

# INFORMATION SYSTEMS AND INFORMATICS

Revised Spring 2017

The program in Information Systems and Informatics, offered as an interdisciplinary collaboration between the Departments of Marketing and Computer Science, provides students with core business and technical competencies to traverse the boundary between management and computer information technology. Students learn to design, develop, and implement state-of-the-art information systems to support managerial decision making, statistical modeling, and advanced analytics. The program prepares students for careers as business and systems analysts, designers and developers; data administrators; information systems consultants; and managers in information technology.

The curriculum is based upon the guidelines provided by several professional associations including AACSB (The Association to Advance Collegiate Schools of Business), ABET (the Accreditation Board for Engineering and Technology), and ACM (American Computing Machinery).

A minimum GPA of 2.5 is required for admission to and continuation in the Information Systems major and for graduation. There is no minimum GPA requirement for students enrolling in individual courses.

## Pre-Major Requirements: 33-36 credits

ACC 114	Introduction to Accounting I	4 credits
BUS 160	Business Law I	3 credits
CSC 126	Introduction to Computer Science	4 credits
BUS215	Information Management	4 credits
ISI 300	Information Structures for Business	4 credits
ECO 111	Introduction To Microeconomics	4 credits
ECO 230/MGT230	Introduction To Economic And Managerial Statistics	4 credits
MGT 110	Organizational Theory and Management	3 credits

In addition to the course taken to satisfy Mathematical and Quantitative Reasoning (RMQR), students must take an additional math course from the following list:

MTH 221	Applied Finite Math & Bus Calculus	4 credits
MTH 229/230	Calculus I with Pre-Calculus	6 credits
MTH 229/231	Analytic Geometry and Calculus I	3 credits
MTH 232	Analytic Geometry and Calculus II	3 credits

## Major Requirements: 35 credits

ISI 205	Data Communications and IT Infrastructure	4 credits
ISI 352	Introduction to Systems Analysis and Design	4 credits
ISI 490	Capstone Project In Info Systems	4 credits
CSC 226	Web Database Applications	3 credits
CSC 315	Introduction To Database Management Systems	4 credits

## Major Options Requirements:

Choose three courses in one option area, and one course in the other option area.

### Option 1:

ISI 315	Information Security & Risk Management	4 credits
ISI 334	Business Intelligence And Analytics	4 credits

ISI 364	Enterprise Computing Strategies**	4 credits
ISI 374	IS Project Management**	4 credits

**Option 2:**

CSC421	Internet Data Communications and Security	4 credits
CSC424	Database Management Systems	4 Credits
CSC438	Mobile Application Development	4 credits

**Electives: 7-10 credits**

**Total credits: 120**

**ROLE IN CURRICULUM:** This program provides students with a detailed understanding of the theory and practice of information systems through courses in business, information management and computer science.

**PROGRAM GOALS:** Program Goals are required for Undergraduate and Graduate Degree, Minor and Certificate Programs.

1. Business Knowledge (BK):
    - An ISI graduate will understand the structure, challenges, and opportunities in information technology driven business environments
  2. Computer Science Knowledge (CSK):
    - An ISI graduate will understand the concepts and methods of software design and programming,
    - An ISI graduate will understand data communications paradigms that are incorporated into information systems.
  3. Information Systems Knowledge (ISK):
    - An ISI graduate will have knowledge of the concepts and methods needed to develop and manage the information and technology assets of organizations.
    - An ISI graduate will possess the skills to plan, design, implement, and manage technology solutions that align with business needs and decision making requirements in organizations.
  4. Quantitative Analysis (QA):
    - An ISI graduate will understand the major sources of data, the methods of data organization and management, and have the knowledge and skills for conceptual and statistical analysis to derive actionable insights and knowledge.
  5. Professionalism (P):
    - An ISI graduate will be able to think critically and creatively, communicate effectively orally and in writing, act in an ethical manner, and work effectively in a pluralistic group setting.
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## COURSE DESCRIPTIONS

### PRE-MAJOR COURSES

#### ISI PRE-MAJOR COURSES

##### **CSC 126 Introduction to Computer Science**

6 hours; 4 credits

Computing and information processing. Basic computer structure. Programming methodology: analysis, design, documentation, implementation, and evaluation. Algorithmic approach to problem solving. Computer solutions of several numerical and non-numerical problems. (FSWR) (STEM)

NOTE: This course has a material fee.

Pre- or corequisite: [MTH 123](#) or [MTH 130](#) or [MTH 221](#) or [MTH 230](#) or [MTH 231](#) or [MTH 235](#)

##### **BUS 215 Information Management** (Offered Every Semester)

4 hours; 4 credits

An introduction to the use and application of Business Information Systems and Technology. It examines how information technologies support business functions, satisfy management needs, and promote collaboration. Students analyze and develop methods of information technology management for organizational effectiveness, strategic advantage, and value creation for different types of organizations. They discuss the impact of information technology on individuals, organizations, and society. Students apply information technology and management concepts and skills to solve practical business problems.

