

COMPUTER SCIENCE and INFORMATION TECHNOLOGY Department

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- Department Chair & Undergraduate Program Coordinator

Susan Ceklosky, MS, Instructor in Computer Science

William Davis, MBA, Adjunct Faculty

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Pamela King, MS, CFCE, FE, CEECS, MPSC, ACE, Instructor in Digital Forensics

John MacFarlan, MS, Adjunct Faculty

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- Coordinator of the Instructional Technology Program

Chestnut Hill College offers a Bachelor of Science (BS) in Computer and Information Sciences, a Bachelor of Science (BS) in Computer and Information Technology with a concentration in either *Software Development*, *Web Design* or *Web Development*, a Bachelor of Science (BS) in Computer Systems Management, and a Bachelor of Science (BS) in Digital Forensics with a concentration in either *Cyber Security* or *Digital Examiner Specialist*.

The Department offers six Minors that draw from the Computer Science, Computer Technology, and Digital Forensics curriculums: **Computer Science**, **Computer Systems Management**, **Digital Forensics**, **Information Management**, **Programming**, and **Web Design**. Interested students should contact Lisa Olivieri, SSJ, Room 475, 4th Floor, St. Joseph Hall. Telephone: 215.248.7092. Email: lolivieri@chc.edu.

Certifications

The courses required for the Digital Forensics Major prepare students for ACE certification in Digital Forensics. Several courses offered in the Department prepare students for the following certifications *Adobe Certified Associate for Visual Communication* using Photoshop, CompTIA A+ and Network+, and Security+.

Departmental Mission

The mission of the Computer Science and Information Technology Department is to provide its students with a value-oriented technologically-rich education, enabling them to become reflective self-learners, equipped with the expertise necessary to be of service to one another and to the world. While coursework within the Department ranges from theoretical to applied, courses are designed to allow students to grow in knowledge and respect for the world of technology, but most importantly to grow in knowledge and respect of themselves and of the world through the lens of technology.

Advanced Placement Test Information

Generally, a score of 3 or above on an *Advanced Placement Test* earns academic credit at the College. Scores on the following test is equivalent to the course/credit indicated:

AP TEST	SCORE	EQUIVALENT COURSE
Computer Science A	3, 4, or 5	CMSC-200: Programming in Java I (3 credits)

Departmental Honors

Eligibility is determined by mastery of the major field and by general ability. To be eligible a student must have declared a major, have achieved a grade point average of 3.6 or higher in the major and an overall grade point average of 3.5 or higher, and completed 60 semester hours toward his/her degree (12 of which must be credits in the major). In addition, the student must have the recommendation of the faculty in the major department. Students not meeting this criteria might be recommended for the program by the major department. In most instances, students will receive a formal, written invitation early in the Fall semester of their Junior year. The Departmental Honors program provides an opportunity for independent study and research culminating in an Honors thesis submitted in the spring of Senior year. All students who have successfully completed the Honors Program will be recognized with Honors in their Major at the annual Honors Convocation and on their academic transcripts. In addition, the title of the completed *Honors Thesis* will appear on the academic transcript.

Honor Societies

Qualified students may be invited to join *Epsilon Pi Tau*, the International Honor Society for Technology. Students need to complete at least 18 credits of computer science, computer technology, digital forensics, and/or cyber security courses and maintain a Career GPA of 3.25 and a GPA of 3.25 in the Major. Eligible students are also required to be in the top 35% of their class and have approval of the Department.

Students majoring in Computer and Information Science may be invited by the Department to join *Sigma Zeta*, the natural science and mathematics honor society founded in 1925. The society is dedicated to encouraging and fostering the attainment of knowledge in mathematics, computer science, and the natural sciences. Criteria for eligibility for membership include a minimum of 15 credits in the Major, a grade point average of 3.00 in the Major, and a 3.00 Career GPA, plus Departmental approval.

Career Connections, Public Speaking and Technology Requirements

Completion of the courses required for majors in the Computer Science and Information Technology Department fulfills the technological proficiency requirement. *CMSC-279: History, Trends, and Ethical Issues* provide students with instruction and experience in public speaking. The Internship or Simulated Workplace Lab course required for each major fulfills the career connections requirement.

Clubs and Teams

GriffinTech

Chestnut Hill College students from all Majors who are interested in technology are welcome to participate in the *GriffinTech*. The mission of this club is to help others through technology. The club's activities consist of service projects, member gatherings, fund raising, and information sessions. The club emphasizes teamwork and support. Students interested in participating in the Club should contact Lisa Olivieri at lolivier@chc.edu, or any member of the Club.

Programming Team

Students who enjoy programming and have taken Programming in Java (CMSC-201) are welcome to become members of the Programming Team. The team competes in Programming Contests sponsored by the Consortium for Computing Sciences in Colleges. The team holds weekly practices in preparation for the Programming Contests. Students interested in becoming a member of the Programming Team should contact Susan Ceklosky at cekloskys@chc.edu. Students may take this as a one-credit course (CMSC-255: Team Programming Techniques).

High Technology Crime Investigators Association (HTCIA) Student Chapter

The Chestnut Hill College Chapter of High Technology Crime Investigators Association (HTCIA) provides students with professional training and collaboration with professionals working in their fields of study. This collaboration provides both internship and career opportunities. The Chestnut Hill College Chapter is sponsored by the Delaware Valley Chapter of HTCIA. Interested students should contact Pamela King at KingP@chc.edu or a member.

Internship Opportunities

All qualified students in the Department may participate in an internship that enables them to apply their academic knowledge and gain experience in the workplace. Students work closely with the Director of Experiential Learning in Career Services and a Department internship advisor to complete the internship process. Students with a GPA of at least 2.5 normally complete a 3 credit internship after their junior year. A 3 credit internship requires a minimum of 126 hours. With permission of the department, students may complete a 2 credit internship (84 hours) or a 4 credit internship (168 hours) in its place. Students with a GPA lower than 2.5 will complete an alternative course: Simulated Workplace Lab. Students with a GPA of 2.5 or above may elect to take this alternative course in place of completing an internship.

