SUGGESTED CLASS SEQUENCE FOR COMPUTER SCIENCE
TOTAL SEMESTER HOURS REQUIRED TO GRADUATE = 123

YEAR 1

Fall				Spring			
UNIV RAMS	1201 or 1201	Freshman Seminar	2	ENGL	1302	College Rhetoric and Composition	3
ENGL	1301	Introduction to College Composition	3	MATH COSC	1342 1323	Statistics Programming Foundations II	3
MATH	1314	Algebra	3	COMM	1315	Public Speaking	3
COSC	1312	Programming Foundations I	3	PSCI	1301 or 1302	US or Texas Government	3
KINE	1304	Health and Wellness	3				3
COSC	1300	Introduction to Computers	3	KINE	1100	Personal Fitness	1
Total			17	Total			16

YEAR 2

Fall				Spring			
PHYS	2425	Physics I	4	PHYS	2426	Physics II	4
COSC	2311	Java I	3	COSC	2322	Java II	3
COSC	2313	Data Structures	3	COSC	2326	Enterprise Computing	3
MATH	2413	Calculus I	4	MATH	2414	Calculus II	4
Social Behavior		Introduction to Sociology; Introduction to Psychology; Social Problems	3	MATH	2305	Discrete Math	3
Total			17	Total			17

YEAR 3

Fall				Spring			
COSC	3315	Operating Systems I	3	COSC	3326	Operating Systems II	3
COSC	3312	Database & Info Retrieval	3	COSC	3213	Computer Organization	3
Language I			3	COSC	3427	Computer Networks and	4
PHIL RELI	2301 or 2302	Religion or Philosophy	3			Distributed Systems	
				Language II		**(Study Abroad Option)**	3
Fine Arts		Musicianship; Introduction to Arts, etc. **(Study Abroad Option)**	3	ENGL	2331	World Literature	3
BUSI	3113	Professional Develop	1				
Total			16	Total			16

YEAR 4

Fall				Spring			
COSC	4311	Software Engineering I	3	COSC	4223	Software Engineering II	3
COSC	4367	Special Topics	3	MATH	3336	Numerical Techniques	3
MATH	2318	Linear Algebra	3	Elective		Diversity **(Study Abroad**	3
HIST	1301 or 1302	US History I or II	3			**Option)**	
Diversity		African American History	3				
Total			15	Total			9

Degree Requirements for Computer Information Systems

The total number of semester credit hours required for the Bachelors of Science degree in Computer Information Systems is 121. The 121 credit hours are as follows:

A. University Core Curriculum Requirements **51 credit hours**

NOTE: Calculus I (4 credit hours) instead of College Algebra

B. Diversity Courses **6 credit hours**

C. Major Course Requirements **44 credit hours**

Computer Information Systems Major Course Requirements

Course #	Course Title	Hours
COSC 1312	Programming Foundations I and II	3
COSC 1323	Programming Foundations I and II	3
COSC 1325	Visual Basic Programming	3
COSC 2324	Information Systems Concepts	3
COSC 2326	Introduction to Enterprise Computing	3
COSC 3312	Database and Information Retrieval	3
COSC 3427	Computer Networks and Distributed Systems	4
COSC 3313	Introduction to Information Security	3
COSC 4313	Systems Analysis & Design	3
COSC 4324	Emerging Technology Solution for Business	3
COSC 4325	Electronic Commerce and the Internet	3
ECON 2302	Principles of Macroeconomics	3
ACCT 2301	Principles of Financial Accounting	3
ACCT 2302	Principles of Managerial Accounting	3
MGMT 3311	Principles of Management	3
BUSI 3312	Legal, Social, and Ethical Aspects of Business	3
MGMT3322	Organizational Behavior	3
BUSI 3113	Professional Development Seminar	1

