University of Central Florida **2021 - 2022 Undergraduate**

Data Science (B.S.)

College of Sciences
Department of Statistics and Data Science; Department of Mathematics
https://sciences.ucf.edu/statistics
https://sciences.ucf.edu/math/

College of Engineering and Computer Science
Department of Computer Sciences; Department of Industrial Engineering and Management Sciences
https://www.cs.ucf.edu/
http://www.iems.ucf.edu/

Description

Data Science is an emerging discipline that seeks to infer insights from large amounts of data ("big data") by using various statistical techniques and algorithms. The discipline is concerned with both statistical techniques that measure the validity of such insights and with computational techniques for managing data and resources efficiently.

The Data Science B.S. is an interdisciplinary degree that is offered jointly by the departments of Computer Science, Statistics and Data Science, Mathematics, and Industrial Engineering and Management Systems. This program emphasizes the technical aspects of big data analytics, including algorithm design, programming, acquisition, management, mining, analysis, and interpretation of data. This program aims to train students to develop algorithms and computerized systems to facilitate the discovery of information from big data.

In addition to preparing graduates for immediate entry into careers and the job market, graduates of this program may also go on to pursue advanced degrees, such the UCF M.S. in Data Analytics program or a related MS degree, or a Ph.D. program in Computer Science, Statistics and Data Science or a related area, and graduates may also seek professional distinction.

Admission Requirements

- None

Degree Requirements

- Students who change degree programs and select this major must adopt the most current catalog.

- With the exception of the Capstone course, co-op or internship credit cannot be used in this major. Students should consult with a departmental advisor.
- All prerequisites of courses taught within the College of Sciences and the College of Engineering and Computer Science will be enforced.
- Courses designated in the General Education Program (with the exception of prerequisite courses) may be spread over 4 years, and those designated in the Common Program Prerequisites section must be completed within the first 60 hours.
- Students must earn at least a "C" (2.0) in each advanced core required course for the major.
- Students must achieve a minimum cumulative GPA of 2.0 in all courses satisfying major requirements.Data Science students must have continual access to a computer. Contact the UCF Technology Product Center or see the website (http://www.cstore.ucf.edu) for the minimum hardware and software specifications.

General Education Program (GEP) (39 Credit Hours)

- Certain courses must be selected in the GEP for this major bringing the total hours to more than 36.
- At least one course completed in each Foundation area must be a designated State General Education Core Course.

Communication Foundations (9 Credit Hours)

- ENC 1101 - Freshman Composition 1 — Credit Hours 3 (Required)
- ENC1102 - Freshman Composition II — Credit Hours 3 (Required)
- Select one course from Area 3 — Credit Hours 3

Cultural & Historical Foundations (9 Credit Hours)

Mathematical Foundations (7 Credit Hours)

- MAC 2311C - Calculus with Analytic Geometry I — Credit Hours: 4 (Required)
- STA 2023 - Statistical Methods I — Credit Hours: 3 (Required)

Social Foundations (6 Credit Hours)

Science Foundations (8 Credit Hours)

- BSC 2010C - Biology I — Credit Hours: 4 (Required)

Select one:

- CHM 2045C - Chemistry Fundamentals I — Credit Hours: 4
- PHY 2048C - General Physics with Calculus I — Credit Hours: 4

Common Program Prerequisites (CPP) (11 Credit Hours)

- BSC 2010 - General Biology — Credit Hours: (GEP)
- COP 3223 - Introduction to Programming with C — Credit Hours: 3
- MAC 2311C - Calculus with Analytic Geometry I — Credit Hours: (GEP)
- MAC 2312 - Calculus with Analytic Geometry II — Credit Hours: 4
- MAC 2313 - Calculus with Analytic Geometry III — Credit Hours: 4
- STA 2023 - Statistical Methods I — Credit Hours: (GEP)

Select One:

- CHM 2045 - Chemistry Fundamentals I — Credit Hours: (GEP)
- PHY 2048 - General Physics with Calculus I — Credit Hours: (GEP)

Core Requirements: Basic Level

The basic core is fulfilled by GEP and CPP course completion.

