Computer Systems Technology

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PROGRAMS:

Computer Information Systems/AAS
Microcomputer Business Systems/AAS
Computer Systems/BTech
Service Courses: Data Processing

FACULTY:

Professor: Braneky
Assoc Profs: Bellehsen, Cabo, Griemsmann, Malyuta
Asst Profs: Guidone, H. Li, X. Li, Moody, Oudjehane, Pinto, Shahidullah
Lecturers: Archibald, Ebbers, Holley, Milonas, Simmons, Viglina
CLTs: Duong, Graham, Liu, Rodney

Associate in Applied Science in MICROCOMPUTER BUSINESS SYSTEMS

The Computer Systems Technology department offers three degree programs as well as a variety of computer courses for students in other curricula. Some of the courses are designed for students in specific majors, such as accounting, telecommunications technology or legal assistant studies, while some are intended to provide computer literacy to students in any major.

This microcomputer business systems program, the only one of its kind in CUNY, offers strong preparation for those planning microcomputer careers. Students will be introduced to microcomputer concepts, operating systems, application packages such as word processing, spreadsheet, database systems and programming, networks, microcomputer operating systems, principles of electricity, electronics and computer maintenance.

Careers, such as specialist in PC support, hardware/software, LAN administrator, database programmer, applications package adviser/instructor, will be available to the graduate of the program.

Progression in Microcomputer Business Systems

A grade of "C" or better in each course designated with the prefix MS and CS will be required for progression in and graduation from the Microcomputer Business Systems program.

REQUIRED COURSES IN THE MAJOR		Credits
CST 1101/CS 101	Computer Programming and Problem Solving	3
MST 1101/MS 101	Introduction to Microcomputers	3
MST 1204/MS 204	Database Systems and Programming I	3
MST 1205/MS 205	Microcomputer Systems	3
MST 2304/MS 304	Database Systems and Programming II	3
MST 2307/MS 307	Local Area Networks	4
CST 2406/CS 406	Introduction to Systems Analysis and Design	3
MST 2405/MS 405	Microcomputer Operating Systems	4
	Subtotal	**26**
OTHER REQUIRED COURSES		
ACC 1101/AC 101	Principles of Accounting I	4
AC BUS 2425/AC 425	Business Management	3
ETN 1302/ET 429	Principles of Electricity, Electronics and Computer Operations	4
ENG 1101/EG 101	English Composition I	3
ENG 1121/EG 121	English Composition II	3
MAT 1375/MA 375[1]	Mathematical Analysis	4
LAP[2]	Literature/Aesthetics/Philosophy	3
BS/SS[2]	Behavioral Science/Social Science	3
TS[2]	Speech	3
SCI 1[2]	Laboratory Science	4
	Subtotal	**34**
TOTAL CREDITS REQUIRED FOR THE DEGREE		**60**

[1] Students without the requisite math background for MAT 1375/MA 375 will be required to take MAT 1175/MA 175 and/or MAT 1275/MA 275 in preparation. This will increase the required number of credits for the degree by up to eight (8).

[2] See page 34 for detailed explanation of core required courses and categories.

Associate in Applied Science in COMPUTER INFORMATION SYSTEMS

The Computer Information Systems program offers superior instruction for those interested in mainframe computer careers. Students are introduced to mainframe programming in COBOL, online programming using systems such as CICS, database programming, SQL, programming systems using C++, in addition to operating systems and systems analysis and design, introduction to microcomputer concepts and application packages and principles of electricity, electronics and computer maintenance.

Progression in Computer Information Systems

A grade of "C" or better in each course designated with the prefix CS or MS will be required for progression in and graduation from the Computer Information Systems program.

