**YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING**
**(An Autonomous Institution affiliated to R T M Nagpur University Nagpur)**
**Accredited by NAAC (1st Cycle) with 'A' Grade (Score 3.25 on 4 Point Scale)**
**Wanadongri, Hingna Road, Nagpur-441110**

## Department of Computer Technology
## (Honors in AIML)

# B.E. Honors in Artificial Intelligence and Machine Learning
# SoE & Syllabus 2021-22

# B.E Honors in Artificial Intelligence and Machine Learning

Information Brochure of Honor Program

1. Title of Program: **Honors Course in Artificial Intelligence and Machine Learning**
2. Type of Program: **Honor**
3. Department offering the program: **Computer Technology**.
4. Department eligible to opt for the program:

   **Students of Department of Computer technology are only eligible to opt for this program. Department of Computer Technology**

5. General information about courses in program:

   The focus of this course in to cover the concepts of Artificial Intelligence and the Machine Learning. Artificial Intelligence and Machine Learning are the buzzwords in industry. This program contains four theory courses and 6 lab courses which needs to be completed in the span of three semesters (5, 6, 7 semester). This course covers the concept of knowledge representation and reasoning using Artificial Intelligence. Also, it covers search methods for problem solving in Artificial Intelligence. This program also covers the deep learning used to solve the advanced problems. Natural Language Processing is one of the important components of Artificial Intelligence, this course also focuses on that. This complete program is dominated by the lab courses to give rigorous practical exposure of the courses. It includes the advance technologies like TensorFlow as the lab course. This program will have great impact on students' placement as the maximum courses (which are completely industry required) will be completed before the students appear for the placement process.

6. Advance knowledge or research orientation of Program:

   The main objective of the program is to cover the advance technologies in the field of artificial intelligence and machine learning. The exposure of the courses like AI knowledge representation and reasoning, AI search methods and problem solving, are going to give the students opportunity to pursue research in the Artificial Intelligence research area. The other components of this program like Deep Learning and Natural Language Processing are most sought after by industry and also in demand for the research.

## 7. Employability potential of program:

According to a Gartner report, Artificial Intelligence (AI) is estimated to pave way for close to 2.3 million opportunities by the year 2020. Artificial intelligence will transform the global economy, and AI jobs are in high demand. Companies like Google, Quora, and Facebook hire people with the knowledge of machine learning.

The knowledge of Artificial Intelligence and Machine Learning are going to open job opportunities as Machine Learning Engineer, Data Scientist, Business Intelligence Developer, Research Scientist, Big Data Architect/ Engineer etc. One more important aspect of this field is there is no upper limit on the salary of machine learning professionals at top companies.

Google says" Machine Learning is the future", so future of machine learning is going to be very bright.

This program will act as trump card for you in the cut throat competition during the placements drives.

## 8. Departmental Steering committee:

| SN | Name of the Faculty Member | Post | Designation | e-mail ID | Contact Number |
|---|---|---|---|---|---|
| 1 | Dr. G. M. Dhopavkar | HoD & Chairman | Asst. Prof. | hod_ct@ycce.edu | 9822087970 |
| 2 | Dr. P. A. Deshkar | Member | Asst. Prof. | padeshkar@ycce.edu | 9923401052 |
| 3 | Dr. K. R. Singh | Member | Asso. Prof. | singhkavita19@gmail.com | 8275783031 |
| 4 | Dr. S. D. Kamble | Member | Asso. Prof. | shailesh_2kin@rediffmail.com | 9158886477 |
| 5 | Dr. R. D. Wajgi | Member | Asst. Prof | rdwajgi@ycce.edu | 9970238062 |
| 6 | Dr. L. B. Damahe | Member | Asst. Prof. | lalitdamahe3379@ycce.edu | 9823289971 |
| 7 | Prof. N. M. Mangrulkar | Member | Asst. Prof. | nmangrulkar@ycce.edu | 7767888776 |

## 9. Program Coordinator :

| SN | Name of the Faculty Member | Post | Designation | e-mail ID | Contact Number |
|---|---|---|---|---|---|
| 1 | Dr. Prarthana A. Deshkar | Coordinator | Asst. Prof. | padeshkar@ycce.edu | 9923401052 |

