MEMORANDUM

TO: Jennifer Preece  
Dean, College of Information Studies

FROM: Elizabeth Beise  
Associate Provost for Academic Planning and Programs

SUBJECT: Proposal to Modify the Master of Information Management – Data Analytics Specialization (PCC log no. 14029)

At its meeting on February 6, 2015, the Senate Committee on Programs, Curricula and Courses approved the proposal to modify the Master of Information Management – Data Analytics Specialization. A copy of the approved proposal is attached.

The change is effective Fall 2015. Please ensure that the change is fully described in the Graduate Catalog and in all relevant descriptive materials.

MDC/ Enclosure

cc: Gregory Miller, Chair, Senate PCC Committee  
Barbara Gill, Office of Student Financial Aid  
Reka Montfort, University Senate  
Erin Taylor, Division of Information Technology  
Pam Phillips, Institutional Research, Planning & Assessment  
Anne Turkos, University Archives  
Linda Yokoi, Office of the Registrar  
Alex Chen, Graduate School  
Ann Weeks, College of Information Studies
THE UNIVERSITY OF MARYLAND, COLLEGE PARK
PROGRAM/ CURRICULUM/ UNIT PROPOSAL

• Please email the rest of the proposal as an MSWord attachment to pcc-submissions@umd.edu.

• Please submit the signed form to the Office of the Associate Provost for Academic Planning and Programs, 1119 Main Administration Building, Campus.

College/School:
Please also add College/School Unit Code-First 8 digits: 01203500
Unit Codes can be found at: https://hypprod.umd.edu/Html_Reports/units.htm

Department/Program:
Please also add Department/Program Unit Code-Last 7 digits: 1350101

Type of Action (choose one):
X Curriculum change (including informal specializations)  □ New academic degree/award program
□ Curriculum change for an LEP Program  □ New Professional Studies award iteration
□ Renaming of program or formal Area of Concentration  □ New Minor
□ Addition/deletion of formal Area of Concentration  □ Request to create an online version of an existing program
□ Suspend/delete program

Italics indicate that the proposed program action must be presented to the full University Senate for consideration.

Summary of Proposed Action:
The College of Information Studies (Maryland’s iSchool) plans to change the Data Analytics specialization, one of the informal specializations in the Master of Information Management (MIM) program, to offer an updated, more competitive set of courses. The iSchool would like to add three electives to the pool of electives that may be taken to complete the informal specialization, and it would like to replace the Data Analytics Fundamental course, currently INST714 Information for Decision Making, with INST627 Data Analytics for Information Professionals.

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APPROVAL SIGNATURES - Please print name, sign, and date. Use additional lines for multi-unit programs.

1. Department Committee Chair

2. Department Chair

3. College/School PCC Chair   ANN WEEKS  ANN WEEKS  12-17-14

4. Dean   JENNIER BEESE  JENNIER BEESE  12-17-14

5. Dean of the Graduate School (if required)

6. Chair, Senate PCC

7. University Senate Chair (if required)

8. Senior Vice President and Provost
PROPOSAL FOR
MODIFICATION OF SPECIALIZATION (INFORMAL)
UNIVERSITY OF MARYLAND AT COLLEGE PARK, MARYLAND
DATA ANALYTICS SPECIALIZATION FOR
MASTERS OF INFORMATION MANAGEMENT DEGREE

COLLEGE OF INFORMATION STUDIES
DEAN JENNIFER PREECE

SPECIALIZATION _______ DATA ANALYTICS _____________
FOR DEGREE PROGRAM _____ MASTER OF INFORMATION MANAGEMENT ___

Proposed Initiation Date: FALL 2015
I. ABSTRACT

The Master of Information Management (MIM) degree program at the College of Information Studies (iSchool) offers informal specializations to help students identify ways of combining MIM electives to prepare for different careers. These informal specializations, which reflect domains of information management expertise, serve as pathways through the available elective courses.

