BUSINESS TECHNOLOGY

Department Code: BTE

Introduction

The Department of Business Technology serves the University as the foci for research and teaching of digital technology and information management across an entire range of problem domains, including AI in Business; Enterprise Architecture Design; Blockchain; Platforms; Cybersecurity; and Technology Innovation.

The transformative potential of digital technology for business is significant, and we are increasingly recognizing how this potential is turning into a new business reality. The pervasive use of digital technology as reflected in, for instance, self-driving cars, robotic technology, and language technology through Large Language Models is impressive in itself. It certainly promises to challenge what we know about healthcare, transportation, service work, intellectual activity, to name a few areas. In this regard, digital technology is no longer merely a way of more efficiently supporting business processes, but also something that will radically shape the core of what companies do.

In view of this growing importance, the need for business technology specialists is vast.

Educational Objectives

The Business Technology major is designed to provide the student with the key digital technology and management skills needed in today's increasingly digitalized business environment. It also offers a firm grounding in the primary business areas in which these skills will be applied. Graduates of the program may qualify for attractive entry-level positions as systems and/or information analysts, cybersecurity specialists, Fintech consultants, programmers, or other information management positions such as systems designers, Database systems, cloud architects, and business technology consultants.

The Business Technology Department supervises the Minor in Artificial Intelligence for Business Technology. This 12-credit-hour minor is for Miami Herbert Business School students who are seeking to understand how AI is poised to revolutionize the business landscape by offering a transformative competitive advantage to organizations across various sectors.

The Department also co-supervises the Minor in Financial Technology (Fintech) (https://bulletin.miami.edu/undergraduate-academic-programs/business/finance/financial-technology-minor/). This 12-credit-hour minor is for Miami Herbert Business School students who wish to better understand the delivery and use of financial services through use of technological innovation and automation of the financial sector. The Fintech minor combines classes in both Finance and Business Technology and prepares students for careers in the broader Fintech industry.

BTE 120. Introduction to Business Technology and Programming. 3 Credit Hours.
This Course covers the fundamentals of technology focusing on programming logic and structured programming principles including problem solving, algorithm design, and program development using Python The course introduces the student to object-oriented programming through a study of the concepts of program specification and design, algorithm development, and coding and testing using a modern software development environment. Students learn how to write programs in an object-oriented high-level programming language (Python). Topics covered include fundamentals of algorithms, flowcharts, problem solving, programming concepts, classes and methods, control structures, arrays, and strings, data structures and object oriented programming. Throughout the semester, problem-solving skills will be stressed and applied to solving computing problems. Weekly assignments will provide hands-on experience in topics covered in this course.
Components: LEC.
Grading: GRD.
Typically Offered: Summer.

BTE 210. Fundamentals of Business Technology and Innovation. 3 Credit Hours.
This course covers the fundamental technologies used in business today. Topics include information technology platforms; enterprise technology concepts; network infrastructure; enterprise resource planning; information security; technology architectures; internet; cloud, mobile, and web platforms; analytical technologies; business intelligence; expert systems, and Big Data. Students work on an innovation project to create a specification/business canvas for a new technology product.
Requisite: Miami Herbert Business School.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

BTE 271. Generative AI for Business Technology. 3 Credit Hours.
AI is altering conventional business models in unprecedented ways thanks to recent developments in machine learning, automation, and natural language processing, among others. It is also poised to spur innovation and evolution across industries. Organizations that adopt AI will be empowered to open new opportunities, realize operational efficiency, and drive sustainable development. Generative AI, specifically, is poised to revolutionize the business landscape by offering a transformative competitive advantage to organizations across various sectors. This technology's ability to generate human-like text, images, and even entire applications enables unprecedented levels of automation, personalization, and creativity. Businesses can harness generative AI to streamline content creation, automate customer interactions, and develop hyper-personalized marketing campaigns. Moreover, it facilitates rapid prototyping and innovation, enabling companies to swiftly adapt to changing market dynamics. With the power of generative AI, organizations can unlock new efficiencies, engage customers more effectively, and stay at the forefront of their industries, redefining how they operate and thrive in an increasingly digital world. Several case studies and group projects are introduced to reinforce students' understanding and applicability of the topic.
Prerequisite: BTE 210 or BUS 150 or equivalent.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

