



KINGDOM OF SAUDI ARABIA
IMAM MOHAMMAD IBN SAUD ISLAMIC UNIVERSITY
COLLEGE OF COMPUTER AND INFORMATION SCIENCES
INFORMATION SYSTEMS DEPARTMENT
MASTER OF SCIENCE IN INFORMATION SYSTEMS

المملكة العربية السعودية
جامعة الإمام محمد بن سعود الإسلامية
كلية علوم الحاسب والمعلومات
قسم نظم المعلومات
ماجستير العلوم في نظم المعلومات

SYLLABUS

Course Code: IS-6221 **Course Name: Fundamentals of Data Science**

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|---------------------|----------|
| CREDIT HOURS | 4 |
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|---------------------|-------------|
| PREREQUISITE | None |
|---------------------|-------------|

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| Instructor: |
| Contact information and office hours |
| Office No: To be announced (TBA) |
| Office Hours: TBA |
| E-mail: _____@imamu.edu.sa |

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| COURSE DESCRIPTION |
| Data Science is a field which uses methods and algorithms for extraction of information from structured or unstructured data. Due to growth in data and evolution in technology, the domain of data science has seen a tremendous rise. This course is designed to give you a comprehensive introduction to data science and analytics landscape. You will learn to apply statistical techniques and machine learning algorithms to draw insights and build predictive models while adhering to ethical guidelines. |

| COURSE LEARNING OUTCOMES (CLOs) | | Aligned SOs |
|---------------------------------|--|-------------|
| 1 | Knowledge and Understanding | |
| 1.1 | Understand the fundamental concepts of data science. | K1 |
| 1.2 | Review state of art researches to comprehend popular data science statistical tools. | K3 |
| 2 | Skills : | |
| 2.1 | Perform research to identify gaps in existing and standard systems in the | S1 |



| | | |
|----------|---|----|
| | field of data science. | |
| 2.2 | Utilize the appropriate technology to meet the organizational needs of data science. | S4 |
| 3 | Values: | |
| 3.1 | Write course project reports abiding all ethical standards using leadership and management talents. | V2 |
| 3.2 | Function effectively individually as well as on teams to accomplish a common goal. | V3 |

TEACHING Strategies

Class lectures, Assignment, Project explanation session.

| N o | List of Topics | Contact Hours | Self- Learning |
|----------------|---|--------------------------|---------------------------|
| 1 | Introduction to Data Science | 4 | |
| 2 | Data Manipulation and Analysis with Pandas | 4 | |
| 3 | Data Visualization with Matplotlib | 4 | |
| 4 | Statistical Inference, probability distributions and hypothesis testing | 4 | |
| 5 | Introduction to Machine Learning and techniques | 4 | |
| 6 | Supervised Learning | 4 | |
| 7 | Unsupervised Learning | 4 | |
| 8 | Neural Networks and Deep Learning | 4 | |
| 9 | Natural Language Processing | 4 | |
| 10 | Ethics and Privacy issues in Data Science | 2 | |
| 11 | Project Presentations | 2 | |
| Total | | 40 | |

TEXT BOOK

Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking by Foster Provost

REFERENCES

- Data Science from Scratch: First Principles with Python by Joel Grus
- Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython by Wes McKinney



| Course Assessment Methods | | | |
|----------------------------------|--------------------------|-----------------|------------------------------|
| No | Assessment Method | Due Week | % of Total Assessment |
| 1 | Quizzes | 3 | 10 |
| 2 | Assignments | 5 | 10 |
| 3 | Midterm | 8 | 20 |
| 4 | Project | 10 | 20 |
| 5 | Final Exam | 11 | 40 |