

School of Continuing Studies

Applied Computing Systems and Technology

Computer-based information systems have become a critical part of the products, services, operations, and management of modern organizations. The effective and efficient use of information and communications technologies is an important element in achieving competitive advantage for business organizations and delivering excellence in service for government and non-profit organizations.

The programs in Applied Computing Systems and Technology are designed to prepare graduates who are professionally competent and able to make valuable contributions to an organization in the application of information systems and technology in helping to achieve organization goals. This is accomplished by providing students with a challenging academic program of study presented by a faculty of experienced Information Systems and Information Technology professionals. The programs emphasize developing the student's ability to think critically, communicate technical information effectively, collaborate in team environments, and apply computer-based solutions to practical problems. They provide a breadth of knowledge in the fundamental areas of Information Systems and Information Technology and allow for in-depth study in the areas of application development, database systems, web application development, business systems analysis, and information technology.

The School of Continuing Studies offers a Bachelor of Science, an Associate of Science, a minor, and five post-baccalaureate certificates in the area of Applied Computing. The programs are open to all part-time students admitted to the School of Continuing Studies.

Note: Applied Computer Systems and Technology courses in the School of Continuing Studies do not count towards the degree requirements of full-time Newcomb-Tulane students.

BACHELOR OF SCIENCE

To receive a Bachelor of Science in Applied Computing Systems and Technology, a student must complete at least 121 credits with a cumulative grade point average of at least 2.0 and a grade point average of at least 2.0 in all major and minor coursework. The major requirements for the degree consist of:

Six Core Courses

18 credits

- CPST 120 Fundamentals of Information Systems and Information Technology
- CPST 220 Programming Fundamentals
- CPST 230 Database Fundamentals
- CPST 360 IT Hardware and Software Fundamentals
- CPST 370 Networking Fundamentals
- CPST 390 Fundamentals of Information Security and Assurance

Six Concentration Courses

18 credits

The concentration courses are chosen from one of the following areas:

Application Development Concentration

- CPST-221 Advanced Programming Fundamentals
- CPST-320 Object-Oriented Design Implementation
- CPST-322 Object-Oriented Programming with Java
- One of the following:
 - CPST-323 Programming in C++
 - CPST-324 Visual Application Development
- CPST-420 Advanced Object-Oriented Methods
- One CPST elective

Business Systems Analysis Concentration

- CPST-350 Information Systems Project Management
- CPST-355 Systems Analysis and Design
- CPST-450 System Requirements Development and Testing
- CPST-455 Systems Analysis Practicum
- Two CPST electives

Database Systems Concentration

- CPST-330 Oracle Forms and Reports
- CPST-331 Relational Database Design and Development

CPST-355 Systems Analysis and Design
CPST-430 Database Application Development

One of the following:

CPST-432 Data Warehousing and Data Mining
CPST-435 Database Administration

One CPST elective

Web Application Development Concentration

CPST-240 Webpage Design and Development
CPST-355 Systems Analysis and Design

Two of the following:

CPST-340 Website Development with XML/XHTML
CPST-341 Website Development with JavaScript
CPST-342 Website Development with CGI/Perl
CPST-343 Website Development with ASP

CPST-440 Internet Database Application Development

One CPST elective

Information Technology Concentration

Six from the following (at least one at the 400 level):

CPST-361 Internet Server Administration with Windows Server and IIS
CPST-365 Internet Server Administration with Linux and Apache
CPST-369 Microcomputer Hardware
CPST-461 Network Administration
CPST-464 TCP/IP Protocol
CPST-467 Advanced Network Administration
CPST-471 Managing a Network Infrastructure
CPST-470 Wide Area Networks
CPST-475 Routers and Switches

CPST-491 Network Security
CPST-492 Website Security

In addition to the major requirements, students must complete the following general requirements:

Proficiency and Supporting Requirements

ENGL 101 or CSEN 125 4 credits

One designated Writing (ENLS 367 recommended) or English course 3 credits

Two math courses 6 -8 credits

Any MATH course, CPST 107 Mathematics for Information Technology; MGMT 325 Business Statistics (Students can take only one of MGMT 325, MATH 111 and MATH 114)

Two courses in Perspectives Outside the European Tradition/Comparative Cultures or foreign language or a combination of the two 6-8 credits

