

KRISHNA UNIVERSITY

BOARD OF STUDIES (BoS) – DEPARTMENT OF COMPUTER SCIENCE

MINUTES OF THE BOARD OF STUDIES MEETING

Date: Saturday, 22 August 2026

Time: 2:55 PM – 4:25 PM

Mode: Online through Google Meet

Members Present

S. No.	Name	Designation	Role
1	Prof. R. Kiran Kumar	Dept. of Computer Science, Krishna University	Chairman
2	Smt. P. Durga Bhavani	HOD, Dept. of Computer Science, Nalanda Degree College, Vijayawada	Member
3	Kondapalli Ramkumar	HOD, Dept. of Electronics and Internet of Things, Nalanda Degree College, Vijayawada	Member
4	Bommareddy Sudheer Reddy	Lecturer, Dept. of Computer Science, Nalanda Degree College & PG Centre, Vijayawada	Member
5	Prof. P. Suresh Varma	Dept. of CSE, Adikavi Nannaya University, Rajahmundry	Member
6	Dr. M.H.M. Krishna Prasad	Dept. of CSE, JNTUK, Kakinada	Member
7	Prof. D. Lalitha Bhaskari	Dept. of CS & Systems Engineering, Andhra University	Member
8	Assoc. Prof. M. Babu Reddy	HOD, Dept. of Computer Science, Krishna University	Member

Agenda

To discuss and approve the introduction of Machine Learning and Cyber Security as Minor papers.

Proceedings

The meeting commenced at **2:55 PM** with the Chairman welcoming all the members. The proposal for introducing **Machine Learning (ML)** and **Cyber Security** as Minor papers was placed before the Board for discussion.

The members discussed the proposed syllabus, course structure, credits, practical components, Course Outcomes, and industry relevance of the two Minor papers. The members also provided suggestions to make the courses practical, application-oriented, and aligned with current industry requirements.

Resolution

After detailed discussion, the **Board of Studies approved/recommended the introduction of the following as Minor papers:**

- 1. Machine Learning**
- 2. Cyber Security**

The Board recommended that the syllabus, Course Outcomes, credits, teaching scheme, and assessment pattern be finalized incorporating the suggestions of the members and submitted to the **competent academic authority for approval and implementation.**

Conclusion

The Chairman thanked all the members for their valuable suggestions and active participation. The meeting concluded with a vote of thanks.

Meeting ended at: 4:25 PM

Chairman, Board of Studies

Prof. R. Kiran Kumar

Signature: _____

BoS Coordinator / Head of the Department

Name: _____

Signature: _____

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Handwritten signature in black ink, possibly reading "JL" or "JL" with a horizontal line.

Handwritten signature in purple ink, possibly reading "K. Anurag" or "K. Anurag" with a horizontal line.

Handwritten signature in black ink, possibly reading "11" or "11" with a horizontal line.

**Model Syllabus for Machine Learning (Minor) in consonance with Curriculum
framework w.e.f. AY 2025-26**

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
II	III	1	Python Programming	3	3
			Python Programming Lab	2	1
	IV	2	Introduction Machine Learning	3	3
			Introduction Machine Learning Lab	2	1
III	V	3	Supervised Machine learning	3	3
			Supervised Machine learning Lab	2	1
		4	Unsupervised Machine learning	3	3
			Unsupervised Machine learning Lab	2	1
	VI	5	Introduction to NLP	3	3
			Introduction to NLPLab	2	1
		6	Deep Learning	3	3
			Deep Learning Lab	2	1

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B.SC Examinations Model Paper for Core Subjects

Semester :III

Paper Title : Python Programming

Time : 3hrs

Max. Marks:70

Section –A

Answer any Five questions. All questions carry equal marks.

