DEPARTMENT OF HIGHER EDUCATION & WORKFORCE DEVELOPMENT

New Program Report

Date Submitted:
10/18/2023

Institution
Fontbonne University

Site Information

Implementation Date:
8/15/0222 12:00:00 AM

Added Site(s):

Selected Site(s):

Fontbonne University, 6800 Wydown Boulevard, St. Louis, MO, 63105-3098

CIP Information

CIP Code:
303001

CIP Description:
A program that focuses on the study of scientific computing and its application. Includes instruction in scientific visualization, multi-scale analysis, grid generation, data analysis, applied mathematics, numerical algorithms, high performance parallel computing, and numerical modeling and simulation with applications in science, engineering and other disciplines in which computation plays an integral role.

CIP Program Title:
Computational Science

Institution Program Title:
Data Science

Degree Level/Type

Degree Level:
Bachelor's Degree

Degree Type:
Bachelor of Science

Options Added:

Collaborative Program**:**
N

Mode of Delivery

Current Mode of Delivery

Classroom

Student Preparation

Special Admissions Procedure or Student Qualifications required:
none

DEPARTMENT OF HIGHER EDUCATION & WORKFORCE DEVELOPMENT

New Program Report

Specific Population Characteristics to be served:
n/a

Faculty Characteristics

Special Requirements for Assignment of Teaching for this Degree/Certificate:
Fontbonne is accredited by the Higher Learning Commission (HLC) and complies with HLC minimum faculty qualifications. In particular, faculty generally must have a degree in the discipline that is one level higher than offered. In doctoral programs, faculty must have a terminal degree and demonstrate research and accomplishments commensurate with a doctoral program. In some cases, we will also hire faculty that do not meet these criteria but do meet the "tested experience" criteria that we developed to comply with the HLC criteria.

Estimate Percentage of Credit Hours that will be assigned to full time faculty:
While this may vary depending on the year and the exact courses chosen by students (including general education courses), we estimate at least 60% of courses will be taught by full-time faculty.

Expectations for professional activities, special student contact, teaching/learning innovation:
All Fontbonne faculty are expected to be up-to-date on their discipline. Full-time faculty, as part of the annual review process, are expected to document professional activities and innovation in the classroom that improves student learning. Fontbonne maintains a low student to faculty ratio, and all faculty have extensive student contact

Student Enrollment Projections Year One-Five

Year 1	**Full Time:** 5	**Part Time:** 0	
Year 2	**Full Time:** 5	**Part Time:** 0	
Year 3	**Full Time:** 5	**Part Time:** 0	**Number of Graduates:** 1
Year 4	**Full Time:** 5	**Part Time:** 0	
Year 5	**Full Time:** 5	**Part Time:** 0	**Number of Graduates:** 5

Percentage Statement:
n/a

Program Accreditation

Institutional Plans for Accreditation:
not applicable

Program Structure

Total Credits:
120

Residency Requirements:
n/a

General Education Total Credits:
42

DEPARTMENT OF HIGHER EDUCATION & WORKFORCE DEVELOPMENT

New Program Report

Major Requirements Total Credits:
73

Course(s) Added

COURSE NUMBER	CREDITS	COURSE TITLE
CIS 330	3	Database Management Systems
CIS 161	4	Advanced Programming using C++
DS Elect	6	Data Science Electives
CIS 435	3	Big Data Analysis and Visualization
MTH 200	3	Linear Algebra
MTH 300	3	Modeling and Numerical Approximation
MTh 120	3	Discrete Mathematics
CIS 455	3	Machine Learning
CIS ELEC	3	CIS Electives
MTH 115	3	Introduction to Statistics
CIS 498	1	Senior Portfolio
Clusters	6	Subject Matter Cluster
MTH 150	4	Calculus with Analytic Geometry I
MTH 325	3	Theory and Applications of Probability
CIS 200	3	Scientific Computer Languages
MTh 151	4	Calculus with Analytic Geometry II
CIS 499	3	Senior Synthesis
CIS 470	3	Deep Learning
CIS 110	3	Computer Applications: Spreadsheets
MTH 315	3	Advanced Statistics
CIS 160	4	Computer Science I
MTH 316	3	Non-parametric Structure

Free Elective Credits:
5

Internship or other Capstone Experience:
Successful completion of portfolio and synthesis

Assurances

I certify that the program will not unnecessarily duplicate an existing program of another Missouri institution in accordance with 6 CSR 10-4.010, subsection (9)(C) Submission of Academic Information, Data and New Programs.

DEPARTMENT OF HIGHER EDUCATION & WORKFORCE DEVELOPMENT

New Program Report

I certify that the program will build upon existing programs and faculty expertise.