The Data Analytics specialization, one of the MIM program’s most popular pathways, focuses on manipulation and mobilization of data to support decision-making processes and organizational goals. This specialization includes two fundamentals courses, one advanced course, and a set of relevant specialty courses. This proposal modifies the informal Data Analytics specialization to reflect an incremental refinement to the Data Analytics Fundamentals course and the addition of Data Analytics specialty courses in big data infrastructure, social network analysis, and community data analytics. The proposed changes are summarized in Table 1 (changes noted in bold).

<table>
<thead>
<tr>
<th>Current Specialization Courses</th>
<th>Proposed Specialization Courses</th>
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<tbody>
<tr>
<td><strong>Data Management Technology Fundamentals</strong></td>
<td>• INST 733 Database Design</td>
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<tr>
<td><strong>Data Analytics Fundamentals</strong></td>
<td>• INST 714 Information for Decision Making</td>
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<tr>
<td><strong>Advanced Data Analytics</strong></td>
<td>• INST 737 Digging into Data</td>
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<tr>
<td><strong>Data Analytics Specialty Courses (two or more are recommended)</strong></td>
<td>• INFM 714 Principles of Competitive Intelligence</td>
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<td>• INFM 732 Information Audits and Environmental Scans</td>
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<td>• INFM 747 Web-Enabled Databases</td>
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<td>• Special Topics courses as designated by the MIM Program Committee</td>
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<td></td>
<td>• INST 714 Information for Decision Making</td>
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<td>• INFM 750 From Data to Insights</td>
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<td>• INST 767 Big Data Infrastructure</td>
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<td></td>
<td>• Special Topics courses as designated by the MIM Program Committee</td>
</tr>
</tbody>
</table>

Table 1: Proposed Changes to Data Analytics Specialization Courses
II. **OVERVIEW and RATIONALE**

The Master of Information Management (MIM) degree program in the College of Information Studies (iSchool) offers informal specializations to help students identify ways of combining MIM electives to prepare for different careers. These informal specializations, which reflect domains of information management expertise, serve as pathways through the available elective courses.

The Data Analytics (DA) specialization is one of the guides offered to MIM students. It focuses on the knowledge and skills needed to manipulate and mobilize data to support decision-making processes and organizational goals. The Data Analytics specialization prepares students for a variety of positions, such as data scientist, data analyst, and information analyst.

The DA specialization introduces foundational data analytics concepts including measure construction, hypothesis testing, data exploration, pattern identification, and statistical analysis, and provides an overview of commonly used data manipulation and data analysis tools. Through the recommended coursework, students gain hands-on experience with techniques such as data mining, predictive modeling, and visual analytics, which help unearth hidden information and enable organizations to build and sustain long-term competitive advantage based on data assets. In data analytics assignments, projects, and activities, students practice working with these techniques and tools to create information resources that can be used in individual and organizational decision-making and problem-solving processes.

According to current program statistics, approximately 30 percent of MIM students have followed the Data Analytics specialization since fall 2013, and approximately 30 percent of fall 2014 applicants indicated that they planned to follow the Data Analytics specialization if admitted to the program.

To better help these MIM students benefit from relevant course offerings within the iSchool, the MIM Program Committee, with approval from the iSchool’s Program, Curricula, and Courses Committee (PCC), worked with faculty to modify the specific courses included in the guidelines for the Data Analytics specialization. The modified specialization makes better use of available courses to meet the specialization’s learning objectives (see Appendix A) and prepares students for successful careers in data analytics. In particular, the added courses provide more extensive coverage of the fundamentals and more options for students seeking to explore sub-areas within Data Analytics.

III. **COURSE CHANGES TO SPECIALIZATION**

The Master of Information Management (MIM) degree (36 credits) requires students to successfully complete four required core courses (12 credits) and two project courses (an internship course [3 credits] and a capstone project course [3 credits]). The remaining 18 credits are designated as electives, 3 credits of which must be an advanced (700 level) technology course.
While students in the MIM program are free to satisfy the elective requirements however they choose, they may select (or design) a career-relevant specialization that provides them with a depth of knowledge in one or more domains of information management expertise.

