WALCHAND INSTITUTE OF TECHNOLOGY, SOLAPUR
(AN AUTONOMOUSINSTITUTE)

Affiliated to
Punyashlok Ahilyadevi Holkar Solapur University, Solapur

Information Technology

CHOICE BASED CREDIT SYSTEM (CBCS)

Structure for
Honors Degree in
Artificial Intelligence and Machine Learning

S.Y. B. Tech. Information Technology W.E.F. 2022-23
T.Y. B. Tech. Information Technology W.E.F. 2023-24
Final Year B. Tech Information Technology W.E.F. 2024-25

Information Technology Department

Department Vision

To be a frontier in Information Technology, to produce globally competent engineers with an aptitude for leadership and research, who will be instrumental in continuous socio-economic development.

Department Mission

M1: To impart quality education in Information Technology in accordance with the needs of the society through blended mode.

M2: To inculcate critical thinking and creativity for identifying various issues and to provide sustainable solutions by becoming a lifelong learner.

M3: To enhance career opportunities through academia-industry interaction and research, while embodying professional ethics.

Information Technology
Under Graduate Program
Program Educational Objectives (PEOs)

1. Graduates will exhibit strong fundamental knowledge and skills in the field of Information Technology to pursue successful professional careers , higher studies and research.
2. Graduates will exhibit capabilities to understand and resolve the various issues through their problem solving skills.
3. Graduates will be sensitive to ethical, societal and environmental issues while serving at their professional work and society.

Program Outcomes (POs)

The program outcomes of B. Tech. Information Technology Program are summarized as following:

1. **Engineering Knowledge :**Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
3. **Design/Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. **The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities, relevant to the professional engineering practice.
7. **Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

1. Students will be able to apply fundamentals of mathematics, algorithms and computational systems to Information technology.
2. Students will be able to provide a solution to the problem in the areas of Networking, Database management, System Software, Web Technology, Information Security and Thrust areas.
3. Students will be able to design and develop IT solution for societal problem/s while encouraging usage of Free and Open Source Software (FOSS)

Legends used–

L	Lecture Hours / week
T	Tutorial Hours / week
P	Practical Hours / week
FA	Formative Assessment
SA	Summative Assessment
ESE	End Semester Examination
ISE	In Semester Evaluation
ICA	Internal Continuous Assessment
POE	Practical and Oral Exam
OE	Oral Exam
F.Y.	First Year
S.Y.	Second Year
T.Y.	Third Year
B. Tech.	Bachelor of Technology

Course Code Format for Honors:

2	1	I	T	U/P	2	H	A	1	T/L
Year of Syllabus revision		Program Code		U-Under Graduate, P-Post Graduate	Semester No. / Year 1/2/3/…8	Honors Code		Course Serial No. 1-9	T-Theory, L-Lab session

Program Code	
IT	Information Technology
Honors Code	
HA	Honors in Artificial Intelligence and Machine Learning

Sample Course Code:

21ITU4HA1T	Foundations and Applications of Machine Learning

Walchand Institute of Technology, Solapur
Information Technology
Honors in Artificial Intelligence and Machine Learning

Structure of S. Y. B. Tech. Information Technology
(W.E.F. 2022-2023)

Semester- IV

Course Code	Theory Course Name	Engagement Hours			Credits	FA	SA		
		L	T	P		ESE	ISE	ICA	Total
21ITU4HA1T	Foundations and Applications of Machine Learning	3	-	-	3	60	40	-	100
	Laboratory:								
21ITU45HA1L	Foundations and Applications of Machine Learning	-	-	2	1	-	-	25	25
	Grand Total	**3**		**2**	**4**	**60**	**40**	**25**	**125**

Walchand Institute of Technology, Solapur
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Honors in Artificial Intelligence and Machine Learning

Structure of T. Y. B. Tech. Information Technology
(W.E.F. 2023-2024)

Semester- V

Course Code	Theory Course Name	Engagement Hours			Credits	FA	SA		
		L	T	P		ESE	ISE	ICA	Total
21ITU5HA1T	Reinforcement Learning	3	-	-	3	60	40	-	100
	Laboratory:								
21ITU5HA1L	Reinforcement Learning	-	-	2	1	-	-	25	25
	Grand Total	**3**		**2**	**4**	**60**	**40**	**25**	**125**

