

# INFORMATION, TECHNOLOGY, AND OPERATIONS

## Courses

### Business Analytics (BYGB) Courses

#### **BYGB 7811. Finance Analytics Internship. (3 Credits)**

Financial planning and analysis to consolidate disparate data sources.

#### **BYGB 7943. Programming with Python. (3 Credits)**

This introductory course covers the fundamentals of programming in Python. Through lectures, hands-on coding exercises and assignments, as well as a project, students will gain a solid understanding of Python syntax, data structures, control flow, functions, and essential packages used in business applications and data analysis.

#### **BYGB 7967. Machine Learning for Business. (3 Credits)**

Machine Learning, a branch of Artificial Intelligence, is concerned with constructing computer programs capable of learning from data. This course covers the core concepts, theory, algorithms, and business applications of machine learning. Topics include supervised learning (e.g., regression and classification), unsupervised learning (such as association rules models), and an introductory overview of Deep Learning. Students engage in hands-on model building exercises using machine learning libraries and software tools.

#### **BYGB 7973. Data Management and SQL. (3 Credits)**

This course covers the basics of database management including modeling and structured query language (SQL), a critical element of all IT organizations. Databases are the foundation for operational/transaction systems and for analytics and management decision-making. Topics include database analysis and data modeling, database design with entity-relationship and relational models, and SQL. Additional managerial topics include data administration, data warehousing and ETL, security and privacy, distributed and no-sql databases and the Internet database environment.

#### **BYGB 7975. Data Visualization. (3 Credits)**

This course introduces the concepts of business analytics and data visualization and the various related concepts and techniques including business intelligence, data analytics, data science, the scientific method, visualization, visual storytelling, and brief overviews of statistical and machine learning analytics. It explores the process, contents, and context of managerial decision making and looks at how business analytics can help in improving management decision-support effectiveness in the various functional areas of business such as marketing, finance, and manufacturing. Managers in general and not just IT individuals stand to gain from the discussion. We'll also discuss the managerial issues of data ethics, ownership, governance, standards, privacy, and security. Further, we'll discuss analytics in different industries (e.g., supply chain, health, customer, sustainability, etc.). Class members working individually and in teams will gain hands-on experience in implementing an analytics project. You're expected to apply primarily visualization, with additional statistical and machine learning models in the project.

#### **BYGB 7977. Natural Language Processing and Applications. (3 Credits)**

This course introduces the concepts of processing, analyzing, extracting, and generating insights from rich text data. You will explore a range of important topics in text analytics, including basic natural language processing techniques, sentiment analysis, text classification and clustering, information extraction, probabilistic topic models, social media analysis, and text visualization. The course combines lectures with case studies and student projects to offer a well-rounded learning experience. You will use Python throughout the course and become proficient in NLP packages such as NLTK.

#### **BYGB 7978. Web Analytics. (3 Credits)**

Web analytics is the science of accessing and analyzing the vast swaths of Internet data to create business value. Typical data types include content (user queries in search engines, discussion threads in online forums, chats in social media), linkage (webpage links and social network links), and website usage logs (clickthrough data). This course also covers two core components of web analytics in modern businesses. First, you build skills that extract and integrate data from online sources for actionable business insights. Second, you learn conceptual and hands-on approaches to analyzing web content, linkage, and usage, including how search engines work, how online marketing web works, and how to model and analyze population-scale networks. You will use Python throughout the course and become proficient in Google Analytics.

#### **BYGB 7988. Business Performance Analytics. (3 Credits)**

This course aims to develop a good understanding of knowledge required and techniques available to enable managers to measure and manage business performance and risk within their organization. The role of business analytics in enabling business performance and risk management is emphasized. The application of analytics to such concepts as balanced scorecard strategy maps, KPI, corporate metrics, risk analysis, corporate governance information communication and dissemination, compliance and regulation assessment and reporting and information assurance is the hallmark of this course. The social, ethical, and behavioral dimensions of the role of technology in analytics and performance management are discussed.

#### **BYGB 7990. Cloud Computing for Analytics. (3 Credits)**

Many of the world's biggest discoveries and decisions in science, technology, business, medicine, politics, and society are now being made based on analyzing massive data sets. Those typical datasets include millions of online customer reviews, social comments from Facebook, Twitter, and other popular social platforms, shopping transaction records, mobile messages, financial news, climate data, IoT data, and others. Today's organizations face the key challenge of analyzing massive data to gain key insight to make informed decisions. This course provides a broad and practical introduction to Big Data from three perspectives: (1) introduction to the Big Data problem, current challenges, trends, and applications; (2) technologies for Big Data management, Big Data technology and tools, special consideration made to the MapReduce paradigm and the Hadoop ecosystem; (3) algorithms for Big Data analysis, mining and learning algorithms that have been developed specifically to deal with large datasets. Technology is still evolving very rapidly. Therefore, there is a level of experimentation with new material that will take place during the semester.

