

# College of Science and Mathematics

The College of Science & Mathematics is home to the departments of Biology and Physics, Chemistry and Biochemistry, Computer Science and Information Systems and Mathematics. Staffed by faculty with exceptional teaching skills and applied research interests, these departments have gained nationwide recognition for the success of their faculty and graduates. The college's degree programs offer curricula that are state-of-the-art and challenging. Opportunities abound for students to develop a strong identity with their respective departments through student organizations and mentoring relations with the faculty.

The college offers baccalaureate degree programs in biology, biochemistry, biotechnology, chemistry, computer science, information security and assurance, information systems, and mathematics. It offers master's degrees in information systems and applied computer science, and also offers certificate programs in mathematics of computing, information technology,

e-business systems, and information security and assurance. Close, collaborative relationships exist between the departments and the Bagwell College of Education. These collaborations are reflected in the strong content areas in Biology and Mathematics Education programs. Biology and mathematics education majors receive the same in-depth course work in the disciplines of science and mathematics as do students majoring in these fields.

Students with career interests in the sciences, mathematics, computer science or information systems will find degree programs in these areas in the College of Science & Mathematics. Those students with interests in medicine, dentistry, pharmacy, veterinary medicine, engineering, or related fields most frequently choose to pursue the pre-professional requirements in the Biology and Physics or the Chemistry and Biochemistry Department. While degree programs are not offered in these pre-professional areas, students with appropriate course selection can

meet the entrance requirements of most professional schools with a biology, biochemistry, biotechnology, or chemistry degree from the College of Science & Mathematics.

Students have numerous opportunities to gain practical experience in their field. Through co-ops and internships available to students in all degree programs, they can obtain direct experience in the workplace with companies or government agencies. Our Mentor-Protégé Scholarship Program enables students to work one-on-one with faculty in undergraduate research projects in areas of mutual interest. The Center for Industrial Collaboration within the college enables students to work alongside faculty on company-sponsored applied research. Our industry-based programs give students career-related experiences that often lead directly to job offers upon graduation.

## Accreditations

The programs in computer science, information systems, professional chemistry & biochemistry, and teacher education degree programs in the sciences and mathematics are nationally accredited. In addition, the teacher education programs are nationally recognized and have state approval for 6-12 teacher certification in Georgia.

## Academic Departments

The College of Science and Mathematics houses four academic departments:

- The Department of Biology and Physics
- The Department of Chemistry and Biochemistry
- The Department of Computer Science and Information Systems
- The Department of Mathematics and Statistics

### **Department of Biology & Physics** **(770) 423-6158**

**biol@kennesaw.edu**

**<http://science.kennesaw.edu/biophys/>**

The Department of Biology and Physics offers a wide variety of courses that introduce students to the important fields of Biology,

Biotechnology, and Physics. Instruction in biology and physics is well balanced by contemporary approaches to the teaching of science. The department takes great pride in its multidisciplinary approach to cell and molecular biology, organismal, field and population biology, and in its commitment to the student's understanding of how these disciplines contribute to the indispensable role of science in society.

On-campus academic courses and independent research activities, as well as off-campus co-op and internship experiences, support the department's philosophy of a "hands-on" approach to the study of science. Through these practical experiences, students are prepared for a diverse number of exciting careers in the biological sciences. By maintaining high academic standards, the Department of Biology and Physics has not only been an important educator of students destined for graduate school, medical, dental and other health-related professional schools, but, in addition, has successfully prepared well-trained graduates who can immediately enter the job market.

### **Department of Chemistry and Biochemistry**

**chem@kennesaw.edu**

**<http://science.kennesaw.edu/chem>**

The Department of Chemistry and Biochemistry offers class and laboratory instruction in all areas of chemistry including computational chemistry. The chemistry courses utilize modern instructional techniques to help students become knowledgeable of many abstract concepts in modern chemistry. The department has two degree programs which offer the students a range of options so that they will be prepared for jobs in the chemical industry; for beginning graduate studies in many areas of chemistry and biochemistry; for entrance into medical, dental, pharmacy, or other professional schools; for teaching high school chemistry; for jobs in the business end of the chemical industry; or for other possible employment areas related to chemistry. Internships and cooperative employment opportunities which give the

students valuable field-related work experience are available for chemistry majors. Many students are involved in research projects with faculty which emphasizes the department's attitude that one learns best by doing. Financial aid opportunities include three scholarships, and employment as either laboratory or research assistants.