5X4=20M

1. Explain different types of literals
2. Write a short notes on lambda functions
3. Explain loop control statements
4. What is array slicing? Give an example
5. Explain basic aggregation functions
6. Explain about Inspecting datasets - head(), tail(), info(), describe()
7. Explain any two seaborn visualizations
8. Explain advantages of NumPy arrays over Python lists

Section–B

Answer ALL Questions. All questions carry equal marks.

5 X 10 = 50M

9. a) Explain python data types in detail

OR

- b) Explain python operators and input/output statements in detail

10. a) Explain conditional statement in detail

OR

- b) Describe function definition and calling and explain about recursion

11. a) Explain arithmetic and mathematical operations on NumPy arrays with examples

OR

- b). Explain basic matrix operations with examples

12. a) , Explain Handling missing values with examples

OR

b). Explain how to read CSV and Excel files using pandas

13. a) Explain the importance of data visualization. Describe different Matplotlib plots

OR

b). Explain how to Load sample datasets and the use of scikit-learn for Machine Learning

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B.SC Examinations Model Paper for Core Subjects

Semester :IV

Paper Title : Introduction Machine Learning

Time : 3hrs

Max. Marks:70

Section –A

Answer any Five questions. All questions carry equal marks. 5X4=20M

1. Explain the structure of data in machine learning
2. Define polynomial regression.
3. What is feature engineering? Why is it important?
4. Define model interpretability
5. What is the role of weight in a neural network?
6. Explain the role of weights and bias in a neural network
7. List the types of clustering
8. Give two applications of unsupervised learning

Section–B

Answer ALL Questions. All questions carry equal marks. 5 X 10 = 50M

9. a) Discuss the applications of machine learning in different domains.

OR

b) Explain supervised, unsupervised, semi-supervised and reinforcement learning with examples in detail

10. a) Explain the various steps involved in data pre-processing

OR

b) Explain the different methods used for evaluating machine learning algorithms

11. a) Explain the working of Naïve Bayes classifier with an example

OR

b) Explain simple linear regression and multiple linear regression with examples

12. a) Explain hierarchical clustering and its types

OR

b). Explain the k-Means clustering algorithm with its steps.

13. a) Explain the structure of a neural network with input, hidden and output layers

OR

b). Explain the different activation functions: Step, Sigmoid, and ReLU

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B.SC Examinations Model Paper for Core Subjects

Semester :V

Paper Title : Supervised Machine learning

Time : 3hrs

Max. Marks:70

Section –A

Answer any Five questions. All questions carry equal marks.

5X4=20M

1. What is machine learning? Explain key terminology.
2. Explain about normalizing numeric values.
3. Explain about decision trees.
4. Explain learning the naïve bayes classifiers.
5. Explain probability distribution for classification.
6. Write about sigmoid function.
7. Write about kernel function.
8. Explain about support vector machines.

Section–B

Answer ALL Questions. All questions carry equal marks.

5 X 10 = 50M

9. a) Explain key tasks of machine learning .

OR

- b) Explain how to creating scatter plots with matplotlib.

10. a) Explain how to use vecursion to construct a decision tree.

OR

- b) Explain about plotting trees in metplotlib.

11. a) Explain Naïve Bayes theorem.

OR

- b) Explain parsing data from RSS feeds.

12. a) Explain classification with logistic regression and the sigmoid function.

OR

- b) Explain the gradient descent optimization algorithm.

13. a) Explain SMO algorithm for optimization .

OR

- b) Write about comparing support vector machines with other classifiers.

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B.SC Examinations Model Paper for Core Subjects

Semester :V

Paper Title : Unsupervised Machine learning

Time : 3hrs

Max. Marks:70

Section –A

Answer any Five questions. All questions carry equal marks.

5X4=20M

1. Explain about unsupervised learning.
2. Write about Bisecting K-means.
3. Discuss about association analysis.
4. Write about uncovering patterns in congressional voting.
5. Explain about FP trees.
6. Write about mining a click stream from new site.
7. Explain about principal component analysis.
8. Explain about matrix factorization.