**Prerequisite:** BYGB 7967.

#### **BYGB 8999. Tutorial. (3 Credits)**

Tutorial in Business Analytics.

## Information Systems (ISGB) Courses

### ISGB 6910. Business Tech & Analytics. (3 Credits)

FT MBA CORE/ PMBA FLEX CORE COURSE (Formerly "Business IT")

This course focuses on applied tech and analytics skills for business managers/leaders, and strategic use of digital technologies in business.

It will help students meet two objectives: (1) Make effective business decisions involving digital technologies and data; (2) Build essential hands-on software skills. We will use and demo a number of hands-on tools useful for managers and business leaders. Students will analyze case studies and will learn to become valuable participants in business decisions involving digital technologies. They will learn how to evaluate business applications, propose digital innovation ideas and work on a semester-long project to make data-driven decisions or develop a proposal/prototype for a company. Topics include enterprise applications, systems development processes, data management, data visualization, data mining, web analytics, IT for competitive advantage, e-commerce, creating a web presence, network effects and platform strategies, digital business models, digital innovation foundations & tech trends, cloud strategies, mobile commerce, social business technologies, adtech and cybersecurity. The course emphasizes applied active learning and a global perspective, informed by industry speakers from the vibrant NYC tech ecosystem. (This is an MBA core course, and a recommended course for other MS students interested in an introduction to business tech and analytics).

**Attributes:** BUAN, BUBA, ISCY, ISDT, ISEC, ISEL.

### ISGB 7811. Internship Project. (1 to 3 Credits)

Internship project in information technology or business analytics.

### ISGB 7901. E Business Strategies & Appl. (3 Credits)

This course introduces students to concepts, issues, technologies and trends essential to conducting business in the Internet-based digital economy. The main question answered is: How do you create a successful web presence for your company? The course emphasizes marketing aspect of e-business and hands-on skills on building effective business websites. The course reviews common e-business models (e.g., e-tailing, digital content, digital social media, etc) and applications such as web-based customer relationship management (CRM) and e-procurement. It addresses search engines, web analytics & metrics and discuss cutting-edge issues including e-retailing, content providers, Internet advertising technologies, e-payment systems, regulatory & tax issues, security & privacy concerns and mobile commerce. This course has a global focus through case studies in a variety of business sectors, including retailing, financial services, information services and global e-commerce. Hands-on skills include use of HTML, CSS, Javascript, WordPress, and other related technologies and platforms. In a group project, students will propose an e-commerce business strategy and create a website to implement it.

**Attributes:** ABEB, ABEP, ABIB, ISDT, ISEL.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

### ISGB 7902. System Analysis & Design. (3 Credits)

This course aims to give you the analysis skills and hands-on tools to analyze and design high quality systems. It provides the foundations and current issues of systems analysis and design and related systems development and software product development issues in business. The course teaches the language that connects IT with business units and cultivates essential skills for tech professionals and other managers involved in developing new IT business solutions. The course emphasizes technical skills, managerial skills, processes, software tools, challenges, opportunities, and success factors in systems development within established companies and startups. Course topics include: systems development lifecycle, agile development, capturing and managing system requirements, data and process modeling using the Unified Modeling Language (UML) standard, redesigning business processes, architectural and detailed design, UI/UX design, testing, and deployment. Students will acquire hands-on skills such as modeling using UML and structured methods, and a number of analysis and design tools and platforms. Students will deliver a group project in phases.

**Attributes:** ABFI, BUAN.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

### ISGB 7905. Web Applications Development. (3 Credits)

(Formerly Web Technologies and E-Business Applications) This course begins with a brief review of e-business models and applications, such as online purchasing, customer relationship management, electronic marketplaces, application service providers, supply chain management, enterprise resource planning, and enterprise portals. It will cover the full web application development lifecycle, with an emphasis on hands-on web systems design, build, and implementation. Students will use both WAMP/MAMP and MERN stacks and discuss project control procedures, tools, metrics, and organizational change enablement.

**Attributes:** ABEB, ABEP, ISEA.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

### ISGB 7910. Info Systems Strategy & Mgmt. (3 Credits)

Focuses on issues of aligning business and technology strategies. Addresses how IT supports business strategy and business processes, the role of the CIO, systems integration, outsourcing, the value of IT, selection of technologies IT strategy and infrastructure, dealing with emerging technologies and organizational issues surrounding technology implementations. This is the Information Systems area capstone course.

**Attributes:** ABGS, ABIB, BUAN.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 7922. Healthcare IT. (3 Credits)**

This course introduces students to the subject of health information technology (HIT) and describes the organizational context surrounding the implementation, use, and management of HIT. Students examine the concepts, applications, and strategies of HIT. Key concepts include the role of HIT in enabling quality, safety, and efficiency of health care delivery. The course also surveys the various types of HIT, including electronic health records, clinical decision support systems, master patient indexes, analytics, and telemedicine, among others. The organizational issues of user acceptance, value measurement, alignment, workflow analysis, and management are discussed. And contemporary developments—including the trend toward service-oriented architectures/web services and meaningful use—are highlighted. The key challenges of security, privacy, and compliance with regulations are also examined.