D. Mathematics Requirements **20 credit hours**

Course #	Course Title	Hours
MATH 2414	Calculus II	4
MATH 1342	Statistics	3

E. Elective Requirements **3 credit hours**

SUGGESTED CLASS SEQUENCE FOR COMPUTER INFORMATION SYSTEMS
TOTAL SEMESTER HOURS REQUIRED TO GRADUATE = 123

YEAR 1

Fall				Spring			
UNIV RAMS	1201 or 1201	Freshman Seminar	2	ENGL	1302	College Rhetoric and Composition	3
ENGL	1301	Introduction to College Composition	3	MATH	2414	Calculus II	4
MATH	2413	Calculus I	4	COSC	1323	Programming Foundations II	3
COSC	1312	Programming Foundations I	3	COMM	1315	Public Speaking	3
KINE	1304	Health and Wellness	3	PSCI	1301 or 1302	US or Texas Government	3
COSC	1300	Introduction to Computers	3	KINE	1100	Personal Fitness	1
Total			18	Total			17

YEAR 2

Fall				Spring			
Science I		Biology, Chemistry, or Physics	4	Science II		Biology, Chemistry, or Physics	4
ACCT	2301	Financial Accounting	3	ACCT	2302	Managerial Accounting	3
COSC	1325	Visual Basic	3	COSC	2324	Information Systems Concepts	3
MATH	1342	Statistics	3				
Social Behavior		Introduction to Sociology; Introduction to Psychology; Social Problems	3	COSC ECON	2326 2302	Enterprise Computing Macroeconomics	3 3
Total			16	Total			16

YEAR 3

Fall				Spring			
BUSI	3312	Legal, Social, and Ethics	3	MGMT	3322	Organizational Behavior	3
MGMT	3311	Principles of Management	3	COSC	3427	Networks/Distributed System	4
BUS	3113	Professional Development	1				
COSC	3312	Database/Info Retrieval	3	Language II		**(Study Abroad Option)**	3
Language I			3	ENGL	2331	World Literature	3
Fine Arts		Music; Introduction to Arts, **(Study Abroad Option)**	3	HIST	1301 or 1302	US History I or II	3
Total			16	Total			16

YEAR 4

Fall				Spring			
COSC	4313	System Analysis and Design	3	COSC	4324	Emerging Technology	3
COSC	4325	Electronic Commerce and the Internet	3	Elective		Diversity **(Study Abroad Option)**	3
COSC	2324	Information Systems Concepts	3	PHIL	2301 or	Religion or Philosophy	3
Diversity		African American History	3	RELI	2302		
				COSC/BUSI		Elective	3
Total			12	Total			12

COURSES IN COMPUTER SCIENCE (COSC)

COSC 1300 Introduction to Computers — 3 Credit Hours

This is a required general education course for all students at Huston-Tillotson University. This course presents a general introduction to computers, computing, the Internet, and World Wide Web. Topics include computer literacy, hardware components, systems software, and applications software. The focus is on experiences using major software packages that include word processing, spreadsheet, database management, graphics, and Internet/Web applications. Materials covered in lectures and

laboratory exercises emphasize applications in business, government, and education. Students may earn three credit hours by completing the course successfully, by passing a comprehensive departmental placement test, or by documenting appropriate experiences in a portfolio which computer science faculty evaluate. Credit hours gained in this course do not count toward required credits for a major or minor in COSC. Laboratory required.

Prerequisite: None **Offered: Fall/Spring Yearly**

COSC 1312 Programming Foundations 1 3 Credit Hours

This course is the first core course for computer science majors and minors and for students intending to continue on to higher level courses in computer and information systems. It is taught in a contemporary language and emphasizes basic computer science and program construction concepts, such as problem solving, programs and programming environment, high-level languages and machine code, programming methodology, algorithm analysis, object orientation, variables and expression, control structures and repetition.

Corequisite: MATH 1316 or higher

Prerequisite: MATH 1314 or higher **Offered: Fall/Yearly**

COSC 1323 Programming Foundations II 3 Credit Hours

This is a continuation of COSC 1312. The course covers arrays, streams and files; data structure and data abstraction; exception handling; and graphics and user interface. It introduces object-oriented programming (OOP), illustrates how classes and objects are created and used, and covers the concepts and uses of polymorphism and inheritance.