I certify that the institution has conducted research on the feasibility of the proposal and it is likely the program will be successful. Institutions' decision to implement a program shall be based upon demand and/or need for the program in terms of meeting present and future needs of the locale, state, and nation based upon societal needs, and/or student needs.

Contact Information

First and Last Name: Katie Piacentini

Email: kpiacentini@fontbonne.edu

Phone: 314-889-4679

Fontbonne University 2023-2024 Undergraduate and Graduate Catalog

Data Science, B.S.

The BS in Data Science degree is an interdisciplinary program offered by the Department of Mathematics and Computer Science. The Data Science degree at Fontbonne combines theories and techniques from many fields including computer science, mathematics, probability, statistics, machine learning, data visualization and deep learning.

Baccalaureate Degree and Residency Requirements

All requirements for an undergraduate degree are listed under Academic Policies and Regulations in the undergraduate introductory section of this catalog. These requirements include a graduation requirement of at least one course in religion or theology.

General Education Requirements

The 42 credit hours of general education requirements are presented in the Academic Information section of this catalog. A course that meets a general education requirement may also meet a course requirement in the major or a course requirement in another discipline.

Accelerated Master's Program

Students applying to an Accelerated Path Master's Program must:

- Be a currently enrolled Fontbonne University student
- Have completed at least 60 credit hours (including CIS 200 , CIS 330 , MTH 120 and MTH 150 with a grade of B or higher in each of these four courses.)
- Have at least one full semester an undergraduate remaining
- Possess a minimum Fontbonne cumulative GPA of 3.25

Admission Requirements

Students applying for admission to a master's program through the Accelerated Option submit an Accelerated Master's Program Application, which must be approved by the graduate program director and/or department chair. Application can be made as early as the first semester of the junior year, but typically in the third semester prior to completion of the undergraduate degree and with at least one full semester remaining at the time of application. Students must have completed at least 12 credit hours in the undergraduate major by the time they are admitted into an Accelerated Path. Undergraduate students admitted to a master's program through an Accelerated Path must maintain

- a cumulative GPA of 3.25 and
- a cumulative GPA of 3.0 or higher in all of their CIS courses.

Degree and Tuition Policies

Once admitted to a master's program through the Accelerated Path, students may take up to a maximum of **12** credit hours

of graduate coursework (as listed below the major requirements) and have those hours count toward both the bachelor's and master's degrees. Students will be charged at the undergraduate rate and retain eligibility for undergraduate scholarships. For each semester in which they take courses for both undergraduate and graduate credit, students must complete a "mixed credit" registration form that is approved by the advisor. Students taking courses for graduate credit must adhere to all relevant graduate policies.

Students admitted to an Accelerated Path Master's Program must meet all graduate program admission requirements at the time they complete the baccalaureate degree and must meet all degree completion requirements of the graduate program.

Learning Outcomes

The student outcomes for the BS in Data Science degree program are the following:

- Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify problems.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- Function effectively as a member or leaders or a team engaged in activities appropriate to the program's discipline.
- Apply data science concepts and models to manage and analyze big data sets, to support decision-making and to produce solutions to real-world problems.

Courses Required for the Major

- MTH 115 - Introduction to Statistics **Credit(s): 3** OR MTH 125 - Biostatistics
- MTH 120 - Discrete Mathematics **Credit(s): 3**
- MTH 150 - Calculus with Analytic Geometry I **Credit(s): 4**
- MTH 151 - Calculus with Analytic Geometry II **Credit(s): 4**
- MTH 200 - Linear Algebra **Credit(s): 3**
- MTH 300 - Modeling and Numerical Approximation **Credit(s): 3**
- MTH 315 - Advanced Statistics **Credit(s): 3**
- MTH 316 - Non-Parametric Statistics **Credit(s): 3**
- MTH 325 - Theory and Applications of Probability **Credit(s): 3**
- CIS 110 - Computer Applications: Spreadsheet **Credit(s): 3**
- CIS 160 - Computer Science I **Credit(s): 4**
- CIS 161 - Advanced Programming using C++ **Credit(s): 4**
- CIS 200 - Scientific Computing Languages **Credit(s): 3**
- CIS 288 - Portfolio A **Credit(s): 0**
- CIS 330 - Database Management Systems **Credit(s): 3**
- CIS 435 - Big Data Analysis and Visualization **Credit(s): 3**
- CIS 455 - Machine Learning I **Credit(s): 3**
- CIS 470 - Deep Learning **Credit(s): 3**
- CIS 498 - Senior Portfolio **Credit(s): 1**

- CIS 499 - Senior Synthesis **Credit(s): 3**

CIS Electives

Choose one of the following.