General Course Options

In addition to courses for Majors and minors, the department offers several courses for students of any Major interested in pursuing an interest without completing a minor. Courses are three credits unless indicated. Courses are open to students of any Major meeting the indicated Prerequisites and may not be offered every semester. Check the *Course Descriptions* for information on the following courses:

Computer and Information Sciences:

- CMSC-190: Introduction to Python Programming
- CMSC-205: Systems Analysis and Design
- CMSC-200: Programming in Java I
- CMSC-279: Computer Science: History, Trends, and Ethical Issues

Computer and Information Technology:

- CMTC-190: Introduction to Computer Hardware and Peripherals
- CMTC-195: Introduction to Computer Art
- CMTC-200: Introduction to Web Development and Design

Digital Forensics:

- CMDF-105: Digital Forensics I
- CMDF-140: Legal Issues in Digital Forensics I

Computer and Information Sciences

The Bachelor of Science (BS) in Computer and Information Sciences is designed to prepare students for graduate study and/or careers in computer science and related fields. Students take a variety of courses that introduce them to programming concepts, data structures, computer algorithms, computer architecture, networking, and cyber security. Students participate in an internship that enables them to apply their academic knowledge and gain experience in the workplace.

Students declaring a Major in Computer and Information Sciences should schedule an initial placement interview with a member of the faculty either at orientation or at another convenient time. Based on the student's prior experience, CMSC-200: *Introduction to Java Programming I* and CMTC-190: *Introduction to Computer Hardware and Peripherals* may not be required; students will be advised to register for the next level of appropriate coursework.

Major in Computer and Information Sciences

A minimum Career GPA of 2.00 and a minimum Major GPA of 2.00 are required for graduation. Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the Major unless an exception is noted. An *Independent Study* may be available with appropriate permissions; *Special Topics* courses are repeatable for credit, as is CMSC-401: *Internship in Computer and Information Sciences*. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Major in Computer and Information Sciences

CMSC-200: Introduction to Java Programming I
CMSC-201: Introduction to Java Programming II
CMSC-205: Systems Analysis and Design
CMSC-251: Data Structures in Java (4 credits)
CMSC-279: Computer Science: History, Trends, and Ethical Issues
CMSC-285: Algorithms in AI and Robotics
CMSC-300: Application Development and Design
CMSC-3II: Research Methods* (Writing Intensive)
CMSC-350: Computer Architecture and Logic Design (4 credits)
CMSC-401: Internship in Computer and Information Sciences
OR CMSC-375: Simulated Workplace Lab
CMSC-405: Programming Languages
CMSC-498: Senior Seminar in Computer and Information Sciences
CMDF-350: Cyber Security
CMTC-103: Introduction to Excel (1 credit)
CMTC-190: Introduction to Computer Hardware and Peripherals
CMTC-230: Introduction to Data Communications
CMTC-284: Introduction to Database Design and Development (4 credits)
Choose one:
CMSC-305: Mobile Application Development
CMTC-260 Applied OS
CMTC-295 Web Programming I
CSEC-275: IPv6 – Networking and Security
MATH-202: Math for Mgmt II/Applied Calculus
or MATH-203: Analytic Geometry and Calculus I
MATH-227: Introduction to Probability and Statistics
MATH-261: Discrete Methods in Mathematics

*Student must earn a grade of C or better.

Recommended, but not required:

MATH-204: Analytic Geometry and Calculus II
PHYS-121: Principles of Physics I (4 credits; Fulfills Core Natl Sci Req)

PHYS-122: Principles of Physics II (4 credits)

Sample Academic Plan

Major in Computer and Information Sciences

This is a *suggested academic plan only*; it is not meant to address each student's individual requirements or interests. Students will develop a personalized plan with a Faculty Advisor; however, it is the student's responsibility to be aware of, register for, and successfully complete all of the requirements for graduation in the Major. The minimum number of Academic Credits required for graduation is 122.

Year One/Fall	15 academic credits/16 credits total	Year One/Spring	13 academic credits/14 credits total
CMSC-200: Introduction to Java Programming I		CMSC-201: Introduction to Java Programming II	
CMTC-190: Intro to Computer Hardware and Peripherals		CMTC-103: Introduction to Excel (1 credit)	
FILA-120: Foundations in the Liberal Arts		CMTC-230: Introduction to Data Communications	
Foreign Language Requirement		ENGL-101: College Writing	
FYIN-120: First Year Initiative (1 credit non-academic)		Foreign Language Requirement or General Elective	
RLST-104: The Religious Imagination		Physical Education Requirement #1 (1 credit non-academic)	

Year Two/Fall	16 academic credits	Year Two/Spring	16 academic credits
CMSC-205: Systems Analysis and Design CMSC-251: Data Structures in Java (4 credits) Core Religious Studies 200-Level Requirement GLST-201: Global Awareness Seminar MATH-202 or MATH-203		CMSC-285: Algorithms in AI and Robotics CMSC-279: Comp Sci: History, Trends, and Ethical Issues CMSC-350: Computer Architecture/Logic Design (4 credits) Core Literature Requirement MATH-261: Discrete Methods in Mathematics	
Year Three/Fall	15 academic credits	Year Three/Spring	15 academic credits/16 credits total
Core Ethics Requirement CMTC-284: Intro to Database Design & Development MATH-227: Introduction to Probability and Statistics Core History Requirement Core Social Science Requirement		CMSC-311: Research Methods CMDF-350: Cyber Security CMSC-405: Programming Languages Choice of above Elective in CMSC, CMTC or CSEC Core Arts Requirement Physical Education Requirement #2 (1 credit non-academic)	
Year Four/Fall	15 academic credits	Year Four/Spring	15 academic credits
CMSC-300: Application Development and Design CMSC-498: Senior Seminar/Comp and Information Sci Core Natural Science Requirement Minor #1 or Computer or General Elective Minor #2 or Computer or General Elective		CMSC-401: Internship in Comp and Information Sciences OR CMSC-375: Simulated Workplace Lab Minor #3 or Computer or General Elective Minor #4 or General Elective Minor #5 or General Elective Minor #6 or General Elective	

