DATA SCIENCE CERTIFICATE OF ACHIEVEMENT

The Data Science Certificate of Achievement equips students with the foundational knowledge, skills, and practical experience to tackle complex, data-driven challenges in today's digital age. With a focus on programming, statistics, machine learning, big data analytics, and data visualization, students engage in projects and collaborations that prepare them for the data-driven workforce. The program fosters critical thinking, problem-solving, and interdisciplinary collaboration, emphasizing both technical skills and domain-specific knowledge. Ideal for students with a mindset of lifelong learning and ethical responsibility, the program offers a pathway to meaningful careers and further education in the evolving field of data science.

Code	Title	Units
Required Courses:		
CIT 103	Amazon Web Services (AWS) Academy: Cloud Foundations	4
CS 102	Introduction to Python Programming	3
or CS 102H	Introduction to Python Programming - Honors	
CS 160	Introduction to Data Science and Engineering	4
or MATH 180	Introduction to Data Science	
CS 104	Data Programming with Python	4
CS 189	Introduction to Machine Learning	3
One course from the following:		
CIT 116	Database Management: Access	3
CIT 215	Database Management Systems	3
CS 188	Introduction to Artificial Intelligence (AI)	3
CS 190	Programming in C++	4
CS 130	Discrete Structures	3
CS 265	Data Structures and Algorithms with C++	3
or CS 265H	Data Structures and Algorithms With C++ - Honors	
Total Units		**21-22**

Students working for certificates must have a basic knowledge of arithmetic, reading and writing in order to learn and work in the occupations they select.

This is a Gainful Employment Program

Program Learning Outcomes

At the completion of this program, students will be able to:

a. Apply statistical techniques to analyze data sets, interpret results, to draw appropriate conclusions to support decision-making processes.
b. Use programming skills in languages commonly used in data science, such as Python or R, to manipulate data, perform analysis, and create visualizations.
c. Demonstrate proficiency in collecting, cleaning, and managing various types of data from diverse sources, including structured and unstructured data.
d. Explain fundamental concepts of machine learning algorithms and apply them to solve predictive modeling and pattern recognition problems.
e. Create visualization of data effectively using tools and libraries such as Matplotlib, Seaborn, or ggplot2 and communicate insights and findings clearly.
f. Administer data using database management systems, including querying databases using SQL, designing databases using design principles, and data warehousing concepts.
g. Discuss the ethical considerations and legal regulations surrounding data usage, privacy, and security, and apply ethical principles in their data-related work.
h. Develop critical thinking and problem-solving skills to identify data-related issues, formulate research questions, and propose appropriate solutions.
i. Collaborate effectively with team members, communicate findings and insights to both technical and non-technical stakeholders, and contribute within interdisciplinary teams.
j. Plan, implement, and administer data science projects effectively, including defining project scope, setting goals, allocating resources, and meeting deadlines.
k. Employ data analysis techniques emphasizing open-source inclusivity, diverse methodologies, and ethical practices, focusing on addressing institutional inequities and ensuring data-driven decisions are accessible and fair across all communities.