

Ph.D. Program in Business Data Science

Course Mapping Form

MTSM, NJIT

Student Name:

Date:

Please fill in the tables below regarding to your background with respect to the bridge courses in Part 1 and core courses in Part 2. Please refer to the course information in Part 3. You may map one NJIT course to one or more courses that you have taken (in which case, you may insert additional lines in the tables below). It is anticipated that incoming students do not have background in all the courses in this interdisciplinary program.

Part 1: Mapping of Bridge Courses

		NJIT Course		Mapping courses		
Area	Course ID	NJIT Course Name	Similar Course	Grade	URL and/or Attachment of Course Description/Syllabus	
			Name			
Data Structure	CS 280	Programming Language Concepts				
	or CS 505 ¹	Programming Data Structures and Algorithms				
Calculus	Math 211	Calculus III				
Probability and Statistics	MGMT 216	Business Statistics				
	or MATH 333 ²	Probability and Statistics				
Basic Business Knowledge	MGMT 492	Business Policy				
	MGMT 501	Management Foundations				

¹ Option to map either CS 280 or CS 505

² Option to map either MGMT 216 or MATH333

Part 2: Mapping of Core Courses (this part is optional, and is only filled by students with MS/MBA degree before entering the program)

NJIT Course		Mapping courses		
Course ID	NJIT Course Name		Grade	URL and/or Attachment of Course Description/Syllabus
		Similar Course Name		
MGMT 682	Business Research Method (I)			
MGMT 683	Business Research Method (II)			
MGMT 635	Data Mining and Analysis for Managers			
or CS ³ 634	Data Mining			
CS 631	Database Management System Design			
or IS ⁴ 631	Enterprise Database Management			
Math 660	Introduction to Statistical Computing			
Math 644	Regression Analysis Methods			

³ Option to map either MGMT 635 or CS 634

⁴ Option to map either CS 631 or IS 631

Part 3. Course Description

Bridge Courses

Part A. Basic Business Knowledge

1. MGMT 501 Management Foundations. 3 credits, 3 contact hours.

Prerequisite:

Description: This course provides foundation knowledge for MSM and MBA students whose undergraduate coursework does not include coursework in accounting and finance. It therefore, serves as a pre-qualifier for the MSM and MBA programs.

<http://catalog.njit.edu/graduate/management/management/technology-mba/index.html>

2. MGMT 492 Business Policy. 3 credits, 3 contact hours.

Prerequisite: senior standing.

Description: A capstone course in the area of business administration focusing on the integration of concepts taught in various functional courses such as marketing, finance, operations management, accounting, organizational behavior. Issues related to corporate responsibilities and ethical behavior are also incorporated in this course. Emphasis on application of concepts to real life situation is achieved through case discussion and projects.

<http://catalog.njit.edu/undergraduate/management/management/business-bs/>

Part B. Programming and Data Structure

3. CS280 Programming Language Concepts. 3 credits, 3 contact hours.

Prerequisite: CS 114 OR CS 116 OR IT 114 OR IT 102

Description: Conceptual study of programming language syntax, semantics and implementation. Course covers language definition structure, data types and structures, control structures and data flow, run-time consideration, and interpretative languages.

<http://catalog.njit.edu/undergraduate/computing-sciences/computer-science/bs/>

4. CS505 Programming Data Structures and Algorithms. 3 credits, 4 contact hours.

Prerequisite: knowledge of at least one procedure-oriented language such as PASCAL or C.

Description: Intensive introduction to computer science principles: a procedure-oriented language such as C++; program design techniques; introductory data structures (linked lists, stacks, sets, trees, graphs); and algorithms (sorting, searching, etc.) and their analysis. Programming assignments are included.

<http://catalog.njit.edu/graduate/computing-sciences/computer-science/ms/>

Part C. Advanced Calculus

5. Math211 Calculus III. 3 credits.

Prerequisites: Math 112 with a grade of C or better or Math 133 with a grade of C or better

Description: Topics include vectors, curvature, partial derivatives, multiple integrals, line integrals, and Green's theorem. Students who are considering a major in Mathematical Sciences or who are undecided about their major should take Math 213. Effective From: Fall 2012.

https://m.njit.edu/Undergraduate/Course_Syllabi/Spring2016/Math_211-SP16.pdf

Part D. Probability and Statistics

6. MGMT 216. Business Statistics. 3 credits, 3 contact hours

Prerequisite: MATH 105 or MATH 333

Description: Introduction to business data analysis for application in management decision-making processes. Productivity measures, employment trends, national income data, and consumer price changes. Methods for collection of business and economic data, presentation of data and computer applications, index numbers, historical analysis trend projections, survey sampling, and planning for business research.