Minor in Computer Science

Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the minor. An *Independent Study* may be available with appropriate permissions; *Special Topics* courses are repeatable for credit. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Minor in Computer Science

CMSC-200: Introduction to Java Programming I
or one Computer Science Elective

CMSC-201: Introduction to Java Programming II

CMSC-251: Data Structures in Java (4 credits)

CMSC-350: Computer Architecture and Logic Design (4 credits)

Two additional Computer Science Electives (6 credits)

Computer Science Electives:

CMDF-350: Cyber Security
CMSC-205: Systems Analysis and Design
CMSC-281: Special Topics in Computer Science
CMSC-285: Algorithms in AI and Robotics
CMSC-300: Application Development
CMSC-305: Mobile Application Development
CMSC-405: Programming Languages
CMSC-481: Advanced Special Topics in Computer Science
CMTC-230: Introduction to Data Communications
CMTC-284: Introduction to Database Design and Development
CMTC-295: Web Programming I

Computer and Information Technology

The Bachelor of Science (BS) in Computer and Information Technology prepares students for the field of computer and information technology by introducing them to a variety of current hardware and software technologies. The Major presents sufficient background and experience in problem solving to enable students to learn and adapt to new technologies they will meet in the workplace. These programs provide a solid preparation for students interested in pursuing graduate study in the area of web and computer technology.

Students majoring in Computer and Information Technology select a Concentration in one of three areas: *Software Development*, *Web Design* or *Web Development*. Students declaring this Major schedule an initial placement interview with a member of the faculty either at the formal orientation or at another convenient time. Based on the student's prior experience, *CMTC-190: Introduction to Computer Hardware and Peripherals* may not be required; students will be advised to register for the next level of appropriate coursework.

Major in Computer and Information Technology with Concentration in Software Development

A minimum Career GPA of 2.00 and a minimum Major GPA of 2.00 are required for graduation. Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the Major unless an exception is noted. An *Independent Study* may be available with appropriate permissions; *Special Topics* courses are repeatable for credit, as is *CMTC-401: Internship in Computer and Information Technology*. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Major in Computer and Information Technology with Concentration in Software Development

CMSC-200: Introduction to Java Programming I
CMSC-201: Introduction to Java Programming II
CMSC-205: Systems Analysis and Design
CMSC-251: Data Structures (4 credits)
CMSC-279: Computer Science: History, Trends, and Ethical Issues
CMSC-285: Algorithms in AI and Robotics
CMSC-300: Application Development and Design
CMSC-305: Mobile Application Development
CMSC-405: Programming Languages
CMTC-103: Introduction to Excel (1 credit)
CMTC-190: Introduction to Computer Hardware and Peripherals
CMTC-260: Applied Operating Systems
CMTC-275: Web Design: HTML and CSS
CMTC-284: Introduction to Database Design and Development (4 credits)
CMTC-295: Web Programming I
CMTC-296: Web Programming II
CMTC-311: Research Methods* (Writing Intensive)
CMTC-401: Internship in Computer and Information Technology
OR CMTC-375: Simulated Workplace Lab
CMTC-498: Senior Seminar in Computer and Information Technology
One Mathematics Elective (3 credits)

*Student must earn a grade of C or better.

Mathematics Electives:

MATH-115: Understanding Our Quantitative World
MATH-121: Precalculus I
MATH-122: Precalculus II
MATH-123: Precalculus -A Condensed Approach
MATH-201: Math for Management I/Finite Mathematics
MATH-202: Math for Management II/Applied Calculus
MATH-203: Analytic Geometry and Calculus I
MATH-204: Analytic Geometry and Calculus II

MATH-211: Calculus and Modern Analysis I
MATH-212: Calculus and Modern Analysis II
MATH-215: Mathematics for Liberal Arts
MATH-227: Introduction to Statistics
MATH-251: Calculus and Linear Algebra
MATH-252: Calculus and Modern Analysis III
MATH-261: Discrete Methods in Mathematics
MATH-262: Probability and Statistics

Sample Academic Plan

Major in Computer and Information Technology with Concentration in Software Development

This is a *suggested academic plan only*; it is not meant to address each student's individual requirements or interests. Students will develop a personalized plan with a Faculty Advisor; however, it is the student's responsibility to be aware of, register for, and successfully complete all of the requirements for graduation in the Major. The minimum number of Academic Credits required for graduation is 121.

Year One/Fall	15 academic credits/16 credits total	Year One/Spring	15 academic credits
CMSC-200: Introduction to Java Programming I		CMSC-201: Introduction to Java Programming II	
CMTC-190: Introduction to Hardware and Peripherals		CMSC-205: Systems Analysis and Design	
FILA-120: Foundations in the Liberal Arts		CMTC-260: Applied Operating Systems	
Foreign Language Requirement		ENGL-101: College Writing	
FYIN-120: First Year Initiative (1 credit non-academic)		Foreign Language Requirement or General Elective	
RLST-104: The Religious Imagination			