REQUIRED COURSES IN THE MAJOR		Credits
CST 1101/CS 101	Computer Programming and Problem Solving	3
MST 1101/MS 101	Introduction to Microcomputers	3
CST 1205/CS 205	Operating Systems and MVS Control Systems	2
CST 1202/CS 202	COBOL Programming I	3
CST 2302/CS 302	COBOL Programming II	3
CST 2303/CS 303	Online Programming (CICS)	3
CST 2304/CS 304	Database Programming	3
CST 2403/CS 403	Introductory C++ Language Programming	3
CST 2406/CS 406	Systems Analysis and Design	3
	Subtotal	**26**
OTHER REQUIRED COURSES		
ACC 1101/AC 101	Principles of Accounting I	4
AC BUS 2425/AC 425	Business Management	3
ETN 1302/ET 429	Principles of Electricity, Electronics and Computer Operations	4
ENG 1101/EG 101	English Composition I	3
ENG 1121/EG 121	English Composition II	3
MAT 1375/MA 375[1]	Mathematical Analysis	4
LAP[2]	Literature/Aesthetics/Philosophy	3
BS/SS[2]	Behavioral Science/Social Science	3
TS[2]	Speech	3
SCI 1[2]	Laboratory Science	4
	Subtotal	**34**
TOTAL CREDITS REQUIRED FOR THE DEGREE		**60**

[1] Students without the requisite math background to enter MAT 1375/MA 375 will be required to take MAT 1175/MA 175 and/or MAT 1275/MA 275 in preparation. This will increase the number of required credits for the degree by up to eight (8).

[2] See page 34 for detailed explanation of core required courses and categories.

Bachelor of Technology in COMPUTER SYSTEMS

This is the only comprehensive curriculum in CUNY that addresses the specific needs of the information technology industry by integrating theory, hands-on experience and industry exposure to applied skills through a required internship degree program component. It provides the student with the flexibility of choice in specialization areas, such as:

- Object-Oriented Systems Analysis and Design
- Programming Design and Unix
- Database Systems Design
- Local Area Networks
- Client/Server Technology
- Web Design

The program's structures will allow for timely changes in specialization course offerings as the information technology field evolves. As our professional consulting board perceives a need in industry for expertise in some new area, an additional three-course module could be designed and offered as a supplementary elective option.

Goals of the Bachelor of Technology in Computer Systems

- Provide highly qualified professionals who can understand, apply, manage and anticipate cutting-edge technology,
- Prepare marketable candidates for positions in the information technology field,
- Provide students with the command of applied skills in technical fields that require a solid foundation in scientific and mathematical theory as well as excellent communications, problem-solving and critical-thinking skills, allowing students to anticipate the direction of technology, not just to follow it,
- Provide graduates of related AAS programs in computer systems the opportunity to transfer into this program and earn a BTech degree required for progression in and graduation from the Computer Systems program.

REQUIRED COURSES IN THE MAJOR		Credits
AAS Degree		**60**
Students must complete all courses in any three of the following seven modules for 27 credits:		
Programming Design and UNIX		
CST 3503/CS 503	Structured Program Design	3
CST 3603/CS 603	Object-Oriented Programming	3
CST 4703/CS 703	UNIX	3
Object-Oriented Systems Analysis and Design		
CST 3506/CS 506	Object-Oriented Systems Analysis	3
CST 3606/CS 606	Object-Oriented Systems Design	3
CST 4706/CS 706	Design of Object-Oriented Distributed Systems	3
Local Area Network		
CST 3507/CS 507	Advanced Single-LAN Concepts	3
CST 3607/CS 607	Introduction to Local Area Network Connectivity	3
CST 4707/CS 707	LAN-Internet Connection	3
Client/Server Technology		
CST 3508/CS 508	Design of Graphic User Interfaces	3
CST 3608/CS 608	Distributed Application Processing	3
CST 4708/CS 708	Client/Server Technologies	3
Database Systems Design		
CST 3504/CS 504	Design of Microcomputer Databases	3
CST 3604/CS 604	Design of Distributed Databases	3
CST 4707/CS 704	Data Warehousing	3
Web Design		
CST 3509/CS 509	Web Page Design and Implementation	3
CST 3609/CS 609	Web Programming	3
CST 4709/CS 709	Installing and Maintaining Web Servers	3

Information Security		
CST 3510/CS 510	Computer Security	3
CST 3610/CS 610	Network Security Fundamentals	3
CST 4710/CS 710	Advanced Security Technologies	3
Workplace Component		
CST 4900/CS 900	Internship	3
	Subtotal	**30**
OTHER REQUIRED COURSES		**Credits**
BUS 3525/BU 5251	Strategic Management	3
CST 4800/CS 800	Project Management	3
CST 4801/CS 801	Special Topics in Information Technology	1
PSY 2404/PS 404[2]	Organizational Behavior	3
	Subtotal	**10**
BACCALAUREATE CORE DISTRIBUTION[3]		
ENG 3700/EG 533	Advanced Technical Writing	3
MAT 1475/MA 475	Calculus I	4
LAP[4]	Literature/Aesthetics/Philosophy	3
LIT	Literature Elective	3
BS/SS[4]	Behavioral Science/Social Science	3
SCI 2[4]	Laboratory Science	4
	Subtotal	**20**
TOTAL CREDITS REQUIRED FOR THE DEGREE		**120**