Oral Communications 3 credits
Any SPEC course, MGMT 225, or THEA 210

Distribution Requirements (at least two disciplines per category)

Humanities 12 credits

Social Sciences 12 credits

Sciences 12 credits

Minor Requirements typically 18 credits

Students may select a minor from any of the academic departments of the University, but only the unique minors of the SCS are guaranteed to be available in the evening hours. Since Information Systems and Information Technology are intimately tied to applications in business environments, students who choose this program are highly encouraged to consider a minor in generalized Business Studies or one of the specific areas of Business. Students who choose the Internet Application Development concentration may wish to obtain a minor in Media Arts in lieu of a business-related minor.

Free Electives

As necessary to achieve a total of 121 credits

Total 121 credits

ASSOCIATE OF SCIENCE

To receive an Associate of Science in Applied Computing Systems and Technology, a student must complete at least 61 credits with a cumulative grade point average of at least 2.0 and a grade point average of at least 2.0 in all major coursework. The major requirements for the degree consist of:

Six Core Courses 18 credits

CPST 120 Fundamentals of Information Systems and Information Technology

CPST 220 Programming Fundamentals

CPST 230 Database Fundamentals

CPST 360 IT Hardware and Software Fundamentals

CPST 370 Networking Fundamentals

CPST 390 Fundamentals of Information Security and Assurance

Two concentration courses 6 credits

The concentration courses are chosen from one of the 5 areas of concentrations listed under the Bachelor of Science.

In addition to the major requirements, students must complete the following general requirements:

Proficiency and Supporting Requirements

ENGL 101 or CSEN 125 4 credits

One math courses 6 -8 credits

Any MATH course, CPST 107 Mathematics for Information Technology; MGMT 325 Business Statistics

Oral Communications 3 credits

Any SPEC course, MGMT 225, or THEA 210

Distribution Requirements

Humanities 3 credits

Social Sciences 3 credits

Sciences 3 credits

Free Electives

As necessary to achieve a total of 61 credits

Total 61 credits

POST-BACCALAUREATE CERTIFICATES

Post-Baccalaureate Certificates are available to students who already hold a bachelor's degree. Certificates are available in each of the 5 areas of concentration available in the BS degree. Each certificate consists of the 6 core courses required in the BS degree and the 6 required courses for the chosen concentration area. Students seeking to earn multiple certificates can not overlap elective courses from one certificate to another certificate.

APPLIED COMPUTING SYSTEMS AND TECHNOLOGY COURSE DESCRIPTIONS

CPST 100 Introduction to Microcomputers

This course introduces students to the microcomputer and some popular micro applications. Special attention is given to essential concepts, word processing, spreadsheets, and database management. The course also provides a preface to operating environments such as Windows. Includes hands-on laboratory sessions; currently, Microsoft Office tools are used for this course.

CPST 107 Mathematics for Information Technology

This course provides an introduction to discrete mathematical structures and themes with an emphasis on applications to computing and information technology. It develops analytical skills used to solve problems concerning the speed and logical structure of computer software, computer hardware, and computer networks.

CPST 120 Fundamentals of Information Systems and Technology

This survey provides a broad foundation in the concepts of modern information systems, information processing and information technologies. It provides an overview of the key technology

components that make up modern information systems and the processes and issues involved in the development of information systems. (Formerly UCIS-110)

CPST 122 Introduction to Programming: Visual Basic

This introductory programming course assumes no previous programming experience and introduces programming in an "object-like" environment. The student is introduced to the use of problem-solving, logic skills and program design to develop simple computer-based solutions in Visual Basic. Students will write Visual Basic programs using elementary applied computing techniques including editing, calculation, decision branching, control looping, and file I/O.

CPST-140 Working with the Internet

This course acquaints the students with the Internet, its uses and history, and a wide variety of tools and applications for effectively accessing information. Students will have the opportunity to learn classic text-based Internet applications, as well as graphical and multimedia capabilities of the World Wide Web. Coverage of basic technologies (e.g., hardware, protocols, authoring software) is included. Note: This course does not count toward the requirements for a major or minor in Applied Computing Systems and Technology but can be used to satisfy the School of Continuing Studies' Supporting Requirement of a computer application course. (Formerly UINS-227)

CPST 220 Programming Fundamentals

This course presents a structured approach to problem analysis, algorithm design and solution implementation in a high level computer language. Students will learn how to analyze problems and represent solutions in pseudo-code. Students will study the basic concepts of programming, internal representation of data, simple data types, searching and sorting techniques.