**Attributes:** ABHM, BUAN, ISDT, ISEA, ISEL.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 7924. Mobile E-Commerce and Apps. (3 Credits)**

Roughly two-thirds of the world's population participates in the new mobile economy. Leveraging the mobile marketplace requires a conceptual understanding of mobile-commerce as well as the practical skills needed to create the next generation of wireless enabled goods and services. This course will provide both, using a combination of global case studies and hands-on experience in building mobile applications for handheld devices.

**Attributes:** ABEB, ABEP, BUAN, ISDT, ISEL.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 7932. Accounting Info System. (3 Credits)**

The rapid advances in information technology (IT) of recent years have brought with them dramatic changes in the way business organizations operate and compete. Information technology, for example, is generating new products and services and transforming the world economy. Familiarity with information systems (IS) has become indispensable to the leaders of today's and tomorrow's organizations. It is equally true that any enterprise in either the private or public sector requires sound accounting procedures and processes that integrate throughout. It comes as no surprise that Account Information Systems have become integral to the vitality of the corporation. It has become even more critical with the surge in fraud and white-collar crime which has resulted in the sweeping Sarbanes-Oxley legislation. The purpose of this course is to introduce students to the subject of computer-based accounting information systems. The four critical objectives are a sound understanding in business processes, transaction cycles, internal controls, and the systems components of each.

**Attributes:** BUAN, ISDT, ISEC, ISEL.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 7933. Audit Data Analytics. (3 Credits)**

Introduces audit and accounting students to data analytics foundations, methods and tools. It reviews industry applications and trends. Students will do hands-on projects analyzing audit and other accounting data.

**Attributes:** BUAN, BUBA, CME, GB02, ISBA, ISEL.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 7934. Artificial Intelligence. (3 Credits)**

The goal of this course is to acquaint you with the objectives and methods of researchers and practitioners in Artificial Intelligence. We will explore numerous aspects of computational models of intelligence including search and problem solving, planning, machine learning, reasoning, knowledge representation, robotics, natural-language processing, speech recognition, vision, cognitive science, and expert systems. We will also discuss genetic algorithms, fuzzy logic and deep machine learning including neural networks. The ethics of Artificial Intelligence is also addressed. The course is organized as a seminar style survey, with hands-on assignments in open-source artificial intelligence tools. The course focuses on concepts, design, tools, and applications. Python knowledge is required; the underlying math is not discussed. This course is an applied course focused on the hands-on, practical aspects of AI.

**Attributes:** BUAI, BUAN, GB02, ISBA, ISEL.

**ISGB 7942. Optimization Models in Bus. (3 Credits)**

Optimization models seek to find the best decisions given a set of constraints. Applications are in diverse areas of business, including finance, logistics and marketing. The course will introduce different kinds of models, including network, linear programming, mixed-integer programming, and non-linear programming, and demonstrate their use in different areas of business. Students will learn how to use optimization software, including solvers and modeling languages.

**Attributes:** BUAN, BUBA, ISBA, ISEL.

**ISGB 7943. Programming with Python. (3 Credits)**

This introductory course covers the fundamentals of programming in Python. Through lectures, hands-on coding exercises and assignments, as well as a project, students will gain a solid understanding of Python syntax, data structures, control flow, functions, and essential packages used in business applications and data analysis.

**Attributes:** ABEP, ABFI, BUAN, BUDS, CME, GB01, ISEC, ISEL.

**ISGB 7944. Sports Analytics. (3 Credits)**

Sports businesses achieve superior performance and gain competitive advantage by leveraging data and analytics. The course explores technologies, tools and analytics projects in Sports business.

**Attributes:** BUAN, BUBA, GB02, ISBA, ISEL.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 7945. IT and Sustainability. (3 Credits)**

(Formerly Business Design Through IT). This course discusses the transformative role of information and communication technologies (ICTs) in enabling sustainability. ICTs' effect on sustainability dimensions are felt at both the macro, societal level, as well as at the business level. These include ICTs' positive impact on development, education, environment, health care, power, transportation, and others. Simultaneously, ICTs themselves are subject to sustainability practices, for example, green computing. Additional topics include the design of smart cities, digital divide, the knowledge society, rebound effects, governance, and world development indicators. Students working in groups will analyze several contemporary cases from a global perspective and also develop an IT-based sustainability plan.

**Attributes:** ABEB, ABEP, ABGS, ISDT, ISEL, SOIN.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 7955. Project Management. (3 Credits)**

Provides the skills project managers need to complete projects on time and on budget. Technology improvements in organizations are implemented through projects, and strong project management skills are a key success factor for companies to achieve the expected benefits from their technology investments. Topics include setting and maintaining project scope, developing work plans, estimating required resources, developing work programs, organizing project teams, super-users, monitoring and controlling projects, maintaining relationships with users and management, status reporting and key factors for realizing the anticipated benefits from the investment. Students use a computer-based project management tool as part of this course.

