North Carolina Agricultural & Technical State University

College of Engineering

Computer Science Department

Bachelor of Science

in

Computer Science

Undergraduate Student Handbook

(Last Curriculum Update- Fall 2009)

(Last Handbook Update –June 25, 2009)

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Introduction

This handbook provides information about the Bachelor of Science Degree in Computer Science at North Carolina A&T State University. This handbook serves as a guide to students majoring or interested in majoring in Computer Science. Please also see the North Carolina A&T State University Undergraduate Bulletin for general information concerning undergraduate students.

Vision

It is the vision of the Computer Science Department that we will produce high quality graduates who will be among the top professionals and researchers in the computing field, and who will be outstanding contributors in enhancing the quality of life for future generations.

Objectives

The objectives of the Department of Computer Science are to:

1. Provide high quality education in computer science through exemplary teaching, scholarly research, and public service, focused on preparing our student to be distinctive leaders and significant contributors to society.
2. Provide a broad base in the design, implementation, and application of computer software systems and a functional background in computer hardware systems. This primary objective strives to impart lasting theoretical concepts and fundamental skills to prepare the students for lifelong learning as well as to familiarize them with current technology.
3. Give the student the opportunity to develop a well rounded background as an overall articulate individual by requiring study in written and oral communication, natural and social sciences, humanities and the arts, business and economics, as well as promoting their participation in social and professional activities.
4. Prepare students for advanced scholarly endeavors in computer science.
5. Develop professional skills and work ethics (ethics in the workplace and the ethics of working hard).

The educational objectives of the Computer Science Undergraduate Program are:

Each graduate of the program should be able to:

1. Perform effectively in a computer science related position in industry.
2. Perform effectively in graduate programs where an undergraduate degree in computer science is required.
3. Communicate ideas and interact effectively with others to accomplish desire goals.
4. Uphold ethical behavior as it relates to the computing industry and the society at large.

The Computer Science Program enables students to achieve the following outcomes by the time of graduation:

a. An ability to apply knowledge of computing and mathematics appropriate to the discipline.
b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
c. An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs.
d. An ability to function effectively on teams to accomplish a common goal.
e. An understanding of professional, ethical, and social responsibilities.

f. An ability to communicate effectively.
g. An ability to analyze the impact of computing on individuals, organizations, and society, including ethical, legal, security, and global policy issues.
h. Recognition of the need for and an ability to engage in continuing professional development.
i. An ability to use current techniques, skills, and tools necessary for computing practice.
j. An ability to apply mathematical foundations, algorithmic principles and computer theory in modeling and design of computer-based systems.
k. An ability to design and development principles in construction go software systems of varying complexity.
l. An understanding the basics of computer hardware and how software interacts with computer hardware.

Accreditation

The Computer Science Department is accredited by the Computing Accreditation Commission (CAC) of the Accreditation Broad for Engineering and Technology (ABET).

Admission Policies

Actual admission into the Computer Science Undergraduate Program is coordinated through the NC A&T State University Admissions Office. Students must first apply to the University and support his/her application for admission with the following evidence of qualification in order to be considered for admission into the Computer Science Undergraduate Program:

1. English – 4 units emphasizing grammar, composition and literature
2. Science – 3 units (including at least one unit in a biological or life science, one unit in a physical science, and one unit in Chemistry. At least one unit should have a laboratory component.)
3. Mathematics - 4 units (including Algebra I, Algebra II, Geometry, and an additional unit beyond Algebra II - e.g., Trigonometry, Math Analysis, etc.).
4. Social Sciences - 2 units (including at least one unit in United States History)
5. Foreign Language 2 units are recommended in one foreign language.
6. Electives - 3 units (no more than 2 units in vocational subjects and 2 units in the disciplines of Music and Physical Education)

An applicant's high school record, class rank, and Scholastic Aptitude Test (SAT) or Admission College Test (ACT) scores are used in the admission decision process.

Policy for Changing Major to Computer Science

If you are currently undecided or in another major at North Carolina A&T State University, and you wish to change your major to Computer Science, you must meet the following criteria.

1. Complete GEEN163 with a grade of C or better.
2. Complete MATH131 or MATH123 or COMP180 with a grade of C or better.
3. Must have a cumulative grade point average of 2.5 or better.

Policy on Undergraduate Students Receiving Credit by Examination

The following is the procedure by which a student may receive credit by exam for undergraduate computer science courses.

1. A student wishing to receive credit by exam for any undergraduate course in computer science must be recommended by a faculty member who is very familiar with the course material.
2. To receive credit by exam for a course, the student must be registered for the course.
3. The student must take a comprehensive exam for the course and get 80% of the exam correct.
4. If a student passes the exam, the student will receive a grade of "P" for the course.
5. The student must take the exam no later than the first week of class.
6. A faculty member, who normally teaches the course, will provide and administer the exam.

Computer Science Department Policy on Cheating:

Cheating covers any case in which a student has received unauthorized aid in his/her performance that contributes to a course grade or submits material contributing to a course grade with the intent to deceive the instructor or grader. If the unauthorized aid includes help from another student, then that student is considered to have cheated as well.

If a student cheats on a homework assignment, then he/she will receive a grade of zero (a grade of F) for that assignment as will anyone assisting him/her in an unauthorized way. If a student cheats on an exam or final, he/she will receive a failing grade for the class. All cases of cheating will be reported to the Director of Undergraduate Studies. When a student cheats for the second or more time in any Computer Science class, he/she will receive an F in the class in which the most recent case occurred and will be referred to the University authorities for disciplinary action.

Undergraduate Colloquium Enrollment Policy

A student must enroll in a colloquium class every semester, except possibly one, that he/she is enrolled as a full-time computer science major.

Minimum Grade of "C" Policy

Computer Science students must earn a grade of "C" or better in the following courses to graduate or to satisfy prerequisite requirements of subsequent courses.

GEEN163, GEEN165, COMP101, COMP180, COMP280, COMP285, COMP360, COMP365, COMP370, COMP375, COMP385, COMP390, COMP450, COMP467, COMP476, COMP510, COMP596, MATH123, MATH131, MATH223

This policy will apply to all students entering the Computer Science Program in Fall 2002 and thereafter.