Prerequisite: COSC 1312 **Offered: Spring/Yearly**

COSC 1324 Web Site Design and Maintenance 3 Credit Hours

The focus of this course is on creating the content of a Web Site and introducing students to concepts, steps and issues dealing with setting up Web servers. The course covers introductory through intermediate/advanced concepts and techniques in Hypertext Markup Language (HTML) including basic syntax and standards that allow various browsers to recognize code. It also includes design guidelines for HTML style sheets and dynamic HTML. Additionally, it covers Web site design processes ranging from background research to techniques and methods of successful design, preparation, development, and on-going maintenance. The course is hands-on and project-oriented. It provides an opportunity for students to use commercial software programs to construct and maintain a Web site.

Prerequisites: COSC 1300, COSC 1312 **Offered: Spring/Yearly**

COSC 1325 Programming in Visual Basic (VB) 3 Credit Hours

This course introduces the VB interactive development environment, user interface with graphical controls. It covers VB code, variables, functions and error handling objects and events, creating programs to manage data, working with multiple forms, printing reports, working with random and sequential access files, database access, Dynamic Data Exchange (DDE), and Object Linking and Embedding (OLE), creating multiple document applications, programming with classes, creating toolbars with controls, and preparing advanced reports. This course also includes debugging, designing object-oriented event-driven programs, and database design and implementation.

Prerequisite: MATH 1314 or Higher **Offered: Fall/Yearly**

COSC 1327 Advanced Applications 3 Credit Hours

This course focuses on design, setup, text, images, file preparation, printing, sharing/dissemination of documents, and integrating other office applications. Students in this course will use desktop publishing technology that is widely used in education and business to create electronic and print-based documents such as newsletters, forms, brochures, newspapers, and web components. Creative thinking, problem solving, communications, and decision-making are employed throughout this

projects based course. ***This course has a substantial writing component*** and fulfills the requirements for Desktop Publishing.

Prerequisite: Placement exam or COSC 1300 and instructor approval **Offered: Spring/Yearly**

COSC 1366 Introduction to Emerging Technologies 3 Credit Hours

This course is a general elective for all students at Huston-Tillotson University. This course is designed to give students an understanding of emerging technologies and how they can impact lives. Some of the emerging technologies include RFID, nanotechnology including nanoelectronics, wireless technologies, computer viruses, airborne networks, enviromatics, grid computing, mechatronics, software assurance, machine learning, and many more. Students will have an opportunity to research new emerging technologies that interest them. A requirement for this course is an innate curiosity in new discoveries and technologies.

Prerequisites: None **Offered: As Needed**

COSC 2311 Java I 3 Credit Hours

This course continues building on the concepts learned in COSC 1312 and COSC 1323. Topics include: programming methodology, algorithm analysis, object orientation, variables and expressions control structures and repetition, arrays, streams and files. Applets are also introduced.

Prerequisite: MATH 1314 or higher and COSC 1323 **Offered: Fall/Yearly**

COSC 2313 Data Structures and Programming 3 Credit Hours

This is a required course for computer science majors. It provides a strong foundation for advanced programming. The course covers various data structures and related issues including string and searching techniques. It also treats implementation and analysis of algorithms based on these and other structures, facilitating structured program design and development.

Prerequisite: COSC 1323 **Offered: Fall/Yearly**

COSC 2322 Java II 3 Credit Hours

This course is a continuation of COSC 2311. It covers data structure, data abstraction, exception handling, graphics, and user interface. It includes object-oriented programming (OOP) and graphical user interface (GUI) methods. It illustrates how classes and objects are created and used and covers the concepts and uses of polymorphism and inheritance.