**Attributes:** BUAN, ISEA.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 7967. Machine Learning for Business. (3 Credits)**

Machine Learning, a branch of Artificial Intelligence, is concerned with constructing computer programs capable of learning from data. This course covers the core concepts, theory, algorithms, and business applications of machine learning. Topics include supervised learning (e.g., regression and classification), unsupervised learning (such as association rules models), and an introductory overview of Deep Learning. Students engage in hands-on model building exercises using machine learning libraries and software tools.

**Attributes:** ABFI, ASDM, GB01.

**Prerequisites:** ISGB 6910 (may be taken concurrently) or GBA Waiver Information Systems with a score of 070.

**ISGB 7973. Data Management and SQL. (3 Credits)**

This course covers the basics of database management including modeling and structured query language (SQL), a critical element of all IT organizations. Databases are the foundation for operational/transaction systems and for analytics and management decision-making. Topics include database analysis and data modeling, database design with entity-relationship and relational models, and SQL. Additional managerial topics include data administration, data warehousing and ETL, security and privacy, distributed and no-sql databases and the Internet database environment.

**Attributes:** ABFI, GB02, ISEA.

**ISGB 7975. Data Visualization. (3 Credits)**

This course introduces the concepts of business analytics/data visualization and various related concepts and techniques, including business intelligence, data analytics, data science, the scientific method, visualization, visual storytelling, and brief overviews of statistical and machine learning analytics. It explores the process, contents, and context of managerial decision making and looks at how business analytics can help in improving management decision-support effectiveness in the various functional areas of business, such as marketing, finance, and manufacturing. Managers in general, not just IT individuals, stand to gain from the discussion. We'll also discuss the managerial issues of data ethics, ownership, governance, standards, privacy, and security. Further, we'll discuss analytics in different industries (e.g., supply chain, health, customer, sustainability, etc.). Class members working individually and in teams will gain hands-on experience in implementing an analytics project. Students will be expected to apply primarily visualization, with additional statistical and machine learning models in the project.

**Attributes:** ASDM, GB01, ISBA, ISEA, ISEL.

**ISGB 7977. Natural Language Processing and Applications. (3 Credits)**

This course introduces the concepts of processing, analyzing, extracting, and generating insights from rich text data. You will explore a range of important topics in text analytics, including basic natural language processing techniques, sentiment analysis, text classification and clustering, information extraction, probabilistic topic models, social media analysis, and text visualization. The course combines lectures with case studies and student projects to offer a well-rounded learning experience. You will use Python throughout the course and become proficient in NLP packages such as NLTK.

**Attributes:** ABFI, ISBA, ISEL.

**ISGB 7978. Web Analytics. (3 Credits)**

Web analytics is the science of accessing and analyzing vast swaths of Internet data to create business value. Typical data types include content (user queries in search engines, discussion threads in online forums, chats in social media), linkage (webpage links and social network links), and website usage logs (clickthrough data). This course also covers two core components of web analytics in modern businesses. First, students will build skills that extract and integrate data from online sources for actionable business insights. Second, they will learn conceptual and hands-on approaches to analyzing web content, linkage, and usage, including how search engines work, how online marketing web works, and how to model and analyze population-scale networks. Students will use Python throughout the course and become proficient in Google Analytics.

**Attributes:** ABEB, ABEP, GB02, ISBA, ISEL, PMMA.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 7980. Bus Modeling w/Adv Sprdsheets. (3 Credits)**

Covers the vital role of advanced spreadsheet methods in business modeling and decision-support. Students learn to build and analyze decision-making models using a spreadsheet package (Excel), with extensive hands-on use of the package and add-ins. Students model and solve representative practical problems covering key business functions such as accounting and finance, sales and marketing, management and operations and human resources. Topics include various advanced spreadsheeting functions, "what-if" analysis, list and data management tools, Solver and sensitivity analysis, simulation and forecasting models. A basic understanding of Microsoft Excel is required for this course.

**Attributes:** BUAN, BUBA, GB02, ISBA, ISEL.

**ISGB 7985. Data Warehousing. (3 Credits)**

Provides an advanced, comprehensive overview of data warehousing along with in-depth discussion of critical issues in planning, design, deployment and ongoing maintenance. Students gain a clear understanding of techniques for data extraction from source systems, data cleansing, data transformations, data warehouse architecture and infrastructure, and the various methods for information delivery. Additional concepts discussed include data marts, real-time information delivery, data visualization, requirements gathering methods, multi-tier architecture, OLAP applications, Web click-stream analysis, data warehouse appliances, and data-mining techniques. Students undertake hands-on exercises and projects in commercial data warehousing modeling and implementation tools and perform case analyses.