Curriculum Guide for a Bachelors of Science in Computer Science

Freshmen Year

Semester 1 (Fall) Courses		**Semester 2 (Spring) Courses**	
UNST 100 University Experience	1	UNST 140 The African American Experience	3
UNST 110 Critical Writing	3	UNST 130 Analytical Reasoning	3
UNST 120 The Contemporary World	3	Approved Business Elective	3
MATH 131 Calculus I	4	MATH 132 Calculus II	4
GEEN 110 Colloquium I	0	GEEN 120 Colloquium II	0
COMP 101 Intro to Computer Science	3	GEEN 163 Intro. to Computer Programming	3
Total	14	Total	16

Sophomore Year

Semester 3 (Fall) Courses		Semester 4 (Spring) Courses	
Cluster Theme Elective[3]	3	Cluster Theme Elective	3
Cluster Theme Elective	3	Cluster Theme Elective	3
COMP 180 Discrete Structures	3	Approved Science Elective	4
MATH 431 Differential Equations	3	Approved Statistics Elective [1]	3
GEEN 165 Computer Programming Design	4	COMP 280 Data Structures	3
COMP 200 Colloquium III	0	COMP 201 Colloquium IV	0
Total	16	Total	16

Junior Year

Semester 5 (Fall) Courses		Semester 6 (Spring) Courses	
COMP 285 Analysis of Algorithms	3	COMP 360 Programming Languages	3
COMP 467 Data Base Design	3	COMP 375 Computer Arch & Org	3
COMP 370 Intro. to Comp. Arch.	3	COMP 365 Programming Meth. & Concepts	3
Approved Mathematics Elective[2]	3	COMP 450 Operating Systems	3
Approved Science Elective	4	Approved Science Elective	4
COMP 300 Colloquium V	0	COMP 301 Colloquium VI	0
Total	16	Total	16

Senior Year

Semester 7 (Fall) Courses		Semester 8 (Spring) Courses	
COMP 385 Theory of Computing	3	COMP 596 Senior Project II (Capstone)	3
COMP 510 Software Engineering	3	Approved COMP Elective	3
Approved COMP Elective	3	Approved COMP Elective	3
COMP 476 Networked Comp. Sys.	3	ENGL 331 Technical Writing	3
COMP 390 Soc. Implications of Computing	3	Free Elective	3
COMP 400 Colloquium VII	0	COMP 401 Colloquium VIII	0
Total	15	Total	15

Program Total ------- 124

[1] MATH 224 Probability & Statistics *or* INEN 370 Engineering Statistics or ECEN 356 Stochastic Processes and Random Variables

[2] MATH 440 Numerical Methods *or* MATH 450 Linear Algebra

[3] Students are required to complete 12 credit hours within a single thematic cluster.

Curriculum Guide for a Bachelors of Science in Computer Science (For Students Needing Pre-Calculus)

Freshmen Year

Semester 1 (Fall) Courses		**Semester 2 (Spring) Courses**	
UNST 100 University Experience	1	UNST 140 The African American Experience	3
UNST 110 Critical Writing	3	UNST 130 Analytical Reasoning	3
UNST 120 The Contemporary World	3	Approved Business Elective	3
MATH 110 Pre-Calculus	4	MATH 131 Calculus I	4
GEEN 110 Colloquium I	0	GEEN 120 Colloquium II	0
COMP 101 Intro to Computer Science	3	GEEN 163 Intro. to Computer Programming	3
Total	14	Total	**16**

Sophomore Year

Semester 3 (Fall) Courses		**Semester 4 (Spring) Courses**	
Cluster Theme Elective[3]	3	Cluster Theme Elective	3
Cluster Theme Elective	3	Cluster Theme Elective	3
COMP 180 Discrete Structures	3	Approved Science Elective	4
MATH 132 Calculus II	4	MATH 431 Differential Equations	3
GEEN 165 Computer Programming Design	4	COMP 280 Data Structures	3
COMP 200 Colloquium III	0	COMP 201 Colloquium IV	0
Total	**17**	**Total**	**16**

Junior Year

Semester 5 (Fall) Courses		**Semester 6 (Spring) Courses**	
COMP 285 Analysis of Algorithms	3	COMP 360 Programming Languages	3
COMP 467 Data Base Design	3	COMP 375 Computer Arch & Org	3
COMP 370 Intro. to Comp. Arch.	3	COMP 365 Programming Meth. & Concepts	3
Approved Statistics Elective [3]	3	COMP 450 Operating Systems	3
Approved Science Elective	4	Approved Science Elective	4
COMP 300 Colloquium V	0	COMP 301 Colloquium VI	0
Total	**16**	**Total**	**16**

Senior Year

Semester 7 (Fall) Courses		**Semester 8 (Spring) Courses**	
COMP 385 Theory of Computing	3	COMP 596 Senior Project II (Capstone)	3
COMP 510 Software Engineering	3	Approved COMP Elective	3
Approved Mathematics Elective[4]	3	Approved COMP Elective	3
COMP 476 Networked Comp. Sys.	3	ENGL 331 Technical Writing	3
COMP 390 Soc. Implications of Computing	3	Approved COMP Elective	3
COMP 400 Colloquium VII	0	COMP 401 Colloquium VIII	0
Total	**15**	**Total**	**15**

Program Total ------- 125 Proposed

[3]MATH 224 Probability & Statistics *or* INEN 370 Engineering Statistics or ECEN 356 Stochastic Processes and Random Variables

[4] MATH 440 Numerical Methods *or* MATH 450 Linear Algebra

[3] Students are required to complete 12 credit hours within a single thematic cluster.

Curriculum Guide for a Bachelors of Science in Computer Science with Concentration in Information Assurance

Freshmen Year

Semester 1 (Fall) Courses		**Semester 2 (Spring) Courses**	
UNST 100 University Experience	1	UNST 140 The African American Experience	3
UNST 110 Critical Writing	3	UNST 130 Analytical Reasoning	3
UNST 120 The Contemporary World	3	Approved Business Elective	3
MATH 131 Calculus I	4	MATH 132 Calculus II	4
GEEN 110 Colloquium I	0	GEEN 120 Colloquium II	0
COMP 101 Intro to Computer Science	3	GEEN 163 Intro. to Computer Programming	3
Total	**14**	**Total**	**16**

Sophomore Year

Semester 3 (Fall) Courses		**Semester 4 (Spring) Courses**	
Cluster Theme Elective	3	Cluster Theme Elective	3
Cluster Theme Elective	3	Cluster Theme Elective	3
COMP 180 Discrete Structures	3	Approved Science Elective	4
MATH 431 Differential Equations	3	Approved Statistics Elective [5]	3
GEEN 165 Computer Programming Design	4	COMP 280 Data Structures	3
COMP 200 Colloquium III	0	COMP 201 Colloquium IV	0
Total	**16**	**Total**	**16**

Junior Year

Semester 5 (Fall) Courses		**Semester 6 (Spring) Courses**	
COMP 285 Analysis of Algorithms	3	COMP 360 Programming Languages	3
COMP 467 Data Base Design	3	COMP 375 Computer Arch & Org	3
COMP 370 Intro. to Computer Arch.	3	COMP 365 Programming Meth. & Concepts	3
COMP 320 Fundamentals of Information Assurance	3	COMP 450 Operating Systems	3
Approved Science Elective	4	Approved Science Elective	4
COMP 300 Colloquium V	0	COMP 301 Colloquium VI	0
Total	**16**	**Total**	**16**