[1] Prerequisite AC BUS 2425/AC 425 or equivalent

[2] Prerequisite PSY 1101/PS 101 or equivalent

[3] In addition to the liberal arts equivalent core requirements for the AAS at City Tech

[4] See page 34 for detailed explanation of core required courses and categories.

COURSES:

COMPUTER INFORMATION SYSTEMS COURSES (CS)

All CS, DP and MS courses incur a $5 materials fee

CST 1101/CS 101

Computer Programming and Problem Solving

2 cl hrs, 2 lab hrs, 3 cr

This course introduces the student to concepts of programming using a visual environment. The student uses code and concepts of programming to solve various common problems.
Prerequisites: Must be CUNY certified in reading, writing and mathematics: corequisites: MST 1101/MS 101

CST 1202/CS 202

Sequential Mainframe Programming

2 cl hrs, 2 lab hrs, 3 cr

Introductory course in the COBOL programming language. Topics include input-stream, data input, printer output, alphanumeric and numeric editing, the IF and EVALUATE statements, as well as the concepts of Structured Programming. Programming problems are assigned and executed through the CUNY University Computer Center VM/MVS system.
Prerequisites: CST 1101/CS 101, MST 1101/MS 101, MAT 1175/MA 175; corequisites: MAT 1275/MA 275, CST 1205/CS 205

CST 1205/CS 205

Operating Systems and MVS Job Control Language

2 lab hrs, 2 cr

This course provides an overview of computer hardware and operating system concepts used on personal and business computer systems. Students will problem solve using the command line interface in the Windows, Linux, and UNIX environment. Focus will be on command syntax, disk organization, and writing simple to complex batch files. Students will use partition the hard drive and install Windows 2000. Students will also use Linux and UNIX operating systems to execute problem-solving exercises. Topics such as Data Security and Data Mining will be covered.
Prerequisites: CST 1101/CS 101, MST 1191/MS 101; corequisite: CST 1202/CS 202

CST 2302/CS302

Sequential Mainframe Programming II

2 cl hrs, 1 lab hr, 3 cr

This course is a continuation of CS 202, Sequential Main-Frame Programming I. It covers advanced COBOL topics, including control breaks, summary report writing, validity checking, one-and-two dimensional tables, the SORT statement, the techniques used in designing and writing structured COBOL programs involved in the maintenance of sequential datasets created and stored on direct access storage devices (DASD), and the creation and usage of VSAM data sets. Programming problems are assigned and executed through the CUNY University Computer Center VM/MVS system.
Prerequisites: CST 1202/CS 202 and CST 1205/CS 205; corequisite: MAT 1375/MA 375

CST 2303/CS 303

Online Programming (CICS)

2 cl hrs, 2 lab hrs, 3 cr

An introduction to real-time programming concepts. A hands-on programming experience will be gained using CICS and COBOL software on a mainframe. Topics include interactive pseudo-conversational programming, full-screen mapping, and real-time program file management (add, delete, update, and browse) of records in VSAM files.
Prerequisites: CST 1202/CS 202 and CST 1205/CS205; corequisite: CST 2302/CS 302, MA375

CST 2304/CS 304

Database Systems

2 cl hrs, 2 lab hrs, 3 cr

This course will introduce the student to ANSI standard Structured Query Language (SQL). The course will cover the various syntax that governs this language. In-depth discussions and practice will be given so that the student will be able to manipulate (insert, update, delete and retrieve) data in a relational database.
Prerequisites: CST 1202/CS 202 and CST 1205/CS 205 or MST 1205/MS 205