**Attributes:** BUAN, BUBA, ISBA, ISEA, ISEC, ISEL.

**Prerequisites:** ISGB 6910 or INSY 6910 or ICGB 6910 or GBA Waiver Information Systems with a score of 070 and ISGB 7973.

**ISGB 7988. Business Performance Analytics. (3 Credits)**

This course aims to help students develop the knowledge required and techniques available to enable managers to measure and manage business performance and risk within their organization. There will be an emphasis on the role of business analytics in enabling business performance and risk management. The application of analytics to such concepts as balanced scorecard strategy maps, KPIs, corporate metrics, risk analysis, corporate governance information communication and dissemination, compliance and regulation assessment, and reporting and information assurance is the hallmark of this course. The social, ethical, and behavioral dimensions of the role of technology in analytics and performance management are discussed.

**Attributes:** GB02, ISBA, ISDT, ISEL.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 7989. Info Tech in Transnatl. (3 Credits)**

Provides practical guidelines for managers to integrate international business with IS planning and operations. As businesses increasingly operate globally, corporations with transnational business strategies must also develop transnational Information Systems. Today's managers need to coordinate international telecommunications and IS operations as well as exploit the organizational and economic opportunities Information System creates for businesses that operate globally. INTERNATIONAL BUSINESS COURSE.

**Attribute:** ABIB.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 7990. Cloud Computing for Analytics. (3 Credits)**

Many of the world's biggest discoveries and decisions in science, technology, business, medicine, politics, and society are now being made based on analyzing massive data sets. Those typical datasets include millions of online customer reviews, social comments from Facebook, Twitter, and other popular social platforms, shopping transaction records, mobile messages, financial news, climate data, IoT data, and others. Today's organizations face the key challenge of analyzing massive data to gain key insight to make informed decisions. This course provides a broad and practical introduction to Big Data from three perspectives: (1) introduction to the Big Data problem, current challenges, trends, and applications; (2) technologies for Big Data management, Big Data technology and tools, special consideration made to the MapReduce paradigm and the Hadoop ecosystem; (3) algorithms for Big Data analysis, mining and learning algorithms that have been developed specifically to deal with large datasets. Technology is still evolving very rapidly. Therefore, there is a level of experimentation with new material that will take place during the semester.

**Attributes:** ABFI, GB02, ISBA, ISEL.

**Prerequisite:** ISGB 7967.

**ISGB 799D. Cybersecurity and Data Privacy. (3 Credits)**

This class will explore the concepts of cyber risk management within an enterprise. The course will help a manager develop a solid understanding of cyber risk and successful mitigation strategies to reduce an organization's risk profile. The course will include topics such as IT control assessments, static and dynamic application security, network security, information security policies and standards, threat modeling and analysis, risk/benefits of BYOD (bring your own device), IOT (the internet of things), and many other real-time cyber topics.

**Attributes:** BUAN, ISCY, ISEL.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 799L. Study Tour: Germany. (3 Credits)**

The study tour to Germany will be held from March 21 - April 1 during the spring/Easter break. It allows students to learn about the business environment in Germany and the European Union. Through academic presentations, company visits, and visits to cultural and historic sites, students will learn how the current business practices in Germany have been influenced by its rich culture, the world wars and the formation of the European Union and technology led globalization. The study tour will include stays in Marburg, Frankfurt, and Munich. There is no Course related readings and pre-trip and post-trip assignments will be available in the first week of the spring semester. Expenses for the trip, including airfare are expected to be around \$2,700 per student (in addition to the tuition for the course). Please contact Prof. Saharia at saharia@fordham.edu with any questions. The course is open to MBA and MS students in good standing.

**Attributes:** ABIB, ISDT, ISEL.

**ISGB 799R. IT Audit and Information Assurance. (3 Credits)**

This course will present an overview of the various elements of IT Audit and Information Assurance. Basic IT audit and information assurance concepts will be discussed and analyzed. General IT and application controls will be covered along with how the controls underlie SOX Section 404 Legislation. The course will also examine business processes, technologies and controls relating to financial reporting. Key components of information systems, including operating system security, database controls, network safeguards, systems development and application maintenance will also be covered. Technology processes supported under COBIT 5 will be discussed along with risk assessment techniques. The challenges around information assurance, data governance and privacy will be explored in detail.

**Attributes:** BUAN, BUBA, CME, ISDT, ISEL.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 799S. C++ Programming. (3 Credits)**

This course will teach Object Oriented programming using the C++ programming language. Students will learn the fundamentals of developing coherent, expressive programs. Students will work on a realistic albeit simplified financial application project.

**Attributes:** ISEC, ISEL.

**Prerequisite:** ISGB 6910.

**ISGB 799V. R Statistical Programming. (3 Credits)**

This is a programming course using the R programming language. Applications will focus on data analytics and statistical programming.