Senior Year

Semester 7 (Fall) Courses		**Semester 8 (Spring) Courses**	
COMP 385 Theory of Computing	3	COMP 596 Senior Project II (CAPSTONE)	3
COMP 510 Software Engineering	3	Approved Mathematics Elective[6]	3
Approved Information Assurance Elective[3]	3	Approved COMP Elective	3
COMP 476 Networked Comp. Systems	3	ENGL 331 Technical Writing	3
COMP 390 Soc. Implications of Computing	3	Free Elective	3
COMP 400 Colloquium VII	0	COMP 401 Colloquium VIII	0
Total	**15**	**Total**	**15**

Program Total ------- 124

[5] MATH 224 Probability & Statistics *or* INEN 370 Engineering Statistics or ECEN 356 Stochastic Processes and Random Variables

[6] MATH 440 Numerical Methods *or* MATH 450 Linear Algebra

[3] **COMP 321 Computer Systems Security *or* COMP 420 Applied Network Security *or* COMP 421 Security Management for Information Assurance**

Required Computer Science & Computer Programming Courses

GEEN 163	Introduction to Computer Programming	3
GEEN 165	Computer Programming Design	4
COMP 280	Data Structures	3
COMP 285	Design and Analysis of Algorithms	3
COMP 360	Principles of Programming Languages	3
COMP 365	Programming Methodologies & Concepts	3
COMP 370	Introduction to Computer Architecture	3
COMP 375	Computer Architecture and Organization	3
COMP 385	Theory of Computing	3
COMP 390	Social Implications of Computing	3
COMP 450	Operating Systems	3
COMP 467	Data Base Design	3
COMP 476	Networked Computer Systems	3
COMP 510	Software Engineering	3
COMP 596	Senior Project II	3
GEEN110/120, COMP 200/201/300/301/400/401 Colloquium		0
COMP	Computer Science Elective	9
	Total	55

Computer Science Electives

COMP 170	Introduction to Web Engineering
COMP 320	Fundamentals of Information Assurance
COMP 321	Computer System Security
COMP 322	Internet Systems
COMP 340	Game Intelligence
COMP 356	Computational Hip-Hop & Object-Oriented Design
COMP 363	Object Oriented Programming
COMP 368	Object Oriented Software Design
COMP 420	Applied Network Security
COMP 421	Security Management for Information Systems
COMP 440	Game Design
COMP 445	An Introduction to Artificial Intelligence
COMP 500	Independent Study
COMP 567	Introduction to Data Mining
COMP 590	Special Topics in Computer Science
COMP 595	Senior Project I
COMP 620	Information Privacy and Security
COMP 627	Wireless Network Security
COMP 645	Artificial Intelligence
COMP 653	Computer Graphics
COMP 663	Compiler Design
COMP 681	Formal Methods
COMP 690	Special Topics in Computer Science

Computer Science Electives Offered in other Departments

BUAD 440	Management Information Systems
BUED 342	Business Programming
ELEN 427	Introduction to Microprocessors
ELEN 433	Digital Systems Laboratory
ELEN 617	Microprocessor Hardware Design
ELEN 619	Microprocessor Laboratory
ELEN 627	Switching Theory
INEN 415	Simulation of Production Systems
MATH 460	Numerical Analysis
MATH 631	Linear & Non-Linear Programming
MATH 665	Principles of Optimization
MATH 675	Graph Theory

Mathematics

COMP 180	Discrete Structures	3
MATH 131	Calculus I	4
MATH 132	Calculus II	4
MATH 431	Differential Equations	3
MATH 224	Statistics and Probability *or* INEN 270 Engineering Statistics	3
MATH 440	Numerical Methods *or* MATH 450 Linear Algebra	3
	Math total	**20**

Science

Take any one of the following groupings

CHEM 106	Chemistry I with CHEM 116 lab	4
CHEM 107	Chemistry II with CHEM 117 lab	4

And any one course from the list below

PHYS 241	Physics I with PHYS 251 lab	4
BIOL 100	Biological Science	4
BIOL 101	Concepts of Biology	4
SLSC 338	Fundamentals of Soil Science	4

Or

PHYS 241	Physics I with PHYS 251 lab	4
PHYS 242	Physics II with PHYS 252 lab	4

And any one course from the list below

BIOL 100	Biological Science	4
CHEM 106	Chemistry I with CHEM 116 lab	4
SLSC 338	Fundamentals of Soil Science	4
	Science total	**12**

General Education Requirements

UNST 100	University Experience	1
UNST 110	Critical Writing	3
UNST 120	The Contemporary World	3
UNST 130	Analytical Reasoning	3
UNST 140	The African American Experience	3
Cluster Theme Electives		12
ENGL 331	Technical Writing	3
Approved Business Electives		3
General Education total		**31**

Business & Economics Group Electives

BUAD 220	Business Environment
BUAD 341	Introduction to Management Information Systems
BUAD 422	Management Concepts
BUAD 426	Human Behavior in Business
BUAD 430	Marketing
BUAD 481	Management Science
ECON 200	Principles of Economics (Micro)
ECON 201	Principles of Economics (Macro)

Cluster Theme-Based Courses

Students are required to complete 12 credit hours within a single thematic cluster. If a student decides to change to a different thematic cluster, he/she will have to satisfy all the course requirements for the new cluster. The Dean of University Studies will consider exceptions to this rule based on individual petitions. Theme-based courses are communication intensive (oral and written) and emphasize interdisciplinary learning motivated by societal issues and problems. Course descriptions of approved thematic courses offered by departments outside of University Studies can be found in the requisite sections of the Bulletin.

Science, Technology, and Society		
AGEN 216	ITT 385	UNST 210
PHIL 266	POLI 410	UNST 213
*COMP 390	POLI 448	UNST 219
ENGL 206	SOCI 473	UNST 221
ENGL 231	SOWK 415	UNST 203
**ENGL 331	UNST 201	UNST 206
ENGL 336	GEOM 210	UNST 207
HIST 307		

Computer Science majors CANNOT take a science or mathematics course as a Theme Cluster Course.

***If COMP390 is taken as a Theme Cluster Course, Computer Science majors must take an additional free elective course.**

****If ENGL331 is taken as a Theme Cluster Course, Computer Science majors must take another course that is that is a social science, humanities or business.**

Courses in this cluster will help students understand the complex relationships between scientific discovery, technological advances, and societal change. In addition, students will debate the ethical implications of contemporary scientific research, examine how technology is portrayed in literature and the arts, and evaluate the frequently made claim that better science and technology lead to better lives.

UNST 201. Inventing America: Science, Technology, and Progress

This course explores the complex relations among scientific discovery, technological advancement, and societal change through analysis of key episodes in American history from the pre-industrial era to the Information Age. In addition, students will debate the ethical issues triggered by scientific and technological innovation, examine how technology is portrayed in literature and the arts, and evaluate the frequently made claim that more advanced science and technology lead to better lives.

UNST 203. Technology, the Real, the Fake and the Authentic

This course encourages analysis and comparison of cultural systems through case studies of real, fake, virtual, and authentic works and personal experiences studied from the standpoint of the technologies and cultural communities that produced and consumed them. These case studies include works of art, technological artifacts, and other experiences.