# SoE_Honors in Artificial Intelligence and Machine Learning

| SN | Sem | Sub Code | Subject | T/P | Credit Hours | | | | Credits | % Weightage | | | | ESE Duration Hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | L | T | P | Hrs | | MSEs | TA | CA | ESE | |
| 1 | 5 | CTH101 | AI knowledge Representation and Reasoning | T | 3 | 0 | 0 | 3 | 3 | 30 | 30 | | 40 | 3 |
| 2 | 5 | CTH102 | Lab: AI knowledge Representation and Reasoning | p | 0 | 0 | 2 | 2 | 1 | | | 60 | 40 | 1 |
| 3 | 5 | CTH103 | Artificial Intelligence: Search Methods for Problem Solving | T | 3 | 0 | 0 | 3 | 3 | 30 | 30 | | 40 | 3 |
| 4 | 5 | CTH104 | Lab: Artificial Intelligence: Search Methods for Problem Solving | P | 0 | 0 | 2 | 2 | 1 | | | 60 | 40 | 1 |
| 5 | 6 | CTH111 | Introduction to Deep Learning | T | 3 | 0 | 0 | 3 | 3 | 30 | 30 | | 40 | 3 |
| 6 | 6 | CTH112 | Lab: Introduction to Deep Learning | P | 0 | 0 | 2 | 2 | 1 | | | 60 | 40 | 1 |
| 7 | 6 | CTH113 | Applied Natural Language Processing | T | 3 | 0 | 0 | 3 | 3 | 30 | 30 | | 40 | 3 |
| **8** | 6 | CTH114 | Lab: Applied Natural Language Processing | P | 0 | 0 | 2 | 2 | 1 | | | 60 | 40 | 1 |
| **9** | 7 | CTH121 | Lab: Machine Learning using TensorFlow Lab | P | 0 | 0 | 2 | 2 | 1 | | | 60 | 40 | 1 |
| **10** | 7 | CTH122 | Lab: Open-source tools for AI-ML | P | 0 | 0 | 2 | 2 | 1 | | | 60 | 40 | 1 |
| | | | **Total** | | **12** | **0** | **12** | **24** | **18** | | | | | |

**MSEs* = Three MSEs of 15 Marks each will conducted and marks of better 2 of these 3 MSEs will be considered for Continuous Assessment**

**TA ** = for Theory : 20 marks on lecture quizzes, 8 marks on assignments, 2 marks on class performance**
**TA** = for Practical : MSPA will be 15 marks each**

## V Semester

| CTH101: | Artificial Intelligence: Knowledge Representation and Reasoning | | | L= 3 | T = 0 | P = 0 | Credits = 3 |
|---|---|---|---|---|---|---|---|
| Evaluation Scheme<br>*Best Two out of three MSE's would be considered | MSE-I* | MSE-II* | MSE-III* | TA | ESE | Total | ESE Duration |
| | 15 | 15 | 15 | 30 | 40 | 100 | 3 Hrs |
| **Prerequisites** | | | | | | | |

**Course Objective**

Students should be able to

1. To learn basics of Knowledge Representation and Reasoning and its logical representation.
2. To understand basic of Knowledge representation using concept of First order logic and Conceptual dependency
3. To learn the basics of Prolog program and its representation
4. To understand basic of Knowledge representation using Semantic network, frames
5. To represent knowledge in uncertain domain

**Course Outcome**

Students will be able to

1. Identify the need and importance of knowledge representation and its methods.
2. Map natural statements into FOL and CD representation
3. Model simple application domains in a logic-based language
4. Attain the capability to represent various real life problem domains using logic based techniques and use this to perform inference
5. Formulate and solve problems with uncertain

**UNIT I:**

Introduction to Knowledge Representation and Reasoning, Formal logic, Propositional Logic, Syntax and truth values, Rules of Inference and Natural Deduction, The Tableau Method, The Resolution Refutation Method

**UNIT II:**

First Order Logic (FOL) Syntax, Semantics, Entailment and Models, Proof Systems, Forward Chaining, Unification, Forward Chaining Rule Based Systems, The Rete Algorithm, Programming in a Rule Based Language, The OPS5 Expert System Shell

**UNIT III:**

Representation in FOL Skolemization, Knowledge Representation, Properties and Categories, Reification, The Event Calculus, Mapping Natural Language to FOL: Conceptual Dependency (CD) Theory and analysis: Mapping English to CD Theory

| |
|---|
| **UNIT IV :**<br>Backward Chaining, Logic Programming with Prolog, Depth First Search and Efficiency Issues, Controlling Search, The Cut Operator in Prolog, The Resolution Refutation Method for FOL, Clause Form and The Resolution Rule, FOL with Equality |
| |
| **UNIT V:**<br>Semantic Nets, Frames, Default Reasoning, Circumscription, Default Logic, Epistemic Logic, Multi Agent Scenarios |
| |
| **UNIT VI:**<br>Reasoning in uncertain domain, Dempster–Shafer theory Bay's rule and its use, Inference in Bayesian Network, Case study: Bayesian and belief network |

