

Group 19

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CONTENTS

1 MIE1624 Course Redesign

Program Curriculum Design

Program Visualization

Recommender System Design



PART 01

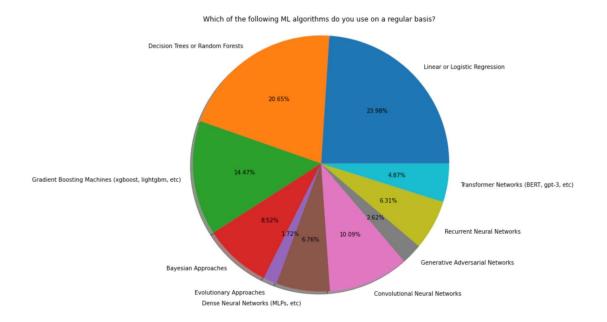
MIE1624 course redesign

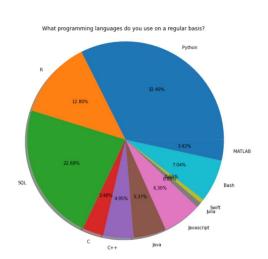
Resourse

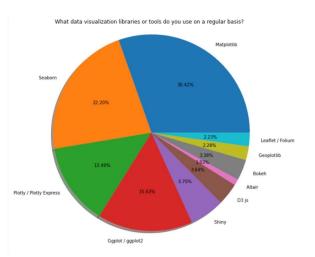
Kaggle Machine Learning & Data Science
 Survey 2021

• Similar courses

Analysis the survey data









The most popular computer programming languages are Python, SQL and R.



The most frequently used machine learning algorithms are linear or logistic regression, decision trees or random forest and Gradient Boosting Machines



Matplotlib and Seaborn are the two most frequently used visualization libraries

MIE1624 Module

Visualization Optimization Unsupervised Supervised Introduction to · Introduction to visual algorithm machine learning data science analytics Linear optimization · Visualization using algorithm · Course introduction Hierarchical Random Forest Matplotlib Unconstrained Data science Clustering Gradient Boosting · Visualization using nonlinear optimization concept K-means Clustering K-NN Seaborn algorithm Introduction to · K- Nearest neighbors Naïve Bayes · Visual analytics in Constrained non-linear programming in Principal Tableau and Power BI optimization algorithm python Components Visualization case Optimization case · Introduction to SQL **Analysis** studies in Ipython studies in Ipython 10 3 Introduction to Overview of **Basic statistics** Modeling Supervised **Automated**

Mathematics concept and optimization

- Linear algebra and matrix computations
- Derivative and convexity

- · Random variables and Sampling
- · Probability distribution
- Bayesian statistics
- · Hypothesis testing and statistical significance
- · Statistic case studies in **Ipython**

techniques

- Data mining
- · Preprocessing data
- · Model selection
- Hyperparameter tuning
- · Bias-variance tradeoff