Structure of T. Y. B. Tech. Information Technology.,
(W.E.F. 2023-2024)

Semester- VI

Course Code	Theory Course Name	Engagement Hours			Credits	FA	SA		
		L	T	P		ESE	ISE	ICA	Total
21ITU6HA1T	Natural Language Processing	3	-	-	3	60	40	-	100
	Laboratory:								
21ITU6HA1L	Natural Language Processing	-	-	2	1	-	-	25	25
	Grand Total	**3**		**2**	**4**	**60**	**40**	**25**	**125**

Walchand Institute of Technology, Solapur
Information Technology
Honors in Artificial Intelligence and Machine Learning

Structure of Final Year B. Tech. Information Technology
(W.E.F. 2024-2025)

Semester- VII

Course Code	Theory Course Name	Engagement Hours			Credits	FA	SA		
		L	T	P		ESE	ISE	ICA	Total
21ITU7HA1T	Deep Learning	3	-	-	3	60	40	-	100
	Laboratory:					**OE**			
21ITU7HA1L	Deep Learning	-	-	2	1	-	-	25	25
21ITU7HA2L	Mini project	-	-	4	2	50	-	50	100
	Grand Total	**3**	**-**	**6**	**6**	**110**	**40**	**75**	**225**

Note: -These courses are to be completed by the student in addition to the courses of B. Tech Information Technology

Walchand Institute of Technology, Solapur

Honors in Artificial Intelligence and Machine Learning

S.Y.B.Tech. (Information Technology), Semester-IV

21ITU4HA1T – FOUNDATIONS AND APPLICATIONS OF MACHINE LEARNING

Teaching Scheme:
Lecture: 3 hrs/week, 3 credits
Practical: 2 hrs/week, 1 credit

Examination Scheme:
ESE : 60 Marks
ISE : 40 Marks
ICA : 25 Marks

Introduction: This course provides a foundational understanding of machine learning models as well as demonstrate how these models can solve the real time problems.,

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Course Prerequisite: Basics of Data Structures and Programming , Probability, Statistics

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Course Objectives:

1. To introduce various types of machine learning algorithms.
2. To enable designing of a model selecting appropriate machine learning algorithms for a given problem.
3. To study methods to validate previously designed machine learning models.
4. To introduce methods to evaluate and tune machine learning models.

Course Outcomes:

At the end of the course students will be able to

1. Demonstrate types of machine learning algorithms.
2. Design a model by selecting appropriate machine learning algorithm for a given Problem.
3. Validate designed machine learning model.
4. Evaluate and tune machine learning model based on various parameters.
5. Apply machine learning algorithms for various use cases.

SECTION-I

Unit 1 - Introduction to Machine Learning (07)

What is Machine Learning? How do machine learn, Well-posted learning problem Types of Machine Learning: Supervised learning, unsupervised learning, Reinforcement learning, Comparison – supervised, unsupervised and reinforcement learning, Problems not to be solved using Machine Learning, State-of-The-Art Languages/Tools in Machine Learning.

Unit 2 – Preparing to Model (07)

Introduction, Machine Learning Activities, Basic Types of Data in Machine Learning, Exploring Structure of Data, Data Quality and Remediation, Basics of Feature Engineering: Introduction, Feature Transformation, Importance of Statistical Tools in Machine Learning, Data Pre-processing,

Unit 3 – Modeling and Evaluation **(06)**

Introduction, Selecting a Model, Training a Model (for Supervised Learning), Model Representation and Interpretability, Evaluating Performance of a Model, Improving Performance of a Model.

SECTION-II

Unit 4: Supervised Learning **(12)**

Classification: Introduction, Examples of Supervised Learning, Classification model, Classification learning steps, Common Classification Algorithms-Naïve Bayes classifier- Bayes theorem, Applications of Bayes classifier, Handling continues numeric features in Bayes classifier, k-Nearest Neighbors (k-NN), Decision tree, Random Forest model, Support Vector Machine.

Regression: Introduction, Examples of regression, Common regression algorithms-Simple Linear regression, Multiple linear regression, Assumptions in regression analysis, Main Problems in regression analysis, Improving accuracy of the linear regression model, Polynomial regression model, logistic regression model.

