Type of Course: Value Added Course		
Course Code: VACA201	**Title:** Data Science	**Duration:**40hrs
Course offered to- MCA 1st year	**Course Coordinator:** Mr. Saurabh Kumar	
Course Overview	This **VAC(value added course)** is offered by the **Faculty of Computer Applications.** It has 8 modules to complete this course, upon completion you will be awarded a Certificate. In this value added course students will learn how to extract insights from data using statistics and ML techniques, as well as data visualization skills. Students learn to work with popular analysis tools such as python and machine learning frameworks. This course is for all the students studying in the Faculty of Computer Applications. The following are the details.	
Course Prerequisites	Dedication to learn, Laptop with minimum i3 processor or better ,Comfort with learning mathematics and programming will be required; Understanding of Basic Python Programming Concept and Basics of Mathematics.	
Objectives	• To provide a strong foundation about Data Science • To understand the use of statistics in data science • To Understand the essential concepts of basic probability • To understand concepts about types of data • To learn the fundamentals of Machine Learning. • To understand concepts of Supervised Learning • To understand basic component of an intelligence system. • To explore applications of Data science. • To understand different types of machine learning algorithms and tools. • To learn how to use machine learning model to solve real world problem.	
Course Outcome	• Apply the fundamentals of statistics on real world data • List various approaches of Machine Learning. • Use Data Science for personal use • Describe machine learning algorithms to solve the real-world problems. • Develop machine learning models. • Classify data using Logistic regression • Identify appropriate models for solving machine learning problems. • Use of statistical tools to analyze and interpret data accurately • To make informed decisions based on the data	
Module No.	**Module Title**	**No. of hours (per module)**
Module I	**Overview of AI, M & DS**	**2**
Introduction to Data Science, Machine Learning and AI, Overlap between Data Science, Machine Learning and AI, Applications of Data Science in day to day life		
Module II	**Basic understanding about Data**	**2**
Data, Types of data: Structured Data, Semi structured data, Unstructured data, presence noise of data		
Module III	**Fundamentals of Statistics**	**5**

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Introduction, Descriptive Statistics: Mean, Mode, Median, variance, standard deviation, Normal distribution, Binomial Distribution, Sampling, correlation, outliers, Hypothesis testing, P-Value		
Module IV	**Fundamentals of Probability**	**6**
Definition, Important concepts of probability theory including random variables and independence, independent events, mutually exclusive events, collectively exhaustive events, conditional probability, Bayes Theorem, Discrete probability distribution.		
Module V	**Foundation of Linear Algebra**	**4**
Introduction to linear algebra, notations and definitions, Operations on matrices: additions, subtraction, multiplication, scalar multiplication, vector multiplication, Matrix inversion, transformation,		
Module VI	**Python Libraries Required For Data Science**	**7**
Numpy: key operations using numpy, **Pandas:** key operations on Data Frames, **Matplotlib:** Visualizing data, creating graphs		
Module VII	**Supervised Learning and Linear Regression**	**7**
Difference between supervised, unsupervised and semi-supervised learning and Reinforcement learning, Linear Regression, Loss function, Method of gradient descent		
Module VIII	**Classification and Logistic Regression**	**7**
Introduction to classification problems and Types of classification - Binary Classification, Multi-Class Classification, Logistic Regression		
Text Books	1. Introduction to Machine Learning with Python: A Guide for Data Scientists, Andreas C. Müller and Sarah Guido, O'Reilly, 2016.	
Reference Books	1.Python Cookbook, 3rd Edition by David Beazley (Author), Brian K. Jones (Author)	
Mode of Evaluation	Quizzes, Class Test	

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Department of Computer Applications

02 Nov 2020

CIRCULAR

VALUE ADDED COURSE (Data Science)- MCA

Students of MCA 1st year are hereby informed that value added course "Data Science" is scheduled from 18th November 2020 in your respective classroom, Academic Block-III.

Schedule:

- Time Slot: 03:00 PM to 05:00 PM
- Key Speaker: Mr. Saurabh Kumar
- Duration: 2 hrs

Program Overview:

The objective of this course is to develop python skills of students who are ready to deal with complexities in the computing world and are able to maintain data science skills as per the requirement.

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Mr. Jitendra Choudhary

(HOD)

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Data Science

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Organised By:

FACULTY OF COMPUTER APPLICATIONS

DATE
18 Nov- 16 Dec 2020

TIME
03 PM TO 05 PM

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Faculty of Computer Applications
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HOD
Mr. Jitendra Choudhary

Speaker:
Mr. Saurabh Kumar

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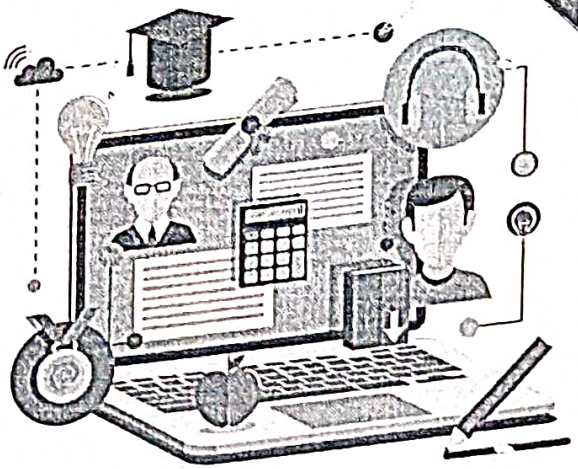
COURSE OVERVIEW

This course teaches students how to visualise data and extract insights from it using statistics and machine learning approaches. Students also gain experience working with well-known analysis tools including Python and machine learning frameworks.



HOD
MR. JITENDRA CHOUDHARY

Head
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SPEAKER
MR. SAURABH KUMAR

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