DESCRIPTION OF COURSES (BSc-ADS)

ADS 100 Introduction to Data Science

1 Term; 3 Credits

This course aims to offer fundamental knowledge of data science and computer to students. The course covers the basic knowledge of data science concepts and methodologies, applications of data science, data management practices, computer architecture, and basic networking and cryptographies. Upon completion of the course, students will possess a basic understanding of data science and computer which will be further developed in other data science related courses throughout the programme.

ADS 130 Probability and Statistics

1 Term; 3 Credits

This course explores the concepts of modern probability and statistical theory for decision making in various fields including economics, business, and social sciences. It will help students in learning and understanding theoretical and practical applications of probability and statistics. The course also aims to develop skills in analysing and solving problems from probabilistic and statistical point of view. Additionally, this course provides the basic knowledge of these concepts that are further used in machine learning theory for prediction applications.

ADS 151 Python for Data Science

1 Term; 3 Credits

The aim of this course is to offer the essential knowledge of Python for data science application. The course provides the basic understanding of data science workflow in Python and the essential skills of using Python to solve data science problems. Upon completion of the course, students will be able to apply data science skills to validate hypotheses and disseminate thoughts.

ADS 210 Digital Humanities: Theories and Methods

1 Term; 3 Credits

This is an introductory course on Digital Humanities, its theory, methods, and applications. The aim of the course is to use data to tell stories and understand the usage of different tools related to data to reverse engineer digital humanities projects. Students will be able to compare different tools in accordance with different digital humanities projects and research. Students will be able to use these tools to answer questions related to digital humanities research and projects. The course also includes a final project so students can learn how to work collaboratively in this field.

ADS 230 Introduction to Database Systems

1 Term; 3 Credits

The aim of this course is to develop students' skills to store data in database systems through introducing the fundamental concepts of database systems. The course covers not only the basic knowledge of the related technologies in database implementation, but also practical skills to administer and manipulate database systems of multiple databases. Upon completion of the course, students will be able to apply the database design methods to the modelling, design and implementation of databases for various business information systems.

ADS 240 Computer Programming as Problem Solving

1 Term; 3 Credits

The aim of this course is to develop students' programming skills through introducing the core and fundamental computer programming knowledge. The course covers the knowledge on common programming tools and terminology and the way of improving problem solving skills with programming. Upon completion of the course, students will break down daily problems with a logical approach and implement the programming solution.

ADS 250 Introduction to Data Visualization and VR/AR

1 Term; 3 Credits

The aim of the course is to introduce the concepts of Data Visualization and Virtual/Augmented Reality (VR/AR) technologies and equip students with the hands-on skills to become a better storyteller using data visualization and virtual environments. This course is divided into three parts. The first part gives a solid foundation of data visualization for students so that they can present data optimally through visualization. The second part introduces the characteristics of different VR/AR techniques and applications. The third part equips students with skills to develop VR/AR applications through Unity. Through the practical exercises, students will be able to apply data visualization and VR/AR techniques to address real-world problems.

ADS 261 Calculus and Linear Algebra

1 Term; 3 Credits

The aim of this course is to deliver the basic mathematical concepts which are applicable in diverse disciplines. Upon completion of the course, students will possess a basic understanding on linear algebra, matrix and calculus, and conduct their operations, including the rules of differentiation and integration.

ADS 310 Research Methods and Data Analytics

1 Term; 3 Credits

This course introduces basic research methods, helps students develop the required thought process for identifying a real-world research question and the skills to use data to provide a solution for the identified research problem. This course also aims to equip students with concepts, tools, ability to identify good literature resources, and perform data analytics. Finally, the course also aims to introduce data analytics, frameworks and software tools for data

visualization, processing and understanding data, which can assist them to write good technical reports. This course enables students to write their own research proposals and ultimately good research articles.

ADS 320 Introduction to Data Mining

1 Term; 3 Credits

The aim of this course is to develop students' skill on data mining through introducing the fundamental concept of data mining. The course covers a broad view of the general data mining issues surrounding semi-structured and unstructured data and the application of models. Upon completion of the course, students will be able to perform data mining tasks including data preprocessing, selecting a model, tuning the model, and evaluating the performance of the data mining model adapted.

ADS 330 Research Methods and Data Analytics

1 Term; 3 Credits

The course aims to develop student's ability to learn the need of data analytics to leverage social media data. The course introduces students with tools such as engagement analytics, sentiment analysis, social network analysis, evaluation of social media, topic modelling etc. This course will help students to deepen their insights based on the mentioned data analytics tools and help them to take better business decisions by leveraging social media data.

ADS 340 Big Data Ecosystem

1 Term; 3 Credits

The aim of this course is to enhance students' understanding of the concept of big data ecosystem and architecture including the knowledge on distributed storage and basic operations over Hadoop big data architecture. Upon completion of the course, students will be able to select the appropriate tools for different challenges in building a big data environment, configure Hadoop Distributed File System (HDFS), and install monitor performances of HDFS.

ADS 360 Computational Thinking

1 Term; 3 Credits

The aim of this course is to equip students with an understanding of fundamental computational thinking with a very basic experience in computer programming. Students will have the opportunity to learn how to abstract and solve different problems logically and arithmetically, and their implementation in a programming language. This course introduces concepts of devising algorithms by introducing a few basic algorithms, testing and debugging and evaluating solutions. Additionally, students also learn how to show their output data professionally.

ADS 370 R for Data Science

1 Term; 3 Credits

The aim of this course is to enhance students' coding skills through R programming. The course covers the beginner and intermediate levels of R programming and packages. The

course provides not only the basic understanding of data science workflow in R, but also the essential skills of R to solve data science problems. Upon completion of the course, students will be able to apply data science skills to validate hypotheses and disseminate thoughts..

Note: For the descriptions of courses not listed under the Department of Applied Data Science, please refer to their respective Departments for details