Prerequisite: COSC 2311 **Offered: Spring/Yearly**

COSC 2324 Information System Concepts 3 Credit Hours

This is an introductory course designed to give students a broad understanding of issues involving the use of information technology (IT) in organizations. It includes an examination of pertinent technologies, human-machine interface, and motivations for IT uses within private and public organizations. This course covers topics such as the role of information systems, hardware, software, telecommunications, end-user computing, work-group collaboration, multimedia, hypertext, and decision support systems. The course also covers planning, implementation, and management issues. This course is designed for CSC majors, minors, or other students interested in information systems management.

Prerequisite: None **Offered: Spring/Yearly**

COSC 2326 Introduction to Enterprise Computing 3 Credit Hours

This course provides students of information systems technology with the background, knowledge, and skills necessary to begin using the basic facilities of a mainframe computer. Topics covered include: the mainframe in business today, mainframe job roles; mainframe interfaces; Job Control Language; mainframe hardware and architecture; middleware for the mainframe; application

programming on the mainframe; networking; and security topics. Students will have the opportunity of logging on to the mainframe using an of IBM hubs.
Prerequisite: None **Offered: As Needed**

COSC 2365 Introductions to Multimedia 3 Credit Hours
This is an introductory course that covers multimedia applications and development. It covers concepts and evolution of multimedia systems; hardware and software requirements including operating systems and device drivers; digital audio MIDI and creating a MIDI arrangement; CD formats and mastering CDs; working with data, music, and photo CDs; images, formats, scanning and editing; animation, frames, modeling, morphing; digital video, WWW, HTML, JAVA, and DHTML applications. Laboratory exercises and projects are designed to give students hand-on practice in understanding, developing, and using multimedia applications.
Prerequisite: COSC 1300 **Offered: Fall/Yearly**

COSC 2367 Introduction to SQL 3 Credit hours
This course covers the concepts of relational databases and the powerful SQL programming language. Students are taught to create and maintain database objects and to store, retrieve, and manipulate data. Students learn to retrieve data by using advanced techniques such as ROLLUP, CUBE, set operators, and hierarchical retrieval. They also learn to write SQL and SQL*Plus script files using the iSQL*Plus tool to generate report-like output. Demonstrations and hands-on practice reinforce the fundamental concepts. Oracle 9i is software used for the course.
Prerequisite: COSC 1323 **Offered: Spring/As Required**

COSC 3312 Database and Information Retrieval 3 Credit Hours
This course gives an overview of database systems. It covers conceptual modeling with emphasis on the relational model. ACCESS and ORACLE will serve as the principal relational DBMS programs. Selected micro DBMS software programs are evaluated using magazine reviews (InfoWorld, PC Magazine, Byte, Software Digest). An important segment of the course is a DBMS team project.
Prerequisite: COSC 1323 **Offered: Fall/ Yearly**

COSC 3313 Introduction to Information Security 3 Credit Hours
This course will equip students with knowledge of the underlying principles of information security and provide them with the skills needed to analyze and evaluate information security problems, especially in the areas of the Internet, World Wide Web and Electronic Commerce. Included is a concise overview of threats, countermeasures, security services and cryptographic base techniques. Find out about specific threats in wireless and mobile communication networks and get an overview of key security concepts in current wireless and mobile communication standards.
Prerequisite: Upper division standing in Computer Science; COSC 2324 **Fall/Yearly**

COSC 3315 Operating Systems and Theoretical Foundations 3 Credit Hours
This is the first course in a two-course sequence dealing with computer operating systems. It introduces such basic concepts as performance, multiprogramming, synchronization, protection, time sharing, asynchronous processes, and real-time systems. It examines components of operating systems, especially file systems, scheduling (CPU, disk and drum), I/O Programming, memory management, virtual memory, device management, distributed systems, and file management. Throughout the course, comparisons and contrasts will be made between Unix and Windows in terms of how several of these concepts and features are implemented.
Prerequisite: COSC 1323 **Offered: Fall/Yearly**

COSC 3321 Computer Organization **3 Credit Hours**

This course covers Microcomputer applications using IBM and applied microcomputers. Topics include character codes (BCD, EBCDIC, ASCII), Boolean algebra, assembly programming, software development, implementation and debugging, computer hardware including architecture memory, control, ALU and I/O interfacing. Loaders, assemblers, and compiler design consideration are also covered.