machine learning I

- · Linear regression
- · Logistic regression
- · Decision tree

machine learning II

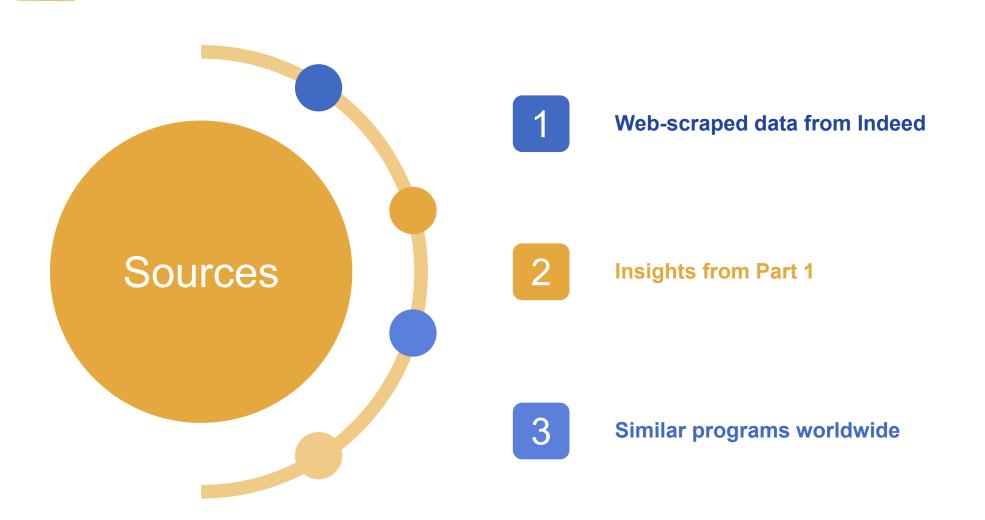
machine learning tools

- · Automated model selection
- Automation of ML pipelines
- Automated hyperparameter tuning



PART 02

Program Curriculum Design



Identified skills

Coding & Software

- Python
- R
- Tableau
- ..

Professional

- Data analysis
- Database management
- Data visualization
- ...

Business-oriented

- Communication
- Teamwork
- Leadership
- ...

Program Structure





Time Length

16 months, full-time, 7 credits



Courses

- 2 introductory courses, 4 core courses, 6 elective courses
- 1 co-op term
- 1 capstone project equals to 2 elective courses



Specializations

- Data analysis
- Data science
- Data engineering
- Data management



PART 03

Program Visualization

Master of Data Science and Artificial Intelligence

Become an excellent data professional

In the era of big data today, most enterprises are using big data. Every link of the data industry needs to be completed by professionals. However, the ability to uncover business insights based on data is a highly specialized skills processed by too few people. The supply of data professionals who can derive business insights and make informed decisions from data is far from meeting the market demand.

Master of Data Science and Artificial Intelligence program was designed to address this workforce gap by equipping students with the technical skills, business skills, practical experience, and most importantly, the confidence to seize opportunities in an ever-expanding field.

Comprehensive learning

The combination of the theoretical learning and the practical learning

Program Features

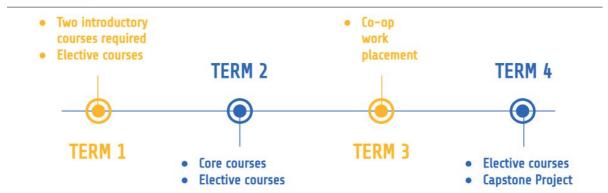
Real-world experience

Students gain practical experience using real data sets across a range of domains



Diverse datasets

Students have chances to apply their theoretical knowledge in the real company business problems.



Technical - Oriented

Core Courses

- Machine Learning With Applications In Python-
- · Data Modeling and Database Management
- Data Analytics: Methods and Practical Approaches
- · Introduction to Artificial Intelligence
- · Applications with Deep Learning

Elective Courses

- Modeling Tools for Predictive Analytics
- Experimental Design for Data Science
- Storytelling with Data using Tableau
- · Research Data and Research Operations
- Forecasting and Time Series Analytics
- · Cloud Technology in Data Science
- · R for Data Science
- · Optimization Techniques
- · Stochastic Modeling
- Reinforcement Learning

Core Courses

Business Leadership and Communication

Business - Oriented

- Data Mining for Business Applications
- Business Problem Analysis and Management

Elective Courses

- Business Immersion
- · Analytics in Management
- Supply Chain Management
- · Data Driven Investments
- Simulation and Risk Analytics
- Analytics for Marketing Strategy