Unit 5: Unsupervised Learning **(08)**

Introduction, Unsupervised vs Supervised learning, Applications of Unsupervised learning, Clustering: Clustering as a Machine learning task, different types of clustering techniques, Partitioning methods, k-means algorithm, k-medoids, Hierarchical clustering, Density based methods-DBSCAN, finding patterns using association rule-Definition of common terms, Association rule, Aprioris algorithm.

Unit 6: Applications of Machine learning **(5)**

Applying Learning to Real Problems, Classifying Images, Scoring Opinions and Sentiments, Recommending Products and Movies, Using Machine Learning to Provide Solutions to Business Problems, Future of Machine Learning.

ISE Evaluation: ISE Evaluation for the course will consists of three tests based on the topics mentioned in the syllabus .

Internal Continuous Assessment (ICA):

Minimum 10 assignments requiring students to develop machine learning applications for real world problem/use- case/scenario based on any of the following topics:

1. Basic mathematics for Machine Learning – Simulating solutions using Python to: I. Matrix operations II. Problems using Probability
2. Data exploration, Visualization and Preprocessing
3. Linear and Multilinear Regression
4. Decision Tree regressor
5. K-Nearest Neighbour (KNN) classifier
6. Logistic Regression classifier
7. Support vector machine (SVM) Classifier
8. Decision Tree classifier
9. Naive-Bayes classifier
10. Ensemble Models

11. K-means clustering (Unsupervised Learning)
12. Improving Machine Learning models using cross-validation and Hyper parameters tunning

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Text Books:

1. Machine Learning - Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, Pearson Publication.
2. Machine Learning for Dummies by John Paul Mueller, Luca Massaron (Published by For Dummies; First edition).

Reference Books:

1. Machine Learning by Tom M. Mitchell (Publisher: McGraw Hill Education; First edition + New Chapters from Second edition).
2. 2. Introduction to Machine Learning (Second Edition) by Ethem Alpaydın (published by The MIT Press Cambridge, Massachusetts London, England
3. Machine Learning with Python for Everyone by Mark E. Fenner , Pearson Publication

Walchand Institute of Technology, Solapur

Honors in Artificial Intelligence and Machine Learning

T.Y.B.Tech. (Information Technology), Semester-V

21ITU5HA1T : REINFORCEMENT LEARNING

Teaching Scheme	**Examination Scheme**
Lectures – 3 Hours/week, 3 Credits	ESE – 60 Marks
Practical – 2 Hour/week, 1 Credit	ISE – 40 Marks
	ICA – 25 Marks

Introduction :

Reinforcement learning is an area of machine learning, where an agent or a system of agents learns to archive a goal by interacting with their environment. In recent years there has been success in reinforcement learning research in both theoretical and applied fields. This course primarily focuses on training students to frame reinforcement learning problems and to tackle algorithms from dynamic programming, Monte Carlo and temporal-difference learning.

Pre-requisite:

A basic course on Artificial Intelligence & Machine learning

COURSE OUTCOMES :

At the end of the course students will be able to

1. Demonstrate the fundamental mathematical models and algorithms in the field of NLP.
2. Apply these mathematical models and algorithms in applications of software design and implementation for NLP.
3. Use tools to analyze language resource annotation and apply to data for acquiring intended information.
4. Design and implement various NLP applications.

SECTION I

Unit 1 Introduction (05)

Reinforcement Learning, Examples, Elements of Reinforcement Learning, History of Reinforcement Learning

Unit 2 Evaluative Feedback (05)

A k-armed Bandit Problem, Action-value Methods, The 10-armed Test-bed, Incremental Implementation

Unit 3 The Reinforcement Learning Problem (06)

The Agent–Environment Interface, Goals and Rewards, Returns, Unified Notation for Episodic and Continuing Tasks, Value Functions, Optimal Value Functions, Optimality and Approximation

Unit 4 Finite Markov Decision Processes (06)

The Agent–Environment Interface, Goals and Rewards, Returns and Episodes, Unified Notation for Episodic and Continuing Tasks, Policies and Value Functions.

SECTION II

Unit 5 Dynamic Programming (05)

Policy Evaluation (Prediction), Policy Improvement, Policy Iteration, Value Iteration,

Asynchronous Dynamic Programming, Generalized Policy Iteration, Efficiency of Dynamic Programming, Introduction to Monte Carlo Methods.