Section–B (50Marks)

Answer ALL Questions. All questions carry equal marks.

5 X 10 = 50M

9 a). Explain about K-means clustering algorithm.

OR

b). Explain about improving cluster performance with post processing.

10. a) Write about Apriori algorithm and the Apriori principle.

OR

b). Explain mining association rules from frequent item sets.

11. a) Explain how to Build FP-Tree.

OR

b) Write about how to finding co-occurring words in a twitter feed.

12. a) Write about Dimensionality reduction techniques.

OR

b) Explain how to use PCA to reduce the dimensionality of semi-conductor manufacturing data.

13. a) Write about Applications of the SVD.

OR

b) Explain the a restaurant dish recommendation engine.

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B.SC Examinations Model Paper for Core Subjects

Semester :V

Paper Title : Introduction to NLP

Time : 3hrs

Max. Marks:70

Section –A

Answer any Five questions. All questions carry equal marks.

5X4=20M

1. Explain about Language modeling.
2. Write about Tokenization.
3. Explain normal forms for grammar.
4. Explain about Tagging.
5. Explain probabilistic CFG.
6. Explain about semantic attachments.
7. Explain about word sense Disambiguation.
8. Explain about British National Corpus.

Section–B (50Marks)

Answer ALL Questions. All questions carry equal marks.

5 X 10 = 50M

9. a) Explain origins and challenges of NLP.
OR
b) Explain how to detecting and correcting spelling errors.
10. a) Explain about Evaluating N-grams.
OR
b) Write about Issues in POS tagging.
11. a) Explain Grammar rules for English.
OR
b) Write about Lexicalized CFGs.
12. a) Explain Boot Strapping methods.
OR
b) Explain word similarity using Thesaurus and Distributional methods.
13. a) Explain Hobbs and Centering Algorithm.
OR
b) Discuss lexical resources such as Word Net, Prop Bank and Frame net.

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B.SC Examinations Model Paper for Core Subjects

Semester :VI

Paper Title : DEEP LEARNING

Time : 3hrs

Max. Marks:70

Section –A(20 Marks)

Answer any Five questions. All questions carry equal marks.

5X4=20M

1. Explain the Perceptron algorithm
2. Define Neural Network.
3. What are ReLU heuristics
4. What is Regularization
5. What is a CNN
6. What are Encoder-Decoders
7. What is Image Segmentation?
8. Explain the role of deep learning in sentiment analysis.

Section–B (50Marks)

Answer ALL Questions. All questions carry equal marks.

5 X 10 = 50M

- 9. a) Define an Artificial Neural Network. Explain the basic concept of neurons.**

OR

- b) Explain the Back Propagation Network and its importance.**

- 10. a) Explain **Gradient Descent algorithm** with an example.**

OR

- b) Explain the architecture of a **Feed Forward Neural Network**.**

- 11. a) What is a **Convolutional Neural Network (CNN)**? Explain its architecture.**

OR

- b) What are **Pooling Layers**? Explain Max Pooling and Average Pooling.**

- 12. a) Explain the Differentiate between **LSTM and GRU****

OR

b) What are **Adversarial Generative Networks**? Explain it.

13. a) Explain **Object Detection** using deep learning.

OR

b) Explain **Video-to-Text** using **LSTM models**.

SEMESTER-III

COURSE 1: PYTHON PROGRAMMING

Theory

Credits:

3 hrs/week

UNIT I: PYTHON BASICS - Introduction to Python, features, applications, python syntax and indentation, Literals- Integer, Float, Complex, Boolean, String, and Special Literals, variables, identifiers, data types, comments, operators, input and output statements

UNIT II: PROGRAMMING FUNDAMENTALS

Conditional statements - if, if-else, if-elif-else. Loops - for loop, while loop. Loop control statements – break, continue, pass

Functions - Function definition and calling, built-in functions, user defined functions, recursion, , Lambda functions