UNST 206. Scientific Revolutions and Social Change

This course highlights the complex connections between science, technology, scientific breakthroughs, and social, political and economic change. The experiences of and the lessons from the Industrial Revolution of the 18th Century will be used to understand the social, political, and ethical implications and challenges of the current revolution in nanotechnology. Students are led to discover the deeper relationships between seemingly unrelated

events in history, and explore competing interpretations given by different disciplines.

UNST 207. Ethics and Technology

This course examines ethical issues arising from scientific and technological advancements. The central normative question students will consider is: Simply because we can do something does this mean we should? After exploring various standards of morality, students analyze issues such as reproductive technologies, cloning, genetic engineering, stem-cell research, life-span extension, genetically-modified foods, and ethical concerns within nanotechnology.

UNST 210. Ethics in Information Technology

This course will explore moral, ethical, and legal problems associated with information technologies including issues such as security and privacy. Students will critique ethical dilemmas, debate moral issues, and develop ideas for reducing ethical problems and coping with their effects.

UNST 213. Evolution and Social Implication of Technology. Theme: Technology and Progress

This course examines diverse technology systems such as biotechnology, communication, construction, manufacturing, medical, and transportation. Discussion focuses on the interaction of technology with human health, the environment, the global economy, and politics, as well as technological forecasting and assessment.

UNST 219. Technology and Public Wellness

This course describes, reviews, and challenges issues arising from the development of technology and the implications for public health policy. Students explore the relationship between the development and implementation of technology and cultural factors such as religion, politics, history, and economics. The course also examines how technology influences health and wellness in local and global contexts. In addition, students critically evaluate how technology policies of the industrialized superpowers influence the well-being of people in non-industrialized nations.

UNST 221. Thematic Writing and Speaking: Technology and Society

This course is designed to improve students' abilities to write, speak. and think critically about important issues in the contemporary world by focusing on the rhetoric of science, technology and progress. Students examine rhetoric as represented in fiction and nonfiction: essays, short stories, drama, poetry, novels, film, popular culture (including popular science writing and journalism), and speeches.

Energy, Environment and Society		
AGEC 300	POLI 410	UNST 221
AGEN 216	POLI 415	UNST 229
BUAD 361	POLI 448	UNST 205
GEOG 200	SOCI 200	UNST 211
GEOG 322	SOCI 300	UNST 212
HIST 435	PHIL 308	POLI 250

Computer Science majors CANNOT take a science or mathematics course as a Theme Cluster Course.

Courses in this cluster will examine the role of energy in both local and world economies—how energy issues often intersect and collide with political power, social relationships, and economic development. In addition, this cluster will explore how decisions surrounding energy and environmental issues affect social justice within communities, across the country, and around the world.

UNST 205. The Impact of Energy and the Environment on Development in Non-Industrialized Countries

This course examines issues and challenges that result from the formation of energy and environmental practices and policies of non-industrialized countries. Students use historical perspective to explore why non-industrialized nations are energy dependent.

UNST 211. Case Studies in Environmental Issues

This course utilizes case studies to gain an understanding of the roles environmental law, journalism/communications, economics, and science/engineering play in environmental issues.

UNST 212. Contemporary Issues in Energy Uses and Sources

This course is designed to provide integrative experiences to students using contemporary energy issues as an underlying theme. It will cover the economic importance of the energy sector, the production and use of different types of energy, and their impact on the environment and health.

UNST 221. Thematic Writing and Speaking: Technology and Society

This course is designed to improve students' abilities to write, speak, and think critically about important issues in the contemporary world by focusing on the rhetoric of science, technology and progress. Students examine rhetoric as represented in fiction and nonfiction: essays, short stories, drama, poetry, novels, film, popular culture (including popular science writing and journalism), and speeches.

UNST 229. Contemporary Issues in Nuclear Energy

This course is designed to present a current understanding of nuclear energy. Different reactor designs, economics of nuclear energy, and management of nuclear energy will be reviewed. Nuclear power will be compared to other alternative energy sources. Emphasis will be placed upon regulations, environmental issues, health issues, and security and safety concerns. Nuclear power and options for the future will be examined.

Community, Conflict and Society		
PHIL 260	HIST 417	UNST 216
BUAD 361	HIST 418	UNST 220
CRJS/SOCI 406	HIST 461	UNST 221
ENGL 336	POLI 446	UNST 222
HIST 203	POLI 448	UNST 224
HIST 209	SOCI 406	UNST 230
HIST 312	SOWK 413	UNST 231
HIST 332	UNST 204	
HIST 336	UNST 208	

Computer Science majors CANNOT take a science or mathematics course as a Theme Cluster Course.

Courses in this cluster help students better understand the factors that lead to conflict, and its resolution, at the local, national, and international level. Special attention will be paid to how people of different backgrounds reach peaceful solutions to difficult problems. Students will also be given opportunities to learn mediation and conflict resolution skills as part of their experience in this cluster.

UNST 204. 21st Century Organizations: Attitudes, Attention Drivers, and Angst

This course introduces students to the factors that affect organizations in the 21st century by exploring the principles, practices, and pitfalls that affect organizational success or failure in a global society. The empowerment of individuals to create organizational cultures will be demonstrated through case studies of successful organizations (e.g., Fortune 100 companies). Students will learn about leadership, communication, and group dynamics through the investigation of targeted units.

UNST 208. Foundations of Negotiation and Conflict Resolution

This course explores negotiation, arbitration, and mediation techniques. It encourages students to manage conflict and negotiate peaceful solutions to business, economic development, social, and political problems in our local communities and global societies.

UNST 216. Genocide in the Modern World

This course examines the concept of genocide, the deliberate murder of a specific group of people, through careful analysis and discussion of theoretical approaches, specific case studies, and relevant cultural artifacts, including literature and film.

UNST 220. Social Consequences of Scientific and Technological Progress in the African American Experience

This course presents an analytical approach to the issues of social justice and environmental racism with a focus on African-American communities. Students explore historical and contemporary social and economic impacts of science and technology, how and why they differentially affect African-American communities, and how these consequences can be mitigated.

UNST 221. Thematic Writing and Speaking: Technology and Society

This course is designed to improve students' abilities to write, speak, and think critically about important issues in the contemporary world by focusing on the rhetoric of science, technology and progress. Students examine rhetoric as represented in fiction and nonfiction: essays, short stories, drama, poetry, novels, film, popular culture (including popular science writing and journalism), and speeches.

UNST 222. Introduction to Crime Studies and Research

This course will introduce students to research methodologies used in the field of crime studies. Students examine the impact of crime studies research on public policy. The topics include math and quantitative research, competing theories of crime in society, and the relationship between legal and scientific reasoning.

UNST 224. Thematic Writing Fieldwork

This course explores the interdisciplinary applications of fieldwork and emphasizes the ethnographer's skill set, cultural awareness and sensitivity, precise observation, careful interviewing and note taking, and the crafting of convincing prose. Fieldwork is centered around the principles of ethnographic research.