CPST 221 Advanced Programming Fundamentals

Prerequisite: CPST-220 or equivalent programming experience. This course discusses techniques for solving moderately complex problems such as modularization. The course will present abstract data types and data storage concepts. The programming will involve learning to use classes and objects. Problem solving will require the design and use of classes and objects in a high level language.

CPST 230 Database Fundamentals

Prerequisite: CPST-220 or equivalent programming experience. Introduction to database management systems with an emphasis on relational database concepts, database systems with an emphasis on database design, development and implementation. Includes implementation of current DBMS tools and SQL (Formerly UICS-221/UINS-220)

CPST 240 Webpage Design and Development

This course goes beyond mere use of the Internet into the tools and techniques needed to successfully publish digital media. Through lectures, class discussions, and hands-on lab work, you will become acquainted with the hardware, software (on workstations, on servers, and on the Internet), and tool management techniques needed to create and maintain web documents and sites. The course includes coverage of HTML. (Formerly UWEB-229)

CPST 305 Technology and Ethics

This course examines the ethical and social aspects of information technology with emphasis on computing. Pertinent issues include acquisition, access, stewardship, liability, freedom, privacy, control and security. Note: This course can be used to satisfy a School of Continuing Studies' Humanities Distribution Requirement. (Formerly UINS-351)

CPST 320 Object-Oriented Design & Implementation

Prerequisite: CPST-221 or equivalent programming experience. This course presents a study and application of Unified Modeling Language to model object-oriented systems. The course concentrates on the implementation of solutions for systems from a modeled system design. (Formerly UCIS-342)

CPST 322 Object-Oriented Programming with Java

Prerequisite: CPST-221 or equivalent programming experience. This course presents the fundamentals of the JAVA programming language. Topics include JAVA syntax, data types, design of classes, class libraries, data structures, exception handling, threads, input and output, and applet programming. (Formerly UCIS-295)

CPST 323 Programming in C++

Prerequisite: CPST-322 or equivalent programming experience. This course presents the fundamentals of the C++ programming language. It covers development of computer-based solutions in C++, using object-oriented and event-driven techniques, and

accessing databases with open database connectivity. (Formerly UCIS-293)

CPST 324 Visual Application Development

Prerequisite: CPST-322 or equivalent programming experience. This course presents the development of computer based solutions within a “visual” tool environment using object-oriented and event-driven techniques. It covers fundamental data types and derived data structures of a database engine and the design of effective graphical user interfaces.

CPST 330 Oracle Forms & Reports

Prerequisite: CPST-230 or equivalent database experience. This course covers the concepts and principles of elementary application component development using Oracle Forms tools and relational databases. Additionally the course covers the design and production of reports using Oracle Corporation's Developer tool. An overview of the structure and toolset of Oracle Developer is provided. Hands-on practices and implementation of forms and reports development is taught in a lab setting. (Formerly UCIS-282)

CPST 331 Relational Database Design and Development

Prerequisite: CPST-230 or equivalent database experience. This course covers design and development concepts for relational database systems. The students will work on the design and development of a database application by analyzing organizational data needs, model and present those needs using diagrams and specifications, exploring different database designs, and implementing the design in a working system. Topic include normalization, entity-relationship modeling, database application design, data base processing using internet technology, managing multi-user data bases, accessing the database server, and sharing enterprise data. (Formerly UCIS-340/UINS-321)

CPST 340 Website Development with XML/XHTML

Prerequisite: CPST-240 or equivalent experience. This course is designed to provide students with an introduction to programming using XML. Students taking this course should have a working knowledge of HTML and FTP as gained by completing the course Webpage Design course. Students should have a basic understanding of programming concepts and a relational database including relationships of primary and secondary tables via keys and foreign keys. Some sample learning activities are: author XML documents using a given Document Type Definition (DTD); create

a DTD; create a CSS and/or XSLT style sheet; create an XML-based information system that brings together the skills learned throughout the course. (Formerly UWEB-302)

