

MASTER OF COMPUTER APPLICATION

ASSIGNMENTS

MCA – 3rd SEMESTER



(SESSION 2026-2027)

**Centre for Distance and Online Education
Guru Jambheshwar University of Science
& Technology, Hisar - 125001**

CENTRE FOR DISTANCE AND ONLINE EDUCATION
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR
Programme: Master of Computer Application

Course Name: Machine Learning
Paper Code: MCA-31

Semester: 3rd
Total Marks: 30

Important Instructions

- 1) Attempt all questions from each assignment given below.
- 2) Each assignment carries 15 marks.
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal.

ASSIGNMENT-I

1. Define machine learning techniques and also explain different type of machine learning techniques with example in details.
2. What do you mean by unsupervised learning? Illustrate k-means clustering with the help of a real-life problem.
3. Explain decision tree with example. Also describe different measure used in the development of decision tree.

ASSIGNMENT-II

1. What is single and multilayer perceptron? Define backpropagation algorithm in details.
2. Define term instance-based learning. Explain k-nearest neighbour algorithm with the help of an example.
3. Explain supervised learning. Also describe support vector machine technique with its pros and cons.

Prepared by:
Dr. Neeraj Verma
Assistant Professor (CS)
CDOE, GJUS&T, Hisar

GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR
CENTRE FOR DISTANCE AND ONLINE EDUCATION
Programme: Master of Computer Application

Course Name: Advance Operating System
Code: MCA-32

Semester: 3rd
Total Marks: 30

Important Instructions

- 1) Attempt all questions from each assignment given below.
- 2) Each assignment carries 15 marks.
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal.

ASSIGNMENT-I

- Q1. Discuss the concept of operating system. Also explain its function and characteristics.
- Q2. Explain operating system services and system calls. Explain Types of operating system in detail.
- Q3. Write short note on:
- 1) PCB
 - 2) CPU Scheduling
 - 3) Thrashing

ASSIGNMENT-2

- Q1. What is File system? Discuss various types of files and their access methods in detail.
- Q2. What do you mean by Distributed operating system? Describe the issues in distributed operating system in detail.
- Q3. Write short note on:
- 1) Paging
 - 2) Segmentation
 - 3) TLB

Prepared By:
Dr. Ritu
Assistant Professor (CS)
CDOE, GJUS&T, Hisar

**CENTRE FOR DISTANCE AND ONLINE EDUCATION
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY,
HISAR**

Paper: Data Analytics

Semester: 3rd

Paper Code: MCA-33

Max. Marks: 30

Note: Important Instructions for submission of Online-Assignments.

- Attempt **all questions** from the following both assignments. Each question carries equal marks.
- **Typed and Xerox Copies of Assignments will not be accepted in any case.**
- All questions are to be attempted in **legible handwriting and written** on plane white A-4 size paper along with front page. Each page must carry your **Enrolment Number**.
- The student needs to scan all pages of handwritten assignment in **PDF format** size, of maximum **data 10 MB** per assignment.
- The student needs to upload assignments on **students' portal**. Read **“How to upload online Assignments”** and check the Instructions for online submission of Assignments.

ASSIGNMENT-1

- Q1. What are the different objects in R. Provide examples of how each object is implemented in R.
- Q2. Explain ten statistical functions. How would you compute and interpret statistical summaries (mean, median, mode, variance, and standard deviation) in R? How do you differentiate between a sample and a population when describing data?
- Q3. What are the different types of plots used for visualizing data? Explain how to create and interpret a scatter plot and a box plot using R?

ASSIGNMENT-2

- Q1. Explain the process of simple linear regression modeling. How would you estimate the coefficients and assess the accuracy of your model in R?
- Q2. Explain the process of classification modeling. Describe decision trees classification algorithm?
- Q3. Discuss how you would evaluate the accuracy of a classification model using metrics such as confusion matrix, sensitivity, specificity, and ROC curve.

Prepared By:
Dr Kapila Devi
Assistant Professor (CS), CDOE, GJUST

GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR
CENTRE FOR DISTANCE AND ONLINE EDUCATION

Programme: Master of Computer Applications

Course Name: Cyber Security

Semester: 3rd

Code: MCA-34

Total Marks: 30

Important Instructions

- 1) Attempt all questions from each assignment given below.
- 2) Each assignment carries 15 marks.
- 3) All questions are to be attempted in legible handwriting on plain white A-4 size paper and upload the scanned copy of the assignments on student's portal.