CST 2403/CS 403

Introductory C++ Programming Language Part I

2 cl hrs, 2 lab hrs, 3 cr

This course is an intensive introduction to computer programming intended for CIS majors. Initial topics include the implementation in the C++ language of data types, operations, expressions, decision statements, and loops. Other topics include functions and subprogram structure, pointers, arrays, and structures. The course will teach the fundamental programming assignments aimed at reinforcing the material covered in class.
Prerequisites: CST 1101/CS 101, MAT 1275/MA 275 or higher

CST 2406/CS 406

Systems Analysis and Design

3 cl hrs, 1 lab hrs, 3 cr

An introduction to systems analysis and design concepts and tools, including the three basic phases of the System Development Life Cycle: system analysis, system design and system implementation and maintenance. CASE tools are introduced to perform data process modeling.
Prerequisites: CST 2302/CS 302, CST 2304/CS 304 or MST 2304/MS 304, and ENG 1121/EG 121

CST 3503/CS 503

C++ Programming Part II

4 cl hrs, 3 cr

This course is an intensive description of object-oriented programming intended for BT majors. Central to this object orientation is the concept of a class, which is a programmer-defined data type. Initial topics include implementation in the C++ language. The construction of class is based on both structures and functions, member functions, friend function, operator overloading. Other topics include inheritance, virtual functions and polymorphism and class templates.
Prerequisite: CST 2406/CS 403

CST 3504/CS 504
Design of Microcomputer Databases
2 cl hrs, 2 lab hrs, 3 cr
This course provides a general introduction to database design. The three main phases in database design are covered; that is, conceptual, using Entity Relational Diagram (ERD) and Unified Modeling Language (UML); logical, using relational model; and physical, using a Database Management System. The basics of relational data model (concepts of relation, attribute, primary key, and foreign key) are reviewed, and mapping the conceptual model to the relational model is discussed. Advanced concepts of relational theory normalization and denormalization are included. Physical implementation is described with the help of a particular Relational Database Management System (RDBMS). The students must be familiar with SQL.
Prerequisites: (MST 2304/MS 304 or CST 2304/CS 304) and CST 2406/CS 406

CST 3506/CS 506
Object-Oriented Systems Analysis
2 cl hrs, 2 lab hrs, 3 cr
This course introduces the concepts of Object-Oriented Analysis through the use of CASE tools. Object-Oriented Analysis is the method that brings together the concepts of process modeling and data modeling into a unified framework. Abstract concepts will be explained and demonstrated as concrete examples using business situations with CASE tools. Topics will include objects and attributes; classification structures; assembly structures; subjects, attributes and services; transition to Object-Oriented Design.
Prerequisites: CST 2406/CS 406 and MAT 1375/MA 375 or higher

CST 3507/CS 507
Advanced Single-LAN Concepts
2 cl hrs, 2 lab hrs, 3 cr
This course is designed as a second local area network course. Its main points of reference are the various protocols used in the available network operating systems, Novell NetWare, Windows NT, UNIX. It also addresses TCP/IP protocols. Building on a base of introductory network concepts, this course is a guide to troubleshooting network problems and those problems that arise with network-specific applications development. The student will be taught to create a troubleshooting process that identifies and isolates network problems in a consistent manner. The student will be introduced to LAN-network topics including current technology and emerging trends. Third-party diagnostics tools will be presented together with native diagnostic utilities. The setting for the course will be a lab with multiple LANs, one of each two computers serving as a server and the other as a workstation. Each pair of students will be responsible for its individual LAN.
Prerequisites: MST 2307/MS 307 and MAT 1375/MA 375 or higher

CST 3508/CS 508
Design of Graphic User Interfaces
Visual Basic
2 cl hrs, 2 lab hrs, 3 cr
At the end of the course students will be able to build programs that use a modern "visual" programming environment. They will be able to write object-oriented programs emphasizing object reusability and build state-of-the-art user interfaces for their programs. They will also be able to write programs with client/server capabilities using DDE and OLE, and that interact as clients and servers with respect to a database. Classroom exercises and additional exercises will demonstrate these concepts.
Prerequisites: CST 1101/CS 101 and CST 2304/CS 304 or MST 2304/MS 304, and MAT 1375/MA 375 or higher