CPST 341 Website Development with JavaScript

Prerequisite: CPST-240 or equivalent experience. This course provides the opportunity to obtain a solid understanding of some of the tools and techniques, beyond basic HTML, used to publish on the Internet via the World Wide Web. Through online 'lectures' and posted materials, electronic discussions, and hands-on 'lab' work you will become acquainted with the computer hardware, software (both used on your machine and the Net), and programming techniques needed to design, create and maintain fully interactive Web documents and sites. This course will primarily on JavaScript programming and some additional advanced techniques and concepts. (Formerly UWEB-303)

CPST 342 Website Development with CGI/Perl

Prerequisite: CPST-240 or equivalent experience. The tools and techniques, beyond basic HTML, used to publish on the Internet via the World Wide Web. The computer hardware, software and programming techniques needed to design, create and maintain fully interactive Web documents and sites. This course will focus primarily on CGI/Perl programming with some additional advanced techniques and concepts. (Formerly UWEB-304)

CPST 343 Website Development with ASP

Prerequisite: CPST-240 or equivalent experience. This course teaches the fundamentals of programming for web sites using ASP Active Server Pages, a popular tool for enhancing home pages. The language is part of the Microsoft's internet development tool effort and may be found on millions of websites. Students develop ASP based functions and use SQL statements with Access or SQL Server to interface with a small database application using ASP code. (Formerly UWEB-308)

CPST 350 Information Systems Project Management

Prerequisite: CPST-120 or equivalent experience. This course provides an introduction to the principles and application of project management techniques with an emphasis on the design and management of Information Systems. Topics include project planning, work team design, project estimation techniques, project reporting, identifying and controlling project risks, budgets, and quality assurance. (Formerly UINS-356)

CPST 355 System Analysis and Design

Prerequisite: CPST-230 or equivalent experience. Examines the concepts, tools, and techniques used to develop and support computer-based information systems. Systems planning, analysis, design, and implementation are covered. Techniques for studying, documenting, specifying, designing, implementing and testing small and/or enterprise-wide business systems. Analysis and design includes structured and object-oriented methods, using CASE tools. (Formerly UCIS-322/UINS-320)

CPST 360 IT Hardware and Software Fundamentals

Prerequisite: CPST-120 or equivalent experience. This course covers the principles and applications of computer hardware and software. It supports learning of the hardware/software technology background needed to understand tradeoffs in computer architecture for effective use in an organizational environment. It provides an overview of computer system architectures, the logical interconnection of components for processing data, and the controlling software that manages systems resources. Architectures include single processor and multi-processor systems, single user and multi-user central and networked systems, as well as single and multi-user operating systems. (Formerly UCIS-310)

CPST 361 Internet Server Administration with Windows Server and IIS

Prerequisite: CPST-370 or equivalent experience. This course will provide students with a comprehensive understanding of all facets of Microsoft Windows server based web service installation, configuration, administration, and maintenance. The course will focus on hardware, software, Internet protocols, and advanced web server hosting and services. It provides students with the understandings and skills needed to effectively plan, implement, and deploy valuable World Wide Web services in a professional or personal capacity. (Formerly UTEL-316)

CPST 365 Internet Server Administration with Linux and Apache

Prerequisite: CPST-370 or equivalent experience. This course will provide students with a comprehensive understanding of all facets of Linux/Unix server based web service installation, configuration, administration, and maintenance. The course will focus on hardware, software, Internet protocols, and advanced web server hosting and services. It provides students with the understandings

and skills needed to effectively plan, implement, and deploy valuable World Wide Web services in a professional or personal capacity. (Formerly UTEL-317)

CPST 369 Microcomputer Hardware

The course provides learning opportunities in the various industry-standard hardware components of microcomputers. It also covers their interconnectivity relationships and fundamental system software. This hands-on course emphasizes managing and maintaining the personal computer components: system board, storage drives (especially hard drives), and peripheral equipment (e.g., video and network cards), managing upgrades, etc. (Formerly UINS-312)

