Bachelor of Science in Business Administration - Information Systems and Technology

Ling Li, Chair
Weiyong Zhang, Assistant Chair
Roya Ardalan, Chief Discipline Advisor

The information systems and technology program is designed to provide students with a technical background in information technology as well as a broad perspective of the business environment in which information technology plays a strategic role. The major emphasizes the development of business analysis and system implementation skills; these skills can provide a basis for job entry, career development and flexibility amid the rapid changes in information technology. Four distinct concentrations are offered under the major.

A student who seeks a Bachelor of Science in Business Administration degree with a major in Information Systems and Technology from Old Dominion University must, in addition to meeting other requirements of the University, earn a minimum of 25 percent of the total number of credits required for the degree (for example, 30 credits in a 120-credit degree program) through on- or off-campus instruction. This must include a minimum of 12 credit hours of upper-level IT courses or upper-level BNAL courses specifically listed as electives on the course lists below.

Information Systems and Technology course work

<table>
<thead>
<tr>
<th>Required Core Courses:</th>
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<td>IT 474 Strategic IT Administration</td>
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Select two of the following IT Electives: 6

| IT 310 Object-Oriented Programming with C++ |
| IT 325 Web Site and Web Page Design |
| IT 367 Cooperative Education |
| IT 368 Student Internship |
| IT 369 Practicum |
| IT 372 COBOL and Applications |
| IT 374 C# and Applications |
| IT 376 PHP and Applications |
| IT 401 Mobile and Cloud Computing |
| IT 408 E-Business Portal Programming |
| IT 410 Business Intelligence |
| IT 416 Network Server Configuration and Administration |
| IT 417 Management of Information Security |
| IT 418 Enterprise Information Assurance |
| IT 419 Enterprise Cyber Defense |

IT 420 Object-Oriented Application Development Using Visual Basic
IT 425 Information Systems for International Business
IT 430 Object-Oriented Application Development with JAVA
IT 451 Database Administration
IT 452 Cloud Database
IT 453 Advanced Database Concepts
IT 454 Web-based Database Administration
IT 461 Implementing Internet Applications
IT 494 Entrepreneurship in Information Technology
IT 495 Selected Topics in Information Systems
IT 497 Independent Study in Information Systems

Select one of the following International Business Electives: 3

| IT 425 Information Systems for International Business |
| ACCT 450 International and Advanced Accounting |
| ECON 450 International Economics |
| FIN 435 International Financial Management |
| MGMT 361 International Business Operations |
| MGMT 462 Comparative International Management |
| MGMT 463 Management Seminar Abroad |
| MKTG 411 Multi-National Marketing |
| MSCM 370 International Shipping |

One Business Elective at 300-400 Level ** 3

Total Hours 36

* IT 425 cannot be used as both the IT major elective and as the International Business elective.

** Can be any 300-400 level course offered by the Strome College of Business, providing that the student has the appropriate prerequisites, except IT 360T.

All courses listed above except the International Business Elective and Business Elective are included in the calculation of the 2.00 overall grade point average required for major course work.

Four-Year Plan - Information Systems and Technology - BSBA (http://catalog.odu.edu/undergraduate/stromecollegeofbusiness/bsbainfosystems/infosysandtech-bsba-fouyearplan/)

This is a suggested curriculum plan to complete this degree program in four years. Please consult information in this Catalog, Degree Works, and your academic advisor for more specific information on course requirements for this degree.

Information Systems and Technology, Database concentration course work

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Four-Year Plan - Information Systems and Technology - BSBA (http://catalog.odu.edu/undergraduate/stromecollegeofbusiness/bsbainfosystems/infosysandtech-bsba-fouyearplan/)
Four-Year Plan - Information Systems and Technology - Network Engineering - BSBA (http://catalog.odu.edu/undergraduate/stromecollegeofbusiness/bsbainfosystems/infosysandtech-networkengn-bsba-fouryearplan/)

This is a suggested curriculum plan to complete this degree program in four years. Please consult information in this Catalog, Degree Works, and your academic advisor for more specific information on course requirements for this degree.