UNST 230. Religion and Society

This course examines interactions between religion and societies as factors influencing the formation of community, the breakdown of community, and reconciliation within and among communities. Contemporary, historical, and nonwestern examples will be explored. Interrelations between religion and societies will be explored from different disciplinary perspectives, including those of psychology, history, sociology, philosophy, evolutionary, biology, neurobiology, and neuropsychology.

UNST 231. Introduction to Christianity

This course introduces students to basic concepts and approaches to the academic study of religion including the origin and history of Christianity as evolving institutions, beliefs, practices, and the ongoing quest by Christians to define themselves in a changing, increasingly global world. The course will introduce students to the global diversity of Christian experience from its Middle Eastern and Greco-Roman origins, African, Eastern and Western forms of Orthodoxy, and contemporary international Pentecostal forms of Christianity in the global southern hemisphere.

Health, Lifestyles and Society		
CRJS/SOCI 406	SOCI 304	UNST 215
HEFS 135	SOCI 308	UNST 217
HPED 219	SOWK 370	UNST 218
HPED 221	SOWK 409	UNST 221
NURS 305	SOWK 415	UNST 225
NURS 315	UNST 202	UNST 226
NURS 415	UNST 209	UNST 227
PHIL 266	UNST 214	UNST 228
PSYC 320		

Computer Science majors CANNOT take a science or mathematics course as a Theme Cluster Course.

Course in this cluster introduce students to the behavioral foundations of healthy lifestyles. Courses will also explore the impact of advances in biotechnology, medical research, medical ethics, and the operation of the heathcare system on the human condition. Special attention is paid to health and lifestyle issues affecting women, the elderly, and the African American community.

UNST 202. Ecological Approach to an Active Healthy Lifestyle

This course examines the integration of cultural, psychological, sociological, and ethical issues affecting and affected by the health and wellness of individuals and the society in which they live. Students explore the contextual and theoretical basis of holistic approaches including the complex nature of humans with regard to health and well-being from ecological perspectives. Students gain experience with specific methods to foster greater appreciation for personal responsibility for health and strategies to enhance and preserve the individual's and the public's health. Societal health issues and the factors that impact on the health and wellness of communities and the individual's role in health policy are also examined.

UNST 209. Disparities in Public Health Care: The Effects on Race, Gender, and Class

This course is designed to explore the disparities that exist among the categories of race, gender, and class in relationship to healthcare. The course focuses on six areas of major health inequities including infant mortality, cancer, cardiovascular disease, diabetes, HIV/AIDS, and immunizations.

UNST 214. Maps, Mapping, and Environmental Health

This course encourages students to conceptualize and assess environmental and health issues from a spatial or geographical perspective. Topics such as air pollution, water pollution, population dynamics, occupational health, food protection, epidemiology, disease causation and prevention, vector-borne disease, and consumer protection are covered. Geographic Information Systems technology is used to model environmental health topics.

UNST 215. Comparative Socio-Cultural Environments of Health Care Systems

This course examines the differential effects of social, political, economic and cultural factors on the development and utilization of health care systems across diverse societies. Students further explore the interrelationships among specific aspects of the socio-cultural environment and the availability and use of health care.

UNST 217. Health and Wellness in the 21st Century

This course explores the impact of globalization on health and wellness from the perspectives of culture, religion, politics, history, economics, and technology.

UNST 218. Fitness for Life

This course is a combination of classroom and activity-based learning activities with a focus on proper nutrition and the mastery of the knowledge and skills necessary for students to become accomplished monitors of their personal fitness.

UNST 221. Thematic Writing and Speaking: Technology and Society

This course is designed to improve students' abilities to write, speak, and think critically about important issues in the contemporary world by focusing on the rhetoric of science, technology, and progress. Students examine rhetoric as represented in fiction and nonfiction: essays, short stories, drama, poetry, novels, film, popular culture (including popular science writing and journalism), and speeches.

UNST 225. Epidemiology

This course will introduce students to the basic principles, theories and concepts of epidemiology and their application specifically pertaining to the distribution and determinants of disease. The course will focus upon the biological, environmental, social, and analytical approaches to understanding the determinants of human health, and the application of that knowledge to improving the health of populations.

UNST 226. A Personal Approach to Health

This course will address the relationship between lifestyle health-related issues, including sexual responsibility, psychological health, nutrition, and exercise. Additionally, issues such as weight control, stress management, tobacco, and alcohol use will be addressed.

UNST 227. Global Health and Socio-Economic Development

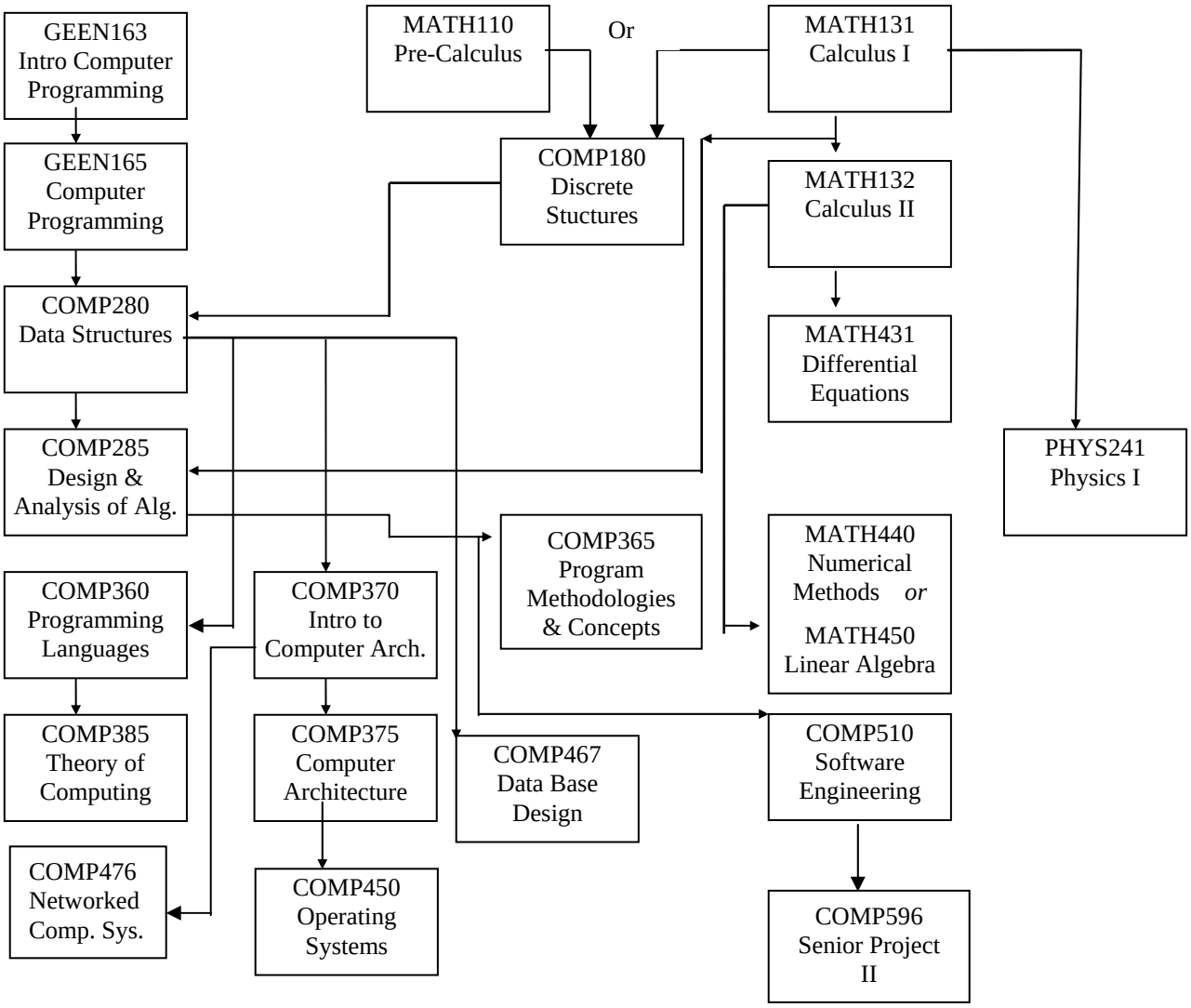
This course will introduce students to the main concepts of global health and the critical links between public health and social and economic development. The course reviews the determinants of health status in terms of biology, demography, epidemiology, culture, sociology, economics, and politics. Global Health introduces students to key concerns regarding reproductive health, child survival, nutrition, communicable diseases, and chronic diseases.

