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**SUMMER SEMESTER 2018-19**

# Course Handout Part I

Date: 21-05-2019

In addition to Part-I (General Handout for all courses appended to the Timetable)

this portion gives further specific details regarding the course.

Course No. : BITS F464

## Course Title : MACHINE LEARNING

## Instructor-in-Charge: : Dr. Lov Kumar

Instructors : *Dr. Lov Kumar*

**COURSE DESCRIPTION :**

Machine Learning addresses the problem of identifying patterns in data. The major goal of machine learning is allow to computers to learn (potentially complex) patterns from data, and then make decisions based on these patterns. This class will provide an introduction to the fundamentals of this discipline. The main objective of this course is to get familiarity with a set of well-known supervised, unsupervised and semi-supervised learning algorithms. This course helps to achieve the ability to design & implement some basic machine learning algorithms and understanding of how machine learning algorithms are evaluated.

**SCOPE & OBJECTIVE:**

The course covers design, implementation and applications of many supervised and unsupervised machine learning algorithms. The classification algorithms, namely, Logistic Regression, Support Vector Machines, Artificial Neural Networks, Decision Trees, Baysian methodologies will be studied exhaustively. This course also encompasses regression techniques like liner regression of one variable and different variables. The unsupervised techniques like k-means algorithm will also be covered in this course.

**TEXT BOOK :**

**T1. Christopher Bishop, Pattern Recognition and Machine Learning, Springer International Edition**

**REFERENCE BOOK :**

**R1. Tom M. Mitchell. Machine Learning, The McGraw-Hill Companies, Inc..**

**Course Plan:**

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| --- | --- | --- |
| **Lecture No.** | Learning Objectives | **Chapter in the Text Book** |
| 1-2 | Course Introduction & Motivation. | Lecture Notes |
| 3-5 | Concept Learning &General-to-Specific Ordering | R1 – Ch. 2 |
| 6-9 | Data Preprocessing: | Lecture Notes |
| 10-14 | Clustering Algorithms | T1 – Ch. 8 |
| 15-18 | Decision Tree Learning | R1 – Ch. 3 |
| 19-20 | Evaluating Hypotheses | R1 – Ch. 5 |
| 21-22 | Bayesian Learning | R1 – Ch. 6 |
| 23-26 | Regression – Linear Regression with single and multiple variables | T1 – Ch. 3 |
| 27-29 | Logistic Regression | T1 – Ch. 4 |
| 30-32 | Support Vector Machines | T1 – Ch. 7 |
| 33-35 | Artificial Neural Networks | R1 – Ch. 4 |
| 36-40 | PCA & Miscellaneous | T1 – Ch. 12 |

**Evaluation**

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| --- | --- | --- | --- | --- |
| **Component** | **Duration** | **Mode** | **Date & Time** | **Weightage** |
| Mid-semester Exam | 90 Mins. | Closed Book | 15/6  9.00 - 10.30AM | 25% |
| Quiz-1 | 30 Mins. | Open Book |  | 7.5% |
| Quiz-2 | 30 Mins. | Open Book |  | 7.5% |
| Mini-project / Home Asst. (with viva) |  | Open Book |  | 20% |
| Comprehensive Exam | 3 Hrs. | Closed Book | 13/07 FN | 40% |

**6. Make-up Policy**

For genuine reasons other than medical, prior approval from the IC is mandatory. Requests coming after the test will not be honored. For make-up on medical grounds, first inform the warden about the illness and take his help for consulting the doctor, and finally Chief Hostel Warden’s recommendation is a must and such students should not leave the campus during Test dates (please refer to the guidelines by ID in this regard). No make-up will be given by just producing some medical prescription. The above mentioned rules will be followed very strictly.

**7. Course Notices**

All notices pertaining to this course will be displayed on the CS&IS Notice Board.

**8. Chamber Consultation:** To be announced.

9. **Academic Honesty and Integrity Policy**:

Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

**Instructor-In-Charge,**

BITS F464