# Syllabus

## Introduction of Data Science, Artificial Intelligence, & Machine Learning

## Duration: 32 hours

**Module I:**

**Introduction to Data Science:** Definition and description of Data Science, history and development of Data Science, terminologies related with Data Science, basic framework and architecture, difference between Data Science and business analytics, importance of Data Science in today's business world, primary components of Data Science, Opportunities in Data Science, Data Scientist, Data Analyst.

**Module II:**

**Overview**: Data Mining, Data Warehouse, Difference between database and data warehouse. Definition of Artificial Intelligence, Importance of Artificial Intelligence, Machine Learning, deep Learning.Introduction to Big Data Analytics, Big Data technologies, Hadoop.

**Module III:**

**Introduction to Machine Learning:** Machine learning basic concepts, Perspectives and Issues in Machine Learning, Types of Machine Learning, supervised – unsupervised – reinforcement,

**Supervised learning:** Linear Regression, Gradient Descent (GD), Classification- Logistic regression, k-nearest neighbor classifier

**Unsupervised Learning:** k-means clustering, Association

**Text Book:**


- Tom M. Mitchell, "Machine Learning. Tata McGraw-Hill Education.
- Alpaydin, E. '"Introduction to machine learning. MIT press.
- Elaine Rich, Kevin Knight: Artificial Intelligence, Tata McGraw Hill.
- Data Smart: Using Data Science to Transform Information into Insight 1st Edition by John W. Foreman. (2015) Wiley Publication.
- Arun K Pujari, "Data Mining Techniques", 2nd Edition University Press, 2010


**Reference Book:**


- Dr. Anil Maheshwari, "Data Analytics", McGraw Hill Education (India) Private Limited
- Data Science For Dummies by Lillian Pierson
- Tom M Mitchell, ―Machine Learning‖, First Edition, McGraw Hill Education.
- D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999.

# Schedule

## BCA-III-A

| Duration: 32 hours | | | |
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| **Session** | **Content** | **Time** | **Date** |
| S 1 | Definition and description of Data Science | 3:00-4:00 | 16-Aug-21 |
| S 2 | history and development of Data Science | 3:00-4:00 | 20-Aug-21 |
| S 3 | terminologies related with Data Science | 3:00-4:00 | 23-Aug-21 |
| S 4 | basic framework and architecture | 3:00-4:00 | 17-Aug-21 |
| S 5 | difference between Data Science and business analytics | 3:00-4:00 | 30-Aug-21 |
| S 6 | importance of Data Science in today's business world | 3:00-4:00 | 3-Sep-21 |
| S 7 | primary components of Data Science | 3:00-4:00 | 6-Sep-21 |
| S 8 | Opportunities in Data Science | 3:00-4:00 | 10-Sep-21 |
| S 9 | Data Scientist | 3:00-4:00 | 13-Sep-21 |
| S 10 | Data Analyst. | 3:00-4:00 | 17-Sep-21 |
| S 11 | Revision | 3:00-4:00 | 20-Sep-21 |
| S 12 | Data Mining | 3:00-4:00 | 24-Sep-21 |
| S 13 | Data Warehouse | 3:00-4:00 | 27-Sep-21 |
| S 14 | Difference between database and data warehouse | 3:00-4:00 | 1-Oct-21 |
| S 15 | Definition of Artificial Intelligence | 3:00-4:00 | 4-Oct-21 |
| S16 | Importance of Artificial Intelligence | 3:00-4:00 | 8-Oct-21 |
| S17 | Machine Learning | 3:00-4:00 | 11-Oct-21 |
| S18 | deep Learning | 3:00-4:00 | 18-Oct-21 |
| S19 | Introduction to Big Data Analytics | 3:00-4:00 | 22-Oct-21 |
| S20 | Big Data technologies | 3:00-4:00 | 25-Oct-21 |
| S21 | Hadoop. | 3:00-4:00 | 29-Oct-21 |