Prerequisite: 6 Credit Hours of Programming Languages **Offered: Spring/Yearly**

COSC 3325 Computer Forensics **3 Credit Hours**

This course covers an overview of the investigators' computer lab, computer forensic tools, processing crime and incident scenes, controlling digital evidence, data acquisition from a crime scene, e-mail investigations, and network forensics. This course involves hands-on projects.

Prerequisite: COSC 3315 **Offered: As Needed**

COSC 3326 Operating Systems: Windows and UNIX Applications **3 Credit Hours**

This is the second course in the two-course sequence dealing with OS. The focus will be on knowledge and skills needed to use Unix and Windows Operating Systems. It presents an overview of Windows and UNIX system architecture and important concepts involved in systems programming for Windows and UNIX. It also describes additional file systems of Windows and UNIX. Laboratory assignments will be based on C/C++ and UNIX scripts.

Prerequisite: COSC 3315 **Offered: Spring/Yearly**

COSC 3364 Artificial Intelligence and Robotics **3 Credit Hours**

This course covers the historical overview and applications of artificial intelligence, problems, state spaces and search strategies. Emphasis is placed on knowledge representation, pattern recognition, expert systems, symbolic computation, and machine learning. Programming projects are used to reinforced concepts

Prerequisites: COSC 2313 and COSC 3321 **Offered: As Needed**

COSC 3365 Database Administration Fundamentals I **3 Credit Hours**

This course is designed to give the database administrator (DBA) a firm foundation in basic administrative tasks. The primary goal of this course is to give the DBA the necessary knowledge and skills to set up, maintain, and troubleshoot a database. This course is the first step toward success as a DBA professional. Oracle is the software used for the course.

Prerequisite: COSC 2367 **Offered: As Needed**

COSC 3366 Software Testing **3 Credit Hours**

This course covers various types of testing and test management and gives the students an opportunity to practice each type of testing. Various topics include black box testing, white box testing, system testing, web testing, context driven testing, verification and validation, inspections, exploratory testing, performance testing, acceptance testing, automated testing, plus the latest advances in software testing. Hands-on projects are key part of this course.

Prerequisite: Upper division standing in COSC, COSC 3312; COSC 2313 **Offered: As Needed**

COSC 3427 Computer Networks and Distributed Systems **4 Credit Hours**

This course covers computer network concepts, network types, design, and protocols as well as the design, implementation, and management of distributed systems. Topics include layering in communication protocols, with particular reference to the OSI reference model, interprocess communication, remote invocation, distributed naming, cryptographic security, distributed file systems, data replication, distributed transaction mechanisms, and distributed timing and coordination

mechanism. UNIX and MS Windows are used for students' hands-on exercises and laboratory experience.

Prerequisite: COSC 1323 **Offered: Fall/Yearly**

COSC 4308 Computer Science Internship 3 Credit Hours

This course helps to prepare students for the working environment. Students obtain assignments with local businesses where they may use their knowledge base and explore other learning experiences.

Prerequisite: 12 COSC Major credits and advisor approval **Offered: Fall/Spring Yearly**

COSC 4309 Computer Science Research/Project 3 Credit Hours

This course is designed to focus on (1) academic thinking and problem solving; (2) research methods: (3) report preparation; and (4) presentation. The course enables students to work independently under the supervision of computer science or computer information systems faculty. Broad areas of recommended topics reflect the understanding that computer science is concerned with software technology and development. Selected topics include algorithms and their performance; comparison of languages; knowledge-based systems; genetic and neural algorithms; software engineering; interface technology; and communications protocols and performance. Each student enrolled in this course must prepare and submit three deliverables:

1. Project proposal including problem definition,
2. Review of pertinent literature; and
3. Final project report.

Prerequisite: Instructor approval **Offered: Fall/Spring Yearly**

COSC 4311 Software Engineering 1 3 Credit Hours

This course covers issues, techniques, and concepts involved in planning, designing, and implementing software systems. Topics include problem solving concepts, software life-cycle models, the software process, software quality, developing teams, requirements gathering, utilizing CASE tools, risk management, black box and white box testing, creating objects, reusability and portability, planning and estimating software projects. Student laboratory exercises and projects will emphasize team work, coordination of multiple programmers, documentation, user friendly interface design, and software costing.