Year Two/Fall	16 academic credits/17 credits total	Year Two/Spring	16 academic credits
Core Religious Studies 200-Level Requirement		CMSC-279: Comp Sci: History, Trends, and Ethical Issues	
CMSC-251: Data Structures (4 credits)		CMTC-103: Introduction to Excel (1 credit)	
CMTC-284: Intro to Database Design & Development Core		CMTC-295: Web Programming I	
Social Science Requirement		Core Ethics Requirement	
Mathematics Elective		Core Literature Requirement	
Physical Education Requirement #1 (1 credit non-academic)		GLST-201: Global Awareness Seminar	
Year Three/Fall	15 academic credits/16 credits total	Year Three/Spring	15 academic credits
CMSC-285: Algorithms in AI and Robotics		CMTC-311: Research Methods	
CMTC-296: Web Programming II		CMSC-305: Mobile Application Development	
CMTC-275: Web Design: HTML and CSS		Core Natural Science Requirement	
Core History Requirement		Minor #2 or Computer or General Elective	
Minor #1 or Computer or General Elective		Minor #3 or Computer or General Elective	
Physical Education Requirement #2 (1 credit non-academic)			
Year Four/Fall	12 academic credits	Year Four/Spring	15 academic credits
CMTC-401: Internship in Computer/Information Tech <u>OR</u>		CMSC-405: Programming Languages	
CMTC-375: Simulated Workplace Lab		General Elective	
CMTC-498: Senior Seminar in Computer/Information Tech		Minor #4 or Computer or General Elective	
Core Arts Requirement		Minor #5 or Computer or General Elective	
Core Religious Studies 200-Level Requirement		Minor #6 or Computer or General Elective	

Minor in Programming

Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the minor. An *Independent Study* may be available with appropriate permissions; *Special Topics* courses are repeatable for credit. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Minor in Programming

CMSC-200: Introduction to Java Programming I

CMSC-201: Introduction to Java Programming II

CMSC-251: Data Structures in Java (4 credits)

Three Computer Electives (9 credits)

Computer Electives:

CMSC-190: Introduction to Python Programming
 CMSC-285: Algorithms in AI and Robotics
 CMSC-300: Application Development
 CMSC-305: Mobile Application Development
 CMSC-405: Programming Languages

CMTC-295: Web Programming I
 CMTC-296: Web Programming II

Major in Computer and Information Technology with Concentration in Web Development

A minimum Career GPA of 2.00 and a minimum Major GPA of 2.00 are required for graduation. Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the Major unless an exception is noted. An *Independent Study* may be available with appropriate permissions; *Special Topics* courses are repeatable for credit, as is *CMTC-401: Internship in Computer and Information Technology*. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Major in Computer and Information Technology with Concentration in Web Development

CMSC-200: Introduction to Java Programming I

CMSC-201: Introduction to Java Programming II

CMSC-279: Computer Sciences: History, Trends, and Ethical Issues

CMTC-103: Introduction to Excel (1 credit)

CMTC-190: Introduction to Computer Hardware and Peripherals

CMTC-200: Introduction to Web Development and Design

CMTC-210: Computer Graphics Design Using Photoshop

CMTC-255: Web Content Management Systems

CMTC-260: Applied Operating Systems

CMTC-275: Web Design: HTML and CSS

CMTC-284: Introduction to Database Design and Development (4 credits)

CMTC-295: Web Programming I

CMTC-296: Web Programming II

CMTC-311: Research Methods* (*Writing Intensive*)

CMTC-401: Internship in Computer and Information Technology

OR CMTC-375: Simulated Workplace Lab

CMTC-498: Senior Seminar in Computer and Information Technology

Choose Two:

- COMM-221: Video Design and Production I
- or COMM-223: Introduction to Video Editing
- CMSC-190: Introduction to Python Programming
- CMSC- 205: Systems Analysis and Design
- CMSC-251: Data Structures

One Mathematics Elective (3 credits)

*Student must earn a grade of C or better.

Mathematics Electives:

- | | |
|--|--|
| MATH-115: Understanding Our Quantitative World | MATH-211: Calculus and Modern Analysis I |
| MATH-121: Precalculus I | MATH-212: Calculus and Modern Analysis II |
| MATH-122: Precalculus II | MATH-215: Mathematics for Liberal Arts |
| MATH-123: Precalculus -A Condensed Approach | MATH-227: Introduction to Statistics |
| MATH-201: Math for Management I/Finite Mathematics | MATH-251: Calculus and Linear Algebra |
| MATH-202: Math for Management II/Applied Calculus | MATH-252: Calculus and Modern Analysis III |
| MATH-203: Analytic Geometry and Calculus I | MATH-261: Discrete Methods in Mathematics |
| MATH-204: Analytic Geometry and Calculus II | MATH-262: Probability and Statistics |

Sample Academic Plan

Major in Computer and Information Technology with Concentration in Web Development

This is a *suggested academic plan only*; it is not meant to address each student's individual requirements or interests. Students will develop a personalized plan with a Faculty Advisor; however, it is the student's responsibility to be aware of, register for, and successfully complete all of the requirements for graduation in the Major. The minimum number of Academic Credits required for graduation is 120.