### **Department of Computer Science and Information Systems**

**(770) 423-6005**

**csis@kennesaw.edu**

**<http://science.kennesaw.edu/csis>**

The Department of Computer Science and Information Systems offers five degree programs—(1) a masters of science in information systems—a 36-hour applied graduate program which prepares graduates for employment within niches of the IT profession experiencing critical shortages of employees.; (2) a masters of science in applied computer science designed for experienced computing professionals who want to advance their knowledge of computing without disrupting their careers; (3) a bachelor of science in information security and assurance; (4) a bachelor of science in information systems; and, (5) a bachelor of science in computer science. All three baccalaureate degree programs lead to careers in the field of information technology. Although different in emphasis, each undergraduate program is based on a strong technical foundation including programming principles, systems analysis, systems architecture, data communications, and database design. Each program includes an emphasis on data communications and systems development.

A certificate program in information technology is also offered through the CSIS department. This certificate is ideal for students who enjoy working with computers but do not wish to seek a degree in either computer science or information systems. It is also ideal for students who have already completed a bachelor's degree and seek the latest information technology expertise.

A certificate program in e-business systems prepares students for careers in the online world of business-to-consumer and business-to-business computing.

The certificate in Information Security Assurance prepares students to protect the information and technology assets of organizations.

The department serves both traditional and nontraditional students. Many of our students work full or part-time, often in the computing field. Many are returning to school in order to finish work started many years earlier. To serve this diverse group, the department offers a full program at night as well as during the day. The department also has an active co-op/internship program with flexible scheduling and competitive salaries in the IT field. The CSIS Department awards 30 scholarships each year, through the NSF CSEMS grant program.

### **Department of Mathematics and Statistics**

**(770) 423-6327**

**math@kennesaw.edu**

**<http://science.kennesaw.edu/math>**

**<http://science.kennesaw.edu/math/mathed>**

Mathematical skills encompass many areas, especially in today's modern culture. The Department of Mathematics and Statistics offers courses which introduce students to this broad area of knowledge and teaches them how to use quantitative skills to solve real-world problems.

The Department of Mathematics and Statistics offers programs of study leading to the Bachelor of Science in Mathematics and the Bachelor of Science in Secondary Education with a major in Mathematics Education. Certificate programs in Applied Mathematics, and Applied Statistics and Data Analysis are also offered. Additionally, formal minors may be declared in either area. The Department is one of the largest in the state in terms of undergraduate majors in both mathematics and mathematics education. Also, the new graduate program allows students to continue their education and receive a Masters of Science Degree in Applied Statistics.

There are many employment opportunities for mathematics majors. Recently, University graduates who have majored in mathematics received the fourth highest average starting

salaries, nationwide, of new and recent college graduates entering the job market and ranked by major. The three highest ranked degrees all require mathematics. Employment prospects upon graduation are further enhanced with the choice of appropriate interdisciplinary electives. Among these are courses in computer science, biology, chemistry or any of the business areas. A mathematics degree is also excellent preparation for graduate and professional school entrance examinations such as the GMAT (Graduate Management Admissions Test), GRE (Graduate Record Examination), LSAT (Law School Admissions Test) and the MCAT (Medical College Aptitude Test).

## Minors\*

- Applied Mathematics
- Applied Statistics & Data Analysis
- Chemistry
- Environmental Studies

\* See section on Minors for policy on and additional information regarding minors.