CST 3509/CS 509
Web Page Design and Implementation
2 cl hrs, 2 lab hrs, 3 cr
This course focuses on how to design and maintain interactive and dynamic Web sites using HTML, Cascading Style Sheets (CSS) and client-side scripting with JavaScript. The students will also learn basic Web Page design principles. The goal is to develop effective, pleasing and useful Web sites. In the JavaScript part of the course students will develop real-world projects to learn JavaScript programming, the JavaScript Object Model, JavaScript event handlers, and how to integrate JavaScript programs in a HTML document. Students will apply this knowledge to create pop-up windows and scrolling messages as well as to validate forms and enhance the use of images and form objects. Client-side scripting technology will also be used to create cookies and shopping cart applications.A course goal is for each student to publish their work on external information servers where FREE email and web-space are available, make class presentations and write web content and proposals. At the end of the semester each student must give their professor a complete copy of their class projects.
Prerequisites: CST 1101/CS 101 or CST 2403/CS 403; pre- or corequisite: MST 2307/MS 307

CST 3510/CS 510
Computer Security
2 cl hrs, 2 lab hrs, 3 cr
This course is a practical guide to security issues facing computer professionals today. Students will acquire the knowledge and skills to maintain the integrity, authenticity, availability and privacy of data. It covers computer viruses, authentication models, certificates, group policy, cryptography, and access control. It also introduces the fundamental security issues of programming, database and web server. Other topics include how to monitor the system for suspicious activity and fend off attacks, to keep spies and Spam out of email, to take ultimate control of security by encrypting data, to design Active directory, blocking ports, and locking down the registry.
Prerequisite: MST 2307/MS 307, MST 2405/MS 405

CST 3603/CS 603
Object-Oriented Programming
2 cl hrs, 2 lab hrs, 3 cr
This course introduces students to the powerful Visual C++ .NET with Visual Studio and the .NET platform and to Microsoft's Windows integrated development environment. The extensive coverage of Graphical User Interface will give students the tools to build compelling and fully interactive unmanaged and managed application program. The course will introduce the concepts implemented with managed code that enables Visual C++ .NET to use .NET framework class libraries that are shared among Microsoft's .NET languages. This course also will teach students to understand basic database model and queries, to understand and use ADO.NET's model, and to use classes and interfaces of namespace System::Data and System::Data::OleDb to manipulate.
Prerequisite: CST 3503/CS 503

CST 3604/CS 604
Design of Distributed Databases
2 cl hrs, 2 lab hrs, 3 cr
This course is a continuation of the course "Design of Microcomputer Databases" (CST 3504/CS 504). This course concentrates on the physical design of databases, as well as the general introduction to the design of distributed relational databases. Such problems as database management, query processing, transaction management, reliability and security are discussed. Important issues of physical design, including the distribution of the database, are discussed under different architectures of distributed information systems. Such aspects of distributed databases as fragmentation, allocation, and replication of data are discussed in detail. The course covers the special problems that occur from the distribution of data semantic control, reliability, and transaction management, as well as the techniques used to solve these problems.
Prerequisite: CST 3504/CS 504

CST 3606/CS 606
Object-Oriented Systems Design
2 cl hrs, 2 lab hrs, 3 cr
This course introduces the concepts of Object-Oriented Design through the use of CASE tools. The course covers the transition from object modeling to the coding in object-oriented procedure languages and object-oriented database management systems. Topics will include replicated objects, distribution of services throughout the system, code generation, reverse engineering, procedural abstraction, data abstraction, encapsulation, inheritance legacy conversions. Concepts will be demonstrated with the use of CASE tools on business examples.
Prerequisite: CST 3506/CS 506

CST 3607/CS 607
Interconnectivity
2 cl hrs, 2 lab hrs, 3 cr
This course is designed for the student who has a firm foundation in supervision of a single local area network and needs to integrate several existing computers and network architectures into a Windows NT environment. The student will examine the several prominent network cabling standards, protocols, and hardware devices used in most enterprise-wide networks. It will teach how the most popular network operating systems solve various network connectivity problems. And finally, it will describe the technologies for making enterprise networks reliable and manageable. The setting for the course will be a lab with multiple LANs, several NT servers, several NetWare servers, and the remaining PC's acting as workstations.
Prerequisite: CST 3507/CS 507