To help students benefit from the range of courses available within the iSchool (see Appendices C and D for course descriptions), the MIM program provides a variety of informal specializations (see Appendix B for the full list and descriptions). The specialization guidelines provide students with additional information they use when selecting a set of electives to best meet their needs.

The Data Analytics specialization identifies two fundamentals courses\(^1\), one advanced course, and a set of specialty courses from which students are encouraged to select two. If completed, this set of five courses (15 credits) provides students with a solid foundation and depth of knowledge in the concepts, techniques, and tools used in this domain.

The course changes to the Data Analytics specialization include the following:

- Replaces INST 714, *Information for Decision Making*, with INST 627, *Data Analytics for Information Professionals*
- Adds the following courses to a list of recommended specialty courses:
  - INST 633 Analyzing Social Networks and Social Media
  - INST 714 Information for Decision Making
  - INFM 750 From Data to Insights
  - INST 767 Big Data Infrastructure

The new fundamental data analytics course (INST 627) grew out of the prior fundamental course (INST 714), arising when it became clear that one course was not sufficient to provide both the core analytics skills and in depth examination of information resource design and decision-making (as is covered in INST 714). INST 633 and INST 767 are permanent numbers for courses previously offered as special topics courses. INST 750 is an advanced technology elective developed by a new iSchool faculty member.

IV. IMPACT

The proposed changes to the Data Analytics specialization minimally impacts the MIM degree program and the iSchool, generally. All of the courses, above, have been or will be taught by a member of the Graduate Faculty.

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\(^1\) It should be noted while the fundamentals and advanced courses are not formally “required” for the specialization, they are prerequisites for the many of the specialty courses. In this way, the Data Analytics specialization also helps students navigate the prerequisite requirements of the iSchool electives.
The only measurable impact of the course changes will be on advisors and MIM program staff who will need to field student questions regarding the change. No additional staff, resources, or facilities will be needed.

Student impact is also expected to be minimal. As informal guidelines, the Data Analytics specialization is not a constraining requirement. Students can complete the MIM program with any combination of program relevant electives. Whether they follow the existing guidelines or the modified ones, they still satisfy the requirements for the MIM degree.
APPENDIX A: Data Analytics Specialization Learning Objectives

The specialization is designed to help assemble a set of MIM electives in which they will:

- Learn basic concepts in data analytics including measure construction, hypothesis testing, data exploration, pattern identification, and statistical analysis.
- Critically evaluate and select various types of data, data analyses, and data strategies for use in decision-making processes and apply appropriate statistical methods to address decision-making problems.
- Use prescriptive and descriptive analyses to reach defensible, data-driven conclusions.
- Learn commonly used data manipulation and analytic tools.
- Understand how to pose appropriate research questions—using real world datasets—with implications in a wide range of sectors including transportation, health, or government.
- Acquire current techniques and algorithmic approaches to extract information from real-world datasets.
- Learn how to effectively communicate findings to experts and non-experts through analytical insights and data visualizations.
- Design and implement databases as well as understand techniques for deriving value from business data.
- Understand the core technologies supporting data science and business intelligence.
- Understand how business data are collected and organized in data warehouses.
- Transform large data sets into actionable information in an easy-to-understand format to support organizational decision making through the use of advanced analytical tools.
- Manage the quality, security, and privacy of data relevant to an organization to enhance its value.
- Assess alternative approaches and infrastructures for implementing big data analytics.
- Evaluate the appropriate methods and tools for data analysis in specific organizational contexts, including selecting a modeling approach, building a model using appropriate tools, validating the model, and deploying the model for prediction and analysis.
APPENDIX B: Master in Information Management Program (MIM) Overview

Program Description
The Master of Information Management (MIM) program prepares students to be leaders in the use of information and technology in an organization. Drawing from management, computer science, information systems, and information science, the MIM program provides students with the skills and knowledge to successfully meet users’ information needs, lead efforts to develop organizations' information management capabilities, develop and deploy emerging technologies, and manage high-value information resources.

