DATA ENGINEERING (BS)

Bachelor of Science

Our modern world is driven by access to information and has resulted in a high demand for the knowledge and skills required to extract, analyze, and model complex data to make informed decisions. Students in the B.S. in Data Engineering program will become proficient in the techniques necessary for working with modern data driven systems. They will experience core classes in advanced mathematics, analytics and modeling, engineering, design and computer programming. Coursework concentrates on preparing graduates in acquiring the ability to understand and use data for advanced decision making in key industry sectors including finance/business, defense, education, healthcare, manufacturing, and retail. Graduates of the program will be equipped for positions including data engineers, data analysts, data scientists, systems analysts, information systems analysts, and information systems engineers.

Program Requirements

Code	Title	Credits
Mathematics Courses		
MTH-2210	Calculus and Analytic Geometry I	4
MTH-2220	Calculus and Analytic Geometry II	4
MTH-2230	Calculus and Analytic Geometry III	4
MTH-2500	Problem Solving, Modeling, and Design	4
MTH-3100	Financial Engineering	4
MTH-3240	Probability and Statistics I	4
MTH-3250	Linear Algebra	4
MTH-3270	Discrete Mathematics	4
MTH-3300	Differential Equations and Numerical Analysis	4
MTH-3505	Data Analytics I: Predictive Analytics and Data Analysis	4
MTH-4505	Data Analytics II: Modeling, Optimization and Statistical Programming	4
MTH-4240	Probability and Statistics II	4
MTH-4990	Senior Capstone in the Mathematical Sciences	4
Computer Science Courses		
CSC-1700	Introduction to Computer Programming	4
CSC-2300	Computer Systems and Architecture	4
CSC-2150	Data Structures & Algorithms	4
CSC-3250	Object Oriented Software Design and Development	4
CSC-3510	Software Testing Verification, Validation and Quality Assurance	4
CSC-4450	Programming Languages	4
CSC-4500	Database Design and Implementation	4
Science Courses		
CHM-1310 & 1310Z	General Chemistry I and General Chemistry I Laboratory	4
CHM-1320 & 1320Z	General Chemistry II and General Chemistry II Laboratory	4
PHY-2240 & 2240Z	Physics I (Calculus Based) and Physics I (Calculus Based) Laboratory	4
PHY-2250 & 2250Z	Physics II (Calculus Based) and Physics II (Calculus Based) Laboratory	4
Total Credits		**96**

Undergraduate Degree Requirements

A student who graduates from Aurora University with a baccalaureate degree will have met the following requirements:

1. Completion of all requirements for an approved major (with no grades lower than "C").
2. Overall completion of at least 120 semester hours of coursework with a GPA of at least 2.0 on a 4.0 scale (a course may be utilized only once in application toward a degree requirement, unless otherwise noted in the academic regulations). The 120 semester hours of coursework must include:
   - At least 52 semester hours completed at a senior college.
   - Residency Requirement - At least 30 semester hours completed at Aurora University, including the last 24 semester hours in the degree, and including at least 18 semester hours in the major. (Portfolio assessment credit, life and vocational experience credit, off-campus experience credit, examination credit, participation credit, and block credit, shall not count toward the residency requirement).
   - Upper-Division Requirement - A minimum of 30 semester hours numbered 3000 or above. Of these 30 semester hours, 15 semester hours must lie within the major and 15 semester hours must be completed at Aurora University.
3. Completion of all General Education requirements (with no grades lower than "C"), as follows:
   - Quantitative and Formal Reasoning competency requirement (https://catalog.aurora.edu/regulations-policy-catalog/academic-regulations-procedures/general-education/#satisfy-quantitative-reasoning-requirement)
   - ENG-1000 Introduction to Academic Writing
   - IDS-1200 Discover What Matters or IDS-3040 Global Justice
   - IDS-1150 First Year Experience - *Not required for Transfer or AU Online students)*
   - Satisfactory participation in the junior-year mentoring and assessment process designed to guide students to successful completion of their degree and to encourage planning for next steps beyond graduation. (IDS-3500 Junior Mentoring Program I and IDS-3550 Junior Mentoring Program II - *Not required for ADC or AU Online students but may be designated electives for AU Online students admitted with fewer than 15 hours of transfer credit.)*
   - Distribution Requirements
     Students will complete one approved course[1] *from each of the following categories:*
     - Artistic Literacy
     - Cultural Literacy
     - Human Inquiry
     - Scientific Inquiry

     In addition to the above, ADC and Online students will also complete one approved course[1] *from the following category:*

     - Discovery and Reflection

[1] Only courses that are approved to meet the distribution requirement can be used toward this requirement. See the list of approved courses

(https://catalog.aurora.edu/regulations-policy-catalog/academic-regulations-procedures/general-education/#approved-courses-gen-ed-distribution) for available options. Courses taken to meet distribution requirements are 4 semester hours apiece, with the following exceptions:

- An approved transfer course of at least 2.50 semester hours can be used to satisfy a distribution requirement.
- Courses with co-requisite laboratory components may be used to satisfy a distribution requirement, provided that the student successfully complete both the three-credit-hour course and the single-credit-hour lab component.

Learning Outcomes

1. Demonstrate an ability to identify, formulate, and solve complex problems by applying principles of engineering, science, and mathematics
2. Demonstrate an ability to apply design principles to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Demonstrate an ability to communicate effectively with a range of audiences.
4. Demonstrate an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of solutions in global, economic, environmental, and societal contexts.
5. Demonstrate an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use judgment to draw conclusions.
7. Demonstrate an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.