**Machine Learning**

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| **Course Code** | 20CS3602 | **Year** | III | **Semester** | II |
| **Course Category** | PCC | **Branch** | CSE | **Course Type** | Theory |
| **Credits** | 3 | **L-T-P** | 3-0-0 | **Prerequisites** | Linear, algebra, Vectors Statistics and Probability, Data Structures and Algorithms |
| **Continuous Internal Evaluation :** | 30 | **Semester End Evaluation:** | 70 | **Total Marks:** | 100 |

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| **Course Outcomes** | **Blooms Level** |
| Upon successful completion of the course, the student will be able to: |
| **CO1** | Understand the basic concepts of Machine Learning. | L2 |
| **CO2** | Apply Supervised Learning algorithms for solving various problems | L3 |
| **CO3** | Apply Unsupervised Learning and Reinforcement learning algorithms for solving various problems | L3 |
| **CO4** | Analyze the given application and use suitable machine learning algorithm. | L4 |

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| **Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial,2:Moderate,1:Slight)** |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
| **CO1** | 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **CO2** |  |  |  |  |  | 1 | 1 |  |  |  |  |  |  | 3 |
| **CO3** | 2 |  |  |  |  | 1 |  |  |  |  |  |  |  |  |
| **CO4** |  | 2 |  |  |  | 1 | 1 |  | 1 | 1 |  |  |  |  |
| **Avg.** | 2.5 | 2 |  |  |  | 1 | 1 |  | 1 | 1 |  |  |  | 3 |

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| **CO 1** | **Understand the basic concepts of Machine Learning.** |
| **PO1** | **Engineering Knowledge** **Justification:** Students Understand the fundamental principles, mathematical foundations, and algorithmic techniques essential for solving real-world engineering problems. This knowledge enables engineers to analyze data, design models, and develop intelligent systems effectively. |
| **CO 2** | **Apply Supervised Learning algorithms for solving various problems.** |
| **PO6** | **The Engineer and Society****Justification:** **Students** will apply appropriate mathematical proof techniques to validate engineering solutions, optimize algorithms, ensure data integrity, and enhance problem-solving accuracy. This empowers them to develop reliable and efficient solutions for complex engineering challenges. |
| **PO7** | **Environment and sustainability****Justification: Students** will learn to apply various supervised learning algorithms such as decision trees, SVMs, and neural networks to solve real-world problems. By implementing these techniques in domains like healthcare, energy management, and climate modeling, they will contribute to sustainable solutions. |
| **PSO2** | **Apply the Knowledge of Data Engineering and Communication Technologies for Developing Applications in the Domain of Smart and Intelligent Computing.****Justification:** Students utilize supervised learning algorithms to address real-world challenges, strengthening their analytical and problem-solving abilities. |
| **CO3** | **Apply Unsupervised Learning and Reinforcement learning algorithms for solving various problems** |
| **PO1** | **Engineering Knowledge****Justification:** Students can understand and apply unsupervised and reinforcement learning algorithms to solve complex problems, enhancing their analytical thinking. This aligns with engineering knowledge by enabling them to develop data-driven solutions, optimize decision-making, and design intelligent systems across various domains. |
| **PO6** | **The Engineer and Society****Justification: S**tudents leverage unsupervised and reinforcement learning algorithms to address complex problems, strengthening their ability to recognize data patterns and make insightful decisions. This supports to create AI-driven solutions that address societal challenges while upholding ethical and responsible engineering practices. |
| **CO4** | **Analyze the given application and use suitable machine learning algorithm.** |
| **PO2** | **Problem Analysis****Justification:** Students examine the given application to identify patterns and insights, implementing appropriate machine learning algorithms to develop effective solutions. This enhances their problem-analysis skills, enabling them to systematically evaluate complex challenges and implement data-driven strategies for informed decision-making. |
| **PO6** | **The Engineer and Society****Justification:** Students evaluate applications and choose suitable machine learning algorithms to design effective solutions. This helps them create AI-driven systems that address societal needs while ensuring ethical, safe, and responsible engineering practices. |
| **PO7** | **Environment and sustainability****Justification:** By analyzing applications students enhance solution efficiency and effectiveness. This approach supports sustainability by fostering AI-driven innovations that optimize resource utilization and reduce environmental impact. |
| **PO9** | **Individual and team work****Justification:** Students enhance their problem-solving and decision-making skills, strengthening their ability to work both independently and collaboratively. This fosters teamwork and innovation in developing intelligent solutions. |

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| **PO10** | **Communication****Justification:** Students assess the given application and implement appropriate machine learning algorithms, improving their ability to extract valuable insights This enhances their communication skills by enabling them to present findings clearly, convey technical concepts effectively, and collaborate with peers to create impactful solutions. |

**Course Coordinator:**

 **Module Coordinator:**

 **Program Coordinator Signature of HOD**