**Text Books:**

| | Title | Edition | Author | Publisher |
|---|---|---|---|---|
| **1** | Knowledge Representation and Reasoning | Latest Edition | Ronald J. Brachman, Hector J. Levesque | Morgan Kaufmann |
| **2** | A First Course in Artificial Intelligence | Latest Edition | Deepak Kheman | McGraw Hill Education (India) |

**Reference Book:**

| | Title | Edition | Author | Publisher |
|---|---|---|---|---|
| **1** | Knowledge Representation: Logical, Philosophical, and Computational Foundations | Latest Edition | John F. Sowa | Brooks /Cole, Thomson Learning |
| **2** | Artificial Intelligence: A Modern Approach | Latest Edition | Russell &Norvig | Prentice Hall |

## V Semester

| CTH102 | Artificial Intelligence: Knowledge Representation and Reasoning Lab | | | L= 0 | T = 0 | P = 1 | Credits = 1 |
|---|---|---|---|---|---|---|---|
| Evaluation Scheme<br>*Best Two out of three MSE's would be considered | MSE-I* | MSE-II* | MSE-III* | TA | ESE | Total | ESE Duration |
| | -- | -- | -- | 60 | 40 | 100 | 3 Hrs |
| **Prerequisites** | | | | | | | |

**Course Objective**

Students should be able to

1. To learn basics of Knowledge Representation and Reasoning and its logical representation.
2. To understand basic of Knowledge representation using concept of First order logic and Conceptual dependency
3. To learn the basics of Prolog program and its representation
4. To understand basic of Knowledge representation using Semantic network, frames
5. To represent knowledge in uncertain domain

**Course Outcome**

Students will be able to

1. Identify the need and importance of knowledge representation and its methods.
2. Map natural statements into FOL and CD representation
3. Model simple application domains in a logic-based language
4. Attain the capability to represent various real life problem domains using logic based techniques and use this to perform inference
5. Formulate and solve problems with uncertain information using Bayesian approaches

1. Creation of Object model for propositional logic syntax representation.
2. Implementation of propositional resolution for given object model.
3. Implementation of Unification and matching algorithm.
4. Implementation of Resolution Algorithm
5. Implementation of Rete Algorithm.
6. Implementation of database Representation in Logic programming
7. Implementation of Semantic network Representation.
8. Implementation of Frame representation.
9. Implementation of Multi agent scenario.
10. Implementation of Bays theorem.
11. Design and analysis of Bayesian network for given case study.

**V Semester**

| **CTH103** | **Artificial Intelligence: Search Methods for Problem Solving** | | | L= 3 | T = 0 | P = 0 | Credits = 3 |
|---|---|---|---|---|---|---|---|
| Evaluation Scheme *Best Two out of three MSE's would be considered | MSE-I* | MSE-II* | MSE-III* | TA | ESE | Total | ESE Duration |
| | 15 | 15 | 15 | 30 | 40 | 100 | 3 Hrs |
| **Prerequisites** | | | | | | | |

**Course Objective**

Students should be able to

1. To understand various basic concepts used in AI
2. To understand how state space is explored by intelligent agents using various searching techniques
3. To understand various optimization algorithms used during searching state space
4. To understand how AI is used in the domain of game playing
5. To understand various components of expert systems

**Course Outcome**

Students will be able to

1. Design abstract view of intelligent agent
2. Implement various searching algorithms
3. Design advanced optimization algorithm
4. Use AI techniques in game designing and design a game
5. Design an expert system for given problem

**UNIT I:**

Introduction: Overview and Historical Perspective, Turing Test, Physical Symbol Systems and the scope of Symbolic AI, Agents.