## Programs of Study

The College of Science and Mathematics offers the following undergraduate degrees:

- Bachelor of Science in Biology
- Bachelor of Science in Biology Education
- Bachelor of Science in Biotechnology
- Bachelor of Science in Biochemistry
- Bachelor of Science in Chemistry
- Bachelor of Science in Computer Science
- Bachelor of Science in Information Security and Assurance
- Bachelor of Science in Information Systems
- Bachelor of Science in Mathematics
- Bachelor of Science in Mathematics Education

## Certificate Programs

The College of Science and Mathematics offers the following certificate programs:

- Certificate in Applied Mathematics
- Certificate in Applied Statistics and Data Analysis
- Certificate in e-Business Systems
- Certificate in Forensic Chemistry
- Certificate in Information Security and Assurance
- Certificate in Information Technology

## Major in Biology, B.S.

**Bachelor of Science Degree**  
**College of Science and Mathematics**  
**Department of Biology and Physics**  
**(770) 423-6158**  
<http://science.kennesaw.edu/biophys/>

The program of study in biology leading to a Bachelor of Science degree provides students with the opportunity to pursue a major field of concentration in biology with a background in the liberal arts. The breadth and depth of the course offerings combined with high academic standards provide students with the flexibility to concentrate on any of the many career opportunities in biology. The biology degree program will prepare students for graduate school, for professional schools in a number of health-related fields including medical, dental, pharmacy and veterinary schools, for teacher certification in biology secondary education, and for technical positions in a large number of science laboratories.

### Credit Hours

**GENERAL EDUCATION** (see previous listing of requirements) **43**

**UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT** **3**

### Specific General Education requirements for this major

CHEM 1211/L	General Chemistry I/Lab	3/1
CHEM 1212/L	General Chemistry II/Lab	3/1
MATH 1113	Precalculus	3
MATH 1190	Calculus I	4

**LOWER DIVISION MAJOR REQUIREMENTS (AREA F)** **17**

BIOL 2101	Introduction to the Culture and Methods of Biology	3
BIOL 2107	Biological Principles I (formerly BIOL 2201/2201L)	4
BIOL 2108	Biological Principles II (formerly BIOL 2200/2200L)	4
PHYS 1111	Introductory Physics I	
<b>or</b>		
PHYS 2211	Principles of Physics I	4
Lab/math credit from General Education		2

**UPPER DIVISION MAJOR REQUIREMENTS** **45**

#### I. Biology Courses:

BIOL 3300	Genetics	4
BIOL 3370	Ecology	4
BIOL 3380	Evolutionary Biology	3

Choose one from A and one from B:

A. Anatomy and Physiology **4**

BIOL 3320	Plant Morphology	
BIOL 3350	Comparative Vertebrate Anatomy	

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(Major in Biology, Upper Division Major Requirements-cont'd)

		<b>Credit Hours</b>
BIOL 4420	Plant Physiology /Lab	
BIOL 4431	Human Physiology /Lab	
B. Cell and Molecular Biology		3-4
BIOL 3338	Histology	
BIOL 3340	Microbiology	
BIOL 4410	Cell and Molecular Biology	
BIOL 4465	Immunology	
II. Biology Electives*		12-13
Any upper level Biology or Biotechnology courses.** (A student must have a minimum of four (4) laboratory courses: Biology 3300/3300L, BIOL 3370. one laboratory course chosen from among those listed in the Anatomy and Physiology area plus any other upper-level Biology laboratory course of the students choosing.)		
III. Statistics Requirement		
STAT 3125	Biostatistics (must pass with a "C" or better)	3
IV. CHEM 3361/L Organic Chemistry I/Lab		3/1
CHEM 3362/L Organic Chemistry II/Lab		3/1
V. PHYS 1112 Introductory Physics II		
<u>or</u>		
PHYS 2212 Principles of Physics II		4
<b>RELATED STUDIES</b>	Any courses for which prerequisites have been met, chosen from among the following: any upper-level Biology or Biotechnology; any upper-level Chemistry; PHYS 3300; PHYS 3305; PHYS 3312; PHYS 3340; ASTR 3320; ASTR 3321; SCI 3360/L; SCI 3365; any upper-level Math; GEOG 3305, GEOG 3315; GEOG 4405; GEOG 3300; GEOG 3320; GEOG 3330; GEOG 4410; GEOG 4415; ENGL 3140; HIST 3377; POLS 4456; other courses with prior approval of Biology / Physics Department Chair.	<b>3</b>
<b>FREE ELECTIVES</b>	Any credit courses in university curriculum.	<b>12</b>

**PROGRAM TOTAL: 123**

\* A maximum of 8 hours (at least two different experiences) from BIOL 3398, 4400 and/or 4450 can be used to satisfy major electives. Credit for BIOL 3396 can be applied to Free Electives only.