Specializations



Data Analysis Specialization



Data Engineering Specialization

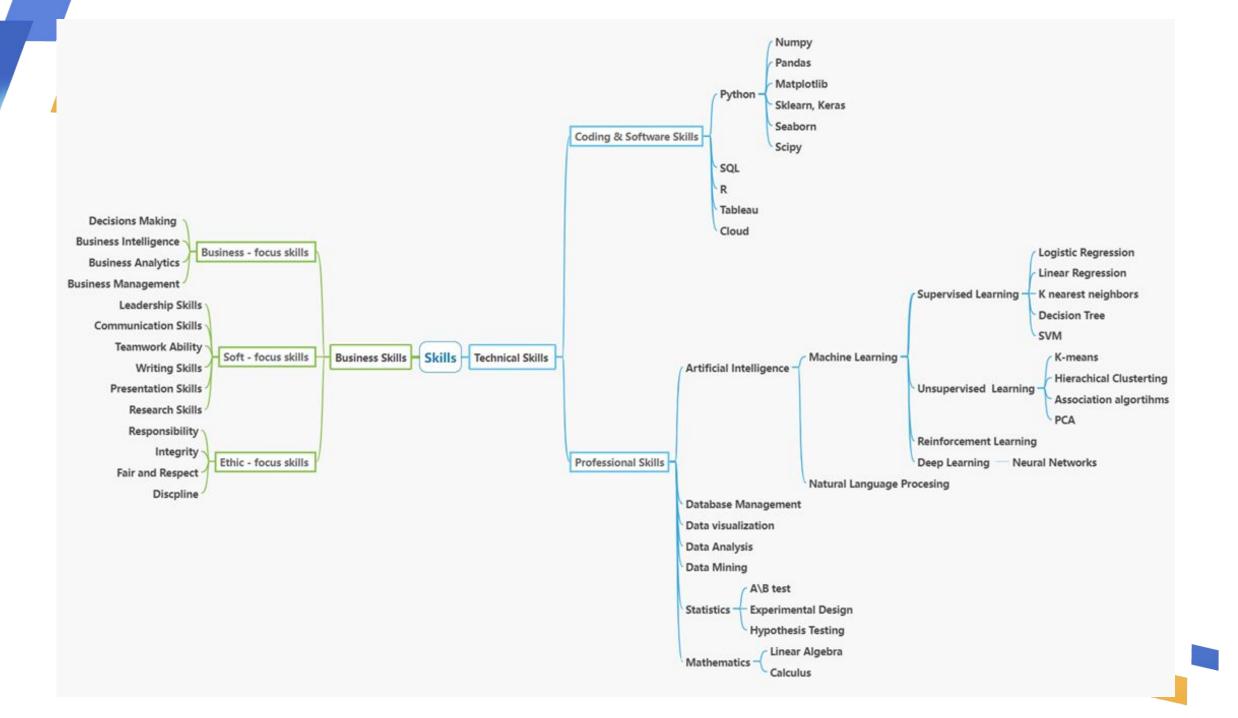


Data Science Specialization

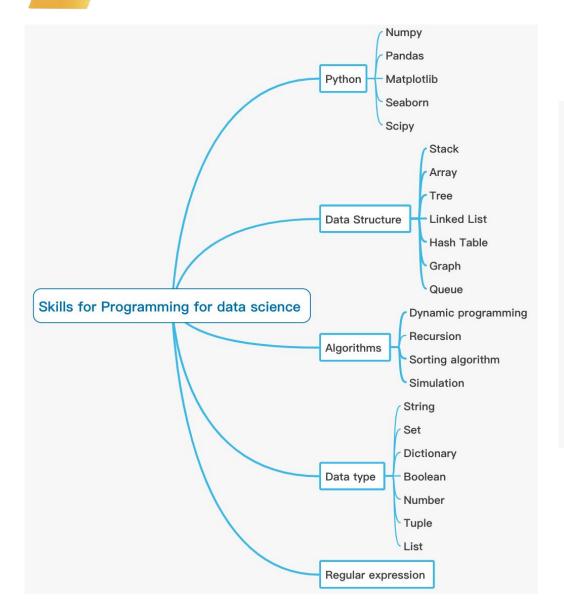


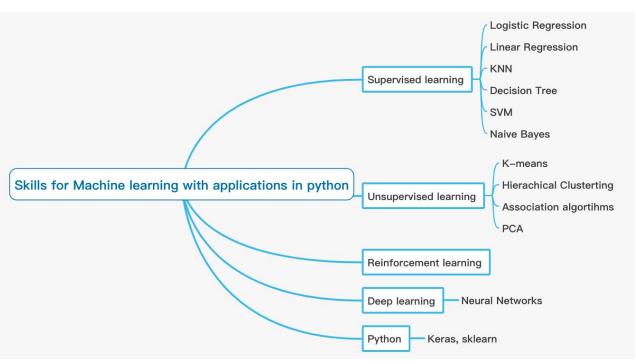
Data Management Specialization Note: Each specialization has different required core courses and recommended elective courses. Students need to complete those requirement to gain the degree.