CPST 370 Networking Fundamentals

Prerequisite: CPST-120 or equivalent experience. This course covers topics in data communications and various technologies that affect business communications. In addition to learning common networking terminology, students will examine existing and emerging networking standards and architectures. Also covered are operating systems, wiring topologies, communications protocols, LAN-to-LAN interconnectivity and WAN fundamentals. This course is intended to provide a solid foundation for further study of communications and networking. (Formerly UTEL-261)

CPST 371 Internet Technologies

Prerequisite: CPST-120 or equivalent experience. The goal of this course is to provide an introduction to Internet technologies and prepare students to pass CompTIA's broad-based, vendor – independent internet technology certification exam, i-Net +. This course covers a wide range of material about Internet, from using the Internet to demonstrating how the Internet works, using different Internet protocols, programming on the Internet, the Internet infrastructure, security, and e-commerce. It not only introduces a variety of concepts, but also discusses in-depth the most significant aspects of Internet, such as the OSI model of networking. In addition to explaining concepts, the course uses a multitude of real world examples of networking issues from a professional's standpoint, making it a practical preparation for the real world. (Formerly UTEL-263)

CPST 390 Fundamentals of Information Security and Assurance

Prerequisite: CPST-370 or equivalent experience. This course provides an introduction to technical and administrative aspects of

Information Security and Assurance. This course provides the foundation for understanding the key issues associated with protecting information assets, determining the levels of protection and response to security incidents, understanding vulnerabilities and designing a consistent, reasonable information security system with appropriate intrusion detection and reporting features. (Formerly UTEL-318)

CPST 420 Object-Oriented Application Development

Prerequisite: CPST-320 and CPST-322 or equivalent experience. This course provides an examination of the principles, practices, and applications of programming in an object-oriented environment, including modeling language and processes. The primary objective of the course is to study an object oriented approach to software development that systematically uses a set of object-oriented principles, methods, and tools to build high-quality software. This study involves practical work using a development environment that supports the methods and its notation and processes. Object-oriented methods currently in widespread use are compared. (Formerly UCIS-376)

CPST 430 Database Application Development

Prerequisite: CPST-330 and CPST-331 or equivalent experience. This course synthesizes principles and design techniques of Prerequisite courses and adds advanced learning components needed to develop a client/server database application. Included are concepts and components of a two-tier client/server application; design and development of database structure, objects, and relationships; design and development of screens/forms to support the database application. Oracle tools are currently being used in this course. (Formerly UCIS-378)

CPST 432 Data Mining and Warehousing

Prerequisite: CPST-330 and CPST-331 or equivalent experience. In this course students receive an introduction to data warehousing and to the development of data warehouse application. This includes the Build and Test phases of the data mart and data warehouse structures and data warehousing tools, such as Oracle. The course also covers analysis, transformation and loading of data into a data warehouse. It covers the development of the data architecture and physical design and the implementation and administration of the data warehouse. It includes a brief introduction to the basic concepts behind data mining and techniques Applicable to traditionally data-rich industries such as

banking, insurance and market research. It is useful for emerging applications in official, environmental and medical statistics. (Formerly UINS-357/UCIS-379)

CPST 435 Database Administration

Prerequisite: CPST-330 and CPST-331 or equivalent experience. This course parallels Oracle Corporation's second course in its database administration track, "Database Administration." Some topics and activities include: installation and management of a database system; ensuring data integrity; managing database users. Students will work in a lab environment to install an Oracle Database, and will then work their way through a series of crucial system-side activities to learn the various tasks of an Oracle database administrator. (Formerly UCIS-347)

CPST 440 Internet Database Application Development

Prerequisite: CPST-230 and CPST-240 or equivalent experience. This course is designed to give the student a firm foundation of Internet Databases. The course will cover the architecture, concepts, design approaches, and challenges involved in the development of applications integrating a web based front-end with a back-end database. The student will build several web applications during the semester. (Formerly UCIS-345)

CPST-445 Multimedia Website Development (3)

Prerequisite: CPST-240 or equivalent experience. This course provides understandings and skills with some of the tools and techniques of designing, developing and publishing multimedia components on the Internet via the World Wide Web. Students become acquainted with the computer hardware, software (both used on the desktop and the Net), and programming techniques needed to design, create and maintain fully multimedia Web documents and sites. This course will primarily focus on sound, video, and animation component development and publishing. The course relies primarily on "plug-ins" but will require some programming as well. (Formerly UWEB-305)

