumar Buyya, Amir Vahid Dastjerdi, and Negin Moghaddam	2019	Morgan kaufmann
2.	Hands on Edge AI with Tensorflow	Bhagwan Kommadi	2021	Apress

Reference Books

S.N	Title	Authors	Edition	Publisher
1	“Edge of Computing: A Primer”	Shanhe Yi, Jie Xu, and Qun Li	2019	Springer
2	"Edge AI: The Power of Artificial Intelligence on Edge Devices"	John K. Waters	2020	The Linux Foundation Wiley.

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FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AI561O(i)	OELE 1 - AI for Everyone	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This course is intended to provide ● The students should be able to understand what AI, its applications and use cases is and how it is transforming our lives.	**Students will be able to** • Comprehend the basic concepts of AI and machine learning. • Interpret the working of self-driving systems. • Learn how to build different AI projects. • Apply AI techniques to any application domain.

Unit I Introduction	**[8Hrs]**
Machine Learning, What is data, The terminology of AI, What makes an AI company, What machine learning can and cannot do, Non-technical explanation of deep learning, basics of neural networks, Examples of AI, Application domains of AI.	
Unit II Building AI projects	**[8Hrs]**
Workflow of a machine learning project, Workflow of a data science project, how to use data, How to choose an AI project, Working with an AI team, How to process and visualize data, Technical tools for AI teams, use of python in AI related projects.	
Unit III I Building AI in Your Company	**[8Hrs]**
Case study: Smart speaker, Case study: Self-driving car, Example roles of an AI team, AI pitfalls to avoid, Survey of major AI application areas	
Unit IV AI and Society	**[8Hrs]**
A realistic view of AI, Discrimination / Bias, Adversarial attacks on AI, Adverse uses of AI, AI and developing economies, AI and jobs	
Unit V Case studies	**[8Hrs]**
AI case studies related to a specific domain.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Artificial Intelligence: A Modern Approach	Stuart Russell Peter Norvig	1st	Prentice Hall
2	Artificial Intelligence: The Basics	Kevin Warwick, Routledge	2nd	Routledge

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Artificial Intelligence for Humans	Jeff Heaton	1st	Independent Publishing,

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AI561OT(ii)	OELE1 - Mobile Application Development	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This course is intended ● To develop mobile application using Android.	**Students will be able to** ● Understand Android architecture, activities and their life cycle. ● Use View Groups comprising layouts and Views in application. ● Manage data binding, user interface events, maps. ● Work with graphics, animation, still images and video. ● Publish and distribute Android Application.

Unit I: Overview of Android	**[6Hrs]**
Introducing Android, The Android Application Components, The manifest file, Downloading and Installing Android, Exploring the Development Environment, Developing and Executing the first Android Application. Using Activities, Fragments and Intents in Android Working with activities, Using Intents, Fragments, Using the Intent Object to Invoke Built -in Application	
Unit II:Working with the User Interface	**[6Hrs]**
Using Vies and ViewGroups Working with View Groups, Building data with the AdapterView Class, Designing AutoTextCompleteView, Implementing Screen Orientation, Designing the views programmatically, Handling UI events, Creating Menus	
Unit III:Storing the Data Persistently	**[6Hrs]**
Introducing the Data Storage Options, Using the internal storage, Using the external storage, Using the SQLite Database, Working with content Provider	
Unit IV:Working with Location & Graphics	**[6Hrs]**
Services and Maps Working with Google Maps, Working with Geocoding and Reverse Geocoding. Working with Graphics and Animation Working with Graphics, Using the Drawable Object, Using the Shape Drawable object, Hardware Acceleration, Working with Animation	
Unit V:Publishing and Distributing Android Application	**[6Hrs]**
Audio, Video and Camera Use Media Player, Recording and Playing sound, Creating a sound pool, Using Camera, Recording Video Publishing and Distributing Android Application Signing the Android Application, Versioning the Android Application, Publishing the Android Application	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Android Application Development	Pradeep Kothari,	1st	Dream Tech
2	Beginning Android 4 Application Development	Wei Meng Lee, Wrox	2nd	Wiley

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Android Wireless Application Development	Lauren Darcey, Shane Conder,	2nd	Pearson

		July 2024	1	Applicable for 2024-25
Chairman - BoS	Dean – Academics	Date of Release	Version	