- BSC 2010 - General Biology — Credit Hours: (GEP)
- COP 3223 - Introduction to Programming with C — Credit Hours: (CPP)
- MAC 2311C - Calculus with Analytic Geometry I — Credit Hours: (GEP)
- MAC 2312 - Calculus with Analytic Geometry II — Credit Hours: (CPP)
- MAC 2313 - Calculus with Analytic Geometry III — Credit Hours: (CPP)
- STA 2023 - Statistical Methods I — Credit Hours: (GEP)

Select One:

- CHM 2045 - Chemistry Fundamentals I — Credit Hours: (GEP)
- PHY 2048 - General Physics with Calculus I — Credit Hours: (GEP)

Core Requirements: Advanced Level (49 Credit Hours)

Complete all of the following courses:

- COP 3502C - Computer Science I — Credit Hours: 3
- COP 4283 - Programming for Scientists — Credit Hours: 3
- ISC 4241 - Data Science I — Credit Hours: 3
- ISC 4242 - Data Science II — Credit Hours: 3
- ISC 4301 - Predictive Analytics — Credit Hours: 3
- ISC 4401 - Data Management Technology — Credit Hours: 3
- ISC 4501 - Data Graphics and Visualization — Credit Hours: 3
- ISC 4701 - Praxis in Data Analysis — Credit Hours: 3
- MAS 3105 - Matrix and Linear Algebra — Credit Hours: 4
- STA 4038 - Statistical Foundations of Data Science and Artificial Intelligence I — Credit Hours: 3
- STA 4039 - Statistical Foundations of Data Science and Artificial Intelligence II — Credit Hours: 3
- STA 4163 - Statistical Methods II — Credit Hours: 3
- STA 4164 - Statistical Methods III — Credit Hours: 3
- STA 4724 - Big Data Analysis Methods — Credit Hours: 3

Select One:

- COT 3100C - Introduction to Discrete Structures — Credit Hours: 3
- MHF 3302 - Logic and Proof in Mathematics — Credit Hours: 3

Select One:

- CAP 4670 Algorithms for Machine Learning — Credit Hours: 3
- ESI 4312 Deterministic Methods for Operations Research — Credit Hours: 3
- MAP 4447 Mathematical Aspects of Machine Learning and Artificial Intelligence — Credit Hours: 3
- STA 4241 Statistical Learning — Credit Hours: 3

Electives (21 Credit Hours)

- Select primarily from upper level courses after meeting with a departmental advisor. Courses may be selected from among those courses not completed within the advanced core or outside the participating departments.

Capstone Requirements

- ISC 4701 - Praxis in Data Analysis (Adv Core)

Foreign Language Requirements

Admissions

- Two years high school, or one year college language (or equivalent proficiency exam) prior to graduation.

Graduation

- None

Additional Requirements

- None

Required Minors

- None

Departmental Exit Requirements

- All students will complete an exit interview.
- Students must earn at least a "C" (2.0) in each advanced core required course for the major.
- Students must achieve a minimum cumulative GPA of 2.0 in all courses satisfying major requirements.

University Minimum Exit Requirements

- A 2.0 UCF GPA
- 48 semester hours of upper division credit completed
- 30 of the last 39 hours of coursework must be completed in residency at UCF.
- A maximum of 45 hours of extension, correspondence, CLEP, Credit by Exam, and Armed Forces credits permitted.
- Complete the General Education Program, the Gordon Rule, and nine hours of Summer credit.

Total Undergraduate Credit Hours Required: 120

Additional Information

Honors In Major

- Application and admissions through The Burnett Honors College. More information about Honors in the Major can be found at honors.ucf.edu/research.

Related Programs
- Actuarial Science (B.S.)
- Computer Science (B.S.)
- Industrial Engineering (B.S.)
- Mathematics (B.S.)
- Statistics (B.S.)

Certificates
- None

Related Minors
- Actuarial Science Minor
- Business Minor
- Computer Science Minor
- Economics Minor
- Information Technology Minor
- Leadership Studies Minor
- Mathematics Minor
- Secure Computing and Networks Minor
- Statistics Minor
- Technological Entrepreneurship Minor

Advising Notes
- It is the student's responsibility to ensure they have satisfied course prerequisites before registering for a class. Students should consult with a program advisor.
- Contact your college advisor in the College of Sciences Advising Services (COSAS) office (CSB 250) for more information about overall progress toward your degree, GEP and other university requirements, academic probation, special problems as well as general academic advising.

Transfer Notes
- Lower division courses do not substitute for upper division courses.
- Courses transferred from private and out-of-state schools must be evaluated for equivalency credit. The student must provide all supporting information.
- Submit your requests for College of Sciences course evaluations at https://sciences.ucf.edu/cosas/ and click on "COS Course Evaluation".
- Courses transferred for equivalency to courses in the College of Engineering and Computer Science must be formally evaluated for equivalency by the relevant department.

