



# SWARNANDHRA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

Narsapur, West Godavari District, A.P. 534280

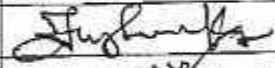

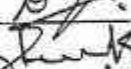
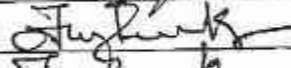
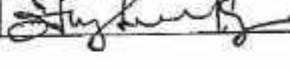
## DEPARTMENT OF MECHANICAL ENGINEERING

### LESSON PLAN

| Course Code                                  | Course Title   | Semester   | Branch                                  | Contact Periods /Week | Academic Year | Date of commencement of Semester |   |
|--|--|--|---|-----------------------|---------------|----------------------------------|---|
| 20ME6T01                                     | Introduction To Artificial Intelligence and Machine Learning   | VI   | ME                                      | 5                     | 2024-25       | 18-11-2024                       |   |
| <b>COURSE OUTCOMES:</b> Students are able to |  |  |   |                       |               |                                  |   |
| 1  | Gain a solid understanding of the fundamentals, principles related to Artificial Intelligence and machine learning [K2]          |  |   |                       |               |                                  |   |
| 2  | Apply feature extraction and selection techniques. [K3]  |  |   |                       |               |                                  |   |
| 3  | Analyze and solve complex problems by applying probabilistic reasoning. [K3]   |  |   |                       |               |                                  |   |
| 4  | Interpret and develop a machine learning model using various steps. [K3]   |  |   |                       |               |                                  |   |
| 5  | Apply machine learning algorithms for classification and regression problems. [K3]   |  |   |                       |               |                                  |   |
| UNIT   | Out Comes / Bloom's Level  | Topics No.                                       | Topics/Activity                         | Text Book / Reference | Contact Hour  | Delivery Method                  |   |
| I  | CO1:<br>Gain a solid understanding of the fundamentals, principles related to Artificial Intelligence and machine learning. [K2] | <b>UNIT INTRODUCTION ARTIFICIAL INTELLIGENCE</b> |   |                       |               |                                  | Chalk & Talk,PPT Quiz                       |
|  |  | 1.1  | Introduction to Artificial Intelligence | T2,R1                 | 1             |                                  |   |
|  |  | 1.2  | Concept of AI                           | T2,R1                 | 1             |                                  |   |
|  |  | 1.3  | History, current status                 | T2, R3                | 1             |                                  |   |
|  |  | 1.4  | scope, agents                           | T2,R1                 | 1             |                                  |   |
|  |  | 1.5  | Environments                            | T2,R1                 | 2             |                                  |   |
|  |  | 1.6  | Problem Formulations                    | T1, T2,               | 1             |                                  |   |
|  |  | 1.7  | Review of tree and graphstructures      | T2, R1                | 2             |                                  |   |
|  |  | 1.8  | State space representation              | T2, R1                | 1             |                                  |   |
|  |  | 1.9  | Search graph and Search tree            | T1, R1                | 1             |                                  |   |
| Content beyond Syllabus                      |  | 1.10   | Generative AI                           |                       | 1             |                                  |   |
| <b>Total</b>                                 |  |  |   |                       | <b>12</b>     |                                  |   |
| II   | CO 2:<br>Apply feature extraction and selection techniques[K3]   | <b>UNIT II SEARCH ALGORITHMS</b>                 |   |                       |               |                                  | Chalk & Talk,PPT, Group Discussion, Videos, |
|  |  | 2.1  | Random search                           | T2, R3                | 1             |                                  |   |
|  |  | 2.2  | Search with closed and open list        | T2, R3                | 1             |                                  |   |
|  |  | 2.3  | Depth first search                      | T2, R3                | 2             |                                  |   |
|  |  | 2.4  | Breadth first search                    | T2, R3                | 2             |                                  |   |
|  |  | 2.5  | Heuristic search                        | T3,R3                 | 1             |                                  |   |
|  |  | 2.6  | Best first search                       | T3,R3                 | 2             |                                  |   |
|  |  | 2.7  | A* algorithm                            | T3,R3                 | 1             |                                  |   |
|  |  | 2.8  | Game Search                             | T3,R3                 | 2             |                                  |   |
| <b>Total</b>                                 |  |  |   |                       | <b>12</b>     |                                  |   |