<http://catalog.njit.edu/undergraduate/management/management/business-bs/>

http://courseschedules.njit.edu/2011F%5CMGMT%5C216%5C101%5CSyllabus_MGMT_216_1

[01_Syllabus_Fall_2011.docx](#) (regression, multi-regression, time series, experiments, nonparametric methods)

7. MATH 333. Probability and Statistics. 3 credits, 3 contact hours

Prerequisite: MATH 112 with a grade of C or better or MATH 133 with a grade of C or better.

Description: Descriptive statistics and statistical inference. Topics include discrete and continuous distributions of random variables, statistical inference for the mean and variance of populations, and graphical analysis of data.

<http://catalog.njit.edu/undergraduate/science-liberal-arts/mathematical-sciences/applied-mathematics/index.html>

https://m.njit.edu/Undergraduate/Course_Syllabi/Spring2016/Math_333-SP16.pdf

Core Courses

Part A. Business (MGMT682, MGMT683)

1. MGMT 682 Business Research Methods (I)

Business Research Methods (I) provides an overview of introductory quantitative and qualitative research methods used in the business research, including: preparing for research, data collection and analyzing, theory of measurement, types of measures, measurement validation, writing and presenting research.

2. MGMT 683 Business Research Methods (II)

Business Research Methods (II) provides an overview of advanced quantitative research methods, including power analysis, experimental and survey designs and analysis of experimental data,

structural equation modeling (SEM), longitudinal modeling, multi level modeling, causal modeling, polynomial regression models with response surface methodology, and emerging methods and tools.

Part B. Technology (MGMT635 or CS634, CS631 or IS631)

3.1 MGMT 635 Data Mining and Analysis for Managers. 3 credits, 3 contact hours.

Prerequisite:

Description: This course provides an introduction to data mining with an emphasis on large scale databases as a source of knowledge generation and competitive advantage. Specific topics include: framing research questions; data modeling; inferential data mining techniques; and evaluation and deployment of data mining systems.

<http://catalog.njit.edu/graduate/management/management/ms/>

3.2 CS 634 Data Mining. 3 credits, 3 contact hours.

Prerequisite:

Description: This course covers the principles of data mining system design and implementation. It presents methods for association and dependency analysis as well as classification, prediction, and clustering. Optional topics may include time series and graph mining, current trends in data mining, and data mining for scientific, medical and engineering applications.

<http://catalog.njit.edu/graduate/computing-sciences/computer-science/ms/>

4.1 CS 631 Database Management System Design. 3 credits, 3 contact hours.

Prerequisite: knowledge of C and data structures.

Description: Acquaintance with fundamental notions of relational database technology. Mathematical properties and usage of database programming languages. Methods of database design and conceptual modeling. Methods of physical storage for database information. Fundamental notions of concurrency control and recovery in database systems.

<http://catalog.njit.edu/graduate/computing-sciences/computer-science/ms/>

4.2 IS 631 Enterprise Database Management. 3 credits.

Prerequisite:

Description: This course introduces the foundations of database systems, focusing on data modeling, query design, and applications. It provides an understanding of the issues in designing and managing database systems as an essential organizational resource. The components of enterprise data management are covered, with a strong emphasis on data modeling as well as the DBLC (Data Base Life Cycle). Implementing a database using SQL is an art and a science and will be addressed in the course. Data warehousing and data mining issues will also be examined.

<http://is.njit.edu/academics/courses/index.php>

Part C. Math (Math660, Math644)

5. Math 660 Introduction to Statistical Computing. 3 credits, 3 contact hours.

Prerequisites: Basic knowledge in statistical concepts or instructor approval.

Description: This course will study SAS and R programming and emphasize the SAS and R data steps including getting data into the SAS and R environments, working and combining data using control flows, merge and subsets, etc. as well as learning to export data and to generate high resolution graphics. Several SAS and R statistical procedures or functions will also be discussed and illustrated. Finally, interactive statistical software JMP and Minitab are briefly introduced.

Effective From: Spring 2014

https://m.njit.edu/Graduate/Course_Syllabi/Fall2015/Math_660-F15.pdf

6. Math 644 Regression Analysis Methods. 3 credits, 3 contact hours.

Prerequisite: MATH 661 or departmental approval.

Description: Regression models and the least squares criterion. Simple and multiple linear regression. Regression diagnostics. Confidence intervals and tests of parameters, regression and analysis of variance. Variable selection and model building. Dummy variables and transformations, growth models. Other regression models such as logistic regression. Using statistical software for regression analysis.

<http://catalog.njit.edu/graduate/science-liberal-arts/mathematical-sciences/applied-statistics-ms/>

Student Signature: _____ **Date:** _____