\*\* Students who wish to sit for the national certification exam in Cytogenetics must take BIOL 3327, BIOL 3398, and BTEC 4300. See director of the Cytogenetics track for details.

## Major in Biology Education, B.S.

**Bachelor of Science Degree  
Leading to Certification for Grades 6-12  
College of Science and Mathematics  
Department of Biology and Physics  
(770) 423-6158, <http://science.kennesaw.edu/biophys/>**

This single field program is designed to prepare biology teachers of adolescents, largely at the secondary school level (grades 6 through 12). It leads to 6-12 teacher certification in the teaching field of biology in Georgia. Candidates complete the equivalent of a major in biology and a second major in pedagogical studies with an emphasis on teaching science.

The B.S. in Secondary Biology Education is fully accredited by NCATE, National Council for Accreditation of Teacher Education, is fully approved by Georgia's Professional Standards Commission for 6-12 teacher certification, and is nationally recognized by NSTA, the National Science Teachers Association.

The specific requirements for admission, retention, degree completion and teacher certification in this degree program are listed with all other teacher education programs. See Bagwell College of Education & PTEU.

## Major in Biotechnology, B.S.

**Bachelor of Science Degree  
College of Science and Mathematics  
Department of Biology and Physics  
(770) 423-6508  
<http://science.kennesaw.edu/biophys/>**

This program of study, leading to a Bachelor of Science degree, is designed to meet growing national, regional, and state needs in different areas of biotechnology. Requirements for this degree are designed to provide graduates with a solid conceptual foundation from multiple disciplines as well as practical laboratory skills. However, completion of this degree will also result in the graduate having sufficient basic scientific knowledge to pursue advanced graduate or professional degrees. This program also includes the Cytogenetics track, which is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS).

### Credit Hours

**GENERAL EDUCATION** (see previous listing of requirements) **44**

**UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT** **3**

### Specific General Education requirements for this major

COM 1109	Human Communication	3
MATH 1113	Precalculus (higher math may be substituted)	3

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(Biotechnology Major, Specific General Education Requirements - cont'd)

**Credit Hours**

MATH 1190	Calculus I	4
CHEM 1211/L	General Chemistry I/Lab	3/1
CHEM 1212/L	General Chemistry II/Lab	3/1

**LOWER DIVISION MAJOR REQUIREMENTS (AREA F)****19**

BIOL 2101	Introduction to the Culture and Methods of Biology	3
BIOL 2107	Biological Principles I	4
BIOL 2108	Biological Principles II	4
PHYS 1111	Introductory Physics I	4
or PHYS 2211	Principles of Physics I	
PHYS 1112	Introductory Physics	4
or PHYS 2212	Principles of Physics II	

**UPPER DIVISION MAJOR REQUIREMENTS****37**

CHEM 3361/L	Modern Organic Chemistry I/Lab	3/1
CHEM 3362/L	Modern Organic Chemistry II/Lab	3/1
BIOL 3300	Genetics	4
BIOL 3340/L	Microbiology/Lab	3/1
BIOL 3380	Evolution	3
BIOL 4486	Bioethics	3
BTEC 3301	Introduction to Biotechnology	4
BTEC 3400	Regulations/QU/QA	3

**Biotechnology Electives (16 credit hours)**

(At least 12 of the 16 hours must be BTEC courses; a minimum of 8 hours must be BIOL/BTEC/CHEM courses with labs chosen from this list)

ANTH 3302	Forensic Anthropology	3
BTEC 3398*	Biotechnology Internship	1-4
BTEC 3399	Seminar in Biotechnology	1
BTEC 4100	Molecular Methods: DNA	3
BTEC 4200	Industrial Microbiology	4
BTEC 4300*	Chromosome Preparation and Analysis	4
BTEC 4400	Directed Study	1-4
BTEC 4455	Case Studies in Forensic Science	3
BTEC 4460	Methods in Forensics DNA Analysis	3
BTEC 4490	Special Topics in Biotechnology	1-4
BTEC 4800	Diagnostics: Infectious Agents	3
BIOL 3327*	Medical Genetics	3
BIOL 3390	Developmental Biology	4
BIOL 4410	Cell and Molecular Biology	3
BIOL 4420	Plant Physiology/Lab	4
BIOL 4431	Human Physiology/Lab	4
BIOL 4460	Medical Microbiology	4
BIOL 4465	Immunology	3
BIOL 4475	Virology	3