The MIM program integrates elements of management, computing, and information science to address critical social, economic, legal, and policy challenges associated with supporting information use by individuals and organizations. Its goals include:

- Preparing professionals for leadership positions that bridge the gap between technology-oriented staff, functional personnel, and management.
- Addressing the growing need for skilled information professionals who can strategically manage information and technology assets to fulfill critical information needs in organizations.
- Providing leadership in the information management field through the study of ethical, political, social, and technical issues related to information management in modern society.
- Assisting organizations in the formation of information policies, development and application of information systems and services, and the use of information management technologies and methods.

The MIM curriculum consists of 36 credits (12 courses) of graduate-level coursework in information management and related subjects, including a balanced mix of required and elective courses.

All MIM students must complete four core courses, which provide a foundation of skills and knowledge related to information, technology, user analysis, and management. These courses allow students to determine which aspects of information management they find most interesting and useful. The MIM core courses cover such information management topics as information definition, information privacy and ethics, technology development and deployment concepts, management principles in organization, as well as efficient user design techniques and strategies.

The learning opportunities in the MIM program are not confined to the classroom. Most MIM courses involve substantial applied components in the form of individual and group projects, in-class exercises, and mini workshops. In addition to courses covering necessary information management theory, there are two project courses—a capstone project and internship—representing the zenith of the program’s practice-oriented focus. After completing the MIM core courses, all students are required complete a set of electives that provides depth of knowledge in one or more areas of information management expertise.
To help students satisfy their specialization requirement the MIM program offers a variety of specialization guidelines. These guidelines provide students with examples of ways their MIM elective coursework can be organized to meet their educational and professional goals.

The following pre-designed specializations are identified:

- **Archives and Digital Curation**—The ADC specialization focuses on the role of archivists, data curation managers and specialists, and other information professionals in contemporary society; linkages between analog and digital assets and how to manage diverse holdings and collection; the records life cycle from pre-creation activities through creation, use, preservation, and access; the intersection of legal, ethical, policy, and political sensitivities in managing analog and/or digital assets.

- **User Interface/User Experience**—The UI/UX specialization focuses on the design and implementation of user interfaces. It prepares individuals for positions such as UI/UX designer, usability analyst, and website developer.

- **Organizational and Process Analysis**—The OPA specialization focuses on developing an individual’s ability to diagnose and solve information management problems associated with critical organizational activities. It prepares a graduate for positions such as: business analyst, systems analyst, and process consultant.

- **Data Analytics**—The DA specialization focuses on the skills needed to manipulate and mobilize data in order to support decision-making and organizational goals in a variety of sectors. This specialization prepares graduates for a variety of positions, such as data scientist, data analyst, or information analyst.

- **Project Management**—The PM specialization focuses on skills to plan, lead, and execute projects in a variety of organizational settings. It prepares graduates for positions such as project manager, program manager, and consulting lead.

- **Strategic Management of Information**—The SMI specialization focuses on the managerial, administrative, and organizational aspects of information management.

- **Technology Development and Deployment**—The TDD specialization focuses on the development, implementation, and maintenance of systems in support of information management.

- **Information Management Research**—The IMR specialization focuses on conducting research that advances the state-of-the-art and state-of-the-practice in information technology and management. It prepares graduates for advanced study in information science doctoral programs and careers in cutting-edge corporate or entrepreneurial environments.

MIM students who choose to design their own specializations prepare an individualized program plan. This option gives students the opportunity to combine technical and managerial coursework to create a unique program of study customized to their interests and needs.
APPENDIX C: MIM Degree Requirements – Core and Required Courses

Core Courses

**INFM 600 – Information Environments**
Graduate catalogue description: Role and function of information in organizations. Organizational environment and its influence on internal and external communication, organizational structure and management, organizational culture, information flow, organizational identity. Shared mental models and group decision making. Differences among types of organizations. Information policy.