UNIT III: NUMPY FOR NUMERICAL COMPUTING

Introduction to NumPy, Advantages of NumPy arrays over Python lists, Creating NumPy arrays, One-dimensional and multidimensional arrays, Indexing and slicing, Reshaping arrays, Joining and splitting arrays, Array arithmetic operations, Mathematical functions, Statistical functions, Basic matrix operations

UNIT IV: PANDAS FOR DATA HANDLING

Introduction to Pandas, Series, Creating and accessing Series, Creating DataFrames, Reading CSV files, Reading Excel files, Inspecting datasets - head(), tail(), info(), describe(). Selecting rows and columns, Filtering data, Sorting data, Handling missing values - Detecting missing values, Removing missing values, Filling missing values. Removing duplicate data, Grouping data, Basic aggregation - sum(), mean(), count(), max(), min()

UNIT V: DATA VISUALIZATION AND PYTHON LIBRARIES

Importance of data visualization, Matplotlib - Creating and customizing plots, Line plot, Bar chart, Pie chart, Histogram, Scatter plot, Labels, titles, legends, and grids. Seaborn - Count plot, Box plot, Heatmap

Modules and Packages - Introduction to modules, Creating and importing modules, Introduction to packages, Introduction to scikit-learn- Loading sample datasets, Basic use of scikit-learn for Machine Learning

Textbooks:

1. Learning Python, Mark Lutz
2. Python for Data Analysis, Wes McKinney
3. Python Data Science Handbook, Jake VanderPlas
4. Python Crash Course, Eric Matthes
5. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, Aurélien Géron

SEMESTER-III

COURSE 1: PYTHON PROGRAMMING

Practical

Credits: 1

2 hrs/week

List of Experiments:

1. (a) Write a python program to demonstrate various List operations
(b) Write a python program to demonstrate String operations
2. Write a Python program to find the largest of three numbers using conditional statements.
3. Write a Python program to generate the Fibonacci series.
4. Write a program to find factorial of a number using recursion
5. Write a Python program to perform basic matrix operations using NumPy arrays.
6. Write a Python program to create DataFrames and access their elements.
7. Write a Python program to read CSV file and inspect datasets using `head()`, `tail()`, `info()`, and `describe()`.
8. Write a Python program to filter data and perform basic statistical operations using Pandas.
9. Write a Python program to create and customize line plots, bar charts, pie charts, histograms, and scatter plots using Matplotlib.
10. Write a Python program to create count plots, box plots, and heatmaps using Seaborn.
11. (a) Write a Python program to create and import a user-defined module
(b) Write a Python program to load a sample dataset using scikit-learn.

SEMESTER-IV

COURSE 2: INTRODUCTION TO MACHINE LEARNING

Theory

Credits: 3

3 hrs/week

Unit 1. Introduction to Machine Learning:

Introduction to Machine Learning: Types of human learning, What is machine learning?, Types of machine learning: supervised, unsupervised, semi-supervised and reinforcement learning, machine learning activities, applications of machine learning. Types of data in machine learning, Structure of data

Unit 2. Model Preparation, Evaluation and feature engineering:

Data pre-processing, Model selection and training (for supervised learning), Model representation and interpretability, Evaluating machine learning algorithms and performance enhancement of models. What is feature engineering?, Feature transformation, Feature subset selection. Principal component analysis.

Unit 3. Supervised Learning:

Classification: Classification model and learning steps, Classification algorithms: Naïve Bayes classifier, k-Nearest Neighbour (kNN)

Regression: Introduction of regression, Regression algorithms: Simple linear regression, Multiple linear regression, Polynomial regression model, Logistic regression

.Unit 4. Unsupervised Learning:

Introduction of unsupervised learning, Unsupervised vs supervised learning, Application of unsupervised learning, Clustering and its types, Partitioning method: k-Means and KMedoids, Hierarchical clustering

Unit 5. Neural Networks:

Introduction to neural networks, Structure of a neural network - Input layer, hidden layer, and output layer, types of neural networks, Weights and bias, Activation functions, Step function, Sigmoid function, ReLU, Applications of neural networks.

