

# HEALTH CARE CONCENTRATION, DATA SCIENCE (MS) ONLINE

## Course Requirements

### Introductory Courses

| Course  | Title   | Quarter Hours |
|---------|---|---------------|
| IT 403  | STATISTICS AND DATA ANALYSIS                    | 4             |
| CSC 412 | TOOLS AND TECHNIQUES FOR COMPUTATIONAL ANALYSIS | 4             |
| CSC 401 | INTRODUCTION TO PROGRAMMING                     | 4             |

### Foundation Courses

| Course   | Title   | Quarter Hours |
|--|---|---------------|
| DSC 423  | DATA ANALYSIS AND REGRESSION                  | 4             |
| DSC 430  | PYTHON PROGRAMMING                            | 4             |
| DSC 441  | FUNDAMENTALS OF DATA SCIENCE                  | 4             |
| DSC 450  | DATABASE PROCESSING FOR LARGE-SCALE ANALYTICS | 4             |
| Select one of the following applied analytics courses: |   | 4             |
| DSC 424  | ADVANCED DATA ANALYSIS                        |               |
| DSC 465  | DATA VISUALIZATION                            |               |

### Advanced Courses <sup>1</sup>

| Course     | Title                     | Quarter Hours |
|------------|---------------------------|---------------|
| DSC 510    | HEALTH DATA SCIENCE       | 4             |
| DSC 540    | ADVANCED MACHINE LEARNING | 4             |
| HIT 421    | HEALTH INFORMATICS        | 4             |
| or MGT 559 | HEALTH SECTOR MANAGEMENT  |               |
| HIT 430    | ELECTRONIC HEALTH RECORDS | 4             |

<sup>1</sup> Some advanced courses may not be offered online. Student may consult with their faculty advisor to determine suitable course substitutions.

### Elective Courses

Students must take eight (8) Credit Hours of graduate level elective courses in the areas of statistical modeling, data mining or database technologies. Elective courses must be selected from the following list:

| Course   | Title  | Quarter Hours |
|----------|--|---------------|
| CMNS 549 | SPECIAL TOPICS IN ORGANIZATIONAL COMMUNICATION         |               |
| CSC 452  | DATABASE PROGRAMMING                                   |               |
| CSC 468  | PROGRAMMING INTERACTIVE DATA VISUALIZATION FOR THE WEB |               |
| CSC 481  | INTRODUCTION TO IMAGE PROCESSING                       |               |
| CSC 482  | APPLIED IMAGE ANALYSIS                                 |               |
| CSC 484  | ETHICS IN ARTIFICIAL INTELLIGENCE                      |               |

|         |  |
|---------|--|
| CSC 521 | MONTE CARLO ALGORITHMS   |
| CSC 528 | COMPUTER VISION  |
| CSC 543 | SPATIAL DATABASES & GEOGRAPHIC INFORMATION SYSTEMS                       |
| CSC 555 | MINING BIG DATA  |
| CSC 575 | INTELLIGENT INFORMATION RETRIEVAL  |
| CSC 576 | COMPUTATIONAL ADVERTISING  |
| CSC 578 | NEURAL NETWORKS AND DEEP LEARNING  |
| CSC 580 | ARTIFICIAL INTELLIGENCE II   |
| CSC 583 | NATURAL LANGUAGE PROCESSING  |
| CSC 594 | TOPICS IN ARTIFICIAL INTELLIGENCE  |
| CSC 598 | TOPICS IN DATA ANALYSIS  |
| DSC 425 | TIME SERIES ANALYSIS AND FORECASTING                                     |
| DSC 433 | SCRIPTING FOR DATA ANALYSIS  |
| DSC 540 | ADVANCED MACHINE LEARNING  |
| DSC 465 | DATA VISUALIZATION   |
| DSC 478 | PROGRAMMING MACHINE LEARNING APPLICATIONS                                |
| DSC 480 | SOCIAL NETWORK ANALYSIS  |
| DSC 484 | WEB DATA MINING  |
| GEO 441 | GEOGRAPHIC INFORMATION SYSTEMS (GIS) FOR COMMUNITY DEVELOPMENT           |
| GEO 442 | GEOGRAPHICAL INFORMATION SYSTEMS (GIS) FOR SUSTAINABLE URBAN DEVELOPMENT |
| GPH 565 | DESIGNING FOR VISUALIZATION  |
| HCI 512 | INFORMATION VISUALIZATION AND INFOGRAPHICS                               |
| IPD 451 | BIG DATA AND NOSQL PROGRAM   |
| IS 478  | INFORMATION TECHNOLOGY CONSULTING  |
| IS 549  | DATA WAREHOUSING   |
| IS 550  | ENTERPRISE DATA MANAGEMENT   |
| IS 574  | BUSINESS INTELLIGENCE AND ANALYTICS SYSTEMS                              |

### Capstone Options

Four (4) Credit Hours are required for the capstone requirement. Students have the option of completing a real world Data Analytics Project, or completing the Data Science Capstone course, or participating in a Data Analytics Internship or completing a Master's Thesis to fulfill their Capstone requirement.

- Data Analytics Project
  - The real data analytics project is for students who are interested in working in a small team on a research project under the supervision of a CDM faculty. A list of available projects is published on the dampa center website (<http://dampa.cdm.depaul.edu>). Students who are interested in proposing their own data analytics project are encouraged to contact a CDM faculty member teaching analytics courses as soon as possible. Students must enroll in CSC 695 for a total of 4 credit hours taken in two consecutive quarters (2 credit hours for 2 quarters) to satisfy the capstone requirement. The faculty who supervises the project will initiate enrollment in the CSC 695course.

- Predictive Analytics Capstone course
  - DSC 672 course offers the opportunity of working on an analytics project in a more structured class format. Students enrolled in the courses will be working in teams on a data analytics project under the supervision of the course instructor.
- Analytics Internship
  - An internship offers students the opportunity to integrate their academic experience with on-the-job training in an analytics related field. Students must enroll in CSC 697 for 4 credit hours to satisfy the practicum requirement. These are the steps:
    - i. Secure an internship with focus in analytics.
    - ii. International Students must obtain the appropriate practical training form and meet with an advisor in the CDM Academic Center for approval (<https://offices.depaul.edu/global-engagement/student-resources/student-services/Pages/Forms.aspx>).
    - iii. Login to MyCDM and click the “MyInternships” link on the left to start the course enrollment process.
- Master’s Thesis
  - A student who has made an original contribution to the area (typically, through work done by CSC 695) may choose to complete a Master’s Thesis. The student and the student’s research advisor should form a Master’s Thesis Committee of 3 faculty. The student will need to submit to the committee a thesis detailing the results of the research project. After a public defense, the committee will decide whether to accept the thesis. In that case, the student will be allowed to register for the 0 credit hour course CSC 698 and the transcript will show the thesis title as the course topic.