Year One/Fall	15 academic credits/16 credits total	Year One/Spring	15 academic credits/16 credits total
CMSC-200: Introduction to Java Programming I		CMSC-201: Introduction to Java Programming II	
CMTC-190: Intro to Computer Hardware & Peripherals		CMTC-200: Introduction to Web Development and Design	
FILA-120: Foundations in the Liberal Arts		CMTC-260: Applied Operating Systems	
Foreign Language Requirement		ENGL-101: College Writing	
FYIN-120: First Year Initiative (1 credit non-academic)		Foreign Language Requirement or General Elective	
RLST-104: The Religious Imagination		Physical Education Requirement #1 (1 credit non-academic)	
Year Two/Fall	15 academic credits/16 credits total	Year Two/Spring	15 academic credits
CMTC-201: Designing Websites		CMSC-279: History, Trends, and Ethical Issues	
Major Elective #1		CMTC-284: Intro to Database Design and Development	
Core Arts Requirement		Core Ethics Requirement	
GLST-201: Global Awareness Seminar		Core Literature Requirement	
Mathematics Elective		Core Social Science Requirement	
Physical Education Requirement #2 (1 credit non-academic)			
Year Three/Fall	15 academic credits	Year Three/Spring	16 academic credits
CMTC-295: Web Programming I		CMTC-103: Introduction to Excel (1 credit)	
CMTC-275: Web Design: HTML and CSS		CMTC-311: Research Methods	
Core Natural Science Requirement		Core Religious Studies 200-Level Requirement	
Minor #1 or Computer or General Elective		Minor #3 or Computer or General Elective	
Minor #2 or Computer or General Elective		Minor #4 or Computer or General Elective	
		Minor #5 or Computer or General Elective	
Year Four/Fall	15 academic credits	Year Four/Spring	15 academic credits
CMTC-255: Web Content Management Systems		CMTC-296: Web Programming II	
CMTC-401: Internship in Computer/Information Tech <u>OR</u>		Core History Requirement	
CMTC-375: Simulated Workplace Lab		General Elective #1	
CMTC-498: Senior Seminar: Comp Info Technology		General Elective #2	
Minor #6 or General Elective		Major Elective #2	
General Elective			

Major in Computer and Information Technology with Concentration in Web Design

A minimum Career GPA of 2.00 and a minimum Major GPA of 2.00 are required for graduation. Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the Major unless an exception is noted. An *Independent Study* may be available with appropriate permissions; *Special Topics* courses are repeatable for credit, as is *CMTC-401: Internship in Computer and Information Technology*. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Major in Computer and Information Technology with Concentration in Web Design

CMSC-190: Introduction to Python Programming
 CMSC-279: Computer Sciences: History, Trends, and Ethical Issues
 CMTC-103: Introduction to Excel (1 credit)
 CMTC-190: Introduction to Computer Hardware and Peripherals
 CMTC-195: Introduction to Computer Art
 CMTC-200: Introduction to Web Development and Design
 CMTC-201: Designing Websites
 CMTC-210: Computer Graphics Design Using Photoshop
 CMTC-255: Web Content Management Systems
 CMTC-260: Applied Operating Systems
 CMTC-275: Web Design: HTML and CSS
 CMTC-284: Introduction to Database Design and Development (4 credits)
 CMTC-311: Research Methods* (Writing Intensive)
 CMTC-401: Internship in Computer and Information Technology
 OR CMTC-375: Simulated Workplace Lab
 CMTC-498: Senior Seminar in Computer and Information Technology
 COMM-221: Video Design and Production I
 or COMM-223: Introduction to Video Editing

Choose Two:

CMSC-200: Introduction to Java Programming I
 CMSC-205: Systems Analysis and Design
 CSM-285: Management Information Systems
 COMM-252: Writing for Digital Media
 COMM-325: Video Design & Production II**

One Mathematics Elective (3 credits)

*Student must earn a grade of C or better.

**Prerequisite of COMM-221

Mathematics Electives:

MATH-115: Understanding Our Quantitative World	MATH-211: Calculus and Modern Analysis I
MATH-121: Precalculus I	MATH-212: Calculus and Modern Analysis II
MATH-122: Precalculus II	MATH-215: Mathematics for Liberal Arts
MATH-123: Precalculus -A Condensed Approach	MATH-227: Introduction to Statistics
MATH-201: Math for Management I/Finite Mathematics	MATH-251: Calculus and Linear Algebra
MATH-202: Math for Management II/Applied Calculus	MATH-252: Calculus and Modern Analysis III
MATH-203: Analytic Geometry and Calculus I	MATH-261: Discrete Methods in Mathematics
MATH-204: Analytic Geometry and Calculus II	MATH-262: Probability and Statistics

Sample Academic Plan

Major in Computer and Information Technology with Concentration in Web Design

This is a *suggested academic plan only*; it is not meant to address each student's individual requirements or interests. Students will develop a personalized plan with a Faculty Advisor; however, it is the student's responsibility to be aware of, register for, and successfully complete all of the requirements for graduation in the Major. The minimum number of Academic Credits required for graduation is 120.

Year One/Fall	15 academic credits/16 credits total	Year One/Spring	15 academic credits/16 credits total
CMSC-190: Introduction to Python Programming		CMTC-200: Introduction to Web Development and Design	
CMTC-190: Intro to Computer Hardware & Peripherals		CMTC-210: Computer Graphics Design Using Photoshop	
FILA-120: Foundations in the Liberal Arts		CMTC-260: Applied Operating Systems	
Foreign Language Requirement		ENGL-101: College Writing	
FYIN-120: First Year Initiative (1 credit non-academic)		Foreign Language Requirement or General Elective	
RLST-104: The Religious Imagination		Physical Education Requirement #1 (1 credit non-academic)	
Year Two/Fall	15 academic credits/16 credits total	Year Two/Spring	15 academic credits
CMTC-195: Introduction to Computer Art		CMSC-279: History, Trends, and Ethical Issues	
COMM-221: Video Design and Production I		CMTC-284: Intro to Database Design and Development	
or COMM-223: Introduction to Video Editing		Core Ethics Requirement	
Core Arts Requirement		Core Literature Requirement	
GLST-201: Global Awareness Seminar		Core Social Science Requirement	
Mathematics Elective			
Physical Education Requirement #2 (1 credit non-academic)			

Year Three/Fall	15 academic credits	Year Three/Spring	16 academic credits
CMTC-201: Designing Websites CMTC-255: Web Content Management Systems Core History Requirement Core Natural Science Requirement Minor #1 or Computer or General Elective		CMTC-103: Introduction to Excel (1 credit) CMTC-311: Research Methods Core Religious Studies 200-Level Requirement Major Elective #1 Minor #2 or Computer or General Elective Minor #3 or Computer or General Elective	
Year Four/Fall	15 academic credits	Year Four/Spring	15 academic credits
CMTC-275: Web Design: HTML and CSS CMTC-498: Senior Seminar: Comp Info Technology Minor #4 or Computer or General Elective Minor #5 or Computer or General Elective Major Elective #2		CMTC-401: Internship in Computer/Information Tech <u>OR</u> CMTC-375: Simulated Workplace Lab General Elective #1 General Elective #2 General Elective #3 Minor #6 or General Elective	