Text Books:

- Introduction to Machine Learning with Python, Andreas C. Müller and Sarah Guido
- Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, Aurélien Géron
- Machine Learning, Tom M. Mitchell
- Pattern Recognition and Machine Learning, Christopher M. Bishop
- Deep Learning, Ian Goodfellow, Yoshua Bengio, and Aaron Courville

SEMESTER-IV

COURSE 2: INTRODUCTION TO MACHINE LEARNING

Practical

Credits: 1

2 hrs/week

List of Experiments:

1. Write a python program to import and export data using Pandas library functions.
2. Demonstrate various data pre-processing techniques for a given dataset
3. Implement Dimensionality reduction using the Principal Component Analysis (PCA)
4. method.
5. Write a Python program to demonstrate various Data Visualization Techniques.
6. 5. Implement MLE on a Dataset
7. Implement Simple and Multiple Linear Regression Models.
8. Develop Logistic Regression Model for a given dataset.
9. Develop Decision Tree Classification model for a given dataset and use it to classify a
10. new sample.
11. Implement Naïve Bayes Classification in Python.
12. Develop K-Means for a Given Dataset
13. Build KNN Classification model for a given dataset.

SEMESTER-V

COURSE 3: SUPERVISED MACHINE LEARNING

Theory

Credits: 3

3 hrs/week

UNIT I:

Machine Learning Basics: What is machine learning? Key terminology, Key tasks of machine learning, How to choose right algorithm, steps in developing a machine learning, why python?

Getting started with Numpy library Classifying with k- Nearest Neighbors: The k-Nearest Neighbors classification algorithm, Parsing and importing data from a text file, Creating scatter plots with Matplotlib, Normalizing numeric values

UNIT II:

Splitting datasets one feature at a time-Decision trees: Introducing decision trees, measuring consistency in a dataset, using recursion to construct a decision tree, plotting trees in Matplotlib

UNIT III:

Classifying with probability theory-Naïve Bayes: Using probability distributions for classification, learning the naïve Bayes classifier, Parsing data from RSS feeds, using naïve Bayes to reveal regional attitudes

UNIT IV:

Logistic regression: Classification with logistic regression and the sigmoid function, Using optimization to find the best regression coefficients, the gradient descent optimization algorithm, Dealing with missing values in the our data

UNIT V:

Support vector machines: Introducing support vector machines, using the SMO algorithm for optimization, using kernels to “transform” data, Comparing support vector machines with other classifiers

TEXT BOOK:

1. Machine learning in action, Peter Harrington by Manning publications Supervised ML with Python Lab

SEMESTER-V

COURSE 3: SUPERVISED MACHINE LEARNING LAB

Practical

Credits: 1

2 hrs/week

List of Experiments:

- 1 Implement and demonstrate KNN
2. Write a program to demonstrate the working of the decision tree based ID3 algorithm.
3. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a CSV file.
4. Implement simple linear Regression
5. Implement Decision Tree Learning

SEMESTER-V

COURSE 4: UNSUPERVISED MACHINE LEARNING

Theory

Credits: 3

3 hrs/week

UNIT I:

Unsupervised Learning: Clustering: k-means clustering algorithm, Improving cluster performance with post processing, Bisecting k-means, Example: clustering points on a map

UNIT II:

Association analysis : Apriori algorithm: Association analysis, The Apriori principle, Finding frequent item sets with the Apriori algorithm, Mining association rules from frequent item sets, uncovering patterns in congressional voting

UNIT III:

Finding frequent item sets: FP-growth –FP trees, Build FP-tree, mining frequent from an FP-tree, finding co-occurring words in a Twitter feed, mining a click stream from a news site.