**UNIT II:**

State Space Search: Depth First Search, Breadth First Search, DFID, Heuristic Search: Best First Search, Hill Climbing, Beam Search

**UNIT III:**

Traveling Salesman Problem, Tabu Search, Simulated Annealing, Population Based Search: Genetic Algorithms, Ant Colony Optimization

**UNIT IV :**

Branch & Bound, Algorithm A, Admissibility of A,Monotone Condition, IDA, RBFS, Pruning OPEN and CLOSED in A

| |
|---|
| **UNIT V:**<br>Problem Decomposition, Algorithm AO, Game Playing,Algorithms Minimax, AlphaBeta, SSS, Planning: Forward/Backward Search, Goal Stack Planning, Sussman's Anomaly,Plan Space Planning, Algorithm Graphplan |
| |
| **UNIT VI:**<br>Rule Based Expert Systems, Inference Engine, Rete Algorithm |

**Textbooks:**

| | Title | Edition | Author | Publisher |
|---|---|---|---|---|
| **1** | A First course in Artificial Intelligence | Latest Edition | Deepak Khemani | MHT Publications |
| **2** | Stochastic Local Search: foundations and Applications | Latest Edition | Holger H. Hoos, Thomas stutzle | Morgan Kauffman series in AI |

**Reference Book:**

| | Title | Edition | Author | Publisher |
|---|---|---|---|---|
| **1** | Artificial Intelligence : A Modern Approach | Latest Edition | Russell and Norvig | Pearson |

## V Semester

| CTH104 | Artificial Intelligence: Search Methods for Problem Solving Lab | | | L= 0 | T = 0 | P = 1 | Credits = 1 |
|---|---|---|---|---|---|---|---|
| Evaluation Scheme<br>*Best Two out of three MSE's would be considered | MSE-I* | MSE-II* | MSE-III* | TA | ESE | Total | ESE Duration |
| | -- | -- | -- | 60 | 40 | 100 | 3 Hrs |
| **Prerequisites** | | | | | | | |

**Course Objective**

Students should be able to

1. To understand various basic concepts used in AI
2. To understand how state space is explored by intelligent agents using various searching techniques
3. To understand various optimization algorithms used during searching state space
4. To understand how AI is used in the domain of game playing
5. To understand various components of expert systems

**Course Outcome**

Students will be able to

1. Design abstract view of intelligent agent
2. Implement various searching algorithms
3. Design advanced optimization algorithm
4. Use AI techniques in game designing and design a game
5. Design an expert system for given problem

1. Implement A* algorithm.
2. Implement AO* algorithm.
3. Implementation of Ant Colony Optimization Algorithms
4. Implementation of Genetic Algorithm
5. Implementation of Unification Algorithm.
6. Implementation of Truth maintenance system using prolog.
7. Implementation of Min/MAX search procedure for game Playing.
8. Parsing Method Implementation using Prolog.
9. Development of mini expert system using Prolog / Expert System Shell "Vidwan"
10. Case study of any one Expert System

## VI Semester

| CTH111 : | Introduction to Deep Learning | | | L= 3 | T = 0 | P = 0 | Credits = 3 |
|---|---|---|---|---|---|---|---|
| Evaluation Scheme | MSE-I* | MSE-II* | MSE-III* | TA | ESE | Total | ESE Duration |
| *Best Two out of three MSE's would be considered | 15 | 15 | 15 | 30 | 40 | 100 | 3 Hrs |
| **Prerequisites** | | | | | | | |

**Course Objective**

Students should be able to:

1. Understand the importance deep learning and optimization
2. Study and understand neural network
3. Study deep learning for sequences
4. Study deep learning for images
5. Understand unsupervised representation learning

**Course Outcome**

Students will be able to

1. Explain and apply the concept of deep learning and optimization
2. Explain and design neural network
3. Describe and design recurrent neural network
4. Interpret and construct convolutional neural network
5. Comprehend the concept of unsupervised learning

**UNIT I :**

Introduction: History of Deep Learning, Deep Learning Success Stories, Deep learning in current scenario, Deep learning Vs Machine Learning, Linear regression, Overfitting and underfitting problem, Hyperparameter and model validation, Estimators, Bias and Variance

**UNIT II :**

Introduction to optimization: Gradient Descent, Model regularization, Stochastic gradient descent, Minibatch gradient descent

**UNIT III :**

Introduction to neural network: McCulloch Pitts Neuron, Thresholding Logic, Perceptron's, Perceptron Learning Algorithm, Feedforward Neural Networks, Backpropagation, Multilayer Perceptrons (MLPs), Representation Power of MLPs, Sigmoid Neurons

**UNIT IV :**

Deep learning for sequences: Recurrent layers, Simple RNN and Backpropagation, Training RNN, dealing with vanishing and exploding gradients

**UNIT V:**

Deep Learning for images: CNN architecture, training CNN. Learning new tasks with pre-trained CNNS, data transformation using PCA, Deep learning for Computer vision

