

DATA VISUALIZATION AND MODELING

SIM3032 | COMPUTER SCIENCE BACHELORS OF SCIENCE

In the Data Visualization and Modeling Course students will learn best practices for visualizing and modeling data. Additionally, they will learn and develop skills programming in Python.

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This course will introduce students to the Python programming language, data visualization and data modeling.

COURSE OUTCOMES

Introduction to the Python language

Understanding the need and process for visualizing large data sets

Development of static and dynamic visualizations

Apply efficient debugging practices and strengthen problem-solving skills

Develop stronger understanding of programming methodology through practice

COURSE MATERIALS

- ▶ Laptop
- ▶ Jupyter Notebooks
- ▶ Anaconda Navigator
- ▶ O'Reilly Books Online
- ▶ Python

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SKILLS DEVELOPMENT



ACADEMICS

Data Visualization and Modeling prepares students for future courses in artificial intelligence and machine learning by introducing the Python programming language and developing the use of visualizations for data-driven decision-making.



CAREER

Data Visualization and Modeling Labs are designed to promote the use of debugging practices that will be essential in the industry.

Additionally, they allow students to practice collaborating with and presenting to stakeholders, which are essential industry skills.



PORTFOLIO

Data Visualization and Modeling prepares students for success in **Capstone Project and Portfolio**. Here students can take data processing, visualization concepts and early machine learning concepts into their final project.

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WEEKLY BREAKDOWN

WEEK ONE

This week students are introduced to best practices in data visualization and begin working with Python visualization tools and the Python Pandas ecosystem.

WEEK TWO

Students begin visualizing data to explore relationships between categorical features and differences between groups.

WEEK THREE

Students develop their visualization skills by creating figures that show more complex relationships between quantitative features and across space and time.

WEEK FOUR

During the final week, students will explore techniques for visualizing unstructured text data. We will wrap up the class with a lesson on exploratory data analysis, which will synthesize the concepts we learned previously and prepare students to excel in future coursework.

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GRADE WEIGHTS

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Data Visualization (10%), Getting Started with Python and Pandas (10%)	20%
Relationships Between Categorical Features (10%), Differences Between Groups (10%)	20%
Relationships Between Quantitative Features (10%) Relationships in Space and Time (10%)	20%
Text Data (15%), Exploratory Data Analysis (15%)	30%
GPS (10%)	10%
Week 1 Week 2 Week 3 Week 4	Total
	100%

OUT-OF-CLASS WORK

This course requires at least 28 hours of preparation and out-of-class work. Out-of-class activities are documented in this syllabus and include skills practice, and homework. Consideration has been given to creating out-of-class work that will support students' efforts to successfully complete this course while achieving course objectives and program learning outcomes.