UNIT IV:

Principal component analysis: Dimensionality reduction techniques, using PCA to reduce the dimensionality of semiconductor manufacturing data

UNIT V:

Singular value decomposition: Applications of the SVD, Matrix factorization, SVD in Python, Collaborative filtering–based recommendation engines, a restaurant dish recommendation engine

TEXT BOOK:

1. Machine learning in action, Peter Harrington by Manning publications
Unsupervised ML with Python Lab

SEMESTER-V

COURSE 4: UNSUPERVISED MACHINE LEARNING

Practical

Credits: 1

2 hrs/week

Details of Lab/Practical/Experiments/Tutorials syllabus:

1. Implementation of K-Means Clustering
2. Implement the bisecting k-means clustering algorithm
3. Implement Apriori algorithm
4. Implement Association rule-generation functions
5. Implement FP-tree creation
6. Write a function to find all paths ending with a given item.
7. Implement Code to access the Twitter Python library
8. Implement the PCA algorithm
9. Write a program to find Rating estimation by using the SVD
10. Implement Image-compression functions using SVD.

SEMESTER-VI

COURSE 5: INTRODUCTION TO NLP

Theory

Credits: 3

3 hrs/week

UNIT I INTRODUCTION

Definition, History and evolution of NLP, Applications of NLP: Chatbots, Virtual Assistants, Machine Translation, Text Summarization, Question Answering, and Spam Detection, Origins and challenges of NLP – Language Modeling: Grammar-based LM, Statistical LM - Regular Expressions, Tokenization, Detecting and Correcting Spelling Errors, Minimum Edit Distance

UNIT II WORD LEVEL ANALYSIS

Unsmoothed N-grams, Evaluating N-grams, Smoothing, Interpolation and Backoff – Word Classes, Part-of-Speech Tagging, Rule-based, Stochastic and Transformation-based tagging, Issues in PoS tagging – Hidden Markov and Maximum Entropy models.

UNIT III SYNTACTIC ANALYSIS

Context-Free Grammars, Grammar rules for English, Treebanks, Normal Forms for grammar – Dependency Grammar – Syntactic Parsing, Ambiguity, Dynamic Programming parsing – Shallow parsing – Probabilistic CFG, Probabilistic CYK, Probabilistic Lexicalized CFGs - Feature structures, Unification of feature structures.

UNIT IV SEMANTICS AND PRAGMATICS

Requirements for representation, First-Order Logic, Description Logics – Syntax-Driven Semantic analysis, Semantic attachments – Word Senses, Relations between Senses, Thematic Roles, selectional restrictions – Word Sense Disambiguation, WSD using Supervised, Dictionary & Thesaurus, Bootstrapping methods – Word Similarity using Thesaurus and Distributional methods.

UNIT V DISCOURSE ANALYSIS AND LEXICAL RESOURCES

Discourse segmentation, Coherence – Reference Phenomena, Anaphora Resolution using Hobbs and Centering Algorithm – Coreference Resolution

Resources: Porter Stemmer, Lemmatizer, Penn Treebank, Brill's Tagger, WordNet, PropBank, FrameNet, Brown Corpus, British National Corpus (BNC).

TEXT BOOKS:

1. Daniel Jurafsky, James H. Martin—Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, Pearson Publication, 2014.
2. Steven Bird, Ewan Klein and Edward Loper, —Natural Language Processing with Python, First Edition, O'Reilly Media, 2009.

REFERENCES

1. Breck Baldwin, —Language Processing with Java and LingPipe Cookbook, Atlantic Publisher, 2015.
2. Richard M Reese, —Natural Language Processing with Java, O'Reilly Media, 2015.
3. Nitin Indurkha and Fred J. Damerau, —Handbook of Natural Language Processing, Second Edition, Chapman and Hall/CRC Press, 2010.
4. Tanveer Siddiqui, U.S. Tiwary, —Natural Language Processing and Information Retrieval, Oxford University Press, 2008.