BTE 320. Python Programming: Fundamentals and Algorithms. 3 Credit Hours.
This course covers the fundamentals of programming logic and structured programming principles in Python including problem solving, algorithm design, and program development—using a high-level programming language. Topics covered include fundamentals of algorithms, flowcharts, problem solving, programming concepts, classes and methods, control structures, lists, tuples, dictionaries, arrays, and strings, pointers, and data structures.
Requisite: Miami Herbert Business School or BTEC Minor.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

BTE 324. Object-Oriented Programming. 3 Credit Hours.
This course introduces the concepts and fundamental techniques of object-oriented programming. Topics include: data abstraction, encapsulation, inheritance, polymorphism, class library, graphics/GUI, exception handling, multithreading, multimedia, files and streams, Internet applets, application development, integrated development environment, interactive program debugging and the eXtensible Markup Language (XML).
Prerequisite: BTE 320 or BTE 420.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

BTE 360. Systems Analysis and Design. 3 Credit Hours.
Through systems design and analysis, students will understand how technologies make (or break) companies, which in turn transform industries, which in turn shape the future. The course inculcates an innovative/entrepreneurial mindset, leveraging strong business fundamentals and critical thinking skills, to develop principled leaders who will transform business and society. The case-based approach covers the following: identifying needs, feasibility analysis, requirements modeling, development strategies, data and interface design, process design, designing for future trends, systems implementation, system maintenance and enhancement, anticipating future threats, disaster recovery planning, and scaling.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

BTE 361. Design of Information Systems. 3 Credit Hours.
This course develops an understanding of software design methods that range from the mathematical models used for high security systems through to agile, rapid development methods used for commercial business systems. The course discusses many methods practitioners will need to develop and maintain working software systems, their utility, cost to implement and role in the software developer's toolbox. Topics include Agile, SaFE, Formal Methods, Continuous delivery model, dedicated agile and waterfall methodologies.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

BTE 371. Foundations of AI for Business Technology. 3 Credit Hours.
The fields of business analytics, data science, decision support system, business intelligence, and artificial intelligence (AI) are evolving rapidly to become more focused on innovative methods. This course focuses on how those fields integrate for enterprise decision support, emphasizing the understanding of core AI methodologies, including robotics, chatbots, natural language processing, & IoT, and how all those are seen as enablers of automation and productivity. AI and analytics support each other by creating the synergy that assists decision-making; businesspeople and entrepreneurs must know what's happening "behind" such systems and be able to recommend AI solutions to real-life problems. Case studies and group projects are introduced to reinforce students' understanding and applicability of the studied strategies and interpret results to accomplish business objectives.
Pre-Requisite BTE 210.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

BTE 389. Launching HighTechnology Ventures. 3 Credit Hours.
This course develops an understanding of the entrepreneurial processes as they apply to new technology ventures. Topics include: venture formation, venture and angle investments, innovation and creativity, business plan creation, human capital, ethics, and intellectual property.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

BTE 400. Web-Mobile-Cloud. 3 Credit Hours.
This course introduces the basics of the cloud computing paradigm and examines how to implement different algorithms for different web and mobile applications in the cloud. The course covers the principles, systems, and applications of cloud computing that integrate web applications, smart phones, and tablets with cloud computing infrastructure. The student will be introduced to the basics of Infrastructure, Platform, and Software as a Service (IaaS/PaaS/SaaS), as well as to cloud platforms such as Google App Engine, Microsoft Azure, and Amazon Web Services (AWS).
Prerequisite: BTE 320 or BTE 420.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

BTE 401. Computers in an Inter-Networked Society. 3 Credit Hours.
This course provides students with fundamental knowledge of the technology and tools that integrate big data, cloud, and mobile computing within a business and social context. Students will study these technologies and their impact on socioeconomic, political, organizational, and personal environments. The course covers the cultural components of a social media society and examines the systems and processes that need to be developed for effective management of that environment.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

BTE 412. Foundations of Business Enterprise Technologies. 3 Credit Hours.
This course provides an understanding of the foundations of enterprise technologies. Topics include: Blockchain, cryptocurrency, making the business case for technology, distributed architectures, customer relationship management systems (CRM), enterprise resource planning systems (ERP), requirements modeling and design for enterprise systems, software development and outsourcing for the enterprise, enterprise productivity technologies (RFID, internet of things, machine data), 3D-design technologies, cloud technologies, and technologies for the global enterprise.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