Unit 6 Temporal-Difference Learning **(05)**

TD Prediction, Advantages of TD Prediction Methods, Optimality of TD(0), SARSA: On-policy TD Control, Q-learning: Off-policy TD Control.

Unit 7 Planning and Learning **(06)**

Models and Planning, Dyna: Integrating Planning, Acting, and Learning , When the Model Is Wrong , Prioritized Sweeping, Expected vs. Sample Updates.

Unit 8 Applications and Case Studies **(06)**

TD-Gammon, Samuel's Checkers Player, Watson's Daily-Double Wagering, Mastering the Game of Go and AlphaGo.

Internal Continuous Assessment (ICA) :

Analysis and implementation of

1. Flappy Kernel Markov Decision Process
2. Implementation of Performance Difference Lemma.
3. Implementation of Pong with Deep Q Learning.
4. Estimation of Warfarin Dose
5. Implementing Bayesian regret bound for Thomson Sampling

Text Books:

1. Reinforcement Learning: An Introduction (Second edition + Upcoming Edition) by: Richard S. Sutton and Andrew G. Barto, MIT Press Publication
(The book is available at http://incompleteideas.net/book/the-book-2nd.html Upcoming edition's January 1 2018 draft available at http://incompleteideas.net/book/bookdraft2018jan1.pdf]

Reference Books:

1. Reinforcement Learning: With Open AI, TensorFlow and Keras Using Python By Abhishek Nandy, Manisha Biswas. Apress Publication
2. Reinforcement Learning: State-of-the-Art, Marco Wiering and Martijn van Otterlo, Eds.
3. Artificial Intelligence: A Modern Approach, Stuart J. Russell and Peter Norvig.
4. Deep Learning, Ian Goodfellow, Yoshua Bengio, and Aaron Courville.

Walchand Institute of Technology, Solapur

Honors in Artificial Intelligence and Machine Learning

T.Y.B.Tech. (Information Technology), Semester-VI

21ITU6HA1T : NATURAL LANGUAGE PROCESSING

Teaching Scheme
Lecture: 3 Hours /Week, 3 Credits
Practical: 2 Hours/Week, 1 Credit

Examination Scheme
ESE – 60 Marks
ISE – 40 Marks
ICA - 25 Marks

Introduction :

Natural Language Processing (NLP) is basically how you can teach machines to understand human languages and extract meaning from text. This course is intended as a theoretical and methodological introduction to a the most widely used and effective current techniques, strategies and toolkits for natural language processing, This course also covers basis of semantic analysis and discourse analysis and drives it to machine translation.

Pre-requisite:

A basic course in a object-oriented programming Language, Theory of computation and parsers.

COURSE OUTCOMES:

At the end of the course students will be able to

1. Demonstrate the fundamental mathematical models and algorithms in the field of NLP.
2. Apply these mathematical models and algorithms in applications of software design and implementation for NLP.
3. Use tools to analyze language resource annotation and apply to data for acquiring intended information.
4. Design and implement various NLP applications.

SECTION-I

Unit 1 Introduction (6)

Introduction to NLP, Machine Learning and NLP, Biology of Speech Processing; Place and Manner of Articulation, Word Boundary Detection, Arg-Max Computation, Lexical Knowledge Networks.

Unit 2 Word-net Theory (6)

Semantic Roles , Word Sense Disambiguation (WSD) : Word-Net, Word-net Application in Query Expansion , Wiktionary, semantic relatedness , Measures of Word-Net Similarity, Similarity Measures . Resnick's work on Word-Net Similarity, Indian Language Word-nets and Multilingual Dictionaries, Multi-linguality, Metaphors, Co references

Unit 3 Theories of Parsing (6)

Parsing Algorithms , Evidence for Deeper Structure, Top Down Parsing Algorithms, Noun Structure, Non-noun Structure and Parsing Algorithms, Robust and Scalable Parsing on Noisy Text as in Web documents Probabilistic parsing, Hybrid of Rule Based and Probabilistic Parsing sequence labeling, Training issues , Arguments and Adjuncts , inside-outside probabilities , Scope Ambiguity and Attachment Ambiguity resolution.

