RDI² Educational Offerings

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Motivation

“Big data to create 1.9M IT jobs in U.S. by 2015, ....but there aren’t enough skilled people to fill the jobs, say Gartner analyst.” ---Computerworld, 2012

“A report last year by the McKinsey Global Institute, the research arm of the consulting firm, projected that the United States needs 140,000 to 190,000 more workers with “deep analytical” expertise and 1.5 million more data-literate managers, whether retrained or hired.”, The Age of Big Data, NYT 2012
RDI2 Education Initiatives

• Goal: to focus on the education and training of data scientists – “Big Data”

• Big Data Topics:
  – Analytics
  – Computation
  – Computational Sciences
  – High Performance Computing
  – Data Management
RDI² Educational Pathways & Offering

**Undergraduate Students**
- Advanced undergraduates can begin taking graduate courses towards a certificate program. This program is open to undergraduates in science, engineering, information science and computing.

- Certificate in Discovery Informatics
- Certificate in Computational and Data Enabled Science & Engineering

**Graduate Students**
- Ph.D./MS students in science, engineering, and computing can take courses in informatics and computation to gain an expertise in data sciences.

- Certificate in Discovery Informatics
- Certificate in Computational and Data Enabled Science & Engineering

**Professional Graduate Students**
- Students interested in a professional degree can combine a science and business curriculum with a focus on data and informatics. Students in other concentrations (e.g., life sciences) can also pursue these certificates.

- Master of Business & Science Degree (MBS) in Discovery Informatics & Data Sciences
- Certificate in Discovery Informatics
- Certificate in Computational and Data Enabled Science & Engineering

**Executive Continuing Education**
- Researchers from industry, working professionals and executives can take continuing education courses to keep up-to-date on the latest research in data related sciences and technologies.

- Short courses on discovery informatics, high performance computing, e-science, and large-scale analytics
- The short courses can be combined for a pathway to graduate education.
Professional Science Master’s Degree: Master of Business & Science (MBS)
Master of Business & Science Degree

- Combination of a traditional MS and MBA -- integrated coursework (24 credits a science concentration, 19 in business)
- Concentrated tracks in science & engineering: “MBS with a concentration in ...”
- Strong Industry component: integrated internship component, industry advisory board, and workforce development in the sciences.
- Global Partnerships with International Universities
- Business curriculum

“T-shaped technical professional, who have skills both broad and deep. In addition to being deep problem solvers...T-shaped scientists (and engineers) are also entrepreneurial and good at communicating with non-specialists “-- Taken for Granted, Fitting the Job Market to a T, B. Benderly, Science Career Magazine, September 05, 2008.
Business courses

- Principles of Finance & Accounting (3cr)
- Marketing (3cr)
- Communication & Leadership (3cr)
- Science & Technology Management Electives (6cr, can include project management, management of innovation, etc)
- Ethics & Professionalism (1cr)
- Capstone – business case, intrapreneurship, entrepreneurship (3cr)
- Colloquium in Science/Tech Management
- Internship opportunities: individual/team internship, innovation immersion, research experience
Master of Business & Science Degree (MBS)  
with a concentration in  
Analytics: Discovery Informatics & Data Sciences

**Statistics (1):**  
16:960:563 Regression Analysis

**Analytics & Data Mining (1):**  
16:137:600 Fundamental of Analytics

**Database Systems (1):**  
17:610:557 Database Design and Management

**Programming (2):**  
16:332:566 Introduction to Parallel and Distributed Computing  
16:332:572 Parallel and Distributed Computing  

**Electives (3):**  
e.g., Machine Learning, Data Mining, Data Analysis and Decision Models, Analytics for Business Intelligence,  
Data Curation, Marketing Analytics, etc

**Business Curriculum (19 credits):** finance & accounting, communication, Ethics, tech ventures, project management, etc.
Spring 2013 New Courses

• **Introduction to Analytics** - *This course provides an overview of modern data analytics techniques that have grown from the fields of statistics, machine learning and information theory. Decision trees, covering algorithms, association mining, statistical modeling, linear models and instance-based learning are some of the basic methods that are covered.*

• **Introduction to Computation and Modeling** — *Introduction to the basics of computing and programming through MATLAB. Topics include: loops, arrays, procedures, mathematical modeling.*
Computational and Data-Enabled Science and Engineering (CDS&E) is an intellectual discipline that brings together core areas of science and engineering, computer science, and computational and applied mathematics in a concerted effort to use cyberinfrastructure (CI) for scientific discovery and engineering innovations.

- 4 course graduate certificate, open to all graduate students in the sciences and engineering
- 2 HPC computing courses, 2 computational science courses
Executive Education

• Short courses on discovery informatics, high performance computing, e-science, and large-scale analytics
  – The short courses can be combined for a pathway to graduate education.

• Webinar courses from other sites

• Continuing Education
“Data Scientist – The Sexiest Job of the 21st Century”
Harvard Business Review 2012