Information Systems and Technology, E-Business and E-Commerce concentration course work

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<td>Introduction to Networking and Security</td>
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<tr>
<td>IT 317</td>
<td>Enterprise Information Architecture (grade of C or better as prerequisite for IT 464)</td>
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<tr>
<td>IT 363</td>
<td>Systems Analysis and Design</td>
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<tr>
<td>IT 450</td>
<td>Database Concepts</td>
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<tr>
<td>IT 464</td>
<td>Project Management in Information Systems</td>
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<tr>
<td>IT 474</td>
<td>Strategic IT Administration</td>
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<td></td>
<td>Select two IT electives from the list below: 6</td>
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<tr>
<td>IT 416</td>
<td>Network Server Configuration and Administration</td>
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<td>IT 417</td>
<td>Management of Information Security</td>
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<tr>
<td>IT 419</td>
<td>Enterprise Cyber Defense</td>
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<td>Select one additional IT elective (any IT 300-400 course) 3</td>
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Total Hours 36

Four-Year Plan - Information Systems and Technology - E-Business and E-Commerce - BSBA (http://catalog.odu.edu/undergraduate/stromecollegeofbusiness/bsbainfosystems/infosysandtech-ebusandecommerce-bsba-fouryearplan/)

This is a suggested curriculum plan to complete this degree program in four years. Please consult information in this Catalog, Degree Works, and your academic advisor for more specific information on course requirements for this degree.
Information Systems and Technology, Application Development concentration course work

Required Core Courses: 24

IT 201 Introduction to Information Systems (grade of C or better required as a prerequisite for upper-level IT courses)
IT 205 Introduction to Object-Oriented Programming
IT 315 Introduction to Networking and Security
IT 317 Enterprise Information Architecture (grade of C or better required as prerequisite for IT 464)
IT 363 Systems Analysis and Design
IT 450 Database Concepts
IT 464 Project Management in Information Systems
IT 474 Strategic IT Administration

Additional Required Course: 3
IT 461 Implementing Internet Applications

Select one of the following Programming Electives: 3
IT 310 Object-Oriented Programming with C++
IT 325 Web Site and Web Page Design
IT 372 COBOL and Applications
IT 374 C# and Applications
IT 376 PHP and Applications
IT 420 Object-Oriented Application Development Using Visual Basic
IT 430 Object-Oriented Application Development with JAVA

Select one of the following Software Electives: 3
IT 401 Mobile and Cloud Computing
IT 408 E-Business Portal Programming
IT 410 Business Intelligence
IT 425 Advanced Database Concepts
IT 445 Web-based Database Administration

Select one of the following International Business Electives: 3
ACCT 450 International and Advanced Accounting
ECON 450 International Economics
FIN 435 International Financial Management
IT 425 Information Systems for International Business
MGMT 361 International Business Operations
MGMT 462 Comparative International Management
MGMT 463 Management Seminar Abroad
MKTG 411 Multi-National Marketing
MSCM 370 International Shipping

Total Hours 36

Four-Year Plan - Information Systems and Technology - Application Development - BSBA (http://catalog.odu.edu/undergraduate/stromecollegeofbusiness/bsbainfosystems/infosysandtech-applicationdev-bsba-fouryearplan/)

This is a suggested curriculum plan to complete this degree program in four years. Please consult information in this Catalog, Degree Works, and your academic advisor for more specific information on course requirements for this degree.

Information Systems and Technology Minor

The minor in Information Systems and Technology is designed primarily for students completing the Bachelor of Science in Computer Science, the Bachelor of Science in Computer Engineering, or the Bachelor of Science in Engineering Technology (Computer Engineering). The courses in the minor have a number of technical prerequisites that are normally waived for those students who have completed CS 150, CS 250, and either CS 170 or ECE 241 or equivalent major course work.