**UNIT VI:**
Unsupervised representation learning: Autoencoders, autoencoders applications, Word embeddings, Generative Models, Generative Adversarial Networks, Applications of Adversarial approach

| **Text Books:** | | | | |
|---|---|---|---|---|
| | **Title** | **Edition** | **Author** | **Publisher** |
| **1** | Introduction to Deep learning | Latest Edition | Eugene Charniak | MIT Press |
| **2** | | | | |
| **Reference Book:** | | | | |
| | **Title** | **Edition** | **Author** | **Publisher** |
| **1** | Deep Learning | Latest Edition | Ian GoodFellow, YoshuaBengio, Aaron Courville | MIT Press |

## VI Semester

| CTH112 : | Introduction to Deep Learning Lab | | | L= 0 | T = 0 | P = 1 | Credits = 1 |
|---|---|---|---|---|---|---|---|
| Evaluation Scheme<br>*Best Two out of three MSE's would be considered | MSE-I* | MSE-II* | MSE-III* | TA | ESE | Total | ESE Duration |
| | -- | -- | -- | 60 | 40 | 100 | 3 Hrs |
| **Prerequisites** | | | | | | | |

**Course Objective**

Students should be able to:

1. Understand the importance deep learning and optimization
2. Study and understand neural network
3. Study deep learning for sequences
4. Study deep learning for images
5. Understand unsupervised representation learning

**Course Outcome**

Students will be able to:

1. Explain and apply the concept of deep learning and optimization
2. Explain and design neural network
3. Describe and design recurrent neural network
4. Interpret and construct convolutional neural network
5. Comprehend the concept of unsupervised learning

1. Implementation of basic machine learning algorithms.
2. Implementation and analysis of simple linear regression
3. Implementation and analysis of linear regression with gradient descent
4. Implementation of neural network
5. Implementation of Simple RNN using python
6. Implementation of CNN using python
7. Implementation of CNN for image classification
8. Implementation and analysis of PCA
9. 10. Project: Apply all knowledge of deep learning to develop a given project

**VI Semester**

| **CTH113 :** | Applied Natural Language Processing | | | L= 3 | T = 0 | P = 0 | Credits = 3 |
|---|---|---|---|---|---|---|---|
| Evaluation Scheme | MSE-I* | MSE-II* | MSE-III* | TA | ESE | Total | ESE Duration |
| *Best Two out of three MSE's would be considered | 15 | 15 | 15 | 30 | 40 | 100 | 3 Hrs |
| **Prerequisites** | | | | | | | |

**Course Objective**

Students should be able to

1. Understand usage of regular expressions in NLP
2. Study document similarity measures and various vector space models
3. Use Text Classification, Clustering, and Summarization
4. Study machine learning techniques relevant to NLP
5. Understand Machine translation, language generation

**Course Outcome**

Students will be able to

1. Extract information using regular expressions.
2. Select appropriate similarity measures
3. Use Vector space models in NLP applications
4. Perform Text Classification, Clustering, and Summarization
5. Select machine learning techniques relevant to NLP
6. Analyze various NLP applications

**UNIT I:**

Introduction to language processing : Tokens, sentences, paragraphs,Regular expressions: extraction of information using Regex.

**UNIT II:**

Document Similarity measures: Cosine and cluster measures, Spelling correction: Edit distance, Information retrieval, extraction Document Classification, Clustering, topic modeling techniques.

**UNIT III:**

Vector Space Model: word vectors, GloVe/Word2Vec model, word embedding.

UNIT IV :

Introduction to NLP Tasks: Text Classification, Clustering, and Summarization.

**UNIT V:**

Back Propagation, Recurrent Neural network relevant to NLP.

**UNIT VI:**
Introduction to Machine Translation, Language Generation Applications: Sentiment Analysis, Spam Detection, Resume Mining.

| **Text Books:** | | | | |
|---|---|---|---|---|
| | **Title** | **Edition** | **Author** | **Publisher** |
| **1** | Foundations of Statistical Natural Language Processing | Latest Edition | Chris Manning, Hinrich Schütze | MIT Press, 1999 |
| **2** | Speech and Language Processing | Latest Edition | Dan Jurafsky, James H. Martin | Prentice Hall |
| **Reference Book:** | | | | |
| | **Title** | **Edition** | **Author** | **Publisher** |
| **1** | Bender's Linguistic Fundamentals for Natural Language Processing | Latest Edition | Bender: Emily | Free online through the NYU |