CST 3608/CS 608
Distributed Application Processing
2 cl hrs, 2 lab hrs, 3 cr
This course covers the new approaches in client/server application development. The core of the course is the concept of business objects that serve as building blocks for distributed applications. Students will learn how to perform analyses, design and implementation of business objects in Visual Basic; and how to utilize these objects for building multitier distributed applications.
Prerequisite: CST 3508/CS 508

CST 3609/CS 609
Web Programming
2 cl hrs, 2 lab hrs, 3 cr
This course focuses on how to design and maintain interactive and dynamic Web applications using server-side scripting. Students will learn server-side scripting by using Active Server Pages (ASP). Students will learn the elements of the VBScript language and the ASP Object Model to program interactive Web applications. Processing of HTML forms on the web server as well as file management on the web server will be discussed in detail. An important component of this course is the construction of data-driven web sites that interact with databases using ActiveX Data Objects (ADO). Other sever-side technologies (PHP, Cold Fusion) will be introduced.
Prerequisite: CST 3509/CS 509

CST 3610/CS 610
Network Security Fundamentals
2 cl hrs, 2 lab hrs, 3 cr
This course is designed to provide a comprehensive overview of network security. It covers authentication methods along with common network attacks and how to safeguard against them. It also teaches important communication security aspects related to the use of remote access, the Web, directory and file transfer, and wireless data. The roles of firewalls, routers, switches, and other network hardware in security are examined. Security considerations for transmission and storage media are discussed as well as network security topologies, and Network Operating System vulnerabilities. In the lab, students will study how network attacks occur and how to defend against them.
Prerequisites: MST 2405/MS 405 and CST 3510/CS 510

CST 4703/CS 703
UNIX Networking and the Internet
3 cl hrs, 2 lab hrs, 3 cr
This course covers UNIX communications and networking and how to access the Internet services from the local system. Topics cover networking basics as applied to the UNIX operating systems, network file systems, modem and high-speed communications, UNIX communications programs, UUCP utilities, remote log-in programs, file transferring using FTP, the IP network addressing, the TCP/IP protocol stack and SNMP. In addition, students will be introduced to the Internet, electronic mail, telnet, gopher, usenet, the World Wide Web and other on-line services.
Prerequisite: CST 3603/CS 603

CST 4704/CS 704
Data Warehousing
2 cl hrs, 2 lab hrs, 3 cr
This course is designed to introduce the student to the principles of data warehousing. Through this course, students are taught how to plan and design a data warehouse and integrate its use through an organizational network. Theoretical and practical models are covered and extensive use is made of case studies, as well as practical exercises to relate theory and practice.
Prerequisite: CST 3604/CS 604

CST 4706/CS 706
Design of Object-Oriented Distributed Systems
2 cl hrs, 2 lab hrs, 3 cr
This course introduces the concepts of designing systems for client/server implementation. Building on the concepts of object-oriented analysis and design, the principles of designing an enterprise-wide distributed information system will be explained. Business examples will be demonstrated using CASE tools. Topics will include technology architecture, data architecture, application architecture, distributed databases, connectivity, middleware, and interoperability.
Prerequisite: CST 3606/CS 606

CST 4707/CS 707
The LAN - Internet Connection
2 cl hrs, 2 lab hrs, 3 cr
Students plan for and connect a hypothetical company's existing integrated LANs with the Internet and its resources. Study of Internet and intranet protocols. Students will build a business case for interconnection. A needs assessment, user requirements and expectations assessment, hardware and software requirements, cost and benefits estimates, and end-to-end connectivity issues will be researched and documented. Student teams will implement actual connection and utilization of Internet resources.
Prerequisite: CST 3607/CS 607

CST 4708/CS 708
Client/Server Technologies
2 cl hrs, 2 lab hrs, 3 cr
The definitions, requirements, benefits and terminology of client/server computing. Topics in this course will cover the client and the server hardware and software components. Defining the role and functions of each component. The architecture of distributed processing and the client/server technologies, and emerging trends. Students will write applications embodying different forms of client/server relationships, including a simple Web application.
Prerequisite: CST 3608/CS 608