UNST 228. Contemporary Issues in Public Health

This course explores current public health, environmental health, and health service delivery issues in the U.S. Topics include organization and costs of health systems, access to care, and the interrelationships between risk factors and health.

**Use of these courses as theme-cluster electives in subsequent semesters is not guaranteed.*

Prerequisites for Computer Science Required Courses



Prerequisites for Computer Science Elective Courses

Course		Prerequisite
COMP 170	Introduction to Web Engineering	none
COMP 320	Fundamentals of Information Assurance	COMP280
COMP 321	Computer System Security	COMP285
COMP 322	Internet Systems	COMP285
COMP 340	Game Intelligence	COMP280
COMP 356	Computational Hip-Hop and OOD	GEEN163 or Instructors Permission
COMP 363	Object Oriented Programming	COMP280
COMP 368	Object-Oriented Software Development	COMP280
COMP 420	Applied Network Security	COMP285
COMP 421	Security Management for Information Systems	COMP285
COMP 440	Game Design	COMP340
COMP 445	An Introduction to Artificial Intelligence	COMP285
COMP 567	Introduction to Data Mining	COMP280 or Instructor's Permission
COMP 595	Senior Project I	COMP285 & COMP510 (Corequisite)
COMP 645	Artificial Intelligence	COMP445
COMP 653	Computer Graphics	COMP285 & MATH450
COMP 663	Compiler Design	COMP375 & COMP385

Course Descriptions

GEEN 110. Computer Science Colloquium 1 **Credit 0**
This course provides the students with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty.
Prerequisite: Freshman standing. **(F)**

GEEN 120. Computer Science Colloquium 2 **Credit 0**
This course provides the student with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty.
Prerequisite: Freshman standing. **(S)**

GEEN 160. Computer Program in C++ for Engineers **Credits 2(2-2)**
This is an introductory course in C++ computer programming for engineering students. Problem solving techniques and coding algorithms will be stressed. Students will write programs for such tasks as engineering decision-making and numerical computation. Material relevant to the Fundamentals of Engineering exam will be covered. **(F;S;SS)**

GEEN 163. Introduction to Computer Programming **Credits 3(3-2)**
This is an introductory course in computer programming. Problem solving techniques and writing algorithms will be stressed. Students will write programs for such tasks as engineering decision-making and numerical computation. Prerequisite: None **(F;S;SS)**

GEEN165. Computer Program Design **Credits 4(3-2)**
This is a second course in computer programming for students with an interest in computers. Students will learn to write programs in a high level programming language. Prerequisite GEEN163 **(F;S;SS)**

COMP 101. Introduction to Computer Science **Credits 3(3-0)**
This course introduces students to a wide variety of areas related to Computer Science. Students will be introduced to the role of Computer Science in areas such as (but not limited to): Game Playing, Computational Art & Music, Robotics, Cyber Security, Artificial Intelligence, and Human Centered Computing. Students will be introduced to object oriented design techniques. Prerequisite: None **(F;S;SS)**

COMP 120. Computers and Their Use **Credits 3(2-2)**
This Course provides a survey of the basic principles of computer hardware, computer communications, application software, operating systems, security, impact on society, use in organizations and systems development. Principles of programming are introduced. Information is at a level for the students to become informed users. This course cannot be taken for credit by computer science majors. Prerequisite: None. **(F;S;SS)**

COMP 170. Introduction to Web Engineering **Credits 4(3-2)**
This course introduces basic web development using HTML and client-side and server-side scripting. Students also learn how to incorporate security features into web sites as well as how to access and manage online databases. This course also covers the role of the web in disseminating knowledge, community formation, training, collaboration, and other social activities. Prerequisite: None **(F;S;SS)**

COMP 180 Discrete Structures **Credits 3(3-0)**
Students will be introduced to formal systems, including propositional and predicate logic, that can be used to reason about computer algorithms. Students will develop an understanding of how to read and construct valid proofs of the properties of algorithms. Important discrete data structures, such as sets, relations, discrete functions, graphs and trees, will be introduced. Prerequisite: MATH110 or MATH131 **(F;S;SS)**

COMP 200. Computer Science Colloquium 3 **Credit 0**
This course provides the students with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Sophomore Standing **(F)**

COMP 201. Computer Science Colloquium 4 **Credit 0**
This course provides the students with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Sophomore standing **(S)**

COMP 280. Data Structures **Credits 3(3-0)**
This is the third course in the computer science sequence. It introduces abstractions (algorithm, data type, complexity) and programming tools (pointers, dynamic memory, and linked data lists, and graphs). It analyzes and implements techniques such as hashing, sorting, searching, and priority queues, to solve general problems. The emphasis of the course is on building modular programs that can be changed to use different data structures and algorithms. Prerequisites: GEEN 165, MATH 123 or COMP 180. **(F;S;SS)**

COMP 285. Design and Analysis of Computer Science **Credits 3(3-0)**
This course covers analysis of efficient algorithms for sorting, searching, dynamic structure manipulation, path finding, fast multiplication, and other problems. It introduces algorithmic techniques such as recursion, divide-and-conquer, and dynamic programming. It develops the following tools for algorithmic analysis: correctness proofs, algorithm synthesis, and discusses issues in non-computability. This course also overviews non-deterministic algorithms, and develops techniques to classify computationally hard problems. The concept of non-deterministic polynomial (NP)-completeness is introduced, and basic issues related to NP-completeness are discussed. Prerequisites: COMP 280, MATH 131. **(F;S;SS)**