## VI Semester

| CTH114 : | Applied Natural Language Processing Lab | | | L= 0 | T = 0 | P = 1 | Credits = 1 |
|---|---|---|---|---|---|---|---|
| Evaluation Scheme | MSE-I* | MSE-II* | MSE-III* | TA | ESE | Total | ESE Duration |
| *Best Two out of three MSE's would be considered | -- | -- | -- | 60 | 40 | 100 | 3 Hrs |
| **Prerequisites** | | | | | | | |

**Course Objective**

Students should be able to

1. Understand usage of regular expressions in NLP
2. Study document similarity measures and various vector space models
3. Use Text Classification, Clustering, and Summarization
4. Study machine learning techniques relevant to NLP
5. Understand Machine translation, language generation and other NLP applications

**Course Outcome**

Students will be able to

1. Extract information using regular expressions.
2. Select appropriate similarity measures and analyze Vector space models in NLP applications
3. Perform Text Classification, Clustering, and Summarization
4. Select machine learning techniques relevant to NLP
6. Analyze various NLP applications

1. Extraction of information using Regular Expression in NLP applications
2. Find out similarity between natural language documents
3. Perform Text classification based on the given criteria
4. Perform Clustering and text summarization
5. Study of Machine translation tool
6. Perform Document mining using NLP tools
7. Perform Spam Mail detection using NLP tools
8. Perform Twitter analysis using Python
9. Perform sentiment analysis using Python
10. Build a mini application using open source tools for NLP

## VII Semester

| CTH121 : | Machine Learning using Tensorflow Lab | | | L= 0 | T = 0 | P = 1 | Credits = 1 |
|---|---|---|---|---|---|---|---|
| Evaluation Scheme<br>*Best Two out of three MSE's would be considered | MSE-I* | MSE-II* | MSE-III* | TA | ESE | Total | ESE Duration |
| | -- | -- | -- | 60 | 40 | 100 | 3 Hrs |
| **Prerequisites** | | | | | | | |

**Course Objective**

Students should be able to

1. Learn core concepts of TensorFlow
2. Learn machine learning algorithms in TensorFlow

**Course Outcome**

Students will be able to

1. Comprehends the concepts of TensorFlow
2. Describe and implement the machine learning algorithms in TensorFlow

1. Getting started with Tensorflow
2. Basics of TensorFlow
3. Loading and Exploring the data
4. Feature Extraction and Transforming data
5. Machine Learning Basics
6. Implementing Machine Learning Algorithms with TensorFlow
7. Evaluation of machine learning algorithms using Tensor board
8. CNN implementation using TensorFlow
9. CNN implementation using TensorFlow
10. Project

| Text Books: | | | | |
|---|---|---|---|---|
| | **Title** | **Edition** | **Author** | **Publisher** |
| **1** | Machine Learning with TensorFlow | Latest Edition | Nishant Shukla with Kenneth Fricklas, Manning | Manning Publications |
| **2** | Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts | Latest Edition | Aurelien Geron | O'Reilly |
| **Reference Book:** | | | | |
| | **Title** | **Edition** | **Author** | **Publisher** |
| **1** | Advanced Deep Learning with TensorFlow 2 and Keras: | Latest Edition | Rowel Atienza | Packt Publication |

## VII Semester

| CTH122 : | Open source tools for AI-ML Lab | | | L= 0 | T = 0 | P = 1 | Credits = 1 |
|---|---|---|---|---|---|---|---|
| Evaluation Scheme<br>*Best Two out of three MSE's would be considered | MSE-I* | MSE-II* | MSE-III* | TA | ESE | Total | ESE Duration |
| | -- | -- | -- | 60 | 40 | 100 | 3 Hrs |
| **Prerequisites** | | | | | | | |

**Course Objective**

Students should be able to

1. Learn core working of different AI and ML open source tool
2. Lean to create different Classification model ,its comparison and algorithm implementation using open source tool

**Course Outcome**

Students will be able to

1. Comprehends the concepts of AI and ML tool
2. Demonstrate and implement the AI-ML models or algorithms using open source tools

1. Study of Teachable Machine ML tool
2. Model creation for image classification using Teachable Machine tool
3. Model creation for audio classification using Teachable Machine tool
4. Model creation for body posture classification using Teachable Machine tool
5. Study of WIT tool
6. Model comparison using WIT tool
7. Analyze and test algorithmic fairness constraints using WIT tool
8. Study of Accord .NET AI tool
9. Demonstrate the corner detection in image using Accord .NET AI tool
10. Project based on Accord .NET AI tool