**Attributes:** BUAN, BUDS, BUSA, CME, GB01, ISEC, ISEL.

**ISGB 799W. Java Programming. (3 Credits)**

This course provides an introduction to business applications programming concepts, techniques and tools. Students will acquire practical skills and experience with object-oriented development using the Java language, one of the most widely used programming languages. Topics include the elements of the language, common Java classes, object-oriented programming including inheritance and interfaces, object-oriented design, and database integration. Case studies in e-commerce and finance will show how Java can leverage the wide variety of available libraries and web services. Course work includes individual assignments and group projects.

**Attributes:** ISEC, ISEL.

**ISGB 799X. Fintech -An Introduction. (3 Credits)**

FinTech is a new and emerging field of technology that is disrupting the way that many companies are conducting business. FinTech has already “forever” changed many sectors including mobile payments, social media, money transfers, loans, fundraising, travel, trading and asset management. It has completely revolutionized the way companies are developing products, conducting research, establishing directed sales and marketing plans, and utilizing start-up technology. Businesses are using FinTech to expand their products and services at a fraction of its previous cost. Entrepreneurs are utilizing FinTech as a central foundation for research, funding, and product development. Customers are already utilizing FinTech as part of their daily lives - mobile apps, social media, banking, online shopping, entertainment and gaming. This course will introduce students to the breadth of FinTech, and touch upon the technical underpinnings.

**Attributes:** BUAN, BUDS, ISDT, ISEC, ISEL.

**Prerequisites:** ISGB 6910 or GBA Waiver Information Systems with a score of 070.

**ISGB 799Y. Blockchain Tech & App Dev. (3 Credits)**

The main objective of this course is to familiarize students with the ecosystem, technologies, and development skills surrounding blockchain. The course starts with foundational concepts, such as distributed state machine, hash tree, P2P network, GPU processing, cryptocurrency, and cryptography. Using simulated sandbox and locally installed environments, the course guides students through the development, front-end integration, and deployment of blockchain-based smart contracts. Other topics covered will include rapid prototyping, design patterns, and agile development to maximize the likelihood of successful blockchain projects.

**Attributes:** ABBC, BUAN, BUDS, ISDT, ISEC, ISEL.

**ISGB 799Z. Deep Learning. (3 Credits)**

The goal of this course is to acquaint you with the objectives and methods of deep machine learning DML. We will explore and learn the basic types of deep neural networks including convolutional, recurrent, and generative adversarial, and the type of data each is designed for. Key additional topics include techniques to improve training, preventing overfitting, and best practices for minimizing error. Students will study the major technology trends driving DML. A key takeaway is a working knowledge of the vocabulary of concepts and algorithms in DML. The challenges and issues surrounding the use of DML including design issues, ethics, governance, ownership of data, privacy, security standards and quality control and validation are also discussed. Emphasis is on business applications. The course is organized as a seminar style survey course, with hands-on assignments in DML tools. The discussion is in the context of business and more application driven. The course focuses on concepts, design, tools, and applications. Python knowledge is expected; the underlying math is not discussed. This course is an applied course focused on the hands-on, practical aspects of DML.

**Attributes:** BUAI, BUAN, GB02, ISBA, ISEL.

**Prerequisites:** (ISGB 7943 or Gabelli Grad Python Waive Exam with a score of 1) and (BYGB 7967 or ISGB 7967).

**ISGB 79AA. Advanced Python for Financial Programming. (3 Credits)**

This course covers advanced Python programming using examples in finance. Topics include data access from a variety of sources (spreadsheets, databases, web pages, and web services) as well as data visualization and statistics. There is hands-on exposure to an extensive set of Python packages and to the definition and design of object-oriented programming. Finance topics include an introduction to financial instruments and analytics (equities, fixed income, options, f/x), portfolio analysis (simulation for risk analysis, optimization for portfolio balancing), machine learning approaches, and handling of intraday data.

**Attributes:** BUAI, BUAN, BUDS, GB02, ISBA, ISDT, ISEC, ISEL.

**Prerequisites:** ISGB 7943 or Gabelli Grad Python Waive Exam with a score of 1.

**ISGB 79AB. Programming for Analytics. (3 Credits)**

This course covers both Python and R as programming languages. The Python portion of the course empowers professionals to process data, handle complex computations, automate procedures, and conduct research efficiently on a massive scale. This course also introduces and advances the understanding of the R programming language in a statistical environment. Students will understand the fundamental syntax and logic of both languages, and learn how both are applied to solve business problems algorithmically.

**ISGB 79AC. Cybersecurity Analytics for Business. (3 Credits)**

Cyber attacks pose an increasing threat to the nation's critical infrastructure, including computer networks, cyber-human systems, business applications, sensor networks, and mobile devices. This course provides an introduction to data analytics for multiple aspects of information security and focuses on using data analytics methods for discovering anomalies pertaining to cyber threats through hands-on exercises in programming, visualization, statistical analysis, machine learning, and big data analytics tools. Prior knowledge of Python and R expected.