ASSIGNMENT-I

- Q1. What is information security? Explain the basic goals of confidentiality, integrity and availability (CIA Triad) with suitable examples. 5
- Q2. Explain common methods used to protect computer systems from unauthorized access. Discuss the role of authentication, authorization and strong passwords. 5
- Q3. What is malware? Explain any four common types of malware and briefly describe how they can affect computer systems. 5

ASSIGNMENT-II

- Q1. What is cyber law? Explain the importance of the Information Technology Act in regulating activities in cyberspace in India. 5
- Q2. Explain the concept of cyber-attack. Describe any four common types of cyber-attacks and suggest suitable preventive measures. 5
- Q3. Explain the role of social media in cyber security. Discuss common security and privacy risks faced by users and suggest ways to use social media safely. 5

Prepared By:

Dr. Ritu
Assistant Professor (CS)
CDOE, GJUS&T, Hisar

**CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR**

**Course: Theory of Computations
Paper Code: MCA-35**

**Semester: 3rd
Total Marks=30**

Important Instructions

- 1) Attempt all questions from each assignment given below.
- 2) Each assignment carries 15 marks.
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper.

ASSIGNMENT-I

- Q1. Explain the concept of Non-Deterministic Finite Automata (NFA) and provide an example. How does it differ from Deterministic Finite Automata (DFA)?
- Q2. What is the significance of the Pumping Lemma for Regular Sets? Explain how it can be used to prove that a language is not regular.
- Q3. What are Moore and Mealy Machines? Discuss their equivalence and provide an example of each.

ASSIGNMENT-II

- Q1. Define Context-Free Grammar (CFG) and Context-Sensitive Grammar (CSG). Discuss the concept of ambiguity in context-free grammar and how it can be resolved.
- Q2. Explain the Chomsky Normal Form (CNF) and Greibach Normal Form (GNF) for context-free grammars. Discuss the process of converting a context-free grammar to CNF and GNF.
- Q3. What is a Turing Machine (TM)? Explain the difference between a Deterministic Turing Machine (DTM) and a Non-Deterministic Turing Machine (NDTM).

Prepared by:
Dr. Kapila Devi
Assistant Professor (CS)
CDOE, GJUS&T, Hisar

CENTRE FOR DISTANCE AND ONLINE EDUCATION
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY,
HISAR

Course Name: Machine Learning Lab.
Code: MCA-36

Semester: 3rd
Max. Marks: 30

Important Instructions

1. Attempt any **Five** experiments/assignments.
2. All assignments are to be completed either in legible handwriting on plain white A4-size paper or typed in a Word file, along with appropriate screenshots of the output of the respective assignments. Practical file must be uploaded on the LMS portal.

List of experiments/assignments:

- Q1. Install WEKA/R/Python/Octave and learn to use these software packages.
- Q2. Two assignments related to classification algorithms and interpreting the results of these algorithms.
- Q3. Two assignments related to clustering algorithms and interpreting the results of these algorithms.
- Q4. Three assignments on designing neural networks for solving learning problems.
- Q5. Two assignments on ranking or selecting relevant features.
- Q6. Two assignments on linear regression and logistic regression.
- Q7. One assignment to be done in groups.

CENTRE FOR DISTANCE AND ONLINE EDUCATION
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR

Course Name: Data Analytics Lab
Code: MCA-37

Semester: 3rd
Max. Marks: 30

Important Instructions

1. Attempt any ten experiments/assignments.
2. All assignments are to be completed either in legible handwriting on plain white A4-size paper or typed in a Word file, along with appropriate screenshots of the output of the respective assignments. Practical file must be uploaded on the LMS portal.

List of experiments/assignments:

- Q1. To provide an overview of a language used for data science.
- Q2. Implement statistics like mean median etc. can be collected for data exploration
- Q3. Write a small program to implement all basic concepts
- Q4. Exercise with file handling packages.
- Q5. Write a script for statistics techniques (mean, mode, median, variance, standard deviation)
- Q6. Design user-define functions to apply processes on dataset.
- Q7. Write a script to work with tabular/ data frame using dataset.
- Q8. Exercise with different types of popular packages.
- Q9. Script to detect outlier and missing values.
- Q10. Write scripts to implement predictive model.
- Q11. Write a code to apply/analyse predictive model fitness.
- Q12. Write scripts on classification and regression algorithms
- Q13. Script for interpretation of confusion matrix from model.
- Q14. Implement the sampling methods for dataset.
- Q15. Implement Bootstrap method.
- Q16. Script for cross validation example.
- Q17. Draw all types of graphs with example in different scripts