Students must complete the following:

IT 363 Systems Analysis and Design 3
IT 450 Database Concepts ** 3

Select six credit hours from the following: 6
IT 310 Object-Oriented Programming with C++
IT 315 Introduction to Networking and Security **
IT 325 Web Site and Web Page Design
IT 367 Cooperative Education ***
IT 368 Student Internship ***
IT 369 Practicum ***
IT 372 COBOL and Applications
IT 374 C# and Applications
IT 376 PHP and Applications
IT 401 Mobile and Cloud Computing
IT 408 E-Business Portal Programming
IT 410 Business Intelligence
IT 420 Object-Oriented Application Development Using Visual Basic
IT 425 Information Systems for International Business
IT 430 Object-Oriented Application Development with JAVA
IT 451 Database Administration
IT 452 Cloud Database
IT 453 Advanced Database Concepts
IT 461 Implementing Internet Applications
IT 464 Project Management in Information Systems
IT 474 Strategic IT Administration
IT 494 Entrepreneurship in Information Technology
IT 495 Selected Topics in Information Systems

Total Hours 12

* Students completing CS 450 must substitute another course for IT 450 from the elective list.
** Computer Engineering and Computer Engineering Technology students completing CS 454 must substitute another course for IT 315 from the elective list.
*** Students seeking an internship, cooperative education or practicum must obtain permission from both the IT internship coordinator as well as the internship coordinator of the students' major department.

For completion of a minor, a student must have a minimum overall cumulative grade point average of 2.00 in all courses specified as a requirement for the minor exclusive of prerequisite courses. A minimum of six hours in upper-level courses in the minor must be taken through courses offered by Old Dominion University.
INFORMATION TECHNOLOGY Courses

IT 150G. Basic Information Literacy and Research. 3 Credits.
This course is designed to provide students with the basic skills necessary to identify, to access and to utilize task appropriate information. Students will learn to evaluate information sources and to apply good research strategies. The course will address qualitative, quantitative, visual and auditory data sources along with the ethical use of data and respect for intellectual property. Focus will be given to research topics in various fields including business, humanities, social science and technology.

IT 200T. Cybersecurity, Technology, and Society. 3 Credits.
Students will explore how technology is related to cybersecurity from an interdisciplinary orientation. Attention is given to the way that technologically-driven cybersecurity issues are connected to cultural, political, legal, ethical, and business domains.

IT 201. Introduction to Information Systems. 3 Credits.
An introduction to the major hardware/software components of modern information systems. Topics include introduction to the history of computers, numbering systems conversion, system and application software, networks and the Internet. Additional topics include Information Systems and Systems Development Life Cycle, Introduction to Programming, Databases and Business Intelligence, Information Security, and Privacy and Ethics in the cyber world. Intended as a comprehensive introduction course to the Information Systems majors.

IT 205. Introduction to Object-Oriented Programming. 3 Credits.
An introductory course on object-oriented programming that emphasizes top down design and documentation representative of business needs and requirements. The programming language is Java or instructor's choice. Topics include simple data types, input/output streams, control structures and logical expressions, functions, arrays, records, and pointers.

IT 310. Object-Oriented Programming with C++. 3 Credits.
An advanced C++ programming course focusing on object-oriented design/ methodologies and the development of Graphic User Interfaces (GUI) for business applications. Special topics include: dynamic variables, linked lists, abstract data types, classes, inheritance, composition, exception handling, templates, and overloading. Prerequisites: IT 205 and a declared major in the university or permission of the Dean's Office.

IT 315. Introduction to Networking and Security. 3 Credits.
Introduction to modern networking concepts and technology. Provides students with the fundamental concepts, technologies, components and issues related to communications and data networks. Topics include network architectures, infrastructures, services, protocols, cyber attacks, adversaries, and defense. Prerequisites: IT 201.

IT 317. Enterprise Information Architecture. 3 Credits.
A comprehensive treatment of the fundamental concepts of enterprise information architecture. Topics include enterprise architecture, information technology infrastructure, components of modern computing environments, system usability and security. Prerequisites: IT 201 with a C or better (grade requirement may be waived by the department), and a declared major in the university or permission of the Dean's Office.