CST 4709/CS 709
Installing and Maintaining Web Servers
2 cl hrs, 2 lab hrs, 3 cr
This course is designed to teach students how to install, configure, administer and secure a Web Server. The lectures will give the student a solid understanding of how a Web Server works in a computer network. In the lab, the student will apply the concepts learned in the lectures by using Internet Information Services (IIS) 5.0 and Apache Web Servers. The student will install IIS 5.0 server and will configure WWW Services and FTP Services. Once the servers are installed and configured, the student will play the role of Web master and perform various tasks including hosting multiple Web sites on a single computer with the Microsoft Management Console and other administrative tools. The student will also learn about the risks of connecting a computer to the Internet. Network security, operating system hardening and how to secure the IIS and Apache Web Servers will be discussed. Students will also learn important concepts about secure communications like encryption and digital signatures and how those can be implemented in a Web server using the secure sockets layer (SSL) protocol.
Prerequisite: CST 3609/CS 609

CST 4710/CS 710
Advanced Security Technologies
2 cl hs, 2 lab hs, 3 cr
This is an advanced network security course and it provides a comprehensive look at advanced security technologies in the real-world, such as Firewalls, Virtual Private Network (VPN), Network Intrusion Detection System (IDS), Network Intrusion Prevention Systems (IPS) and their deployments with other network security components to secure networks. It also includes network security design, evolving security strategies, the evolution of identity and access management, policy and risk management. The students will be working on projects in the information security laboratory.
Prerequisites: CST 3507/CS 507 and CST 3610/CS 610

CST 4713/CS713
Application Architecture Using Java
2 cl hrs, 2 lab hrs, 3 cr
This course is designed for students who have knowledge of the fundamental concepts of computer programming and object-oriented programming. Subsequently, students will learn the fundamental of Java GUI and the application of Java Applet. The details of advanced topics will be introduced that includes Multithreading, Servlets and concept of Java Beans. Network programming concepts will be discussed extensively through working with TCP/IP socket and Datagram sockets and developing the client/server applications.
Prerequisites: CST 3603/CS 603

CST 4714/CS 714
Database Administration
2 cl hrs, 2 lab hrs, 3 cr
This course concentrates on the advanced issues of database management and administration. The course discusses what activities are needed to sustain reliable and secure database with good performance. Managing of database storage (data, log, and backup files), database objects (tables, indexes, clusters, etc), and procedural objects (triggers, stored procedures) for delivering the database properties mentioned above are discussed in details. Also such issues as security, administrating users and recourses, tuning the applications, and monitoring the performance of database are included.
Prerequisites: CST 3604/CS 604

CST 4800/CS 800
Project Management
3 cl hrs, 3 cr
This course covers the most modern techniques for managing large projects, with particular emphasis on projects involving the development of computer software. The course combines the discipline of project management with that of general management and the management of people. A case study follows students through the course, as they work on problems in project scheduling, resource allocation, and project control using current project-management software on a microcomputer.
Prerequisites: Completion of two 3600/600-level courses

CST 4801/CS 801
Topics in Information Technology
1 cl hr, 1 cr
This course explores the new and emerging trends in hardware and software that are at the leading edge of information technology. Topics will be selected from beyond the work of the 700-level courses in each of the six specialty modules. Topics will differ each semester depending on what is the present state of the art in information technology. Students will gather information on these topics by use of the Internet, attending seminars and trade shows and attending industry briefings. Students are expected to research an advanced topic and present it in verbal and written form. In addition students will prepare for a job search through review of resume preparation, interviewing techniques, etc.
Prerequisites: Completion of two 3600/600-level courses

CST 4900/CS 900
Internship in Computer Systems
1 cl hr, 120 field hrs/semester, 3 cr
Supervised work experience in the Information Technology field. The experience can be in small, medium, or large companies or governmental agencies. Students should gain experience in one of their areas of concentration. A minimum of 120 hours for a minimum of six weeks is required. Each student keeps a log/journal to be submitted to the faculty member at a minimum of twice during the semester. Final oral and written presentation of the internship experience will be shared with the entire internship group. The worksite supervisor will evaluate the intern in addition to the faculty evaluation. Required for all students in the BTech program.
Prerequisites: Completion of two 3600/600-level courses

CST 4905/CS 905
Information Systems Project
3 cl hrs, 120 field hrs, 3 cr
The course gives students hands-on experience in working with advanced programming tools in designing and building an information system (IS). Projects will be solicited from industry, non-profit organizations, and the College or individual faculty members. The course allows students to utilize the knowledge in several areas of information technology and go through the main steps of IS life cycle: planning, design, development, implementation and maintenance. Students are organized in teams for different projects. Students will attend scheduled classes as well as work independently in teams. Students can schedule additional meetings with faculty members.
Prerequisites: Completion of 3600/600 level courses from at least two modules, Grade of B- in each of the 3600/600 level courses, permission from the chairperson and/or the internship coordinator.