Minor in Web Design

Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the minor. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Minor in Web Design
CMTC-195: Introduction to Computer Art
CMTC-200: Introduction to Web Development and Design
CMTC-201: Designing Websites
CMTC-210: Computer Graphics Design Using Photoshop
CMTC-255: Web Content Management Systems
CMTC-275: Web Design: HTML and CSS

Digital Forensics

The courses required for the Bachelor of Science (BS) in Digital Forensics prepare students for the ACE certification in Digital Forensics. Students choose between one of the two tracks for this major: *Digital Examiner Specialist* and *Cyber Security*. Students declaring this Major schedule an initial placement interview with a member of the faculty either at the formal orientation or at another convenient time. Based on the student's prior experience, *CMTC-190: Introduction to Computer Hardware and Peripherals* may not be required; students will be advised to register for the next level of appropriate coursework. Students should be able to pass a criminal background check (Federal and State) as most positions require a background check or security clearances for employment. Students are expected to participate in the CHC High Technology Crime Investigator's Association Chapter, which requires a student membership fee per year.

Major in Digital Forensics with a Digital Examiner Specialist Track

A minimum Career GPA of 2.00 and a minimum Major GPA of 2.00 are required for graduation. Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the Major unless an exception is noted. An *Independent Study* may be available with appropriate permissions; *Special Topics* courses are repeatable for credit, as is *CMDF-401: Internship in Digital Forensics*. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Major in Digital Forensics with a Digital Examiner Specialist Track

CMDF-105: Digital Forensics I
CMDF-140: Legal Issues in Digital Forensics I
CMDF-205: Digital Forensics II
CMDF-240: Legal Issues in Digital Forensics II
CMDF-300: Advanced Digital Forensics
CMDF-311: Research Methods in Digital Forensics** (<i>Writing Intensive</i>)
CMDF-320: Legal and Technical Writing in Digital Forensics
CMDF-350: Cyber Security
CMDF-401: Internship in Digital Forensics OR CMDF-375: Simulated Workplace Lab
CMDF-498: Seminar in Digital Forensics
CMSC-190: Introduction to Python Programming
CMSC-279: History, Trends, and Ethical Issues
CMTC-103: Introduction to Microsoft Excel (<i>1 credit</i>)
CMTC-190: Introduction to Computer Hardware and Peripherals
CMTC-230: Introduction to Data Communications
CMTC-260: Applied Operating Systems
CMTC-284: Introduction to Database Design and Development (<i>4 credits</i>)
CRJU-122: Introduction to Criminal Justice
CRJU-225: Criminal Procedure
Another course approved by the Department
One Mathematics Elective (<i>3 credits</i>)

**Student must earn a grade of C or better.

Mathematics Electives:

MATH-115: Understanding Our Quantitative World	MATH-211: Calculus and Modern Analysis I
MATH-121: Precalculus I	MATH-212: Calculus and Modern Analysis II
MATH-122: Precalculus II	MATH-215: Mathematics for Liberal Arts
MATH-123: Precalculus -A Condensed Approach	MATH-227: Introduction to Statistics
MATH-201: Math for Management I/Finite Mathematics	MATH-251: Calculus and Linear Algebra
MATH-202: Math for Management II/Applied Calculus	MATH-252: Calculus and Modern Analysis III
MATH-203: Analytic Geometry and Calculus I	MATH-261: Discrete Methods in Mathematics
MATH-204: Analytic Geometry and Calculus II	MATH-262: Probability and Statistics

Sample Academic Plan

Major in Digital Forensics with a Digital Examiner Specialist Track

This is a *suggested academic plan only*; it is not meant to address each student's individual requirements or interests. Students will develop a personalized plan with a Faculty Advisor; however, it is the student's responsibility to be aware of, register for, and successfully complete all of the requirements for graduation in the Major. The minimum number of Academic Credits required for graduation is 122

Year One/Fall	15 academic credits/16 credits total	Year One/Spring	15 academic credits/16 credits total
CMDF-140: Legal Issues in Digital Forensics I		CMTC-230: Introduction to Data Communications	
CMTC-190: Intro to Computer Hardware and Peripherals		Core Religious Studies 200-Level Requirement	
FILA-120: Foundations in the Liberal Arts		CMDF-105: Digital Forensics I	
Foreign Language Requirement		ENGL-101: College Writing	
FYIN-120: First Year Initiative (1 credit non-academic)		Foreign Language Requirement or General Elective	
RLST-104: The Religious Imagination		Physical Education Requirement #1 (1 credit non-academic)	
Year Two/Fall	16 academic credits	Year Two/Spring	16 academic credits
CMSC-190: Intro to Python Programming		CMDF-205: Digital Forensics II	

CMTC-103: Introduction to Microsoft Excel (1 credit)
 Core Social Science Requirement
 GLST-201: Global Awareness Seminar
 Mathematics Elective
 Core Literature Requirement

CMSC-279: History, Trends, and Ethical Issues
 CMTC-284: Intro to Database Design & Development (4 credits)
 Core Ethics Requirement
 Minor #1 or Computer or General Elective

Year Three/Fall 15 academic credits/16 credits total

Year Three/Spring 15 academic credits

CMDF-240: Legal Issues in Digital Forensics II
 CMDF-300: Advanced Digital Forensics
 CMDF-320: Legal & Technical Writing
 Core History Requirement
 Core Natural Science Requirement
 Physical Education Requirement #2 (1 credit non-academic)

