Ph.D in Business Data Science

Ph.D. in Business Data Science

Degree Requirements

Ph.D. students in Business Data Science (BDS) are expected to conduct innovative and independent research and have their research findings published in peer-reviewed scholarly journals and academic conference proceedings.

By the beginning of the first semester, upon the approval of the Ph.D. program director, student must have filed a Plan of Study (POS) that lists the courses to be taken and the timeline of study. Any modification to the POS must be approved by the Ph.D. program director and dissertation advisor (if chosen).

Course Requirements

By the end of year one, student must have completed any assigned bridge courses upon the PhD program academic advisor’s suggestion with a grade of at least a B in each course. The list of bridge courses are:

- Programming and data structure (e.g. NJIT CS 280 or CS 505)
- Advanced Calculus (e.g. NJIT Math 211)
- Probability and Statistics (e.g. NJIT MGMT 216 or Math 333)
- Basic business knowledge (e.g. NJIT MGMT 492, MGMT 501)

A student entering the program with only a Bachelor’s degree in related areas shall take 36 credits of advanced courses beyond the Bachelor’s degree with the approval of the PhD program academic advisor. The 36 credits shall include six core courses and six elective courses, and are in addition to the credits for dissertation research. Among the 36 credits, at least 12 credits must be of the 700 level courses or courses with PhD track projects.

A student entering the program with a Master’s degree or above in the related areas shall take 18 credits of advanced courses beyond the Master’s degree or its equivalent with the approval of the PhD program academic advisor. These 18 credits are in addition to the credits for dissertation research. Among the 18 credits, at least 12 credits must be of the 700 level courses or courses with PhD track projects.

All core courses are listed in Table DR-1. Among them, MGMT 682 is a pre-requisite of MGMT 782. Typically, MGMT 682, Math 660 and Math 644 are only offered in the Fall semesters.

Table DR-2 provides a partial list of the elective courses available to program students. In addition to the listed elective courses, a student may take other relevant courses, subject to the approval of the dissertation advisor and Ph.D. program director.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Table DR-1: List of Core Courses</td>
<td></td>
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<tr>
<td>MGMT 682</td>
<td>Business Research Methods I</td>
<td>3</td>
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<tr>
<td>MGMT 782</td>
<td>Business Research Methods II</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 635</td>
<td>Data Mining and Analysis</td>
<td>3</td>
</tr>
<tr>
<td>or CS 634</td>
<td>Data Mining</td>
<td></td>
</tr>
<tr>
<td>CS 631</td>
<td>Data Management System Design</td>
<td>3</td>
</tr>
<tr>
<td>or IS 631</td>
<td>Enterprise Database Management</td>
<td></td>
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<tr>
<td>MATH 660</td>
<td>Introduction to statistical Computing with SAS and R</td>
<td>3</td>
</tr>
<tr>
<td>MATH 644</td>
<td>Regression Analysis Methods</td>
<td>3</td>
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<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>Table DR-2: List of Elective Courses</td>
<td></td>
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<tr>
<td>ACCT 615</td>
<td>Management Accounting</td>
<td>3</td>
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<tr>
<td>CS 610</td>
<td>Data Structures and Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>CS 632</td>
<td>Advanced Database System Design</td>
<td>3</td>
</tr>
<tr>
<td>CS 675</td>
<td>Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>or CS 732</td>
<td>Advanced Machine Learning</td>
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<tr>
<td>CS 750</td>
<td>High Performance Computing</td>
<td>3</td>
</tr>
<tr>
<td>CS 645</td>
<td>Security and Privacy in Computer Systems</td>
<td>3</td>
</tr>
<tr>
<td>or CS 708</td>
<td>Advanced Data Security and Privacy</td>
<td></td>
</tr>
<tr>
<td>CS 666</td>
<td>Simulation for Finance</td>
<td>3</td>
</tr>
</tbody>
</table>
ECE 601  Linear Systems
ECE 673  Random Signal Analysis I
ECON 610  Managerial Economics
EM 655  Management Aspects of Information Systems
FIN 600  Corporate Finance I
FIN 610  Global Macro Economics
FIN 624  Corporate Finance II
FIN 626  Financial Investment Institutions
FIN 627  International Finance
FIN 634  Mergers, Acquisitions, and Restructuring
FIN 641  Derivatives Markets
FIN 650  Investment Analysis and Portfolio Theory
FIN 655  Financial Innovations and Market Failures
HRM 601  Organizational Behavior
HRM 630  Managing Technological and Organizational Change
IE 650  Advanced Topics in Operations Research
IE 687  Healthcare Enterprise Systems
IE 688  Healthcare Sys Perf or Modeling
IS 634  Information Retrieval
IS 665  Data Analytics for Info System
IS 682  Forensic Auditing for Computing Security
IS 684  Business Process Innovation
IS 687  Transaction Mining and Fraud Detection
IS 688  Web Mining
MATH 699  Design and Analysis of Experiments
MGMT 620  Management of Technology
MGMT 630  Decision Analysis
MGMT 640  New Venture Management
MGMT 641  Global Project Management
MGMT 649  Convention, Creativity and Innovation
MGMT 656  Public Policy and Business
MGMT 670  International Business
MGMT 680  Entrepreneurial Strategy
MGMT 688  Information Technology, Business and the Law
MGMT 691  Legal and Ethical Issues
MGMT 692  Strategic Management
MGMT 710  Forecasting Methods for Business Decisions
MIS 625  Management Strategies for E-Commerce
MIS 645  Information Systems Principles
MIS 648  Decision Support Systems for Managers
MIS 680  Management Science
MRKT 620  Competing in Global Markets
MRKT 631  Marketing Research
MRKT 636  Design and Development of High Technology Products
MRKT 637  Marketing Communications and Promotions
PTC 628  Analyzing Social Networks