|                                    |  |  |   |              |           |   |
|------------------------------------|--|--|---|--------------|-----------|---|
| III                                | CO3:<br>Analyze and solve complex problems by applying probabilistic reasoning. [K3]       | UNIT III PROBABILISTIC REASONING         |   |              |           | Chalk & Talk,PPT, Active Learning, Quiz         |
|                                    |  | 3.1                                      | Probability                                 | T1, R3       | 1         |   |
|                                    |  | 3.2                                      | Conditional Probability                     | T1, R3       | 2         |   |
|                                    |  | 3.3                                      | Bayes Rule                                  | T1, R3       | 1         |   |
|                                    |  | 3.4                                      | Bayesian Networks representation            | T1, R3       | 2         |   |
|                                    |  | 3.5                                      | construction and inference                  | T1, R3       | 2         |   |
|                                    |  | 3.6                                      | Temporal model                              | T1, R3       | 2         |   |
|                                    |  | 3.7                                      | Hidden Markov model                         | T1, R3       | 2         |   |
|                                    |  |  |   | <b>Total</b> | <b>12</b> |   |
| IV                                 | CO4:<br>Interpret and develop a machine learning model using various steps. [K3]           | UNIT IV INTRODUCTION TO MACHINE LEARNING |   |              |           | Chalk & Talk,PPT, Flipped Class, Seminars, Quiz |
|                                    |  | 4.1                                      | Machine learning                            | T1,R2        | 1         |   |
|                                    |  | 4.2                                      | Statistics vs. Machine Learning techniques, | T1,R2        | 2         |   |
|                                    |  | 4.3                                      | Supervised learning                         | T1,R2        | 2         |   |
|                                    |  | 4.4                                      | Unsupervised learning                       | T1,R2        | 2         |   |
|                                    |  | 4.5                                      | Semi-supervised learning                    | T1,R2        | 1         |   |
|                                    |  | 4.6                                      | Reinforcement learning                      | T1,R2        | 2         |   |
|                                    |  | 4.7                                      | Basics: Probability Theory                  | T1,R2        | 1         |   |
|                                    |  | 4.8                                      | Linear Algebra                              | T1,R2        | 1         |   |
|                                    |  |  |   | <b>Total</b> | <b>12</b> |   |
| V                                  | CO5:<br>Apply machine learning algorithms for classification and regression problems. [K3] | UNIT V DECISION THEORY                   |   |              |           | Chalk & Talk,PPT, Flipped Class, Quiz           |
|                                    |  | 5.1                                      | Statistical Decision Theory                 | T1, R2       | 1         |   |
|                                    |  | 5.2                                      | Regression                                  | T1, R2       | 1         |   |
|                                    |  | 5.3                                      | Classification                              | T1, R2       | 2         |   |
|                                    |  | 5.4                                      | Linear regression                           | T1, R2       | 1         |   |
|                                    |  | 5.5                                      | Multivariate regression                     | T1, R2       | 1         |   |
|                                    |  | 5.6                                      | Logistic regression                         | T1, R2       | 1         |   |
|                                    |  | 5.7                                      | Classification predictive modeling          | T1, R2       | 2         |   |
|                                    |  | 5.8                                      | Binary classification                       | T1, R2       | 1         |   |
|                                    |  | 5.9                                      | multi-class classification                  | T1, R3       | 1         |   |
| CBS                                |  | Fuzzy Logic                              |   | 1            |           |   |
|                                    |  |  |   | <b>Total</b> | <b>12</b> |   |
| <b>CUMULATIVE PROPOSED PERIODS</b> |  |  |   |              | <b>60</b> |   |

| Text Books:      |  |
|------------------|--|
| S.No.            | AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION   |
| 1                | Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", 3 <sup>rd</sup> Edition, Prentice Hall. 2010.   |
| 2                | Elaine Rich and Kevin Knight, "Artificial Intelligence", 3 <sup>rd</sup> Edition, Tata McGraw Hill. 2017.  |
| 3                | AndriyBurkov, "The Hundred-Page Machine Learning Book", 1 <sup>st</sup> Edition, Notion Press, 2019.   |
| 4                | Andreas Muller, "Introduction to Machine Learning with Python: A Guide for Data Scientists", 1 <sup>st</sup> Edition, O'Reilly, 2016.  |
| Reference Books: |  |
| S.No.            | AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION   |
| 1                | Trivedi, M.C., "A Classical Approach to Artificial Intelligence", 2 <sup>nd</sup> edition, Khanna Book Publishing, 2018.   |
| 2                | Saroj Kaushik, "Artificial Intelligence", 1st edition, Cengage Learning India, 2011  |
| 3                | Zhi-Hua Zhou, "Ensemble Methods: Foundations and Algorithms", CRC Press, 2 <sup>nd</sup> edition, 2012.  |
| Web Details      |  |
| 1                | <a href="http://www.ibm.com/in-en/topics/artificial-intelligence">www.ibm.com/in-en/topics/artificial-intelligence</a>   |
| 2                | <a href="http://www.javatpoint.com/artificial-intelligence-ai">www.javatpoint.com/artificial-intelligence-ai</a>   |
| 3                | <a href="http://www.geeksforgeeks.org/artificial-intelligence">www.geeksforgeeks.org/artificial-intelligence</a>   |
| 4                | <a href="https://nptel.ac.in/courses/106105077">https://nptel.ac.in/courses/106105077</a>  |
| 5                | <a href="http://www.simplilearn.com/tutorials/machine-learning-tutorial/what-is-machine-learning">www.simplilearn.com/tutorials/machine-learning-tutorial/what-is-machine-learning</a> |

|                                    | Name                      | Signature with Date   |
|------------------------------------|---------------------------|---|
| i. Faculty                         | Dr. Francis Luther King M |  |
| ii. Faculty II (for common Course) | Mr.N.Bulli Raju           |  |
| iii. Course Coordinator            | Mr.N.Bulli Raju           |  |
| iv. Module Coordinator             | Dr. Francis Luther King M |  |
| v. Programme Coordinator           | Dr. Francis Luther King M |  |



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