SHRI VENKATESHWARA UNIVERSITY

Syllabus

B.Tech
Computer Science and Engineering

VII Semester

(Three Years Programme)
(w.e.f. 2019-20)

SCHOOL OF ENGINEERING & TECHNOLOGY

Computer Science and Engineering
VII - SEMESTER

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	SCS- 701	Artificial Intelligence	3	0	0	20	10	30		70		100	3
2	SCS- 702	Machine Learning	3	0	0	20	10	30		70		100	3
3	SOE-071	Introduction to Industrial Management	3	0	0	20	10	30		70		100	3
4	SOE- 072	ICT for Development	3	0	0	20	10	30		70		100	3
5	SCS- 711	Project Stage-II	0	0	12				100			100	6
6	SCS-777	Summer Internship							100			100	3
												600	21
Summer Internship after VI sem													

ARTIFICIAL INTELLIGENCE

SCS-701 **L T P**

3 0 0

Unit-I **10**

Introduction : Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Intelligent Agents, Structure of Intelligent Agents. Computer vision, Natural Language Possessing.

Unit-II **10**

Introduction to Search : Searching for solutions, Uniformed search strategies, Informed search strategies,Local search algorithms and optimistic problems, Adversarial Search, Search for games, Alpha - Beta pruning.

Unit-III **10**

Knowledge Representation & Reasoning: Propositional logic, Theory of first order logic, Inference inFirst order logic, Forward & Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models (HMM), Bayesian Networks.

Unit-IV **10**

Machine Learning : Supervised and unsupervised learning, Decision trees, Statistical learning models, Learning with complete data - Naive Bayes models, Learning with hidden data - EM algorithm, Reinforcement learning,

Unit-V **5**

Pattern Recognition : Introduction, Design principles of pattern recognition system, Statistical Pattern recognition, Parameter estimation methods - Principle Component Analysis (PCA) and Linear Discriminant Analysis (LDA), Classification Techniques – Nearest Neighbor (NN) Rule, Bayes Classifier, Support Vector Machine (SVM), K – means clustering.

TOTAL LECTURE: 45

REFERENCES:

1. Stuart Russell, Peter Norvig, “Artificial Intelligence – A Modern Approach”, Pearson Education
2. Elaine Rich and Kevin Knight, “Artificial Intelligence”, McGraw-Hill
3. E Charniak and D McDermott, “Introduction to Artificial Intelligence”, Pearson Education
4. Dan W. Patterson, “Artificial Intelligence and Expert Systems”, Prentice Hall of India,

Course Code	SCS-702
Course Name	Machine learning
Credits	3
Pre-Requisites	

Total Number of Lectures:48

COURSE OBJECTIVE
• To learn the concept of how to learn patterns and concepts from data without being explicitly programmed in various IOT nodes.
• To design and analyse various machine learning algorithms and techniques with a modern outlook focusing on recent advances.
• Explore supervised and unsupervised learning paradigms of machine learning.
• To explore Deep learning technique and various feature extraction strategies.

LECTURE WITH BREAKUP	**NO. OF LECTURES**

Unit 1: **Supervised Learning (Regression/Classification)** • Basic methods: Distance-based methods, Nearest-Neighbours, Decision Trees, Naive Bayes	10

• Linear models: Linear Regression, Logistic Regression, Generalized Linear Models • Support Vector Machines, Nonlinearity and Kernel Methods • Beyond Binary Classification: Multi-class/Structured Outputs, Ranking	
Unit 2: **Unsupervised Learning** • Clustering: K-means/Kernel K-means • Dimensionality Reduction: PCA and kernel PCA • Matrix Factorization and Matrix Completion • Generative Models (mixture models and latent factor models)	7
Unit 3 Evaluating Machine Learning algorithms and Model Selection, Introduction to Statistical Learning Theory, Ensemble Methods (Boosting, Bagging, Random Forests)	6
Unit 4 Sparse Modeling and Estimation, Modeling Sequence/Time-Series Data, Deep Learning and Feature Representation Learning	9
Unit 5 Scalable Machine Learning (Online and Distributed Learning) A selection from some other advanced topics, e.g., Semi-supervised Learning, Active Learning, Reinforcement Learning, Inference in Graphical Models, Introduction to Bayesian Learning and Inference	9
Unit 6: Recent trends in various learning techniques of machine learning and classification methods for IOT applications. Various models for IOT applications.	5

COURSE OUTCOMES
After completion of course, students would be able to:
• Extract features that can be used for a particular machine learning approach in various IOT applications.
• To compare and contrast pros and cons of various machine learning techniques and to get an insight of when to apply a particular machine learning approach.
• To mathematically analyse various machine learning approaches and paradigms.

References:

1. Kevin Murphy, Machine Learning: A Probabilistic Perspective, MIT Press, 2012
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning,Springer 2009 (freely available online)
3. Christopher Bishop, Pattern Recognition and Machine Learning, Springer, 2007.

SOE-071
INTRODUCTION TO INDUSTRIAL MANAGEMENT

Unit I

Introduction: Concept and scope of Industrial Management. Productivity: Definition, measurement, productivity index, types of production system, Industrial Ownership.

Unit II

Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management, Social responsibilities of Management, Introduction to Human resources management: Nature of HRM, functions and importance of HRM.

Unit III

Work Study: Introduction, definition, objectives, steps in work study, Method study: definition, objectives, steps of method study, Work Measurement: purpose, types of study — stop watch methods — steps — allowances — standard time calculations — work sampling, Production Planning and Control Inventory Control: Inventory, Cost, Models of inventory control: EOQ, ABC, VED.

Unit IV

Quality Control: statistical quality control, Control charts for variables and attributes, Acceptance Sampling- Single sampling- Double sampling plans, Introduction to TQM.

Unit V

Project Management: Project network analysis, CPM, PERT and Project crashing and resource Leveling.

References:

1. Engineering Management (Industrial Engineering & Management)/ S.C. Sharma & T.R. Banga, Khanna Book Publishing Co. (P) Ltd., Delhi (ISBN: 978-93-86173-072)

2. Industrial Engineering and Management/ P. Khanna, Dhanpatrai publications Ltd.

3. Production & Operation Management /PaneerSelvam /PHI.

4. Industrial Engineering Management/NVS Raju/Cengage Learning.

5. Industrial Engineering Management I RaviShankar/ Galgotia