MSc Data Science

The **MSc in Data Science** program at Osmania University is designed to provide students with a strong foundation in data analysis, machine learning, statistical modeling, and other advanced data science techniques.

The course objectives are crafted to equip students with the necessary skills to handle large data sets, extract valuable insights, and apply those insights to real-world problems across various sectors. The specific course objectives typically include:

1. Building a Strong Theoretical Foundation in Data Science

The program aims to provide a deep understanding of the core principles of data science, including statistics, probability, data analysis, and machine learning, to help students master the underlying theories.

2. Developing Technical Skills

Students gain proficiency in using various tools and programming languages commonly used in data science, such as Python, R, SQL, and big data technologies (e.g., Hadoop, Spark). The course emphasizes hands-on learning and technical skill development.

3. Mastering Data Processing and Analytics

The program prepares students to manage, process, and analyze large datasets effectively. It covers topics like data cleaning, data transformation, exploratory data analysis (EDA), and the application of analytics to solve complex problems.

4. Applying Machine Learning and AI Techniques

A key focus is on equipping students with the skills to apply machine learning algorithms and artificial intelligence techniques to real-world data, including supervised, unsupervised, and reinforcement learning.

5. Data Visualization and Interpretation

The course emphasizes the importance of data visualization in communicating insights. Students learn to use visualization tools like Tableau, Matplotlib, and Power BI to present data in an understandable and actionable manner.

6. Fostering Problem-Solving and Critical Thinking

Students are encouraged to develop strong problem-solving skills and critical thinking to analyze complex data and provide solutions to business and societal challenges using data-driven approaches.

7. Real-World Application in Various Domains

The MSc Data Science program is designed to prepare students for applying data science methods to various domains, including business, healthcare, finance, e-commerce, government, and more.

8. Industry Exposure and Collaboration

Many programs include industry internships, project work, and collaborations with data-driven organizations, allowing students to gain exposure to real-world applications and industry practices in data science.

9. Ethics and Data Governance

The program emphasizes the ethical implications of data science, including data privacy, security, bias in data, and responsible AI. Students are taught how to handle data responsibly, ensuring compliance with relevant laws and regulations.

10. Preparing for Careers in Data Science

The ultimate goal of the program is to prepare students for a career in data science. This includes roles such as data analyst, data scientist, machine learning engineer, business intelligence analyst, and other positions within technology, finance, healthcare, and research.

By the end of the MSc in Data Science program, students are expected to have acquired the technical, analytical, and critical thinking skills needed to effectively solve complex problems through data analysis and machine learning techniques in various industries.

Syllabus

SNO	Semester1	Semester2	Semester3	Semester4
1	Mathematical Foundations for Data Science	Statistical Inference	Deep Learning Techniques	Research Methodology
2	Design and Analysis of Algorithms	Data Visualization Techniques	Machine Learning Operations	Capstone Project-II
3	Software Engineering	Cloud Computing	a) Data Mining b) Text Data Analytics c)Enterprise Architecture d) Business intelligence	----
4	A: Principles of Data Science B: Java Programming	Artificial Intelligence	a) Data Stream Mining b) Sentimental Analysis c) Scalable Architecture d) Computer Vision	----
5	----	Advanced Machine Learning Techniques	----	----
	PRACTICALS			
1	Design and Analysis of Algorithms Lab	Statistical Inference & Data Visualisation Lab	Deep Learning Techniques Lab	----
2	A: Principle of Data Science Lab B: Java Programming Lab	Advanced Machine Learning Lab	Capstone Project-l	----
3	----	----	Seminar	----