- CIS 215 - Database Fundamentals and Web Server Programming **Credit(s): 3**
- CIS 472 - Android Programming **Credit(s): 3**
- CIS 473 - iOS Programming **Credit(s): 3**
- CIS 474 - Software Engineering I **Credit(s): 3**

Data Science Electives

Choose two of the following.

- MTH 461 - Operations Research **Credit(s): 3**
- CIS 460 - Artificial Intelligence **Credit(s): 3**
- CIS 483 - Research in Data Science **Credit(s): 1-4** *
- CIS 493 - Independent Study in Data Science **Credit(s): 1-4** *
- CIS 487 - Internship in Data Science **Credit(s): 1-4** *
- CIS 497 - Advanced Topics in Data Science **Credit(s): 1-4** *

*At most one of the electives may be chosen from among these courses.

Subject Matter Cluster

In consultation with the department chair and faculty advisor, students will select 6-9 hours in a particular cluster. These courses will give students required background in a subject matter field. Subject matter clusters could be Bioinformatics, Social Work, Psychology, Sociology, Economics, Communications or Sports Management.

Bioinformatics Cluster

- BIO 132 - General Biology 1: Diversity of Life **Credit(s): 4**
- BNF 210 - Bioinformatics Data Analysis **Credit(s): 3**
- BNF 301 - Computational Genomics **Credit(s): 3**

Communications Cluster

- COM 340 - Principles and Ethics of Strategic Communication **Credit(s): 3**
- COM 280 - Social Media Communication **Credit(s): 3**

Economics Cluster

- ECN 210 - Principles of Macro Economics **Credit(s): 3**
- ECN 220 - Principles of Micro Economics **Credit(s): 3**
- BSA 410 - Quantitative Analysis in Business **Credit(s): 3**

Psychology Cluster

- PSY 327 - Industrial/Organizational Psychology **Credit(s): 3**
- PSY 330 - Research Methods for the Behavioral Sciences **Credit(s): 3**
- PSY 391 - Testing and Measurement for the Behavioral Sciences **Credit(s): 3**

Social Work Cluster

Required Courses

- SWK 100 - Introduction to Social Work **Credit(s): 3**
- SWK 110 - Human Behavior and the Social Environment **Credit(s): 3**

Choose one from the following.

- SWK 200 - Social and Economic Justice **Credit(s): 3**
- SWK 261 - Introduction to Criminal Justice **Credit(s): 3**
- SWK 300 - Social Issues and Social Welfare Policy **Credit(s): 3**
- SWK 352 - Gerontology **Credit(s): 3**
- SWK 361 - Social Work and the Law **Credit(s): 3**
- SWK 362 - Juvenile Justice System **Credit(s): 3**

Sociology Cluster

- SOC 100 - Survey of Sociology **Credit(s): 3**
- SOC 115 - Social Problems **Credit(s): 3**
- SOC 265 - Diversity and Social Justice **Credit(s): 3**
- SOC 310 - Social Psychology **Credit(s): 3**

Sports Management Cluster

- SPT 101 - Introduction to Sports Management **Credit(s): 3**
- SPT 205 - Sport Accounting and Finance **Credit(s): 3** OR SPT 260 - Sports Marketing
- SPT 370 - Sports Analytics **Credit(s): 3**

Accelerated Master's Approved Courses

Details regarding admission are provided above. The following 3 courses (9 credit hours) can be counted for both undergraduate and graduate credit as part of the accelerated master's program to the Data Science, M.S.

- CIS 555 - Machine Learning I **Credit(s): 3**
- CIS 557 - Big Data Analysis and Visualization **Credit(s): 3**
- CIS 558 - Deep Learning **Credit(s): 3**

- Academics
  - College of Arts and Sciences
  - College of Education and Allied Health Professions

- Eckelkamp College of Global Business and Professional Studies
- Online Learning
- View All Academic Programs
- Academic Affairs
- Course Catalog
- Academic Accreditation
- Library
- Digital Commons
- Admission & Financial Aid
- Apply Now
- Visit Us
- Freshmen
- Graduate
- Transfer
- International
- Corporate Employees
- Registrar
- Paying for College
- Student Life
- Living on Campus
- Getting Involved
- Student Services
- Career Development
- Athletics
- Giving
- Annual Fund
- Seasonal Events
- Community Relations
- Planned Giving
- Campaign
- Giving Societies
- About Us
- Our Story
- What We Believe
- Mission
- Leadership
- Our Community
- Fontbonne Magazine
- By the Numbers
- University News
- Faculty Directory
- Employment

Search...

Search

Search...

Search