Master of Science (MSc) in Data Science

Programme Objectives

- This Programme equips the students with the knowledge and skills that are needed to meet the challenges of data handling and data science in the modern world of Industry I4.0. The programme covers data science, visualization techniques, decision-making and predictive analysis, data modeling optimization and big data analytics.
- Each module is designed to give students a comprehensive understanding of the field of data science, while also applying learnt skills to projects that will help build a portfolio of work.
- Students will learn to comprehend organizational data, develop processes for managing data, analyze large dataset in cloud environment/ data warehouses and use data to make key business decisions.
- This Programme promotes exploratory research in the field of Data Science and computing and digital technologies for business success**.**
- This programme is designed to facilitate the students with exclusive hands-on experience on data science and data analytics software such as R studio, Power BI, Rapid Miner, PL/SQL, Apache Pig, Tableau, Python, Hadoop, Hive and SQL, IBM Watson, Keras, Tensor Flow, Google Colab, Amazon Web Services.

Total Number of Credits: 270

Duration of the Programme: 2 Years

Entry Requirements for the Programme

- An undergraduate degree or equivalent from a recognized higher education institution or alternative qualifications acceptable to the Amity Institute of Higher Education.
- AIHE may also consider applications for mature students meeting its own strict Rules and Regulations taking the appropriate minimum basic qualification into account by adhering to the mature student's policy of AIHE.

Modules
Year: 1
Semester: 1
Module Code: IT421
Module Name: PYTHON PROGRAMMING
Credits: 20
Module Brief:
The student will be able to demonstrate the ability to program using Python language by mastering the learning outcomes including python variables, data types and operators, data Structures in Python. The learner gets trained in coding and practical execution of functions and

dictionaries, Loops and their executions, and analyzing data streams using Python. Database connectivity is practically demonstrated to the learner. The learner is taught exceptions and Error handling, Python standard libraries and packages for data analysis. Basic Portfolio analysis using Python and visualizing the data are demonstrated. Research papers pertaining to the module syllabus are referred to impart better learning by students.

Year: 1
Semester: 1
Module Code: IT431
Module Name: DATABASE SYSTEMS FOR DATA SCIENCE
Credits: 20
Module Brief:
This module equips students with skills to analyze and demonstrate the use of databases for data science, data warehousing and use of big data query language. Students are taught cloud computing techniques and database instance in Cloud using appropriate case scenario consideration. Hands-on training on data integration, big data management, improving data quality, dealing with missing or incomplete data, data visualization, and data classification are imparted to students.

Year: 1
Semester: 1
Module Code: MGT412
Module Name: BUSINESS RESEARCH METHODS
Credits: 20
Module Brief:
The module will build the foundation for research. The students will learn to compare and contrast the new knowledge, farmulate and design research methodology to criticaly define the management problem and investigate the cause. Hence the student would become acquainted with the scientific research methodology and reporting in dynamic business domain. They would also become analytically skillful.

Year: 1
Semester: 2
Module Code: IT422
Module Name: R STUDIO FOR DATA SCIENCES
Credits: 20
Module Brief:
This module equips the students with learning outcomes on importing, performing data cleaning, managing and structuring data files for use in business Analytics. Learner will be trained to apply analytical knowledge, visualize the data, perform statistical data analysis, multivariate analysis, cluster analysis, critically evaluate and interpret the data and perform predictive analytics through the use of R programming language. The module aims to provide hands-on experience on text mining and Web mining using R, thereby developing data mining skills.

Year: 1
Semester: 2
Module Code: IT461
Module Name: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
Credits: 20
Module Brief:
This module promotes searching and discovering intelligent characteristics of existing AI projects. This module aims to equip students with knowledge to understand and interpret AI search strategies for a problem. Skills development in terms of programming a new game/ problem in Prolog, knowledge representation in AI problems, use of machine learning for various industry requirements are achieved through hands-on training, lectures, and through consideration of case scenarios. By learning this module, the students will be able to design appropriate machine learning algorithms for problem solving, design and implement typical AI solutions for industry requirements.

Year: 1
Semester: 2
Module Code: IT472
Module Name: BUSINESS ANALYTICS TOOLS AND TECHNIQUES
Credits: 20
Module Brief:
This module equips students with skills to analyze, evaluate and demonstrate business analytics tools and techniques, and data visualization techniques. The module equips students with knowledge and hand-on training on Hadoop Ecosystem, Yarn, Tableau user interface, data connection, data exploration and Data Analytics, Power BI user interface data connection, data exploration and Data Analytics.

Year: 1
Semester: 3
Module Code: IT572
Module Name: DATA WAREHOUSING AND DATA MINING
Credits: 20
Module Brief:
The module aims to impart knowledge and hands-on training to students on OLAP and OLTP, schemas of multidimensional data, architecture of data warehouse, data staging, data warehouse, visualization and deployment. Implementing KDD process by assuming a data frame of business data, text data mining & clustering techniques are being taught in this module using appropriate case scenarios. Further research is promoted through conduct of group discussions, presentations and critical review on published research papers

Year: 1
Semester: 3
Module Code: IT591
Module Name: GOVERNANCE, RISKS & COMPLIANCE

Credits: 20
Module Brief:
The module aims to impart knowledge to students on relevant laws and regulations, recognizing their significance for dealing with key ethical issues surrounding the creation, storage and dissemination of, and access to information, using ICTs (information and communication technologies), in the context of a globalized 'information society'. The most common cyber security threats and vulnerabilities encountered by organizations, are being discussed through handling of case studies in the module. By learning this module, the student can develop an understanding of technologies and methods to protect an organization against these threats and vulnerabilities and learn to consider what might be the most ethical and professional response to such situations.

Year: 1
Semester: 3
Module Code: IT533
Module Name: CLOUD COMPUTING
Credits: 20
Module Brief:
This module aims to equip students with knowledge and skills development on various cloud platforms and technologies. The module learning promotes student's ability to implement and design cloud patterns, data centre architecture using technologies. The students will be promoted to prepare cloud strategies and technical building blocks of IaaS. This module imparts hands-on experience on cloud capacity management and adopting to cloud to students.

Year: 1
Semester: 4
Module Code: IT574
Module Name: PREDICTIVE AND PRESCRIPTIVE DATA ANALYTICS
Credits: 20
Module Brief:
On successful completion of this module the student will be able to analyse complex datasets, evaluate and demonstrate critical inferential, predictive and prescriptive analytics. This module by gathering tool chest including R, Python libraries manage to interrogate raw and derived data and equips students with skills to simulated big datasets. Students are trained in natural language processing methods, predictive modeling tools and techniques, and in deep learning for predictive and prescriptive analytics.

Year: 1
Semester: 4
Module Code: IT575
Module Name: BIG DATA ANALYTICS
Credits: 20
Module Brief:

This module aims to equip students with knowledge and hands-on experience on software tools and techniques on working big data, and its analytics. Based on case scenario, students are being trained on software tools including Hadoop, MapReduce, Python, Yarn and R programming. Students are promoted to do research that requires the integration and critical analysis on large amounts of data. Details on data classification methods, data clustering, data association, stream memory are being delivered in this module. Students are trained in data management for big data and visualization of the same using NoSQL.