Prerequisites: MGT 110

##### **ISI 300 Information Structures for Business**

5 hours; 4 credits

This course covers basic data structures. Topics covered in this course include classes, exception handling, dynamic memory management, and fundamental data structures including vectors, linked lists, and queues. Standard library classes will be used to implement various data structures. Algorithmic development and analysis will be illustrated using advanced sorting and searching algorithms

PRE-REQUISITES: [CSC 126](#), [BUS 215](#)

Not open to students who have completed [CSC 326](#).

#### FUNCTIONAL PRE-MAJOR COURSES

##### **ACC 114 Introduction to Accounting I**

4 hours; 4 credits

Introduction to the concepts and principles of accounting. Data accumulation technique. Emphasis on preparation and interpretation of financial statements. Areas of concentration include the accounting cycle, accounting for sole proprietorship, and introduction to partnership and corporate accounting.

Prerequisite: MTH 030 or an appropriate score on the CUNY Math Assessment Test and the CUNY Assessment Test in Writing, and the CUNY Assessment Test in Reading or the equivalent.

##### **BUS 160 Business Law I**

3 hours; 3 credits

An introduction to law and its relationship to business and the American legal system. The study of the law of contracts, agency, personal property, bailments, real property, mortgages, fire and casualty insurance, and accountant's legal liability.

Prerequisites: ENG 111 and successful completion of the CUNY Assessment Test in Math or the equivalent **Information Systems Proposed Program Anticipated Launch – Fall 2015**

### **ECO 111 Introduction to Microeconomics**

4 hours; 4 credits

An introduction to microeconomic concepts and analysis. Topics include: theory of the consumer, theory of the firm, choice under uncertainty, inter-temporal decisions, perfect competition, monopoly and monopsony, monopolistic competition, oligopoly and game theory, markets with imperfect information, and externalities and public goods. Application of analytical tools to current economic problems.

Pre or corequisite: MTH 030 or an appropriate score on the CUNY Mathematics Assessment Test

### **MGT 110 Organizational Theory and Management**

3 hours; 3 credits

Theories of organization and management are developed, examined, and applied to business and nonprofit institutions. Evaluation of organizational structure and practice in light of these theories. Studies of leadership, small group behavior, creativity, communication, and the process of social change in the large business organization.

Prerequisites: ENG 111, and MTH 025 or MTH 030, or permission of the Mathematics Department or an appropriate score on the CUNY Math Assessment Test.

### **ECO/MGT 230 Introduction to Economic and Managerial Statistics**

4 hours; 4 credits

Development and application of modern statistical methods, including such elements of descriptive statistics and statistical inference as correlation and regression analysis, probability theory, sampling procedures, normal distribution and binomial distribution, estimation, and testing of hypotheses.

Prerequisites: Successful completion of CUNY Assessment Test in Writing and the CUNY Assessment Test in Reading, and (ECO 101 or ECO 111 or ECO 112) and (MTH 121 or MTH 123 or higher ) and (BUS 150 or BUS 215 or BUS 250 or CSC 102 or CSC 126)

## **CORE COURSES (required)**

### **ISI 205 Data Communications and IT Infrastructure** (redesigned for relaunch)

4 hours; 4 credits

This course covers topics related to both computer/systems architecture and communication networks, with an overall focus on IT infrastructure services and capabilities. Includes organizational computing infrastructure components and architecture such as hardware, operating systems, networking, data centers, cloud-based systems, Service Oriented Architecture, mobile infrastructure, and others. Also includes internet protocols and infrastructure standards, security and risk management.

PREREQUISITES: MATH 123, or 130 or higher, and BUS215

### **CSC 226 Web Database Applications**

1 class hour, 3 laboratory hours; 3 credits

This course offers students a mixture of theoretical and practical information on creating Web database applications. Students will learn open source technologies that are often combined to develop these applications. Student will model and design databases and query remotely located databases on the Web. Searching, browsing, storing user data, validating user input, managing user transactions, and security issues are discussed.

Prerequisites: [CSC 126](#) with a grade of C or higher

### **CSC 315 Introduction to Database Systems (New)**

5 hours; 4 credits

This course is an introduction to database systems with an emphasis on database design and implementation, business data modeling and analysis using modern data modeling languages and tools (i.e. Entity Relationship or UML models), as well as SQL query design and development for efficient and dynamic data processing in database applications. Topics also include fundamental database design techniques, basic concepts, methodologies and best practices for database optimizations and data integrity.