COMP 300 Computer Colloquium 5 **Credit 0**
This course provides the students with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Junior standing **(F)**

COMP 301 Computer Colloquium 6 **Credit 0**
This course provides the students with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Junior standing **(S)**

COMP 320. Fundamentals of Information Assurance **Credits 3(3-0)**
This course covers concepts in computer network and information security. Topics include: software strategies for exchanging secure data and encryption standards. Strategies for the physical protection of information assets are explored. Issues involving information security management within an enterprise are covered, including suitable organizational policy, plans, and implementation strategies. Ethical issues, such as monitoring employee computer use and proper limitations on the use of customer data, are also discussed. Prerequisite: COMP280 **(F;S;SS)**

COMP 321. Computer System Security **Credits 3(3-0)**
This course introduces the principles of information systems security and examines security policies, models, mechanisms for secrecy, integrity, availability and access controls. Topics include common system vulnerabilities and countermeasures, data availability and usage control, authentication technologies, design secure systems, operating systems security, network security, programming language security, and distributed systems security. Prerequisite: COMP285 (F;S;SS)

COMP 322. Internet Systems **Credits 3(3-0)**
This course addresses the structure and functionality of the Internet and software that exploits it. Topics include mark up languages, Web tools, static, dynamic and active web pages, multimedia in Web applications, communication protocols, client-server, computing, scripting, group and coordinating work at different sites, multi-agent systems that exploit the Internet, and architectures to exploit the distributed computational power offered by the Internet. Prerequisite: COMP 285 **(F;S;SS)**

COMP 340. Game Intelligence **Credits 3(3-0)**
This course provides an overview of concepts used in game intelligence. Topics will include intelligent game agents, game state representation, search, and machine learning. Prerequisite: COMP280 **(F;S;SS)**

COMP 356. Computational Hip-Hop and Object-Oriented Design **Credits 3(3-0)**
This course introduces students to the fundamentals of the Unified Modeling Language (UML) from a Hip-Hop perspective. Students will learn how to use UML to reverse and forward engineer design artifacts for Hip-Hop music, and software applications. Prerequisite: GEEN163 or Instructor's Permission **(F;S;SS)**

COMP 360. Programming Languages **Credits 3(3-0)**
This course focuses on formal specification of programming languages, including definition of syntax and semantics: simple statements including precedence, infixes, prefix, and postfix notations. It highlights global properties of algorithmic languages including sequence control, data structure implementation, scooping, storage management, grouping of statements, binding time, sub-routines, and tasks.
Prerequisite: COMP 280 **(F;S;SS)**

COMP 363. Object Oriented Programming **Credits 3(3-0)**
This is a course in object oriented program development. The main topics include encapsulation, polymorphism, inheritance, debugging and performance tuning. Prerequisites: COMP 280 **(F;S)**

COMP 365. Programming Methodologies & Concepts **Credits 3(3-0)**
This course covers advanced programming techniques in order to enhance the student's knowledge and experience in programming. This course includes techniques dealing with advanced object oriented programming, human computer interaction, computer graphics and current programming trends. This course will also cover AI techniques such as search strategies and knowledge representation.
Prerequisites: COMP285 **(F;S;SS)**

COMP 368. Object-Oriented Software Development **Credits 3(3-0)**
This course studies object-oriented software development. Object-oriented modeling, software design by pattern, software design by generic component, software reuse and object-oriented application frameworks are introduced. Problems in large software systems are discussed, and students learn how to integrate object-oriented language features into object-oriented software development. Prerequisite:

COMP280 **(F;S;SS)**

COMP 370. Introduction to Computer Architecture **Credits 3(3-0)**
This course teaches techniques for design and optimization of combinatorial logic circuits, flip-flops, counter, registers and arithmetic concepts necessary to understand computer logic. Additional topics include assembly language programming, interrupt handling, and data representation. Prerequisite: COMP 280 **(F;S;SS)**

COMP 375. Computer Architecture and Organization **Credits 3(3-0)**
This course explores the design of computer systems and their architectures. Topics include central processing unit architecture, microcode, system interconnections, memory systems, input/output systems, interrupt handling, peripherals and communications networks. Prerequisites: COMP370 or ELEN327 **(F;S)**

COMP 385. Theory of Computing **Credits 3(3-0)**
This course is the study of topics, which include theory of finite state machine and automata; regular expressions; Turing machines; grammars; parsing; language hierarchy; machine design and construction; computability; insolvability; halting problem; computational complexity; and recursive functions. The course also discusses issues in equivalence of various computational models, minimization, and characterizations. Prerequisites: COMP 360. **(F;S)**

COMP 390. Social Implications of Computing **Credits 3(3-0)**
This course examines the increasingly complex interaction between computer systems, our social fabric and ethics. Software and microprocessors control automobiles, banks, brokerage trading, aircraft, medical equipment, and just about every other device used in industrialized nations. Impacts of computerized systems upon personal privacy and citizen involvement in governance are examined in relation to the public policy questions of the day. The role and opportunity for historically under-represented groups will be explored. Interdisciplinary readings are stressed, along with required written and oral presentations and class debates. **(F;S)**

COMP 397. Co-operative Industrial Experience I **Credits 3(3-0)**
This is a supervised learning experience in an approved private or government facility. The student must be employed full time for at least one semester and must prefer supervised work that will enhance his/her educational background in an area related to computer science. In addition to the supervisor's evaluation in the field, the student's performance will be evaluated by a departmental faculty committee, based upon the recommendation of the Director of the Co-operative Educational Program, reports, informal portfolios and forum and/or seminar presented by the student upon his/her return to the university. Prerequisite: Permission of Advisor **(F;S)**

COMP 400. Computer Science Colloquium 7 **Credit 0**
This course provides the students with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Senior Standing **(F)**

COMP 401. Computer Science Colloquium 8 **Credit 0**
This course provides the students with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Senior Standing **(S)**

COMP 420. Applied Network Security **Credits 3(3-0)**

This course covers network security concepts and various network security practices and solutions. Topics include cryptography, Public Key Infrastructure (PKI), taxonomy of various attack methods, firewalls, intrusion detection and prevention, Internet Protocol (IP) security, and web security. Prerequisite: COMP285 **(F;S;SS)**

COMP 421. Security Management for Information Systems Credits 3(3-0)
This course covers in-depth examination of topics in the management of information systems security including access control systems & methodology, risk management, business continuity and disaster recovery planning, legal and ethical issues in information system security, computer operations security, physical security, and information security maintenance. Prerequisite: COMP285 **(F;S;SS)**

COMP 440. Game Design Credits 3(3-0)
This course will provide an introduction to current techniques used in game design. Topics will include game engines, game mechanics, autonomous game agents, and multi-player games. Prerequisite: COMP340 **(F;S;SS)**