IT 325. Web Site and Web Page Design. 3 Credits.
Advanced design and hands-on implementation skills in designing and creating dynamic web sites. Key topics include: web page design, usability principles, HTML, XHTML, Cascading Style Sheets (CSS), JavaScript and Internet security. Prerequisites: IT 150G.

IT 360T. Principles of Information Technology. 3 Credits.
A survey of computer hardware, software, procedures, applications, and management information concepts. Provides an understanding of the application of the computer to the support of managerial decision making. Information Systems majors may not use this course for credit toward the B.S.B.A. degree. Prerequisites: completion of general education information literacy and research requirement and junior standing; and a declared major in the University or permission of the Dean's Office.

IT 363. Systems Analysis and Design. 3 Credits.
This course provides an introduction to the analysis and design of computer-based information systems. Emphasis is placed upon the development of requirements that serve the business needs of the organization as well as the logical and physical design of business information systems. This course covers both the structured and the object-oriented approach of system analysis and design process. Topics covered include introduction to the software development methodologies, requirement gathering, modeling, and logical/physical design techniques. Students are also exposed to emerging topics that promise major improvements in software development area. Factors relevant to the creation of business information systems through development and implementation will be examined in detail. Prerequisites: IT 201 with a C or better, IT 205, and a declared major in the university or permission of the Dean's Office.

IT 367. Cooperative Education. 1-3 Credits.
Approval for enrollment and allowable credits are determined by the department and Career Development Services in the semester prior to enrollment. Available for pass/fail grading only. (Qualifies as a CAP experience) Prerequisites: junior standing and a declared major in the university or permission of the Dean’s Office.

IT 368. Student Internship. 1-3 Credits.
Approval for enrollment and allowable credits are determined by the department and Career Development Services in the semester prior to enrollment. Available for pass/fail grading only. (Qualifies as a CAP experience) Prerequisites: junior standing and a declared major in the university or permission of the Dean’s Office.

IT 369. Practicum. 1-3 Credits.
Approval for enrollment and allowable credits are determined by the department and Career Development Services in the semester prior to enrollment. Available for pass/fail grading only. (Qualifies as a CAP experience) Prerequisites: junior standing and a declared major in the university or permission of the Dean’s Office.

IT 372. COBOL and Applications. 3 Credits.
Introduction to the COBOL programming language and its application in industry and government. Prerequisite: IT 310 and a declared major in the university or permission of the Dean's Office.

IT 374. C# and Applications. 3 Credits.
An introduction to programming concepts and skills of the C# programming language and Visual Studio .NET. Topics include: computing fundamentals and Microsoft .NET platform, C# programming fundamentals and object-oriented programming, web app development and cloud app development. Prerequisite: CS 150 or equivalent.

IT 376. PHP and Applications. 3 Credits.
An introduction to programming concepts and skills of the PHP programming language. Topics include: Internet and web concepts, HTML, CSS and XML, PHP programming basics, database with PHP, PHP web services. Prerequisite: IT 201.

IT 401. Mobile and Cloud Computing. 3 Credits.
An introduction to key concepts and techniques of mobile and cloud computing. Topics include: cloud deployment and service models, cloud programming and software environments, performance and security of cloud systems, cloudlets and mobile cloud computing. Prerequisite: IT 450 or CS 450.

IT 408. E-Business Portal Programming. 3 Credits.
An introduction to key concepts, programming techniques, technologies and standards involved in the development of E-Business portal. Topics include: E-Business programming technologies, software development environments, developing a practical E-business project, securing the E-business portal, performance tuning and evaluation. Prerequisite: IT 325.

IT 410. Business Intelligence. 3 Credits.
Business intelligence, data warehouse, data mining, and OLAP. The course will use state-of-the-art business intelligence software tools including SAS products to provide hands-on experience in designing and using data warehouses. Prerequisite: BNAL 206.
IT 416. Network Server Configuration and Administration. 3 Credits.
Advanced course on configuration and management of network servers.
Topics include: user and storage management, ACLs, group policy,
configuring security, backups and disaster recovery, and server management.
Prerequisites: A grade of C or better in IT 315 and a declared major in
the university or permission of the Strome College of Business Dean’s Office.