CPST 450 System Requirements Development and Testing

Prerequisite: CPST-355 or equivalent experience. This course provides a study of concepts and techniques for planning and developing high quality information systems. Fundamentals of specification (including formal models and representations, documents, and standards) are examined. Methods of specifying and developing requirement for generating information systems are discussed. It covers the tools, methods, and current practices for

assessing the quality and correctness of information systems. Topics include the roles of testing and formal verification, fundamentals and formal models of program verification, planning and documentation for quality assurance, methods of performing technical reviews, strategies of system testing and integration planning, and principles and practices used in conducting tests. Projects using these techniques are included.

CPST 455 Systems Analysis And Design Practicum

Prerequisite: CPST-355 or equivalent experience. This course provides for the application of Information Systems concepts to a comprehensive group project for the planning, development and implementation of an information system. Management planning, scheduling, and reporting required. Documentation to include feasibility studies, alternative implementation strategies, programming, testing and users manuals. Appropriate computer assisted software engineering tools are used throughout the project from requirement specification to implementation and testing.

CPST 461 Network Administration

Prerequisite: CPST-360 and CPST-370 or equivalent experience. This course is designed to prepare the student for the challenges faced by network administrators, helpdesk technicians, and network analysts. Individuals working in these areas have the responsibility for installing and maintaining local area networks based on Microsoft Windows, Novell NetWare, UNIX/Linux, Apple Mac OS X or other network operating systems. (Formerly UTEL-362)

CPST 464 TCP/IP Protocol

Prerequisite: CPST-370 or equivalent experience. This course will focus primarily on the TCP/IP protocol suite and a set of related network services. It is designed to help students understand networks that use TCP/IP, the suite of protocols that is used today for the Internet and most modern networks.

CPST 467 Advanced Network Administration

Prerequisite: CPST-370 and CPST-461, or equivalent experience. This course is designed to familiarize students with the skills needed to administer a Microsoft network in the enterprise. The course provides an in-depth look at the features of Active Directory, including Group Policy, scripting, replication, and disaster recovery, plus the use of Exchange Server in the enterprise for reliable messaging services.

CPST 470 Wide Area Networks

Prerequisite: CPST-370 and CPST-475 or equivalent experience. This course examines wide area network architecture and its protocols. Topics include analog and digital transmission, error correction and detection, data link protocols, multiplexing and switching, xDSL, cable networks, copper and optical media, Ethernet, fast Ethernet, Gigabit Ethernet, wireless LANs, ISDN and various routing protocols. (Formerly UTEL-364)

CPST 471 Managing a Network Infrastructure

Prerequisite: CPST-370, CPST-461, and CPST-464 or equivalent experience. This course is designed to help students learn how to design, implement and maintaining a network infrastructure, including topics such as the Dynamic Host Configuration Protocol (DHCP), Windows Internet Name Server (WINS), Domain Naming System (DNS), Remote Access and Virtual Private Networking (VPN.) (Formerly UTEL-365)

CPST-475 Routers and Switches

Prerequisite: CPST-370 and CPST-464, or equivalent experience. The TCP/IP suite of protocols is the de facto standard for multi-vendor connectivity within corporations and serves as the basis for Internet connectivity. This course focuses on Internet communications architecture and the internetworking between autonomous systems that is facilitated by IP routing. Layer 2 and Layer 3 (IP Switching) architectures will also be examined in relation to interLAN and VLAN routing. (Formerly UTEL-315)

CPST 491 Network Security

Prerequisite: CPST-390 and CPST-461 or equivalent experience. This course is designed to provide fundamental skills needed to analyze the internal and external security threats against a network, and to develop security policies that will protect an organization's information. Students will learn how to evaluate network and Internet security issues and design, and how to implement successful security policies and firewall strategies. In addition, they will learn how to expose system and network vulnerabilities and defend against them. (Formerly UTEL-410)

CPST 492 Website Security

Prerequisite: CPST-240 and CPST-390 or equivalent experience. This course is designed to provide students with an introduction to website security and privacy issues. Students will understand how to identify security/privacy issues, recognize security issues

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involving Java, the Internet and email. Students will also explore techniques and best practices for limiting risk. (Formerly UWEB-235)