COMP 445. An Introduction to Artificial Intelligence Credits 3(3-0)
This course is an introduction to the theory of artificial intelligence and a survey of artificial intelligence application areas. It covers the foundational concepts related to knowledge representation and search strategies. An artificial intelligence language is presented to programming experience in implementing basic artificial intelligence concepts. Some of the applications areas that are discussed include: game playing, expert systems, theorem proving natural language understanding, machine learning, planning, and robotics. Prerequisites: COMP 285, MATH 223 **(DEMAND)**

COMP 450. Operating Systems Credits 3(3-0)
This is and introduction to the theory and practice of operating system design and implementation. Algorithmic techniques are presented for implementing process management, storage management, processor management, file systems, security, distributed systems, performance evaluation, and real time systems. Prerequisite: COMP 375 or Corequisite: COMP 375. **(F;S)**

COMP 467. Database Design Credits 3(3-0)
This course focuses on logical and physical organizations of sets of related data. It covers issues in file structures as well as file and database management systems. It explores relational models, hierarchical models, directed graph models, data definition and manipulation languages, and relational calculus. Application oriented projects are required. Prerequisite: COMP 280. **(F;S)**

COMP 476. Networked Computer Systems Credits 3(3-0)
This course presents an overview of the technology, architecture and software used by systems of network-connected computers. The course will cover data transmission, local area network architecture, network protocols, internetworking, security, and World Wide Web technology. Students will write programs that run concurrently on multiple computers.
Prerequisite: COMP 370 **(F;S)**

COMP 500. Independent Study Credits 3(3-0)
This course can be used for study of advanced topics in computer science pertinent to the student's interest under supervision of a faculty member. Prerequisite: Permission of Instructor **(F:S:SS)**

COMP 510. Software Engineering Credits 3(3-0)

This course is an introduction to the principles underlying software specification, implementation, validation, and management. It addresses applications of software engineering concepts to large software systems. Team effort is emphasized throughout the course. Prerequisite: COMP285 **(F;S)**

COMP 567. Introduction to Data Mining **Credits 3(3-0)**
This course introduces the modern computer application of data mining. The theory of data mining is presented as well as applications of its principles in industry. This course covers the basics of techniques and applications such as cluster detection, market basket analysis, decision tree derivation, genetic algorithms, artificial neural networks, memory-based reasoning, and data warehouses. Students learn a variety of algorithms for discovering meaningful patterns and rules in large quantities of data. Prerequisite: COMP280 **(F;S;SS)**

COMP 590. Special Topics in Computer Science **Credits 3(3-0)**
This course permits the exploration of advanced topics pertinent to student's program of study in a seminar setting. **(F;S)**

COMP 595. Senior Project I **Credits 3(3-0)**
This course is the first course in a two-semester sequence, which allows students the opportunity to design and implement a software project from start to finish. Projects started in this course will be completed in COMP596, giving the student the opportunity to work on a project of significant size. Students taking this course must take COMP596. Prerequisite: COMP285 Corequisite: COMP510 **(F;S;SS)**

COMP596. Senior Project II **Credits 3(3-0)**
This course allows students the opportunity to design and implement a software project from start to finish. Projects started in COMP595 must be completed in this course for students working on a year-long project. Student choosing to do a semester project must start and complete the project in this course. This course gives the student the opportunity to work on a software project of significant size.
Prerequisite: COMP510 **(F;S;SS)**

COMP 620. Information, Privacy and Security **Credits 3(3-0)**
This course examines the security and privacy issues associated with informational systems. There are cost/risk tradeoffs to be made. Discussed are topics such as technical, physical, and administrative methods of providing security, access control, identification, and authentication. Encryption is examined, including Data Encryption Standards and public key cryptosystems. Management considerations such as key protection and distribution, orange book requirements, and OSI data security standards are covered. Privacy legislation is covered, as is current cryptographic research. **(DEMAND)**

COMP627. Wireless Network Security **Credits 3(3-0)**
This course covers the security issues associated with wireless networks. Emerging wireless technologies, standards and protocols are explored. The course will define and demonstrate various threats to wireless security. Topics include security service, security protocol, and security architecture for wireless. Details of wireless encryption techniques are examined.

COMP 645. Artificial Intelligence **Credits 3(3-0)**

This course presents the theory of artificial intelligence, and application of the principles of artificial intelligence to problems that cannot be solved or cannot be solved efficiently by standard algorithmic techniques. Topics include search strategies, production systems, heuristic search, expert systems, inference rules, computational logic, natural language processing, knowledge representation, and knowledge-based systems. Predicate calculus is discussed. An artificial intelligence language is presented as a vehicle for implementing concepts of artificial intelligence. Prerequisite: COMP 445 **(DEMAND)**

COMP 653. Computer Graphics **Credits 3(3-0)**

This is a course in fundamental principles and method in the design, use, and understanding of computer graphic systems. Topics include coordinate representations, graphics in functions, and software standards. Hardware and software components of computer graphics are discussed. The course presents graphics algorithms. It also introduces basic two-dimensional transformations, reflection, shear; windowing concepts, clipping algorithms, window-to-viewpoint transformations, segment concept, files, attributes and multiple workstation, and interactive picture-construction techniques. Prerequisite: COMP 285. **(F;S)**

COMP 663. Principles of Compiler Design **Credits 3(3-0)**

This course emphasizes the theoretical and practical aspect of constructing compilers for computer programming languages. The course covers principles, models and techniques used in the design and implementation of compilers, interpreters, and assemblers. Topics include lexical analysis, parsing arithmetic expressions and simple statements, syntax specification, algorithms for syntax analysis, object code generation, and code optimization. Each student will develop and implement a compiler. Prerequisites: COMP 375 (Computer Architecture), COMP 385 (Theory of Computing) **(DEMAND)**

COMP 681. Formal Methods **Credits 3(3-0)**

In this course, formal methods that model the software development process will be studied. Fundamental and practical methodologies and theories, including set theory and the foundations of software engineering will be emphasized. Applications to formal specifications, object-oriented programming and data modeling will be examined. Topics include set theory, relations and functions, induction and recursion, symbolic logic, complex models, and application case studies. **(S)**

Computer Science Department

Chairperson - Dr. Gerry Dozier (508 McNair Hall)

Undergraduate Director - Shearon Brown (504 McNair Hall)

Graduate Director - Dr. Anna Yu (501 McNair Hall)

Faculty Advisors for Undergraduate Students

Freshman

Prof. Brown 504 McNair Hall

Honors Students

Dr. Dozier 508 McNair Hall

Upperclassmen

The corresponding faculty member will advise students whose last name starts within the specified alphabetical range.

A -Bo	Prof. Effort	638 McNair Hall
Br - C	Dr. Kim	506 McNair Hall
D - Go	Dr. Yuan	329 McNair Hall
Gr - Ha	Dr. Esterline	331A McNair Hall
Hi – J	Prof. Bullock	505 McNair Hall
K - Mc	Prof. Carr	330 McNair Hall
Md – Ne	Dr. Li	327 McNair Hall
No - Sh	Dr. Williams	503 McNair Hall
Si - Wa	Dr. Xu	325 McNair Hall
We – Z	Dr. Yu	501 McNair Hall