IT 417. Management of Information Security. 3 Credits.
This course emphasizes the need for management and technology to
successfully implement an information security program in an organization.
Threats, attacks, legal and ethical issues, risk assessment and control
strategies; planning, development, and maintenance of security policies;
contingency planning; firewalls, intrusion detection systems and security
tools; and management of information security are some of the topics
covered in this course. Prerequisites: A grade of C or better in IT 315 or
IT 360T and a declared major in the university or permission of the Strome
College of Business Dean’s Office.

IT 418. Enterprise Information Assurance. 3 Credits.
Assure information and manage risks related to the use, processing, storage,
and transmission of information. Topics include assurance of integrity,
availability, authenticity, non-repudiation and confidentiality. Students will
gain a firm understanding of information-related risk management in cyber
and physical systems. Hands-on exercises and practice opportunities will be
provided to students. Prerequisites: A grade of C or better in IT 315 and a
declared major in the university or permission of the Dean’s Office.

IT 419. Enterprise Cyber Defense. 3 Credits.
Provide students with an understanding of the options available to mitigate
security threats in enterprise information systems. Topics include network
mapping, network security techniques and components, applications of
cryptography, malicious activity detection, countermeasures, and
vulnerability scanning. Students will learn how to describe potential attacks,
defense tools and methods, and measures to be taken when compromises
occur. Prerequisites: A grade of C or better in IT 315 and a declared major in
the university or permission of the Dean’s Office.

IT 420. Object-Oriented Application Development Using Visual Basic. 3 Credits.
Advanced design and implementation strategies are utilized to create
dynamic client/server applications that solve complex problems in a secure
and robust manner. Key concepts include: abstractions, encapsulation,
inheritance, polymorphism, persistence, and dynamic binding. Prerequisites:
IT 205 and a declared major in the university or permission of the Strome
College of Business Dean’s Office.

IT 425. Information Systems for International Business. 3 Credits.
The international business organization and its relationship to information
systems architecture with emphasis on the role of connectivity technology
as a driver of globalization. An introduction to the economics and structure
of the international information technology marketplace. Prerequisites: The
general education impact of technology requirement, a declared major in
the university or permission of the department.

IT 430/530. Object-Oriented Application Development with JAVA. 3 Credits.
Using JAVA as an object-oriented language to write business applications
that solve complex problems in a secure and robust manner. Business
elementary incorporating multimedia, multithreading, networking, and
advanced graphical interfaces are used to reinforce the object-oriented
concepts of abstraction, encapsulation, inheritance, polymorphism,
persistence, and dynamic binding. Prerequisites: IT 205 and a declared major
in the university or waiver approved through the Strome College of Business
Undergraduate Advising.

IT 440. Secure Programming. 3 Credits.
An introduction to methods of secure software design and development.
Key topics include principles and practices of secure programming, input
validation, type checking, parameter validation, buffer overflow prevention,
error handling, web application issues (SQL injection, Cross site scripting,
Cross site request forgery, etc.), static analysis tools and black box testing
tools. Prerequisite: IT 205.

IT 450. Database Concepts. 3 Credits.
Introduction to database concepts. Historical development, data models,
database analysis, design and implementation, query languages, data
security, and introduction to business transaction systems. Prerequisites:
IT 201 with a C or better or IT 360T for non-IT major students and a
declared major in the university or waiver approved through the Strome
College of Business Undergraduate Advising; permission of the instructor is
required for non-IT major students.

IT 451. Database Administration. 3 Credits.
An introduction to the theory and practice for performing the standard
database administrative tasks. Course could serve as a basis in preparation
for OCA Exams 1Z0-051 and 1Z0-052 for Oracle Administrator Certified
Associate. Topics to be covered include: advance SQL statements,
creating schema objects, database installation and configuration, database
architecture, performance monitoring and tuning, storage management,
database security, user management, database connectivity, backup/recovery
techniques and usage analysis. Oracle will be the primary DBMS software
used in the course; other software may be used as well. Hands-on exercises
and practice opportunities will be provided to students. Prerequisites: IT 450,
and a declared major in the university or permission of the instructor.