BTE 413. Introduction to Machine Learning in Business Technology. 3 Credit Hours.
The course examines the best strategies to design, acquire, and build technologies to use big data to create business intelligence strategies in the areas of marketing, product development, systems deployment, and innovation. The course will also cover the basic concepts of machine learning and demonstrates its application in business technology using Python programming language.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

BTE 414. Machine Learning Applications in Business Technology. 3 Credit Hours.
This course covers the statistical concepts and application of supervised and unsupervised machine learning algorithms, including image recognition and natural language processing, in business technology using Python programming language.
Prerequisite: MAS 202 or MAS 311 or ISE 311 or MTH 224 or equivalent.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

BTE 417. Fundamentals of Tech Project Management. 3 Credit Hours.
This course is designed to provide the fundamental project management knowledge necessary for a business manager, consultant, project manager, IT professional, and/or team member to successfully initiate and plan IT and other business projects. It is structured to provide principles, methodology, and practical information through a combination of lectures, group collaboration and hands-on exercises. Emphasis is placed on the importance of standardization and best practices as defined by the PMI's Project Management Body-of-Knowledge (PMBOK®).
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

BTE 420. Python Programming for Fintech. 3 Credit Hours.
The course covers the fundamentals of object-oriented programming, logic and structured programming principles including problem solving, algorithm design, and program development using Python with focus on financial programming applications. Topics covered include fundamentals of algorithms, flowcharts, problem-solving, programming concepts and methodologies, control structures, arrays, and strings, classes and class-methods, data structures and object oriented programming concepts including classes, methods, inheritance and polymorphism.
Requisite: Sophomore Standing.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

BTE 421. Blockchain and Distributed Computing. 3 Credit Hours.
The course introduces the foundations of blockchain software development. The development environments of popular blockchain technologies such as Bitcoin, Ethereum and lightning networks will be examined. Topics include: Blockchain software environments, blockchain languages, decentralized application development, smart contracts, cryptographic algorithms, hashing, digital signatures, NFTs and mining software-technologies.
Prerequisite: BTE 320 or BTE 420.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

BTE 422. Tech Foundations of Fintech. 3 Credit Hours.
The course covers multiple disciplines of technology and how they are individually and collectively applied in financial systems, transactions, payments, and data lifecycles. The course aims to develop a student's understanding of key technological components such as cloud computing, Internet of Things(IoT), Big Data and Machine Learning, Artificial Intelligence, Blockchain technologies, data security, privacy and technology regulations as they relate to financial transactions, financial institutions, public and private business entities, governments, regulations and an overall monetary system.
Requisite: Sophomore Standing.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

BTE 423. Database Management Systems. 3 Credit Hours.
This course covers the foundations of database management systems (DBMS). Topics include: database systems design, SQL, the relational model, entity-relationship modeling, distributed DBMS, object DBMS, web technology and DBMS, semi-structured data, XML, business intelligence, data warehousing, data warehousing design, introduction to OLAP, and a brief overview of data mining. Students will engage in hands-on exercises for the design and implementation of database business applications.
Prerequisite: BTE 320 or BTE 420.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

BTE 430. Business Networks. 3 Credit Hours.
In this course, students will learn the underlying concepts and technologies in the field of business networks with specific focus on their applications in businesses. Topics covered include: network types, networking standards, protocols, and architectures; the characteristics of physical and logical networking components and technologies; the security issues that affect network systems and their implications on business applications; the technical and organizational issues concerning wireless networks; emerging networking technologies and software tools for designing and troubleshooting various aspects of networks.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

BTE 450. Introduction to Health Informatics. 3 Credit Hours.
The course develops an understanding of the role of information systems and technology within a healthcare organization. It examines the business and technical issues associated with the selection, deployment and use of health informatics, both in the clinical and back office areas. Health informatics, for the purpose of the course, is defined as the convergence of information technology, information management, and health care, at various levels, ranging from simple data gathering, to the design and implementation of new health care information systems.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

BTE 465. Web Application Development. 3 Credit Hours.
This course will explore Internet and mobile application development methodologies. Topics include: HTML 5, CSS3, scripting languages (JavaScript); jQuery, AJAX, web services, Web Servers (IIS and Apache) and relational databases (MySQL/Apache Derby/Java DB)—all the skills and tools needed to create dynamic Web-based and mobile applications. The coverage will be both on the client side and the server side of Web-based applications, and the course will provide instruction on building rich Internet applications that enhance the presentation of online content and give web applications the look and feel of desktop applications. Students in the course will build Web-based, client/server, database-intensive, multi-tier, and mobile business applications.
Prerequisite: BTE 320 or BTE 420.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