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| S22 | Revision | 3:00-4:00 | 1-Nov-21 |
| S23 | Machine learning basic concepts | 3:00-4:00 | 8-Nov-21 |
| S24 | Perspectives and Issues in Machine Learning | 3:00-4:00 | 12-Nov-21 |
| S25 | Types of Machine Learning | 3:00-4:00 | 15-Nov-21 |
| S26 | supervised – unsupervised – reinforcement, | 3:00-4:00 | 22-Nov-21 |
| S27 | Supervised learning: Linear Regression, | 3:00-4:00 | 29-Nov-21 |
| S28 | Gradient Descent (GD) | 3:00-4:00 | 3-Dec-21 |
| S29 | Classification- Logistic regression | 3:00-4:00 | 6-Dec-21 |
| S30 | k-nearest neighbor classifier | 3:00-4:00 | 10-Dec-21 |
| S31 | Unsupervised Learning: k-means clustering | 3:00-4:00 | 13-Dec-21 |
| S32 | Association | 3:00-4:00 | 14-Dec-21 |

| | **Report** |
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| **Name of Activity** | Introduction of Data Science, Artificial Intelligence & Machine Learning |
| **Date** | 16th August 2021 to 14th December 2021 |
| **Venue** | BCA Classroom |
| **Organized by** | Computer Application Department |
| **Resource Person** | Mr. Suraj Shukla ,Assistant Professor, MIMT |
| **Beneficiary** | BCA 3rd Semester Sec-A(44 students) |
| **Coordinator** | Mr. Himanshu Rastogi , Assistant Professor, MIMT |
| **Objective** | The aim of this certification course is to<br>• Make students learn different AI and ML techniques required in corporate. With theoretical concepts and their respective examples.<br>• To expose the student set the fundamental concepts of Artificial Intelligence and its applications. To explain about the basics of machine learning.<br>• acquire knowledge on intelligent systems and agents, formalization of knowledge, reasoning with and without uncertainty, machine learning and applications at a basic level. |
| **Content** | With the initiative of IQAC, Mangalmay Institute of Management and Technology organized an add on certification course on "Introduction of Data Science, Artificial Intelligence, & Machine Learning " The course enabled the students to defining basics of AI & ML, what it comprises and its importance in modern day organization.<br>Day1: The session started with the discussion on introduction of data science.<br>Day 2: In this session, the resource person were discussed about the history and development of data science.<br>Day 3: In this interactive session, students knew about the new terminologies related with data science. |

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| | Day 4: In this session, students learnt about the basic framework and architecture of data science.<br>Day 5: The resource persons started to differentiate between data science and business analytics.<br>Day 6: In this session, learnt about the importance of data science in today's world.<br>Day 7: students learnt about the primary components of data science.<br>Day 8: In this session, the resource persons discussed about opportunities in data science.<br>Day 9: The resource persons discussed about the data scientist.<br>Day 10:This session starts with the discussion of data analyst.<br>Day 11: In this session, revision of first module is scheduled.<br>Day 12: In the next session, data mining were discussed.<br>Day 13: Now come to the data warehousing in data science.<br>Day 14: The resource person now comes to differentiate between database and data warehouse.<br>Day 15: In this session, resource person starts with the artificial intelligence.<br>Day 16: Resource person discussed about the importance of artificial intelligence.<br>Day 17: The Resource person discussed about the introduction of machine learning.<br>Day 18: The session was about the deep learning. |

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| | Day 19: In this session, introduction to big data analytics were explain.<br>Day 20: New technologies of big data were discussed.<br>Day 21: The resource person now comes to the Hadoop.<br>Day 22: The resource person revised or discussed the whole session of module 2.<br>Day 23: In this session Students learnt the basic concepts of machine learning.<br>Day 24: Students learnt about the perspectives and issues in machine learning.<br>Day 25: This session discussed about the types of machine learning.<br>Day 26: This session discussed about the terms such as supervised, unsupervised and reinforcement.<br>Day 27: Students learnt more about the supervised learning like linear regression.<br>Day 28: The resource person discussed gradient descent.<br>Day 29: In this session, classification of machine learning were discussed.<br>Day 30: The session is based on the K- nearest neighbor classifier.<br>Day 31: Now come to the unsupervised learning means K- means clustering.<br>Day 32: At the last, association was discussed. |
| **Outcome of Activity** | • Understanding about the basic concepts of Software agents ad representation of knowledge.<br>• Understanding of the strengths and weaknesses of many popular machine learning approaches. |