This course explores various models and methodologies used to capture and deploy internal and external information and knowledge in a number of settings. Throughout the course, students analyze organizations in terms of information creation, flow, sharing, conservation, and application to problem solving. The course takes into account both internal and external influences on the management of information and knowledge. The course examines how information flows, and is managed, in online settings, and involves a number of examples of successful and unsuccessful online information management.

**INFM 603 – Information Technology and Organizational Context**
Graduate catalogue description: Application of communication and information technologies to support work processes, including technology-enhanced communication networks, computer-supported collaborative work, decision-support systems, interactive systems, and systems analysis. The course is also examines acquisition of information systems and their integration into the organization.

The first part of the course is designed to build a progressively richer understanding of how specific foundational capabilities are used together to both process information and create the user experience. Homework assignments are used to demonstrate mastery of specific technologies. In the part half of the course, class sessions will be devoted to more holistic consideration of how those capabilities are used together to support the activities of an organization. During this part of the semester, students complete a term project in which they demonstrate mastery of the integrated use of technologies that were mastered individually during the first half of the semester. By examining technologies first individually and then more holistically, students will have the opportunity to enrich their understanding of how specific technologies interact to help achieve the objectives of an organization.

**INFM 605 – Users and Use Context**
Users are not a generic group, but rather are specific individuals with particular needs and preferences. To be successful, information professionals must be able to understand users, the activities they perform, and the context in which activities are being performed. This course focuses on various user experience research methodologies for learning about users, use, and context. It prepares future information professionals on how to determine the most appropriate approach to gather and report data on the needs of users as part of a design process. In the course, students learn how to identify the strength and weaknesses of various methodologies typically used for gathering information from a diverse range of users with different needs and abilities, to articulate the strengths and weaknesses of the methodologies, as well as to determine which methodology is most suitable for specific types of data collection needs.

**INFM 612 – Management of Information Programs and Services**

Graduate catalogue Description: Administration of information programs, services, and projects, including the role of leadership in management; developing mission, vision, and goals; providing effective management for results; managing professionals; financial management; and professional conduct and ethical issues.

This course is an introduction to various aspects of management focusing on planning, organizing, leading and controlling management stages. The course covers such aspects as the evolution of management, innovative management for the changing world, management styles and leadership, managerial planning, goal setting and decision making. The course also focuses on designing adaptive organizations responding to change, global environment, diversity, and utilizing the appropriate technology to provide effective management for results in information programs and services.

**Project Courses**

**INFM 736 Information Management Experience**

Graduate catalogue Description: Information issues within organizational frameworks. Integrated experiential learning opportunity.

This course is usually taken along with student internship and helps students to successfully define their career short-term and long-term goals, develop their professional plan as well as build a strategy enabling them to make the most of their internships. In this course, students gain hands-on practical experience, acquire knowledge and skills appropriate for a professional career, begin to build a network for support and future employment, and clarify individual professional goals and strategies for career development. The nature of the internship work usually involves everyday operational tasks, or it may involve a special project (in its entirety or as part of a larger project, where the rest of the work can be completed by others). The internship may also be a combination of everyday work plus one or more special projects.
In the past, our students have been able to find and successfully complete internships in such companies as Bank of America, Links Media, LLC, Atlas Copco, National Foreign Language Center, Paradyme Management, Goldman Sachs, Ernst and Young, Time Warner Cable, Wal-Mart E-commerce Labs, Freescale Semiconductor, National Foreign Language Center, etc. Half of the MIM students get full-time job offers after successfully completing their internship projects.

For the summer 2015 term, the iSchool is actively developing relationships with Google and a Brazilian company—Neoway—to present our students with internships and full-time job opportunities in the data analytics field.

INFM 737 – Information Management Capstone
The MIM Capstone Experience course is a core requirement, and it is one academic semester in length. This course is usually taken in students’ last semester and it is a great opportunity for them to demonstrate skills and knowledge they have learned during their course of study.