Prerequisite: [CSC 211](#) or [ISI 300](#)

### **ISI 352 Introduction to Systems Analysis and Design (redesigned for relaunch)**

4 hours; 4 credits

The course covers the concept of IS system development life cycle and introduces methodologies for addressing business needs, articulating business requirements for technology solutions, specifying alternative approaches to acquiring technology capabilities needed to address business requirements, and specifying the requirements for information systems solutions.

PREREQUISITES: [CSC 315](#) and [ACC 114](#)

### **ISI 490 Capstone Project in Information Systems (New)**

4 hours; 4 credits

A capstone project course in IS, including strategies in the development of IS applications. Students will develop a significant IS project including planning, analysis, design and implementation. Students will investigate a real-life application, analyze business requirements, design systems architecture and deliver a working system.

PREREQUISITES: [ISI 352](#)

## **CONCENTRAION AREAS**

Choose one track. Total 4 courses required (three courses from the chosen track, and one from the other track.)

### **Concentration 1: Informatics Track**

*Choose three courses and one from Concentration 2.*

### **ISI 315 Information Security and Risk Management (Offered Every Spring)**

4 hours; 4 credits

This course is an introduction to the principles of information risk analysis, security controls, security planning and management. This course provides the foundation for understanding the key technical and managerial issues associated with cyber threats and risks to information assets, security and compliance requirements faced by IT-intensive business environments. It covers methodologies for

risk assessment, security planning, mechanisms for protection against risks and responses to security incidents, maintaining acceptable risks and compliance requirements and procedural ethics.

Prerequisite: [BUS 215](#)

### **ISI 334 Business Intelligence and Analytics** (redesigned for relaunch)

4 hours; 4 credits

This course introduces the tools and techniques of data analytics for gaining business intelligence to support reliable decision making. It introduces data warehouse and data mart concepts and data mining techniques for analytical reporting, trend analysis, performance analysis, what-if analysis and predictive analysis. Students will learn the different aspects of business data analytics, such as identifying data sources, extracting, combining, exploring, analyzing, modeling, visualizing, and interpreting data.

PREREQUISITES: [CSC 315](#) and [ECO/MGT 230](#)

### **ISI 364 Enterprise Computing Strategies** (New)

4 hours; 4 credits

This course explores the design, selection, implementation and management of enterprise architecture solutions. The focus is on architecture and infrastructure alternatives that can fulfill the strategic vision of a business. Students learn current infrastructure solutions, such as Enterprise Systems, Service Oriented Architecture and Cloud infrastructures, and learn the technical and management challenges in distributed enterprise computing environments. Also included are data integration and migration strategies, mobile and social strategies, and application and service integration issues. Factors influencing the choice of enterprise IT solutions, such as total cost of ownership calculation, IT investment, security/privacy risks, and audit compliance will be discussed and analyzed.

PREREQUISITES: [BUS 215](#)

### **ISI 374 Information Systems Project Management** (New)

4 hours; 4 credits

This course discusses the processes, methods, techniques and tools that organizations use to manage their information systems projects. The course covers a systematic methodology for initiating, planning, executing, controlling, and closing projects. Students will learn various types of technologies including project management software as well as software to support group collaboration, and how to propose, plan, acquire, and manage the required resources necessary for leading the IS projects.

PREREQUISITES: [BUS 215](#)

### **Concentration 2: SW Engineering Track**

*Choose three courses and one from Concentration 1*

#### **CSC 421 Internet Data Communications and Security**

3 class hours, 3 laboratory hours; 4 credits

Designed to present a thorough understanding of the Internet structure, its functionality, and the technology. This course covers networks and how they work; Internet protocols; Internet control protocols; Internet and www, Internet clients and servers and their main features; Internet applications and related protocols; Internet and www security; encryption, public-key cryptography, authentication, and IP security

Prerequisites: [CSC 326](#) with a grade of C or higher or [ISI 300](#)

### CSC 424 Advanced Database Management Systems

4 hours; 4 credits

Introduction to database systems, concepts and architecture; Conceptual data modeling with the Entity-Relationship Model; the Relational database model: concepts, languages, functional dependencies, database normalization and design; programming in SQL; concepts of integrity, security, transactions, concurrency, recovery, distributed and object-oriented databases are introduced. Study of several real-world database management systems. Students are required to implement a database application project in the area of their major interest.

Prerequisite: [CSC 326](#) with a grade of C or higher

### CSC 438 Mobile Application Development

4 hours; 4 credits

This course covers the principles of mobile app design and development. Topics will include memory management; user interface design; user interface building; input methods; data handling; GIS, network techniques and URL loading; and, finally, specifics such as GPS and motion sensing. Projects will be deployed in real-world applications. Course work will include project conception, design, implementation, and pilot testing of mobile phone software applications.

PRE-REQUISITE: [CSC 326](#) with a grade of C or higher or [ISI 300](#)

## **ELECTIVES**

Any courses from 7-10 credits.

Total Credits required for the degree: 120 credits.