CMDF-311: Research Methods in Digital Forensics

 CMTC-260: Applied Operating Systems
 CRJU-122: Introduction to Criminal Justice
 Minor #2 or Computer or General Elective
 Minor #3 or Computer or General Elective

Year Four/Fall 15 academic credits

Year Four/Spring 15 academic credits

CMDF-401: Internship in Digital Forensics OR
 CMDF-375: Simulated Workplace Lab
 CMDF-498: Seminar in Digital Forensics
 Core Arts Requirement
 Minor #4 or Computer or General Elective
 Minor #5 or Computer or General Elective

CRJU-225: Criminal Procedure
 Major Elective
 Minor #6 or General Elective
 General Elective #1
 General Elective #2

Major in Digital Forensics with a Cyber Security Track

A minimum Career GPA of 2.00 and a minimum Major GPA of 2.00 are required for graduation. Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the Major unless an exception is noted. An *Independent Study* may be available with appropriate permissions; *Special Topics* courses are repeatable for credit, as is *CMDF-401: Internship in Digital Forensics*. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Major in Digital Forensics with a Cyber Security Track

-CMDF-105: Digital Forensics I
-CMDF-140: Legal Issues in Digital Forensics I
-CMDF-205: Digital Forensics II
-CMDF-300: Advanced Digital Forensics
-CMDF-311: Research Methods in Digital Forensics** (*Writing Intensive*)
-CMDF-350: Cyber Security
-CMDF-401: Internship in Digital Forensics
 OR CMDF-375: Simulated Workplace Lab
-CMDF-498: Seminar in Digital Forensics
-CMSC-190: Introduction to Python Programming
-CMSC-279: History, Trends, and Ethical Issues
-CMTC-103: Introduction to Microsoft Excel (1 credit)
-CMTC-190: Introduction to Computer Hardware and Peripherals
-CMTC-230: Introduction to Data Communications
-CMTC-260: Applied Operating Systems
-CMTC-284: Introduction to Database Design and Development (4 credits)
-CSEC-270: Linux Operating System in Security
-CSEC-275: IPv6 – Networking and Security
-CSEC-280: Investigating Network Artifacts
-Another course approved by the Department
-One Mathematics Elective (3 credits)

**Student must earn a grade of C or better.

Mathematics Electives:

- | | |
|--|--|
| MATH-115: Understanding Our Quantitative World | MATH-211: Calculus and Modern Analysis I |
| MATH-121: Precalculus I | MATH-212: Calculus and Modern Analysis II |
| MATH-122: Precalculus II | MATH-215: Mathematics for Liberal Arts |
| MATH-123: Precalculus -A Condensed Approach | MATH-227: Introduction to Statistics |
| MATH-201: Math for Management I/Finite Mathematics | MATH-251: Calculus and Linear Algebra |
| MATH-202: Math for Management II/Applied Calculus | MATH-252: Calculus and Modern Analysis III |
| MATH-203: Analytic Geometry and Calculus I | MATH-261: Discrete Methods in Mathematics |
| MATH-204: Analytic Geometry and Calculus II | MATH-262: Probability and Statistics |

Sample Academic Plan

Major in Digital Forensics with a Cyber Security Track

This is a *suggested academic plan only*; it is not meant to address each student's individual requirements or interests. Students will develop a personalized plan with a Faculty Advisor; however, it is the student's responsibility to be aware of, register for, and successfully complete all of the requirements for graduation in the Major. The minimum number of Academic Credits required for graduation is 122

Year One/Fall	15 academic credits/16 credits total	Year One/Spring	15 academic credits/16 credits total
CMDF-140: Legal Issues in Digital Forensics I CMTC-190: Intro to Computer Hardware and Peripherals FILA-120: Foundations in the Liberal Arts Foreign Language Requirement FYIN-120: First Year Initiative (1 credit non-academic) RLST-104: The Religious Imagination		CMTC-230: Introduction to Data Communications Core Religious Studies 200-Level Requirement CMDF-105: Digital Forensics I ENGL-101: College Writing Foreign Language Requirement or General Elective Physical Education Requirement #1 (1 credit non-academic)	
Year Two/Fall	16 academic credits	Year Two/Spring	15 academic credits
CMSC-190: Intro to Python Programming CMTC-103: Introduction to Microsoft Excel (1 credit) Core Social Science Requirement GLST-201: Global Awareness Seminar Mathematics Elective Core Literature Requirement		CMDF-205: Digital Forensics II CMSC-279: History, Trends, and Ethical Issues CMTC-260: Applied Operating Systems Core Ethics Requirement Minor #1 or Computer or General Elective	
Year Three/Fall	15 academic credits/16 credits total	Year Three/Spring	15 academic credits
CMDF-300: Advanced Digital Forensics CMDF-350: Cyber Security CMTC-284: Intro to Database Design & Development Core History Requirement Core Natural Science Requirement Physical Education Requirement #2 (1 credit non-academic)		CMDF-311: Research Methods in Digital Forensics CSEC-270: Linux OS in Security CSEC-275: IPv6 – Networking and Security Minor #2 or Computer or General Elective Minor #3 or Computer or General Elective	
Year Four/Fall	15 academic credits	Year Four/Spring	15 academic credits
CMDF-401: Internship in Digital Forensics OR CMDF-375: Simulated Workplace Lab CMDF-498: Seminar in Digital Forensics Core Arts Requirement Minor #4 or Computer or General Elective Minor #5 or Computer or General Elective		CSEC-280: Investigating Network Artifacts Major Elective Minor #6 or General Elective General Elective #1 General Elective #2	

Minor in Digital Forensics

Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the minor. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Minor in Digital Forensics

CMDF-105: Digital Forensics I
CMDF-205: Digital Forensics II
CMDF-300: Advanced Digital Forensics
CMDF-320: Technical Writing in Digital Forensics or CMDF-350: Cyber Security
CMTC-190: Introduction to Computer Hardware and Peripherals
CMTC-230: Introduction to Data Communications

Computer Systems Management

The Bachelor of Science (BS) in Computer Systems Management prepares students for the world of technology in the business sector by introducing them to a variety of current hardware and software technologies. This major provides students with the background needed to plan and coordinate computer-related activities in a business or organization.