IT 452. Cloud Database. 3 Credits.
An introduction to the principles, techniques, and systems of cloud database.
Topics include: cloud service models, cloud database design, cloud database
management, cloud database development, cloud security, and cloud
database services. Prerequisite: IT 450 or instructor approval.

IT 453. Advanced Database Concepts. 3 Credits.
This course examines the theoretical and practical foundations of advanced
database concepts. It also covers techniques and methodologies that are
used to perform the advanced database management tasks and to insure the
deployment of efficient, secure, and high-performance database applications.
Topics include: advanced database and application design, database
performance tuning and query optimization, data movement and distribution,
distributed DBMS, Business Intelligence and Data Warehouses, Big Data
Analytics and NoSQL, databases and the Internet, and other advanced
database concepts. This course also examines the material included in OCA
Exams 1Z0-051 and 1Z0-052 for Oracle Administrator Certified Associate.
Prerequisites: IT 450 and a declared major in the university or permission of
the instructor.

IT 454. Web-based Database Administration. 3 Credits.
An introduction to key concepts and techniques related to web-based
database administration. Students will gain hands-on experience with a
variety of web-based database technologies. Topics to be covered include:
MySQL, EasyPHP, phpMyAdmin, XML database technologies such as
XQuery, XPath, and XML Schemas, performance tuning, trouble shooting,
and web log analysis tools. Prerequisite: IT 450, or permission of the
instructor.

IT 455. SAP Applications. 3 Credits.
This course introduces students to the concept of enterprise resource
planning. Students will learn SAP (Systems, Applications and Products
in Data Processing) enterprise software to manage business operations and
customer relations by analyzing and presenting data stats in an
engaging way, and producing meaningful and insightful business solutions.
Prerequisite: IT 201, or IT 360T, or OPMT 303, or instructor's permission.

IT 461. Implementing Internet Applications. 3 Credits.
Advanced design and implementation strategies are utilized to create
dynamic e-commerce applications that solve complex problems in a secure
and robust manner. Key concepts include: Internet architecture, structured
data languages, scripting languages, programming languages, database
connectivity, and Internet security. Prerequisites:IT 205 and IT 363, or
instructor's permission.

IT 464. Project Management in Information Systems. 3 Credits.
This course focuses on project management techniques and methodologies
that can be adopted to Information Technology software and systems
projects. Prerequisites: IT 317 with a C or better, IT 363, and a declared
major in the university or waiver approved through the Strome College of
Business Undergraduate Advising.
IT 474. Strategic IT Administration. 3 Credits.
Focuses on improving business use of existing IT and achieving competitive advantage. All students gain a strategic perspective on an important organizational resource--information. Prepares IT students for managerial positions and effective communication with executives. Prerequisites: IT 317 with a C or better, IT 363, and a declared major in the university or waiver approved through the Strome College of Business Undergraduate Advising.

IT 494. Entrepreneurship in Information Technology. 3 Credits.
This course is designed to help students enhance their personal and professional development through real-world entrepreneurial innovation guided by faculty members and professionals. This course allows students to integrate disciplinary knowledge by developing innovative processes, products, businesses, or other innovations utilizing information technology. The real-world entrepreneurial experience will help students understand how academic knowledge leads to innovation and problem solving. Prerequisite: six credit hours of any IT 300 or 400 level courses.

IT 495/595. Selected Topics in Information Systems. 1-3 Credits.
Taught on an occasional basis. See the course schedule for the particular topic being taught each semester. Prerequisite: permission of the department.

IT 497. Independent Study in Information Systems. 1-3 Credits.
Affords students the opportunity to undertake independent study under the direction of a faculty member. Prerequisite: permission of the department.