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).

Coursework

Bridge Courses

Students who lack fundamental knowledge of certain subjects are required to complete assigned bridge courses by the end of year one, with a grade of at least a B in each assigned course. The assignment of bridge courses is based on recommendation and approval by the Ph.D. program director. Subjects and bridge course examples include:

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

Code	Title	Credits
Section I Core Courses		
MGMT 682	Business Research Methods I	3
MGMT 782	Business Research Methods II	3
MGMT 635	Data Mining and Analysis	3
or CS 634	Data Mining	
CS 631	Data Management System Design	3
or IS 631	Enterprise Database Management	

Code	Title	Credits
Section II: Core Electives (At least two courses)		
MGMT 735	Deep Learning in Business	3
MRKT 766	Seminar in Marketing Analytics	3
MGMT 740	Innovation & Entrepreneurship	3
FIN 780	Theory and Practice of Financial Research	3
Section III: Core Electives- MATH (At least one course)		
MATH 660	Introduction to statistical Computing with SAS and R	3
MATH 644	Regression Analysis Methods	3
MATH 662	Probability Distributions	3
MATH 678	Statistical Methods in Data Science	3
MATH 680	Advanced Statistical Learning	3
MATH 691	Stochastic Processes with Applications	3
MATH 699	Design and Analysis of Experiments	3
Section IV: Electives		
BDS 725	Independent Study I	3
BDS 726	Independent Study II	3
ACCT 615	Management Accounting	3
ECON 610	Managerial Economics	3
HRM 601	Managing Organizational Behavior in Technology-Based Organizations	3
HRM 630	Managing Technological and Organizational Change	3
MGMT 620	Strategic Management of Technological Innovation	3

MGMT 630	Decision Analysis with Quantitative Modeling	3
MGMT 640	New Venture Management	3
MGMT 641	Global Project Management	3
MGMT 650	Knowledge Management	3
MGMT 660	Managing Supply and Value Chains	3
MGMT 670	International Business	3
MGMT 680	Entrepreneurial Strategy	3
MGMT 686	Corporate Governance	3
MGMT 691	Legal and Ethical Issues in a Digital World	3
MGMT 692	Strategic Management	3
MIS 625	Management Strategies for E-Commerce	3
MIS 645	Information Technology and Competitive Advantage	3
MIS 648	Decision Support Systems for Managers	3
MIS 680	Management Science	3
MRKT 620	Global Marketing Management	3
MRKT 631	Marketing Research	3
MRKT 636	Design and Development of High Technology Products	3
MRKT 638	Sales Management for Technical Professionals	3
MRKT 645	Digital Marketing Strategy	3
FIN 600	Corporate Finance I	3
FIN 610	Global Macro Economics	3
FIN 611	Intro to Topics in Fin Tech	3
FIN 616	Data Driven Financial Modeling	3
FIN 620	Adv Financial Data Analytics	3
FIN 624	Corporate Finance II	3
FIN 626	Financial Investment Institutions	3
FIN 627	International Finance	3
FIN 634	Mergers, Acquisitions, and Restructuring	3
FIN 641	Derivatives Markets	3
FIN 650	Investment Analysis and Portfolio Theory	3
CS 610	Data Structures and Algorithms	3
CS 644	Introduction to Big Data	3
DS 675	Machine Learning	3
DS 677	Deep Learning	3
CS 732	Advanced Machine Learning	3
CS 782	Pattern Recognition and Applications	3
CS 786	Seminar in Computer Science II	3
ECE 744	Optimization for Data Engineering	3
ECE 788	Selected Topics in Electrical and Computer Engineering	3
IS 650	Data Visualization and Interpretation	3
IS 657	Spatiotemporal Urban Analytics	3
IS 661	User Experience Design	3
IS 665	Data Analytics for Info System	3
IS 684	Business Process Innovation	3
IS 688	Web Mining	3
IS 698	Special topics in Information Systems	3
IS 735	Social Media	3
EM 602	Management Science	3
EM 640	Distribution Logistics	3
IE 621	Systems Analysis and Simulation	3
IE 650	Advanced Topics in Operations Research	3

IE 673	Total Quality Management	3
IE 659	Supply Chain Engineering	3

A student entering the program with only a Bachelor's degree in related areas shall take 36 credits of advanced courses (600-level and 700-level) beyond the Bachelor's degree with the approval by the Ph.D. program director. The 36 credits shall include core and elective courses, in addition to the credits for dissertation research. Among the 36 credits, at least 12 credits must be 700-level courses.

A student entering the program with a Master's degree or above in the related areas shall take 21 credits of advanced courses (600-level and 700-level) or equivalent with the approval by the Ph.D. program director. Students with strong credentials in business and/or data science and with a Master's degree may be approved to take 18 credits of advanced courses, subject to the approval by the Ph.D. committee. At least 12 credits must be 700-level courses.

The required course credits listed above are those in addition to the credits for dissertation research (BDS 792B and BDS 790A).

GPA

Students must maintain a cumulative GPA of 3.0 or higher. As per current NJIT policy, students receiving financial support, as assistantship and fellowship, for the first time must have a cumulative GPA of 3.5 or higher. To continue receiving support, they must maintain a cumulative GPA of at least 3.0

Qualifying Exams

All Ph.D. students are required to take Core Course Qualifying Exams by the end of year one and must pass the Core Course Qualifying Exams by the end of year two. The Core Course Qualifying Exams covers subject matter drawn from the core courses.

All Ph.D. students are required to take Subject Qualifying Exam by the end of year two. Each Subject Qualifying Exam covers a subject area based on the student's research interest.

Dissertation Requirements

Registration

In addition to the required course credits listed above, students must meet Ph.D. dissertation requirements. Students must register BDS 792B for dissertation proposal and BDS 790A for dissertation. The requirement of BDS 792B and BDS 790A credits are described at: http://www5.njit.edu/graduatestudies/content/new-phd-credit-requirements/ and https://catalog.njit.edu/graduate/academic-policies-procedures/.

Dissertation Advisor

Students are recommended to choose a dissertation advisor as soon as possible, but no later than 3 months after passing the Core Course Qualifying Exams.

Dissertation Proposal Defense

The dissertation proposal must be defended in a public forum 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

PhD students must defend the dissertation successfully by the end of the sixth year in the Ph.D. program.

Please refer to the following website for other institution-wide policies and procedures for Ph.D. programs: https://catalog.njit.edu/graduate/academic-policies-procedures/

Other Requirements

Ph.D. students are required to register each semester for a 0-credit course: BDS 791 Doctoral Seminar. Full-time students must attend BDS 791 seminars each semester unless justifiable reasons are approved by the program director in advance. Part-time students are expected to attend at least 50% of the BDS 791 seminars in their first year. They may be asked to perform alternative work assigned by the program director in lieu of attending seminars.

In their first year, Ph.D. students are required to take a 0-credit course: INTD 799 Responsible Conduct of Research and receive a Satisfactory grade.