KRISHNA UNIVERSITY

BOARD OF STUDIES (BoS) – DEPARTMENT OF COMPUTER SCIENCE

MINUTES OF THE BOARD OF STUDIES MEETING

Agenda:

To discuss and approve the proposed **curriculum, course structure and syllabus for I and II Semesters of the following PG programmes**:

- **Computer Applications**
- **Artificial Intelligence and Robotics**
- **Artificial Intelligence and Machine Learning**
- **Cybercrime and Cyber Security**
- **Data Analytics**

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

Proceedings

The meeting commenced with the Chairman welcoming all the members. The proposed curriculum and syllabi for the **I and II Semesters of the PG programmes** were placed before the Board for discussion and consideration.

The members discussed the proposed **course structure, syllabus , credits, teaching scheme, practical components, Course Outcomes and assessment pattern** of the above programmes. The members suggested that the curriculum should be practical, application-oriented and aligned with current technological and industry requirements.

Resolution

After detailed discussion, the **Board of Studies approved/recommended the proposed curriculum and syllabus for the I and II Semesters** of the following PG programmes:

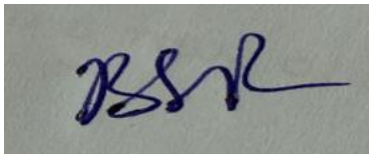
1. **Computer Applications**
2. **Artificial Intelligence and Robotics**
3. **Artificial Intelligence and Machine Learning**
4. **Cybercrime and Cyber Security**
5. **Data Analytics**

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

Conclusion

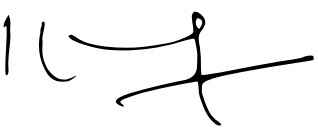
The Chairman thanked all the members for their valuable suggestions and active participation. The meeting concluded with a vote of thanks.











Model Syllabus for PG Diploma in DATA ANALYTICS

COURSE STRUCTURE (for Semester I & II)

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	I	1	Introduction to Python Programming	3	3
			Introduction to Python Programming	2	1
	II	2	Machine Learning	3	3
			Machine Learning practical	2	1

SEMESTER - 1

COURSE 1: Introduction to Python Programming

Theory **Credits: 3** **3 hrs/week**

UNIT – I:

Python basics, Objects- Python Objects, Standard Types, Other Built-in Types,Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types, Operators, Built-in Functions, Related Modules

Numbers - Introduction to Numbers, Integers, Floating Point Real Numbers,Complex Numbers, Operators, Built-in Functions, Related Modules

Sequences - Strings, Lists, and Tuples, Mapping and Set Types

UNIT – II

Files: File Objects, File Built-in Function [open()], File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules, Related Modules

Exceptions: Exceptions in Python, Detecting and Handling Exceptions, Context Management, Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and thesys Module, Related Modules

Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules

UNIT – III

Regular Expressions: Introduction, Special Symbols and Characters, Res and Python

Multithreaded Programming: Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module,
Related Modules

UNIT– IV

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs

Web Programming: Introduction, Wed Surfing with Python, Creating Simple Web Clients, Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI

UNIT – V

Database Programming: Introduction, Python Database Application Programmer's Interface (DBAPI), Object Relational Managers (ORMs), Related Modules. (18 hours)

TEXT BOOKS:

[1] Jake VanderPlas, Python Data Science Handbook:- Essential Tools for Working with Data, O'Reily Media Inc., 2016.

[2] Zhang.Y, An Introduction to Python and Computer Programming, Springer Publications, 2016.

SEMESTER - II

SEMESTER - 1

COURSE 1: Introduction to Python Programming

Practical **Credits: 1** **2 hrs/week**

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.

2. Write a python program to calculate total marks, percentage and grade of a student.

3. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :

   a) Grade A: Percentage >=80
   b) Grade B: Percentage>=70 and <80
   c) Grade C: Percentage>=60 and <70
   d) Grade D: Percentage>=40 and <60
   e) Grade E: Percentage<40

6. Write a python program to display the first n terms of Fibonacci series.

7. Write a python program to calculate the sum and product of two compatible matrices.

8. Write a function that takes a character and returns True if it is a vowel and False otherwise.

10. Write a menu-driven program to create mathematical 3D objects

    a) curve
    b) sphere
    c) cone
    d) ring
    e) Cylinder.

11. Write a python program to read n integers and display them as a histogram.

SEMESTER - II

COURSE 2 : MACHINE LEARNING

Theory **Credits: 3** **3 hrs/week**

UNIT-I

Introduction-Towards Intelligent Machines, Well posed Problems, Example of Applications in diverse fields, Data Representation, Domain Knowledge for Productive use of Machine Learning, Diversity of Data: Structured / Unstructured, Forms of Learning, Machine Learning and Data Mining, Basic Linear Algebra in Machine Learning Techniques.