In the MIM Capstone Experience course, students are working in collaboration with their sponsoring client companies and assigned project managers on individual projects. There are several class meetings throughout the semester, during which students are required to update others on progress being made in their selected projects. Throughout the course, students are expected to schedule frequent, periodic virtual and/or in-person meetings with their clients and project managers, during which discussions regarding project progress and direction helps to keep the project on track. For a successful INFM 737 course completion, students are expected to submit a final project deliverable requested by their sponsors (i.e., market research paper, designed website, product evaluation report, etc.) as well as a written report that must be approved by the students’ respective clients and course instructor. In addition, all students are required to participate in the Experiential Learning Expo (at the end of the academic semester), presenting the project that have been working on, their accomplishments, and lessons learned. Capstone presentations are open to the entire University community and are announced, including their time, location, and titles to the University via the College’s electronic lists.

The MIM Internship and MIM Capstone Experience provide students a rich environment for testing and developing their ability to recognize and capitalize on opportunities to use information management techniques to improve organizations. These courses give students experience grappling with real information management challenges faced by organizations in all sectors of our society as well as expose students to challenges across a variety of organizations, including government agencies, corporations, entrepreneurial startups, academic institutions, and non-profits.
## APPENDIX D: Data Analytics Specialization Course Descriptions

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<tr>
<th>Course</th>
<th>Description</th>
<th>Learning Outcomes</th>
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<tr>
<td><strong>INST 627</strong>&lt;br&gt;Data Analytics for Information Professionals</td>
<td>While much has been written about the promise of “big data”, effectively using data resources to improve individual and group outcomes remains a significant challenge. This course provides students with the foundational skills and knowledge they will need to play a significant role in selecting datasets and sources, performing quantitative and qualitative analyses, and developing high-impact information resources.</td>
<td>At the completion of the course students will: &lt;ul&gt;&lt;li&gt;Select and evaluate various types of data to for use in decision making;&lt;/li&gt;&lt;li&gt;Use prescriptive and descriptive analyses to reach defensible, data-driven conclusions;&lt;/li&gt;&lt;li&gt;Select and apply appropriate statistical methods, including t-tests, chi-square tests, ANOVA, correlation, and regression, to address decision problems;&lt;/li&gt;&lt;li&gt;Use MS Excel and SPSS for basic data manipulation and analysis; and&lt;/li&gt;&lt;li&gt;Critically evaluate data analyses and develop strategies for improving their reliability and validity.&lt;/li&gt;&lt;/ul&gt;</td>
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<td><strong>INST 633</strong>&lt;br&gt;Analyzing Social Networks and Social Media</td>
<td>Introduces students to the science and social science of network analysis. Through real world examples, including analysis of their own social networks, students will develop skills for describing and understanding the patterns and usage of services like Facebook, Twitter, YouTube, and others. Students will read classic and cutting edge articles and books about these topics and discuss their applicability to this new social media. The class will culminate with a capstone project in which students will apply the analysis methods they have learned to understanding a particular question about social networks and social media.</td>
<td>At the completion of the course students will: &lt;ul&gt;&lt;li&gt;Understand the basic concepts of social network analysis.&lt;/li&gt;&lt;li&gt;Collaborative with peers to apply these methods to a variety of social media.&lt;/li&gt;&lt;li&gt;Understand the link between qualitative and quantitative methods of social network analysis.&lt;/li&gt;&lt;li&gt;Understand how these social technologies impact society and vice versa.&lt;/li&gt;&lt;/ul&gt;</td>
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<tr>
<td><strong>INST 733</strong>&lt;br&gt;Database Design</td>
<td>This course focuses on approaches to and methods for designing relational databases. After almost half a century of development, and challenges from various competing paradigms, relational databases remain a standard technology for data storage and organization. A high-quality relational database can help leverage an organization’s data and information assets for better fulfillment of its mission. On the other hand, a poor, problem-ridden database can complicate even the simplest data-driven functions within the organization. There are various factors that determine the quality of a relational database. An indispensable prerequisite for establishing a high-quality database is a</td>
<td>At the completion of the course students will: &lt;ul&gt;&lt;li&gt;Understand and define fundamental concepts in relational databases;&lt;/li&gt;&lt;li&gt;Develop a logical database design;&lt;/li&gt;&lt;li&gt;Develop and interpret entity-relationship diagrams;&lt;/li&gt;&lt;li&gt;Normalize relational databases;&lt;/li&gt;&lt;li&gt;Develop a physical database based on a logical design; and&lt;/li&gt;&lt;li&gt;Perform CRUD (create, read, update, delete) operations on relational databases.&lt;/li&gt;&lt;/ul&gt;</td>
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### College of Information Studies
**Specialization Proposal**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
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<tr>
<td><strong>INST 737</strong></td>
<td>Digging into Data</td>
<td>Computers have made it possible, even easy, to collect vast amounts of data from a wide variety of sources. It is not always clear, however, how to use those data and how to extract useful information from data. This problem is faced in a tremendous range of scholarly, government, business, medical, and scientific applications. The purpose of this course is to teach some of the best and most general approaches to get the most out of data through clustering, classification, and regression techniques. Students will gain experience analyzing several kinds of data, including document collections, financial data, scientific data, and natural images. The course covers such topics as the challenge of Big Data, introducing R and Rattle, representing, exploring, and transforming Data, probability Crash Course, Regression Analysis, Classification, Clustering and Topic Modeling.</td>
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<tr>
<td><strong>INFM 714</strong></td>
<td>Principles of Competitive Intelligence</td>
<td>The intelligence process and how to build business advantage by the collection and analysis of the capabilities, vulnerabilities, market positioning and strategic planning of competitors using open source information. Competitive intelligence is a derivative of governmental intelligence, as well as business marketing, economics and management that is defined similarly: the collection, evaluation, analysis and application of legally available information relevant to the plans, decisions and operations of one’s business. Indeed, in today’s economic environment, competitive intelligence is equally applicable to every business entity – commercial, non-profit or even governmental service providers. Course topics include an overview and comparison of the intelligence process in government and in business (i.e., the intelligence cycle), a detailed consideration of the best and most general approaches to get the most out of data through clustering, classification, and regression techniques; Know the theory and be able to successfully implement data analysis phases, including data collection, data cleaning, data analysis and visualization.</td>
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At the completion of this course students will:
- Evaluate and be able to efficiently apply the best and most general approaches to get the most out of data through clustering, classification, and regression techniques;
- Know the theory and be able to successfully implement data analysis phases, including data collection, data cleaning, data analysis and visualization.
of the requirements and the analytical segments of that process, a survey of current analytical tools, a survey of information sources and information acquisition activities, a survey of required personnel, physical and information security policies, and the necessary efforts in creating an effective CI unit within any business enterprise.