**Attributes:** BUAN, BUBA, GB02, ISCY, ISEL.

**Prerequisites:** ISGB 7975 or BYGB 7975.

**ISGB 79AD. Digital Forensics. (3 Credits)**

This course provides students with an introduction to digital forensic science and the systematic process of acquiring, authenticating, and analyzing digital evidence. Technical and managerial topics will be explored, providing students with both theoretical and practical hands-on experience using forensic equipment and software. The topics of e-discovery, data retention, data disposal, litigation, internal investigations, regulatory compliance, and incident response will be covered.

**Attributes:** BUAN, BUBA, ISCY, ISEL.

**ISGB 79AE. Robotic Process Automation. (3 Credits)**

The Institute of Robotic Process Automation (IRPA) defines RPA as “the application of technology that allows employees in a company to configure software or a ‘robot’ to capture and interpret existing applications for processing a transaction, manipulating data, triggering responses and communicating with other digital systems.” Traditional workflow automation tools relied on APIs or dedicated scripting languages to converse with back-end systems. RPA, on the other hand, observes a user’s actions when interacting with software and mimics those actions by itself. In simpler terms, RPA can also be thought of as a digital assistant that is programmed to behave similarly to the way you do. This course will introduce you to the key concepts of RPA and discuss how organizations can automate some of the internal processes to bring about an improvement in productivity and get employees to move up the work value chain. Additionally, the managerial issues surrounding the introduction of RPA into the organization include cultural and technical challenges, demonstrating the business value of RPA, privacy and security, training, ownership and governance, etc. Additionally, the business and societal implications of the effects of automation will be discussed. Students will do individual hands-on assignments and a group project in learning and applying the key RPA platforms. RPA case studies will be discussed.

**Attributes:** BUAI, BUAN, BUDS, ISDT, ISEC, ISEL.

**ISGB 79AF. Business Dynamics: Systems Thinking & Simulation. (3 Credits)**

Managers and business leaders need to make sense of a complex and fast-changing business landscape. They need to map, model, analyze, and manage complexity to achieve superior performance. This course introduces systems thinking and associated modeling methods, techniques, and software tools that are essential to master complexity and drive business performance. The course explores models, model-modeling approaches for managers, business leaders, and business consultants. These skills can be used to understand system structure and dynamic behavior across a variety of business domains and applications, including business transformation, digital transformation, business model design, and sustainability. Case studies across a variety of industries and a group project add to the student learning experience.

**ISGB 79AG. Cloud Computing and Finance Uses. (1.5 Credits)**

This course introduces the core concepts of cloud computing, including networking, storage, database, access control, security, compliance, and pricing. Cases will be drawn from the finance industry. The course does not require prior programming or cloud computing experience. Students will create their own account on a cloud platform and gain some hands-on experience by provisioning a cloud service and working with it.

**Prerequisite:** ISGB 6910.

**ISGB 79AH. Digital Technology and Social Justice. (3 Credits)**

This course will examine the social impacts of advances in digital technologies on society. The topics covered in the course will include the digital divide, technology-enabled classroom and remote learning, the effect of technology on employment opportunities and social mobility, AI and the future of work, and the role of social media platforms in forming opinions about “others” (as defined by race, gender, nationality), e-government, and uneven access to government services. While our primary focus will be on how technology changes affect underprivileged minorities in the U.S., we will also examine the effects of uneven development across different nations. The course will be run as a research seminar. Each student, working individually or in groups, is expected to undertake research on digital technology and social justice topics. The course is open to Gabelli School of Business graduate students and undergraduate seniors.

**ISGB 79AJ. Ethics of Data Analytics & AI. (3 Credits)**

This class aims to provide students with a comprehensive understanding of the data market and artificial intelligence (AI) business from an ethical perspective. Data analytics opens a set of possibilities and improvements for decisions in business. However, it introduces new risks and moral challenges. This course aims to explore the ethical implications of data analytics within business, with a focus on AI systems. We will study concepts such as privacy, surveillance, power, justice, and accountability related to the production and use of data. The classes will be tied to discussions of a current case (an article or two) following a theory or concept. Our readings include work from philosophy, law, computer science, economics, and AI ethics. The goal is to provide students with the tools to develop critical thinking toward data analytics with ethical frameworks, theories, concepts, and real-world examples.

**ISGB 79AK. Large Language Models and Generative AI. (3 Credits)**

This course provides an in-depth exploration of Large Language Models (LLM) and generative AI (GenAI) technologies and their impact on business. This course will introduce a suite of current LLM and GenAI applications and models. Some of the models and tools we cover are: GPT, OpenAI APIs, Microsoft Copilot, Llama, and RAG. Students will build a customized LLM with current available tools.