**GPA**

Students must maintain a cumulative GPA of 3.0 or higher.

**Qualifying Examination**
All Ph.D. students are required to take a Qualifying Examination (Part-1) by the end of year one, and must pass the Qualifying Examination (Part-1) by the end of year two. The Qualifying Examination (Part-1) covers subject matter drawn from the core courses.

All Ph.D. students are required to take Qualifying Examination (Part-2) by the end of year two, which covers a subject area chosen by the student based on his/her dissertation research area.

**Dissertation Requirements**

Besides the classroom course requirements, students shall also take the following courses for Ph.D. dissertation requirements.

Ph.D. students are required to register each semester for a zero-credit course: BDS 791 Graduate Seminar. Full-time students must attend all BDS 791 seminars each semester unless justifiable reasons are approved by the program director in advance. Part-time students must attend at least 50% of the BDS 791 seminars in their first year. After their first year, they can perform alternative work as assigned by the program director in lieu of attending seminars.

The requirement of pre-doctoral research (BDS 792B) and doctoral dissertation (BDS 790B) credits are described at: http://www5.njit.edu/graduatemasterstudies/content/new-phd-credit-requirements/. Specifically,

- Ph.D. students who pass the Qualifying Examination (part-1) must then register for 3 credits of pre-doctoral research (BDS 792B) per semester until they defend successfully the dissertation proposal
- Ph.D. students who defend the dissertation proposal successfully must then register for the 1-credit dissertation course (BDS 790A) each semester until they complete all degree requirements.

Students may take courses simultaneously with the 790 or 792 course as per Ph.D. program guidelines or dissertation committee recommendation.

**Dissertation Advisor**

Students are recommended to choose a dissertation advisor as soon as possible, but no later than 3 months after passing the Qualifying Exam (part-1).

**Dissertation Proposal**

A dissertation committee must be established, and the dissertation proposal must be defended successfully either by the end of the third year in the Ph.D. program or four semesters after registering for the first time in the 792 pre-doctoral research course, whichever occurs earlier.

**Dissertation Defense**

Full-time PhD students must defend the dissertation successfully by the end of the sixth year in the PhD program.

Please refer to the following website for other Institution-wide policies and procedures for Ph.D. programs: [http://www5.njit.edu/graduatemasterstudies/sites/graduatemasterstudies/files/policies-procedures-doctoral_updated_2015.pdf](http://www5.njit.edu/graduatemasterstudies/sites/graduatemasterstudies/files/policies-procedures-doctoral_updated_2015.pdf)