| INFM 732 Information Audits and Environmental Scans | Techniques to assess the information needs of an organization to meet its strategic objectives. Methods of identifying information sources and gaps and of scanning the internal and external environment to identify changes that affect the organization. Application of information audits and environmental scans in strategic information management. An information audit is the process of reviewing the information environment of an organization to identify the information needs of individuals within an organization as well as those of the organization itself. It identifies information created within the organization and assesses its value. It reviews the use of internal and external information resources. It maps information flows and develops knowledge and information maps of the organization. Complementing the knowledge/information audit, environmental scanning is how managers keep in touch with their external environment as well as with what their own organization is doing; understanding these issues allows the manager to initiate change in response to what he learns. Information professionals may use scanning both in their roles as managers of their own departments and as providers of information to other staff involved in monitoring the environment. Environmental Scanning will explore the theoretical issues associated with identifying the types and sources of information relevant to departmental and organizational scanning needs as well as the practical issues associated with collecting that information. There is no single right or wrong way to conduct an environmental scan. It can be as simple as regularly surfing Web sites. |
| At the completion of the course students will: |
| • Understand the nature and importance of environmental scanning activities and the role of knowledge/information audits; |
| • Analyze an organization's internal and external environment to identify strengths, weaknesses, opportunities, and threats (SWOT analysis); |
| • Understand the methodologies used in knowledge/information audits to plan, execute and evaluate a knowledge/information audit project; |
| • Determine relevant types and sources of information to support an organization's strategic environmental scanning needs; |
| • Create a plan for collecting and communicating information about the environment based on environmental scanning tools and knowledge/information audit tools. |
and reading magazines. Or it can be as sophisticated as conducting formal literature reviews, distributing surveys, and convening focus groups. Methods and techniques for collecting information about an organization’s internal and external environment will be discussed. The organizations financial and human resources as well as its strategic priorities should determine the size and scope of the project. Both environmental scanning and knowledge/information audit are valuable tools for Information Managers.

