| | | |
|---|---|---|
| **Program** | Master of Computer Applications (Autonomous) (M.C.A (Autonomous)) | **Semester - 3** |
| **Type of Course** | - | |
| **Prerequisite** | | |
| **Course Objective** | - | |

| Teaching Scheme (Contact Hours) | | | | Examination Scheme | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Credit | Theory Marks | | Practical Marks | | Total Marks |
| | | | | | | | | |
| 3 | - | 2 | 4 | 50 | 50 | - | - | 100 |

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

**Course Content**

**T** - Teaching Hours | **W** - Weightage

| Sr. | Topics | T | W |
|---|---|---|---|
| 1 | **Introduction, Overview & Machine Learning Basics**<br><br>**Introduction:** Implication and Scope of Machine Learning concepts and its Importance in Economic growth of Nation, Impact of the course on Societal Problems / Sustainable Solutions / National Economy, Career Perspective, Overview of the course in current Innovations and Research Trends.<br><br>**Overview:** Data objects and Attribute types, Overview of Machine Learning Algorithms – Basics of Supervised and Unsupervised Algorithms.<br><br>**Machine Learning Basics:** Well posed learning problems, Perspectives and issues in Machine Learning, Concept Learning: Concept learning task, Concept learning as search, Find-S algorithm, Version Space, Candidate Elimination Algorithm. | 9 | 20 |
| 2 | **Decision Tree Learning**<br><br>**Decision Tree Learning** – Decision Tree representation, Appropriate problems for decision tree learning, Basic decision tree learning algorithm, Problems based on ID3 algorithm, Issues in decision tree learning. | 8 | 20 |
| 3 | **Bayesian Learning**<br><br>**Bayesian Learning** – Introduction, Bayes theorem and concept learning, ML and LS error hypothesis, ML for predicting probabilities, Naïve Bayes Classifier, Bayesian belief networks. | 8 | 20 |
| 4 | **Unsupervised Learning**<br><br>**Unsupervised Learning** – Association Analysis - basic concepts and methods, Frequent itemset Generation, Apriori algorithm, FP-Growth Algorithm, Categorization of Major Clustering Methods, K-Means– Partitioning Methods, Hierarchical Methods. | 8 | 20 |
| 5 | **Evaluating Hypothesis**<br><br>**Evaluating Hypothesis** – Motivation, Estimating hypothesis accuracy, Basics of sampling theorem, General approach for deriving confidence intervals, Difference in error of two hypothesis, Comparing learning algorithms, Instance based learning: Introduction, K-Nearest Neighbor learning.<br><br>**Recap:** Summary of Machine Learning concepts | 9 | 20 |
| | **Total** | 42 | 100 |

**Course Outcomes**

| At the end of this course, students will be able to: | |
|---|---|
| CO1 | Explore the Machine Learning concepts. |
| CO2 | Build suitable Decision tree for a given data set. |
| CO3 | Apply machine learning algorithms for the given problems. |
| CO4 | Perform statistical and probabilistic analysis of machine learning techniques. |
| CO5 | Implement machine learning algorithms for a given use case. |

**List of Practical**

| | |
|---|---|
| **1.** | **Web Scraping** |
| **2.** | **Data Pre-processing** |
| **3.** | **Linear Regression** |
| **4.** | **Find-S Algorithm** |
| **5.** | **K-NN Algorithm** |
| **6.** | **SVM Algorithm** |
| **7.** | **Naïve-Bayes Classifier** |
| **8.** | **K-Means Clustering** |