Students declaring this Major schedule an initial placement interview with a member of the faculty either at the formal orientation or at another convenient time. Based on the student's prior experience, *CMTC-190: Introduction to Computer Hardware and Peripherals* may not be required; students will be advised to register for the next level of appropriate coursework.

Major in Computer Systems Management

A minimum Career GPA of 2.00 and a minimum Major GPA of 2.00 are required for graduation. Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the Major unless an exception is noted. An *Independent Study* may be available with appropriate permissions; *Special Topics* courses are repeatable for credit, as is *CMTC-401: Internship in Computer and Information Technology*. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Major in Computer Systems Management

BUSN-104: Introduction to Business

CMDF-350: Cyber Security

CMSC-200: Introduction to Java Programming I

Choice of:

CMSC-190: Introduction to Python Programming

or CMSC-201: Introduction to Java Programming II

CMSC-205: Systems Analysis and Design

CMSC-279: History, Trends, and Ethical Issues

CMTC-103: Introduction to Excel (1 credit)

CMTC-190: Introduction to Computer Hardware and Peripherals

CMTC-200: Web Development and Design

CMTC-230: Introduction to Data Communications

CMTC-260: Applied Operating Systems

CMTC-284: Introduction to Database Design and Development (4 credits)

CMSM-285: Management Information Systems

CMSM-31I: Research Methods** (*Writing Intensive*)

CMSM-401: Internship in Computer Systems Management

OR CMSM-375: Simulated Workplace Lab

CMSM-498: Senior Seminar in Computer Systems Management

MATH-227: Introduction to Probability and Statistics

MGMT-105: Principles of Management

MGMT-205: Project Management

Choice of two of the following:

ACCT-103: Financial Accounting

CSEC- 270: Linux Operating System in Security

CSEC- 275: IPv6-Networking and Security

CMTC-255: Web Content Management Systems

MGMT-204: Organizational and Management of Human Resources

**Student must earn a grade of C or better.

Sample Academic Plan

Major in Computer Systems Management

This is a *suggested academic plan only*; it is not meant to address each student's individual requirements or interests. Students will develop a personalized plan with a Faculty Advisor; however, it is the student's responsibility to be aware of, register for, and successfully complete all of the requirements for graduation in the Major. The minimum number of Academic Credits required for graduation is 120.

Year One/Fall	15 academic credits/16 credits total	Year One/Spring	15 academic credits/16 credits total
CMSC-200: Intro to Java Programming I		BUSN-104: Introduction to Business	
CMTC-190: Intro to Computer Hardware and Peripherals		Core Religious Studies 200-Level Requirement	
FILA-120: Foundations in the Liberal Arts		CMTC-230: Introduction to Data Communications	
Foreign Language Requirement		ENGL-101: College Writing	
FYIN-120: First Year Initiative (1 credit non-academic)		Foreign Language Requirement or General Elective	
RLST-104: The Religious Imagination		Physical Educ Requirement #1 (1 credit non-academic)	
Year Two/Fall	16 academic credits	Year Two/Spring	15 academic credits
CMTC-103: Introduction to Microsoft Excel (1 credit)		CMSC-279: History, Trends, and Ethical Issues	
CMTC-200: Web Development and Design		CMSM-285: Management Information Systems	
Core Social Science Requirement		CMTC-260: Applied Operating Systems	
GLST-201: Global Awareness Seminar		Core Ethics Requirement	
MATH-227: Introduction to Probability and Statistics		Core Literature Requirement	
MGMT-105: Principles of Management			

Year Three/Fall	16 academic credits/17 credits total	Year Three/Spring	15 academic credits
CMTC-284: Intro to Database Design & Development		CMDF-350: Cyber Security	
Core Arts Requirement		CMSC-201: Intro to Java Programming II	
Core History Requirement		<i>or</i> CMSC-190: Intro to Python Programming	
Core Natural Science Requirement		CMSM-311: Research Methods	
MGMT-205: Project Management		Minor #1 or Computer or General Elective	
Physical Education Requirement #2 (1 credit non-academic)		Minor #2 or Computer or General Elective	
Year Four/Fall	15 academic credits	Year Four/Spring	15 academic credits
CMSM-401: Internship in Comp Systems Management OR		CMSC-205: Systems Analysis and Design	
CMSM-375: Simulated Workplace Lab		Major Elective #2	
CMSM-498: Senior Seminar: Comp Systems Management		Minor #5 or General Elective	
Major Elective #1		Minor #6 or General Elective	
Minor #3 or Computer or General Elective		General Elective	
Minor #4 or Computer or General Elective			

Minor in Computer Systems Management

Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the minor. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Minor in Computer Systems Management

CMTC-190: Introduction to Computer Hardware & Peripherals

CMTC-230: Introduction to Data Communications

CMTC-260: Applied Operating Systems

CMTC-284: Introduction to Database Design and Development (4 credits)

CMSM-285: Management Information Systems

CMSC-205: Systems Analysis and Design

Minor in Information Management

Students must earn a grade of C- (1.70) or better to successfully complete the requirements for the minor. Courses are 3 credits unless indicated and may not be offered every semester.

Requirements for the Minor in Information Management

CMSC-190: Introduction to Python Programming

CMTC-190: Introduction to Computer Hardware and Peripherals

CMTC-200: Introduction to Web Design and Development

CMTC-230: Introduction to Data Communications

CMTC-284: Introduction to Database Design and Development (4 credits)

One of the following:

CMSC-200: Introduction to Java Programming I

CMTC-255: Web Content Management Systems

Special Topics related to Information Management