Prerequisite: COSC 3312 **Offered: Fall/Yearly**

COSC 4313 Systems Analysis and Design 3 Credit Hours

This course covers issues, techniques, and concepts involved in planning, designing, and implementing software systems. Topics include problem solving concepts, software life-cycle models, the software process, software quality, developing teams, requirements gathering, utilizing CASE tools, risk management, black box and white box testing, creating objects, reusability and portability, planning and estimating software projects. Feasibility study, requirements definition and design, and development documentation are covered. Exercises and projects emphasize team work, coordination of multiple programmers, documentation, user friendly interface design, and software costing.

Prerequisite: Upper division standing in Computer Science, and COSC3312 **Offered: Fall/Yearly**

COSC 4322 Software Engineering 2 3 Credit Hours

This course is a continuation of Software Engineering 1 which involves planning, designing, and implementing software systems. Topics include analysis, both classical and object oriented, project management, metrics, emerging development techniques, design, implementation, modeling languages, system testing, user interface design, business process reengineering and maintenance. Software projects will be completed in this course. More emphasis is on applying software engineering discipline to actual projects.

Prerequisites: COSC 4311 **Offered: Spring/Yearly**

COSC 4324 Emerging Technology Solutions for Business 3 Credit Hours
This course is for Business majors and computer science majors. In order for this class to work, there must be a mixture of students from both disciplines. Students investigate various emerging technologies for both their business and technical potential. Teams pairing business students with computer science students will explore whether there are any business opportunities in the emerging technologies that could are exploited for a new business. Business plans and technical plans are put together as a class project. The students have an opportunity to compete in the Moot Corp competitions that are nationwide. This course may have an equivalent Business course number.
Prerequisites: MGMT 3311, or instructor approval **Offered: As Needed**

COSC 4325 Electronic Commerce and the Internet 3 Credit Hours
The course provides students an understanding of issues associated with conducting electronic commerce on the Internet through case studies, in-class discussions, lectures, and course projects. Students develop an understanding of current practices and opportunities in electronic publishing and advertising, electronic shopping and distribution, and become familiar with related software development tools of HTML, XML, and others. The course will include Internet-based procurement and supply chain management issues; ethical and legal issues; and examples of successful and unsuccessful Internet firms. The course provides students with an overview of some of the technical aspects of Web site development methods and construction. The course also explores several of the problems surrounding electronic commerce such as security.
Prerequisite: Upper division standing in Computer Science **Offered: As Needed**

COSC 4366 Computer Graphics 3 Credit Hours
This course is an introduction to computer graphics. Topics included are raster graphics algorithms, graphics hardware and software, projections in 3-D, geometrical transformations, object hierarchy, dialogue design, achromatic and colored light in the quest for visual realism.
Prerequisite: MATH 2414 **Offered: As Needed**

COSC 4367 Special Topics in Computer Science 3 Credit Hours
Special topics include: compiler design, parallelism and concurrency, computer vision, database principles, computer communications networks, internetworking and intranet working, genetic and neural computing, and simulation. Students may repeat the course as topics vary.
Prerequisites: Instructor approval **Offered: Spring/Yearly**

PRE-ENGINEERING PROGRAM

(Huston-Tillotson University and Prairie View A&M University)

Mission

The Pre-engineering Program is to provide an opportunity for students to combine educational experiences at a small liberal arts college and a large state-supported university that lead to baccalaureate degrees in mathematics and engineering.