**Prerequisite:** ISGB 7943.

**ISGB 79AL. Agentic AI with Copilot. (3 Credits)**

Agentic AI (or AI agents) enables innovative solutions based on predictions it makes from large datasets and their ability to perceive their environment. Different from traditional AI, agentic AI systems are autonomous, intelligent agents capable of dynamic decision-making and task execution. This course dives into the development and application of agentic AI systems with Microsoft Copilot software. Students will harness generative AI to design, build, and refine autonomous agents capable of reasoning, planning, and collaboration. The course will run in the form of a series of workshops co-hosted with Microsoft Corp. Students will then be divided into groups to work on industry-specific projects. One signature project involves working with the United Nations on developing Agentic AI prototypes to address United Nations’ goals such as sustainability, global health, or disaster response.

**ISGB 8999. Independent Study. (1 to 3 Credits)**

Independent Study - Information Systems.

**ISGB 899A. Disrupting Financial Services. (1.5 Credits)**

Graduate students will learn directly from industry experts how new technologies, changing demographics and investor preferences are significantly impacting the delivery of wealth management, creation of investment products and capital market mechanisms. From the global adoption of crypto currencies to the trillion dollar tsunami of money flowing into passively managed ETFs, students will be exposed to the current and future implications of these “disruptions” and gain helpful insight and intelligence impacting their careers. We will focus on one “disruption” per week with subject matter experts explaining the economic and cultural implications for both winners and losers. This course will be valuable to all students navigating future employment opportunities in financial services.

**ISGB 899B. Applied Project. (1.5 Credits)**

This course aims to provide experiential learning to students by working on real-life scenarios collaborating with organizations and companies. Students will 1) apply data analytics including machine learning, statistics and visualization to offer data-driven solutions and (or) 2) develop AI tools to help organizations improve their performances.

## Operations (OPGB) Courses

### **OPGB 6627. Operations and Supply Chain Management. (3 Credits)**

This is an MBA flex core course that studies the operations of both manufacturing and service organizations with the objective of simultaneously optimizing the quality and productivity of the operations systems. Students will develop techniques for strategic planning and system design, such as quality control, aggregate and capacity planning, project planning, scheduling and control, material and inventory management, and just-in-time production.

**Attributes:** BUAN, ISEL.

### **OPGB 76AA. Operations and Supply Chain Management. (3 Credits)**

Students will study the operations function for both manufacturing and service organizations with the objective of the simultaneous optimization of the quality and productivity of the operating systems. They will also learn techniques for strategic planning and system design.

### **OPGB 76AP. Project Management. (3 Credits)**

Provides the skills project managers need to complete projects on time and on budget. Technology improvements in organizations are implemented through projects, and strong project management skills are a key success factor from companies to achieve the expected benefits from their technology investments. Topics include setting and maintaining project scope, developing work plans, estimating required resources, developing work programs, organizing project teams, super-users, monitoring and controlling projects, maintaining relationships with users and management, status reporting, and key factors for realizing the anticipated benefits from the investment. Students use a computer-based project management tool as part of this course.

### **OPGB 76BB. Studies in Quality Management. (3 Credits)**

This course is centered around the concepts, theories, and techniques of quality management (QM). It examines the origins of QM and how its principles, techniques, and tools can be properly integrated to improve the performance of both manufacturing and service organizations. Specific topics discussed in the course include quality management principles, national quality awards, ISO 9000, quality aspects of product/service design; quality cost, customer/vendor relations; process capability and statistical process control; and management of improvement process.

### **OPGB 76BR. Health Care Operations Mgt. (3 Credits)**

Health Care Operations Management is a discipline that integrates scientific principles of operations management to determine the most effective and efficient methods to support patient care delivery. The biggest challenge in health care is to provide high quality care while at the same time keeping costs down. As such, all health care sectors must be driven by process management, quality improvement, information technology, knowledge management, and resource alignment. This course addresses these challenges in many ways, from the design of patient flow to streamlined process, from resource management to supply chain management, from quality control to patient safety, from forecasting to capacity planning, and from continuous improvement to project management.

### **OPGB 76CA. Accounting Controls. (3 Credits)**

The primary focus of the class will be on the use of data-driven analytics to help managers make key operating and strategic decisions. A secondary focus will be on the use of data-driven analytics for the purpose of internal control.

### **OPGB 76CB. Process Management and Six Sigma. (3 Credits)**

A process is the collection of activities and operations that transform inputs into outputs. This course focuses on learning how to improve organizational processes by using the globally recognized problem-solving methodology known as Lean Six Sigma. Students in this course will learn the five phases of the Lean Six Sigma method and will have the chance to apply the techniques and tools learned in class in real-world projects. Students that meet the requirements of classroom lectures and tests, case studies, and projects will earn Six Sigma White/Yellow Belt Certificates issued by Ernst & Young; students are also encouraged and supported to get Six Sigma certificates from the American Society for Quality (ASQ).

### **OPGB 8999. Independent Study. (3 Credits)**

Independent Study.