BTE 471. AI Programming for Business Management. 3 Credit Hours.
Artificial intelligence (AI) is the science and engineering of making intelligent systems and machines. It is a field rooted in the discipline of computer science while drawing on insights from philosophy, mathematics, psychology, neuroscience, and more. This course introduces AI findings, techniques, and programming. The curriculum for this class has been designed to cover a moderately broad range of foundational topics, including heuristic search, logical reasoning, planning, reasoning under uncertainty, machine learning principles, and their application to business problems. This course's general educational goal is to familiarize students with the significant problems and methods addressed within these foundational areas, allowing students to recognize system development situations in which these techniques might be fruitfully applied. In addition, this course is designed to make students capable of working with programming solutions to such AI problems.
BTE 210 and BTE 320 or BTE 420 or equivalent.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

BTE 496. Directed Studies in Business Technology. 1-3 Credit Hours.
Supervised readings, individual research project, or independent investigation of selected non-STEM related problems in the discipline. Offered only by special arrangement with supervising faculty member, who approves topic and evaluation process at time of registration.
Components: THI.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

BTE 497. Directed Studies in Business Technology. 1-3 Credit Hours.
Supervised readings, individual research project, or independent investigation of selected STEM related problems in the discipline. Offered only by special arrangement with supervising faculty member, who approves topic and evaluation process at time of registration.
Components: THI.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

BTE 498. Special Topics in Business Technology. 3 Credit Hours.
Special topics in selected non-STEM areas of Business Technology.
Requisite: Sophomore Standing or higher.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

BTE 499. Special Topics in Business Technology. 3 Credit Hours.
Special topics in selected STEM areas of Business Technology.
Requisite: Sophomore Standing or higher.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

BTE 524. Mobile Apps Development. 3 Credit Hours.
This course covers the fundamentals of programming logic and structured programming principles—including problem solving, algorithm design, and program development for mobile environments—with a focus the Android Platform. The course introduces the requirements and methodologies for developing dedicated and client-server applications that target smartphones, tablet computers, and other mobile devices. Topics include: memory management, communications, power systems, APIs, and among others. The techniques studied are applicable to and can be transitioned to the iOS or Windows 8 platforms.
Prerequisite: BTE 320 or BTE 420 and BTE 324.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

BTE 535. Cybersecurity. 3 Credit Hours.
This course introduces the principles of computer security. Information is an important strategic and operational corporate asset that needs to be protected from data breaches. This course investigates some of the security measures that can be employed to safeguard information and explores some of the tools and techniques used in designing these measures. Students will examine how system designs, network protocols, and software engineering practices can result in vulnerabilities. Additional topics include ethical hacking, social engineering strategies, and other approaches to managing vulnerabilities.
Requisite: Sophomore Standing or higher.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

BTE 550. Business Technology Internship. 1-3 Credit Hours.
Student is individually assigned to operating business firm or other organization to gain insight in information technology practice in the area of career interest. Periodic reports and conferences are required.
Components: THI.
Grading: SUS.
Typically Offered: Offered by Announcement Only.

BTE 555. Business Technology Departmental Honors Research Project. 3 Credit Hours.
Research project to fulfill requirements for Departmental Honors in Business Technology.
Components: THI.
Grading: SUS.
Typically Offered: Offered by Announcement Only.

BTE 565. Mobile to Cloud: Developing Distributed Applications. 3 Credit Hours.
This course introduces students to the basics of the emerging cloud computing paradigm. It also examines how to implement different algorithms for different applications in the cloud and how to deploy mobile applications in the cloud. The course covers the principles, systems, and applications of mobile cloud computing that integrates smart phones and tablets with virtualized distributed computing infrastructure. Students will learn the fundamentals of a variety of systems such as virtual machines, the principles and practices of client/server architectures, the concepts and practices of Infrastructure, Platform, and Software as a Service (IaaS/PaaS/SaaS), cloud platforms such as Google App Engine, Microsoft Azure, and Amazon Web Services(AWS), as well as security issues.
Prerequisite: BTE 320 or BTE 420 and BTE 324.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.