SEMESTER-VI

COURSE 5: INTRODUCTION TO NLP

Practical

Credits: 1

2 hrs/week

Experiments List

- 1) Write a program in prolog to implement simple facts and Queries
- 2) Write a program in prolog to implement simple arithmetic
- 3) Write a program in prolog to solve Monkey banana problem
- 4) Write a program in prolog to solve Tower of Hanoi
- 5) Write a program in prolog to solve 8 Puzzle problems
- 6) Write a program in prolog to solve 4-Queens problem
- 7) Write a program in prolog to solve Traveling salesman problem PO5,P07
- 8) Write a program in prolog for Water jug problem List of Experiments (NLP)

1. Word Analysis 2. Word Generation 3. Morphology 4. N-Grams 5. N-Grams Smoothing

SEMESTER-VI

COURSE 6: DEEP LEARNING

Theory

Credits: 3

3 hrs/week

UNIT I BASICS OF NEURAL NETWORKS

Basic concept of Neurons – Perceptron Algorithm – Feed Forward and Back Propagation Networks.

UNIT II INTRODUCTION TO DEEP LEARNING

Feed Forward Neural Networks – Gradient Descent – Back Propagation Algorithm – Vanishing Gradient problem – Mitigation – ReLU Heuristics for Avoiding Bad Local Minima – Heuristics for Faster Training – Nestors Accelerated Gradient Descent – Regularization – Dropout.

UNIT III CONVOLUTIONAL NEURAL NETWORKS

CNN Architectures – Convolution – Pooling Layers – Transfer Learning – Image Classification using Transfer Learning

UNIT IV MORE DEEP LEARNING ARCHITECTURES

LSTM, GRU, Encoder/Decoder Architectures – Autoencoders – Standard- Sparse – Denoising – Contractive- Variational Auto encoders – Adversarial Generative Networks – Autoencoder and DBM

UNIT V APPLICATIONS OF DEEP LEARNING

Image Segmentation – Object Detection – Automatic Image Captioning – Image generation with Generative Adversarial Networks – Video to Text with LSTM Models – Attention Models for Computer Vision – Case Study: Named Entity Recognition – Opinion Mining using Recurrent Neural Networks – Parsing and Sentiment Analysis using Recursive Neural Networks – Sentence Classification using Convolutional Neural Networks – Dialogue Generation with LSTMs.

TEXT BOOK:

1. Francois Chollet, “Deep Learning with Python”, Manning Publications, 2018.

REFERENCES:

1. Ian Good Fellow, Yoshua Bengio, Aaron Courville, “Deep Learning”, MIT Press, 2017.
2. Phil Kim, “Matlab Deep Learning: With Machine Learning, Neural Networks and Artificial Intelligence”, Apress , 2017.
3. Ragav Venkatesan, Baoxin Li, “Convolutional Neural Networks in Visual Computing”, CRC Press, 2018.
4. Navin Kumar Manaswi, “Deep Learning with Applications Using Python”, Apress, 2018.
5. Joshua F. Wiley, “R Deep Learning Essentials”, Packt Publications, 2016.

SEMESTER-VI

COURSE 6: DEEP LEARNING

Practical

Credits: 1

2 hrs/week

List of Experiments

Week-1 : Perceptron Learning Implementation

Week-2 : Multilayer Perceptron and its Hyperparameter Tuning

Week-3 : Hyperparameter Tuning

Week-4 : Implementation of Multilayer Neural Network using Keras and Data Augmentation on MNIST dataset.

Week-5 : CNN Implementation on MNIST Dataset.

Week-6 : Transfer Learning of pretrained models on MNIST dataset

Week-7 : Transfer Learning on Plant Village dataset for Plant Disease Detection

Week-8 : Sentiment Analysis using Recurrent Neural Networks(RNN)

Week-9 : Text Generation using LSTM

Week-10 : Denoising and Dimensionality Reduction for Medical MNIST dataset using Autoencoders