Course visualization





04

PART 04

Recommender System Design

System Overview

Students enroll in the program and register the DataPro App.

Step 1

to recommend related elective courses based on the content of each introductory and core course.

Choose the career path that they are willing to take. e.g. data analyst, data scientist.

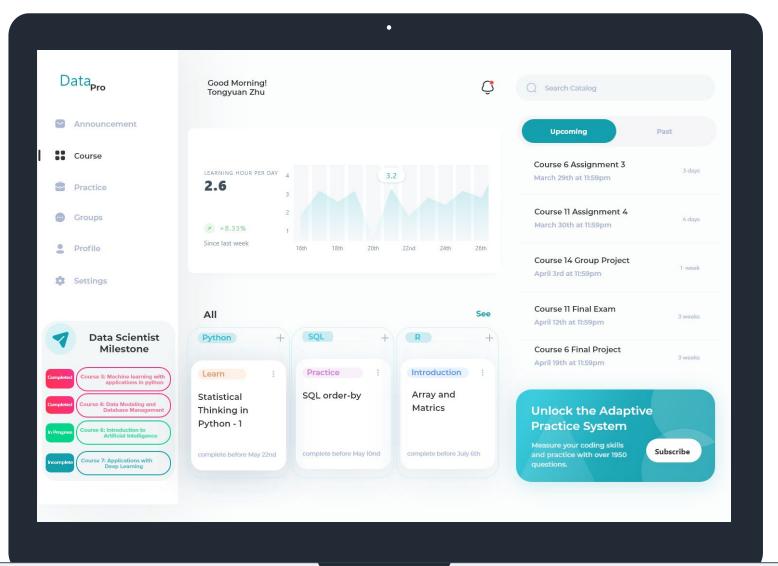
Related introductory and core courses will show in the App.

Step 2

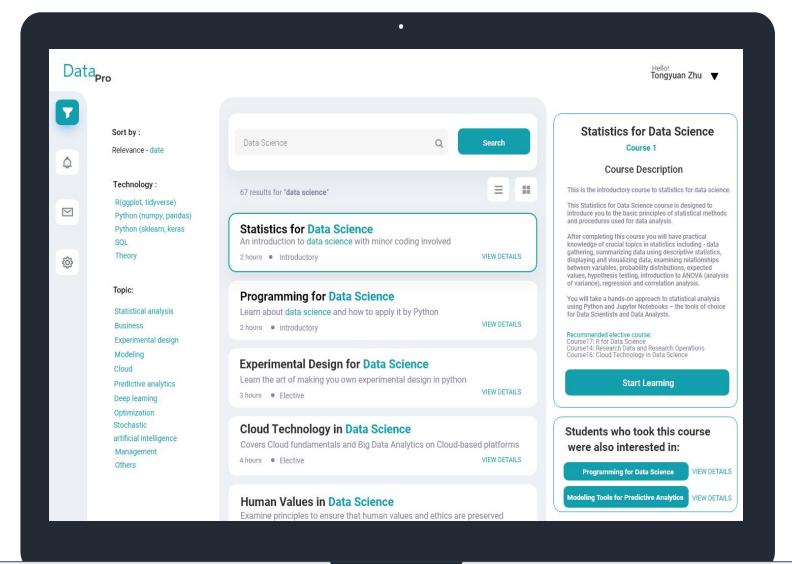
Step 3

A recommender system is designed

DataPro App Design (Main Page)



DataPro App Design (Search Page)



Thank you!