Unit 4 Speech **(6)**

Phonetics , HMM, Morphology, Morphology fundamentals; Morphological Diversity of Indian Languages; Morphology Paradigms; Finite State Machine Based Morphology; Automatic Morphology Learning; Shallow Parsing; Named Entities; Maximum Entropy Models; Random Fields.

SECTION-II

Unit 5 Graphical Models **(6)**

Graphical Models for Sequence, Labelling in NLP, Consonants (place and manner of articulation) and Vowels , Forward Backward probability, Viterbi Algorithm

Unit 6 Phonology **(6)**

Sentiment Analysis and Opinions on the Web, Machine Translation and MT Tools - GIZA++ and Moses. Text Entailment, POS Tagging. ASR, Speech Synthesis, Precision, Recall, F-score, Map.

Unit 7 Semantic Relations **(6)**

UNL, Towards Dependency Parsing, Universal Networking Language, Semantic Role Extraction, Baum Welch Algorithm, HMM and Speech Recognition. HMM training, Baum Welch Algorithm; HMM training

Unit 8 Applications **(6)**

Sentiment Analysis; Text Entailment; Robust and Scalable Machine Translation; Question Answering in Multilingual Setting; Cross Lingual Information Retrieval (CLIR)..

Text Books:

1. Allen, James, "Natural Language Understanding", Second Edition, Benjamin/Cumming, 1995.
2. Charniack, Eugene, "Statistical Language Learning", MIT Press, 1993.
3. Jurafsky, Dan and Martin, James, Speech and Language Processing, Second Edition, Prentice Hall, 2008.
4. Manning, Christopher and Heinrich, Schutze, Foundations of Statistical Natural Language Processing, MIT Press, 1999.

Reference Books:

1. Jurafsky, D., and Martin, J.H. (2008). "Speech and Language Processing" (2nd Edition). Upper Saddle River, NJ: Prentice Hall
2. Bird, S., Klein, E., Loper, E. (2009). "Natural Language Processing with Python". Sebastopol, CA: O'Reilly Media.
3. Radford, Andrew et. al., "Linguistics, An Introduction", Cambridge University Press, 1999.

Internal Continuous Assessment (ICA) :

ICA shall include at least eight of the following:

1. Perform sentiment analysis of tweets using logistic regression and then naïve Bayes,
2. Use vector space models to discover relationships between words and use PCA to reduce the dimensionality of the vector space and visualize those relationships,

3. Write a simple English to French translation algorithm using pre-computed word embeddings and locality sensitive hashing to relate words via approximate k-nearest neighbor search.
4. Create a simple auto-correct algorithm using minimum edit distance and dynamic programming,
5. Apply the Viterbi Algorithm for part-of-speech (POS) tagging, which is important for computational linguistics,
6. Write a better auto-complete algorithm using an N-gram language model,
7. Write your own Word2Vec model that uses a neural network to compute word embeddings using a continuous bag-of-words model.
8. Train a neural network with GLoVe word embeddings to perform sentiment analysis of tweets,
9. Generate synthetic Shakespeare text using a Gated Recurrent Unit (GRU) language model,
10. Train a recurrent neural network to perform named entity recognition (NER) using LSTMs with linear layers,
11. Use so-called 'Siamese' LSTM models to compare questions in a corpus and identify those that are worded differently but have the same meaning.
12. Translate complete English sentences into German using an encoder-decoder attention model,
13. Build a Transformer model to summarize text,
14. Use T5 and BERT models to perform question-answering
15. Build a chatbot using a Reformer model.

Walchand Institute of Technology, Solapur

Honors in Artificial Intelligence and Machine Learning

Final Year B.Tech. (Information Technology), Semester-VII

21ITU7HA1T : DEEP LEARNING

Teaching Scheme
Lecture: 3 Hours /Week, 3 Credits
Practical: 2 Hours/Week, 1 Credits

Examination Scheme
ESE – 60 Marks
ISE – 40 Marks
ICA - 25 Marks

Introduction :

Deep Learning is one of the most exciting and promising segments of Artificial Intelligence and machine learning technologies. . Advancements in deep learning are being seen in various real world applications. This course is designed to help master deep learning techniques and build using Tensor Flow, an open-source software library developed by Google for the purpose of conducting machine learning and deep neural networks. It is one of the most popular software platforms used for deep learning and contains powerful tools to help you build and implement artificial neural networks. With this Tensor flow course, you'll build expertise in deep learning models, learn to operate Tensor Flow to manage neural networks and interpret the results.