Acceptable Substitutes for Transfer Courses
The following substitutions are acceptable for Common Program Prerequisites if taken as part of the AA course work:

- Any COP programming language course will satisfy the CPP. However, COP 3223C (Introduction to Programming with C) is a prerequisite for Computer Science courses and still needs to be taken.
- COP2220 (C Programming) will be substituted for COP3223.

Program Academic Learning Compacts

- Program Academic Learning Compacts (student learning outcomes) for undergraduate programs are located at: http://www.oeas.ucf.edu/alc/academic_learning_compacts.htm

Plan of Study

- This is one of numerous possible plans of study. See program description for all requirements.
- Consult the program director for alternate, new or more appropriate selections.
- Use your Pegasus Path planning tool in your myUCF portal to plan your courses through to graduation.
- Prior to enrolling in Chemistry, take Chemistry Placement Test ~ https://www.sdes.ucf.edu/placement-tests/
- Prior to enrolling in Math, take Math Placement Test ~ https://www.sdes.ucf.edu/placement-tests/
- Although all classes are listed as being taken during the academic year, you may be required to complete 9 hours of them during the Summer. Consult with an advisor to determine if you are exempt.

Freshman Year - Fall (16 Credit Hours)

- ENC 1101 - Composition I — Credit Hours: 3
- MAC 2311C - Calculus with Analytic Geometry I — Credit Hours: 4
- SPC 1608 - Fundamentals of Oral Communication — Credit Hours: 3
- GEP Cultural/Historical Foundation, Area 1 — Credit Hours: 3
- GEP Social Foundation, Area 1 — Credit Hours: 3

Freshman Year - Spring (16 Credit Hours)

- ENC 1102 - Composition II — Credit Hours: 3
- MAC 2312 - Calculus with Analytic Geometry II — Credit Hours: 4
- GEP Cultural/Historical Foundation, Area 2 — Credit Hours: 3
- GEP Cultural/Historical Foundation, Area 3 — Credit Hours: 3
- GEP Social Foundation, Area 2 — Credit Hours: 3

Sophomore Year - Fall (15 Credit Hours)

- BSC 2010C - Biology I — Credit Hours: 4
- MAC 2313 - Calculus with Analytic Geometry III — Credit Hours: 4
- PHY 2048C - General Physics Using Calculus I — Credit Hours: 4
- STA 2023 - Statistical Methods I — Credit Hours: 3

Sophomore Year - Spring (13 Credit Hours)

- COP 3223C - Introduction to Programming with C — Credit Hours: 3
- MAS 3105 - Matrix and Linear Algebra — Credit Hours: 4
- STA 4163 - Statistical Methods II — Credit Hours: 3

- Select One:
  - COT 3100C - Introduction to Discrete Structures — Credit Hours: 3

- MHF 3302 - Logic and Proof in Mathematics Credit Hours: 3

Junior Year - Fall (15 Credit Hours)

- COP 3502C - Computer Science I Credit Hours: 3
- ISC 4241 - Data Science I Credit Hours: 3
- STA 4038 - Statistical Foundations of Data Science and Artificial Intelligence I Credit Hours: 3
- STA 4164 - Statistical Methods III Credit Hours: 3

- Select One:
  - CAP 4670 Algorithms for Machine Learning Credit Hours: 3
  - ESI 4312 - Deterministic Methods for Operations Research Credit Hours: 3
  - MAP 4447 - Mathematical Aspects of Machine Learning and Artificial Intelligence Credit Hours: 3
  - STA 4241 - Statistical Learning Credit Hours: 3

Junior Year - Spring (15 Credit Hours)

- COP 4283 - Programming for Scientists Credit Hours: 3
- ISC 4242 - Data Science II Credit Hours: 3
- STA 4039 - Statistical Foundations of Data Science and Artificial Intelligence II Credit Hours: 3
- Elective 1 Credit Hours: 3
- Elective 2 Credit Hours: 3

Senior Year - Fall (16 Credit Hours)

- ISC 4301 - Predictive Analytics Credit Hours: 3
- ISC 4401 - Data Management Technology Credit Hours: 3
- ISC 4501 - Data Graphics and Visualization Credit Hours: 3
- STA 4724 - Big Data Analytics Methods Credit Hours: 4
- Elective 3 Credit Hours: 3

Senior Year - Spring (15 Credit Hours)

- ISC 4701 - Praxis in Data Science Credit Hours: 3
- Elective 4 Credit Hours: 3
- Elective 5 Credit Hours: 3
- Elective 6 Credit Hours: 3
- Elective 7 Credit Hours: 3