# List of Beneficiary

## BCA-3rd Sem-A

| Sr. No. | Roll No. | Student Name |
|---|---|---|
| 1 | R200992106001 | AASHISH RAWAL |
| 2 | R200992106003 | ABHISHEK KUMAR |
| 3 | R200992106004 | ABHISHEK KUMAR THAKUR |
| 4 | R200992106005 | ABHISHEK SHUKLA |
| 5 | R200992106009 | AMAN RAJ |
| 6 | R200992106010 | AMAN RAJ |
| 7 | R200992106011 | AMAN TRIPATHY |
| 8 | R200992106012 | AMIT |
| 9 | R200992106020 | ANKITA DUTTA |
| 10 | R200992106022 | ANSHIKA SINGH |
| 11 | R200992106026 | BARDANI |
| 12 | R200992106028 | DEEPAK KUMAR |
| 13 | R200992106029 | DEEPAK KUMAR |
| 14 | R200992106030 | DEEPANSHU SHARMA |
| 15 | R200992106035 | GAGAN KUMAR |
| 16 | R200992106036 | GAURABH KUMAR JHA |
| 17 | R200992106037 | GAURAV KUMAR |
| 18 | R200992106039 | HARIOM KUMAR |
| 19 | R200992106040 | HARSH GARG |
| 20 | R200992106041 | HARSH RAJ BHARDWAJ |
| 21 | R200992106044 | JAGANNATH MAJUMDAR |
| 22 | R200992106046 | KUBER SINGH |
| 23 | R200992106049 | LAKSHYA BANSAL |
| 24 | R200992106050 | MANISH |
| 25 | R200992106052 | MANISH RAVI PALIWAL |
| 26 | R200992106061 | MOHIT KUMAR |
| 27 | R200992106064 | NITESH KUMAR |
| 28 | R200992106068 | PARITOSH KUMAR JHA |
| 29 | R200992106073 | PRIYA MISHRA |
| 30 | R200992106085 | SACHIN SINGH |
| 31 | R200992106088 | SAGAR VASHISHT |
| 32 | R200992106090 | SAMIR KUMAR SAW |
| 33 | R200992106092 | SANJAY |
| 34 | R200992106093 | SANJEEV KUMAR |

| | | |
|---|---|---|
| 35 | R200992106094 | SANJEEV KUMAR |
| 36 | R200992106109 | SUMIT KUMAR |
| 37 | R200992106112 | TANISH NAGAR |
| 38 | R200992106114 | TUSHAR BANSAL |
| 39 | R200992106119 | VARUN KUMAR YADAV |
| 40 | R200992106121 | VINEET KASHYAP |
| 41 | R200992106122 | VINIT KUMAR |
| 42 | R200992106126 | VISHAL KUMAR |
| 43 | R200992106129 | VIVEK KUMAR |
| 44 | R200992106132 | YOGITA KAUSHIK |

Mangalmay Institute of Management Technology
Greater Noida (U.P.)

# Resource Person Profile

**Name:** Mr. Suraj Shukla , Assistant Professor

**Organization:** MIMT, Greater Noida

**Qualification:** MCA, PhD (P)

**Experience:** 6 years

**Research Area:** Data Science, Machine Learning, Deep Learning

Mangalmay Institute of Management Technology
Greater Noida (U.P.)

# Certificate Template:

MANGALMAY
INSTITUTE OF MANAGEMENT & TECHNOLOGY

Certificate No. BCA/21-23/SP-302/002

CERTIFICATE OF COURSE COMPLETION

This is to certify that

Lakshya Bansal

Student of BCA, Batch (2020-23) has successfully completed 30 Hours

Specialization Course on AI and ML

from Aug 2021 to Dec 2021 with Grade A

Course Coordinator | Head of the Department | Chairman

MANGALMAY
INSTITUTE OF MANAGEMENT & TECHNOLOGY

Certificate No. BCA/21-23/SP-302/048

CERTIFICATE OF COURSE COMPLETION

This is to certify that

Deepak Kumar

Student of BCA, Batch (2020-23) has successfully completed 30 Hours

Specialization Course on AI & ML

from Aug 2021 to Dec 2021 with Grade B+

Course Coordinator | Head of the Department | Chairman

Mangalmay Institute of Management Technology
Greater Noida (U.P.)

MANGALMAY
INSTITUTE OF MANAGEMENT & TECHNOLOGY

Certificate No. BCA/21-24/SP-302/007

## CERTIFICATE OF COURSE COMPLETION

This is to certify that

Bandani

Student of BCA, Batch (2021-23) has successfully completed 30 Hours

Specialization Course on AI And ML

from Aug 2021 to Dec 2021 with Grade A

Course Coordinator

Head of the Department

Chairman