UNIT-II

Supervised Learning- Rationale and Basics: Learning from Observations, Bias and Why Learning Works: Computational Learning Theory, Occam's Razor Principle and Overfitting Avoidance Heuristic Search in inductive Learning, Estimating Generalization Errors, Metrics for assessing regression, Metris for assessing classification.

UNIT-III

Statistical Learning- Machine Learning and Inferential Statistical Analysis, Descriptive Statistics in learning techniques, Bayesian Reasoning: A probabilistic approach to inference, K-Nearest Neighbour Classifier. Discriminant functions and regression functions, Linear Regression with Least Square Error Criterion, Logistic Regression for Classification Tasks, Fisher's Linear Discriminant and Thresholding for Classification, Minimum Description Length Principle.

UNIT-IV

Support Vector Machines (SVM)- Introduction, Linear Discriminant Functions for Binary Classification, Perceptron Algorithm, Large Margin Classifier for linearly seperable data, Linear Soft Margin Classifier for Overlapping Classes, Kernel Induced Feature Spaces, Nonlinear Classifier, Regression by Support vector Machines.

Learning with Neural Networks: Towards Cognitive Machine, Neuron Models, Network Architectures, Perceptrons, Linear neuron and the Widrow-Hoff Learning Rule, The error correction delta rule.

UNIT -V

Multilayer Perceptron Networks and error back propagation algorithm, Radial Basis Functions Networks. Decision Tree Learning: Introduction, Example of classification decision tree, measures of impurity for evaluating splits in decision trees, ID3, C4.5, and CART decision trees, pruning the tree, strengths and weakness of decision tree approach.

TEXT BOOKS:

[1]. Applied Machine Learning,1e, M.Gopal, Mc Graw Hill Education, 2018

REFERENCE BOOKS:

[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.

SEMESTER - II

COURSE 2 : MACHINE LEARNING

Practical **Credits: 1** **2 hrs/week**

1. Implement Decision Tree learning.
2. Implement Logistic Regression.
3. Implement classification using Multilayer perceptron.
4. Implement classification using SVM
5. Implement K-means Clustering to Find Natural Patterns in Data.
6. Implement K-mode Clustering
7. Implement Hierarchical clustering.
8. Implement Principle Component Analysis for Dimensionality Reduction.
9. Implement Multiple Correspondence Analysis for Dimensionality Reduction.
10. Implement Gaussian Mixture Model Using the Expectation Maximization.
11. Implement k-nearest neighbours algorithm to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.
12. Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.

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P.G. Diploma Model Paper for Core Subjects

Semester: I

Paper Title: Introduction to Python Programming

Time : 3hrs **Max. Marks:70**

Section –A (20 Marks)

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

1. Explain Python Objects.
2) Write about Built-in Functions.
3) Describe about Command-line Arguments.
4) Packages
5) Explain Thread module
6) File Operations
7) Raising Exception
8) Explain Wdgets

Section–B (50Marks)

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

9 a). Explain Data Types in Python with example.

OR

b). Define operator.Explain carious operators available in python

10 a) Discuss about Exception handling mechanism with example.

OR

b). Explain Modules in python.

11 a) Define Regular Expression. Explain methods in Regular Expression.

OR

b) Explain Global Interpreter Lock.

12 a) Explain Tkinter module.

OR

b) . Explain CGI .

13 a) . Explain about DBAPI

OR

b) define ORM. Explain it

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P.G. Diploma Model Paper for Core Subjects

Semester: II

Paper Title: Machine Learning

Time : 3hrs **Max. Marks:70**

Section –A (20 Marks)

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

1. Define ML.
2. Explain Data Mining
3. What is Occam's Razor Principle
4. What is K-Nearest Neighbour
5. What is Minimum Description Length Principle.
6. Draw Network Architecture
7. Define ID3 Algorithm
8. Define Neural Network

Section–B (50Marks)

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

9. a) Explain types of Learning methods in ML.

OR

b) Discuss about Linear Algebra in Machine Learning Techniques

10. a) Discuus about Classification method with suitable example.

OR

b) Explain about Heuristic Search.

11. a) Discuss about Bayesian algorithm

OR

b) Explain Logistic Regression in machine learning

12. a), Explain the concept of Support Vector Machines.

OR

b) Explain the Perceptron Algorithm with example.

13. a) Discuss about back propagation ,

OR

b) Discuss about Decision Tree Algorithm.