DPT 2309/DP 309
Introduction to Computers for Accounting Students
3 cl hrs, 2 lab hrs, 4 cr
For accounting students. An introduction to the use of computers in the business environment. Topics include concepts and techniques used in both mainframe computers and microcomputers. Emphasis is placed on the application of personal computers including such topics as electronic spreadsheets, word processing and the use of database management systems. This course assumes no prior knowledge of computers and includes hands-on exercises on personal computers.
Prerequisite: CUNY certification in reading, writing and mathematics

MST 1101/MS 101
Introduction to Microcomputers
2 cl hrs, 2 lab hrs 3 cr
This course is specially designed to provide the students with a basic knowledge of computers and the computer industry. It is designed to give the student an understanding of the various facets of computing. The course will provide an overview of microcomputer operating systems and their role in hardware, software, and data management. The student is introduced to the concept of binary and hexadecimal systems. In addition, students will receive instructions on the use of a commonly-used word processor, Internet browser, presentation graphics software, and a spreadsheet software. The students will learn how to use the Internet as a research tool. The course will introduce the student to the basic concepts of telecommunications, local area network, and today's issues of computer security.
Prerequisite: CUNY certification in reading, writing and mathematics; corequisite: CST 1101/CS101

MST 1204/MS 204
Database Systems and Programming
2 cl hrs, 2 lab hrs, 3 cr
This course introduces students to the principles and techniques of programming a relational database on the example of MS Access database management system. Special attention is dedicated to Structured Query Language (SQL), the standard language of programming relational databases. Students will learn how to create a database and tables, and how to manipulate (insert, update, delete and retrieve) data.
Prerequisites: MST 1101/MS 101 and CST 1101/CS 101

MST 1205/MS 205
Microcomputer Systems
2 cl hrs, 2 lab hrs, 3 cr
The operating system is the most fundamental program of any computer. It controls all the computer's resources and provides the base upon which the application programs can be written. This course provides an in-depth study of computer hardware and operating system concepts. Focus will be on the command line interface. Students will problem solve using the command line interface in the Windows environment. Focus will be on command syntax, disk organization, writing simple to complex batch files, troubleshooting, and connectivity with local and wide area networks, and analysis and backup of the Windows Registry.
Prerequisites: MST 1101/MS 101 and CST 1101/CS 101

MST 2304/MS 304
Database Systems and Programming II
2 cl hrs, 2 lab hrs, 3 cr
This course covers programming for microcomputer databases using a visual programming language external to the database. It covers all the features of the programming language needed to interact with and process the database, including the data control and the data-aware controls. It includes the processing of tables and queries that have already been defined in the database using the database software. Students will run programming problems on a microcomputer using a recent version of the applicable software.
Prerequisites: MST 1204/MS 204

MST 2307/MS 307
Local Area Networks
3 cl hrs, 3 lab hrs, 4 cr
Study of the current standard local area network. Basic network concepts and the OSI model are discussed. Topics include: topology, servers, workstations, printers and other devices on the LAN, the network operating system, utilities, applications run on the network, and LAN management. The network operating system Netware 5.1 is discussed: NDS, network file system, managing users and groups, security, printing, log-in scripts, operating server console. Each student will be given an account with Administrator privileges and will perform network administration tasks.
Prerequisites: MST 1205/MS 205, MAT 1275/MA 275

MST 2405/MS 405
Microcomputer Operating Systems
3 cl hrs, 3 lab hrs, 4 cr
This is a study of microcomputer operating systems, and the usage of selective features of popular microcomputer-based systems. The course introduces the operating systems concepts via study of MS DOS and MS Windows 2000. Main focus will be on Windows 2000 Server OS. Comparison topics cover the file system, processor management, memory management, device management. Other topics will cover multitasking, security, client/server systems, communications and networking support. All concepts will be demonstrated through laboratory assignments.
Prerequisites : MST 1205/MS 205, MST 2307/MS 307