Pre-requisite:

A basic course in machine learning, introduction to Artificial neural networks & Python programming.

COURSE OUTCOMES:

At the end of the course students will be able to

1. Demonstrate the concepts of TensorFlow, its main functions, operations and the execution pipeline
2. Implement deep learning algorithms, understand neural networks and traverse the layers of data abstraction
3. Build deep learning models in TensorFlow and interpret the results.
4. Troubleshoot and improve deep learning models.

SECTION-I

UNIT 1: **(08)**

Introduction to TensorFlow : Computational Graph, Key highlights, Creating a Graph, Regression example, Gradient Descent, TensorBoard, Modularity, Sharing Variables, Keras
Perceptrons: What is a Perceptron, XOR Gate

UNIT 2: **(06)**

Activation Functions : Sigmoid,ReLU, Hyperbolic Fns,Softmax
Artificial Neural Networks : Introduction, Perceptron Training Rule, Gradient Descent Rule

UNIT 3: **(10)**

Gradient Descent and Backpropagation: Gradient Descent, Stochastic Gradient Descent, Backpropagation, Some problems in ANN
Optimization and Regularization : Overfitting and Capacity, Cross Validation, Feature Selection, Regularization, Hyperparameters

SECTION II

UNIT 4: **(10)**

Introduction to Convolutional Neural Networks: Introduction to CNNs, Kernel filter, Principles behind CNNs, Multiple Filters, CNN applications

UNIT 5: **(08)**

Introduction to Recurrent Neural Networks: Introduction to RNNs, Unfolded RNNs, Seq2Seq RNNs, LSTM, RNN applications

UNIT 6: **(08)**

Deep Learning applications: Image Processing, Natural Language Processing, Speech Recognition, Video Analytics

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Text Book :

Goodfellow, I., Bengio,Y., and Courville, A., Deep Learning, MIT Press, 2016.
https://www.deeplearningbook.org/

References

1. Bishop, C. ,M., Pattern Recognition and Machine Learning, Springer, 2006.
2. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.
3. Golub, G.,H., and Van Loan,C.,F., Matrix Computations, JHU Press,2013.
4. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw-Hill Education, 2004.

Internal Continuous Assessment (ICA) :

ICA shall include at least eight of the following:

1. Introduction to Google Colab, TensorFlow 2.0, Keras API
2. Introduction to Tensorflow , Overview of Machine Learning (Process and Techniques)
3. Demonstration of ML concepts with Deep Playground.
4. Data Input and Preprocessing with Tensorflow.
5. Machine Learning Model Building.
6. Prediction with Tensorflow
7. Monitoring and evaluating models using Tensorboard
8. Advance Tensorflow (Building custom models - CNNs, Scaling up for large datasets) and Distributed training with hardware accelerators

Walchand Institute of Technology, Solapur

Honors in Artificial Intelligence and Machine Learning

Final Year B.Tech. (Information Technology), Semester-VII

21ITU7HA2L : MINI PROJECT

Teaching Scheme
Practical: 4 Hours/Week, 2 Credits

Examination Scheme
POE – 50 Marks
ICA - 50 Marks

Introduction :

Project based learning is a paradigm which is becoming time-honored now a days. To keep abreast with this, Project course is included in the curriculum which is spread over both semesters of final year. For this course, students carry out a project as a team that allows them to demonstrate their abilities and to develop skills within their chosen area of interest. Hardware realization as well software projects with focus on design, development and research aspects are accepted. Also communicating effectively, both in oral and written form are an important skill for engineering graduates in many different contexts. This course also aims to foster these skills.

COURSE OUTCOMES :

1. Analyze technological alternatives for developing IT solution with relevance to environment and sustainability.
2. Explore state-of-art tools and FOSS alternatives to develop solutions meeting societal and professional needs.
3. Develop a system through Software Development Life Cycle.
4. Demonstrate ability to engage in teamwork while observing professional ethics.
5. Write and present a well organized project report
6. Inculcate habit of self study and lifelong learning.