<p>| INFM 747 Web-enabled Databases | Basic methods and tools for developing dynamic, database-driven websites. Acquiring, installing and running web servers, database servers, and connectivity applications. Developing web interfaces, and application-layer components. Contemporary web applications go beyond plain HTML pages, providing interfaces to dynamic databases, and adding several other key functionalities to websites. These functionalities enrich the user experience, and facilitate porting of many information tasks to web environment. This course introduces tools and methods for developing database driven websites. The course will introduce initial steps of building a dynamic website, such as installing and maintaining a web server and a database server, as well as developing web interfaces and server-side applications that provide added functionality to the website. | At the completion of the course students will: • Understand the basic approaches and key development elements to building dynamic websites; • Acquire, install and maintain a web server; • Acquire, install and maintain a database server; • Acquire, install and maintain applications that provide connectivity between different layers of the site architecture; • Build basic web interfaces for communicating with underlying databases; • Program basic application components that will add functionality to websites. |
| INFM 750 From Data to Insights | This course explores the application of data science techniques to unstructured, real-world datasets including social media and geo-referenced sources. The course will focus on techniques and approaches to extract information relevant for experts and non-experts in areas that include smart cities, public health and disaster management. The course examines state-of-the-art research in the field and will put an emphasis on mastering current literature and trends. Students will be required to read and present papers in class as well as to participate in technical discussions. The course will also have an important practical component with students working on a variety of research problems through a | At the completion of the course students will: • Understand how to pose appropriate research questions – using real world datasets- with implications in a wide range of sectors including transportation, health or government; • Acquire current techniques and algorithmic approaches to extract information from real-world datasets; • Learn how to effectively communicate findings to experts and non-experts through analytical insights and visualizations; • Work on real problems driven by data. |</p>
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| INST 714    | Information for Decision-Making                 | Decision problems can be modeled and solved using a range of decision-making and problem-solving methods: hard vs. soft, single-criterion vs. multi-criteria, individual vs. group, deterministic vs. probabilistic. However, no matter how a decision is made, information and data resources play a central role. This course introduces core decision theory concepts, individual and organizational decision-making methods, and common biases and errors in human decision-making. Building on this foundation, students then develop the knowledge and skills needed to select, evaluate, and design information and data resources to support effective decision-making. | At the completion of the course students will:  
• Apply basic concepts in decision theory to analyze decisions and decision-making processes;  
• Identify categories of decision problems and select situation appropriate decision-making methods;  
• Recognize common cognitive, psychological and social pitfalls, which decision makers should avoid, and be able to propose information-based interventions to manage these risks;  
• Build simple models with MS Excel, (and possibly other spreadsheet applications) for use in decision making; and  
• Critically evaluate and develop information and data resources to support individual and group decision-making. |
| INST 767    | Big Data Infrastructure                          | Why are enterprises such as Google, Walmart, and JPMorgan Chase building data warehouses holding tens of petabytes (or more) of data? The central tenant is that data leads to better business decisions and the creation of data-driven products and services that provide value to customers. This is not a new concept, having originated in the late 1980’s under the term “business intelligence”; today, the collection of skills necessary to support these functions is referred to as “data science”. This course provides an introduction to the technical knowledge and skills necessary for conducting data science in modern data-intensive enterprises. | After the completion of the course students will:  
• Understand the core technologies that support data science and business intelligence;  
• Understand how business data are collected and organized in data warehouses;  
• Understand techniques for deriving value from business data;  
Have gained hands-on experience with relevant technologies. |