## Credit Hours

CHEM 2800/L	Quantitative Analytical Chemistry/Lab	2/2
CHEM 3500	Survey of Biochemistry	3
CHEM 3501/L	Biochemistry I/Lab	3/1
CSIS 4575	Technology Commercialization	3
CRJU 1101	Foundations of Criminal Justice	3
CRJU 3320	Criminal Investigation	3
SOCI 3344	Biotechnology and Social Change	3

**Statistics Requirement****3**

STAT 3125      Biostatistics (must pass with a "C" or better)

**Organic Chemistry Requirement****8**

CHEM 3361/L	Modern Organic Chemistry I/Lab	3/1
CHEM 3362/L	Modern Organic Chemistry II/Lab	3/1

**FREE****ELECTIVES**

Any credit courses in university curriculum.

**9****PROGRAM TOTAL: 123****NOTES:** BTEC 3396 (Co-Op) may be used as Free Electives only.

\* Required courses for those in the Cytogenetics track who wish to sit for the national certification exam. See director of the Cytogenetics track for details.

**Major in Biochemistry and Chemistry, B.S.**

The American Chemical Society (ACS) has continually certified the Department since 1987. The programs of study in the department lead to a Bachelor of Science degree in either Biochemistry or Chemistry. The ACS, nationally approves both of these programs. In addition, the Bachelor of Science in Secondary Chemistry Education (track) is fully accredited by NCATE, National Council for Accreditation of Teacher Education, fully approved by Georgia's Professional Standards Commission for 6-12 teacher certification, is nationally recognized by NSTA, the National Science Teacher Association and has pending approval by the ACS.

Biochemistry is the study of the structure, composition, and chemical reactions of substances in living systems. This program is an excellent choice for pre-medical students. Biochemistry is a discipline that is applied to medicine, dentistry, and veterinary medicine. Biochemistry spills over into pharmacology, physiology, microbiology, and clinical chemistry. In these areas, a biochemist may investigate the mechanism of a drug action; engage in viral research; conduct research pertaining to organ function; or use chemical concepts, procedures, and techniques to study the diagnosis and therapy of disease and the assessment of health. To receive the ACS certificate for the Biochemistry degree requires discussion with an appropriate advisor in the department.

Within the Chemistry degree program there are several options, depending upon the student's career goals. Completion of the Professional Chemistry track automatically earns the student a certificate from the ACS, which recognizes them as having completed an ACS approved program. The Professional Chemistry track prepares the student for graduate school in chemistry or biochemistry and for employment in industry, government, or other agencies doing research and development, quality control, environmental studies, or other applications of chemistry and/or biochemistry.

The General Chemistry track was designed to have more electives and to allow the student to prepare for professional schools (medical, dental, veterinary, pharmacy, or optometry), for a career in high school teaching, for law school (patent law), or for a position in sales or management in some chemical or biochemical industry.

Students also have the option of taking either Forensic Chemistry or Chemistry Education curriculum under the General Chemistry track. Because of the wide range of possibilities for curricula modification in the General Chemistry track, it is very important to receive advice from an advisor during the first semester at KSU.

## Biochemistry Major

### Bachelor of Science Degree

### College of Science and Mathematics

### Department of Chemistry and Biochemistry

(770) 423-6159

<http://science.kennesaw.edu/chem>

	Credit Hours
<b>GENERAL EDUCATION</b> (see previous listing of requirements)	<b>42</b>
<b>UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT</b>	<b>3</b>
<b>Specific General Education requirements for this major:</b>	
MATH 1113      Precalculus	3
MATH 1190      Calculus I	4
PHYS 1111      Introductory Physics I w/Lab	4
PHYS 1112      Introductory Physics II w/ Lab	4
<b>LOWER DIVISION MAJOR REQUIREMENTS (AREA F)</b>	
<b>18</b>	
CHEM 1211/L    General Chemistry I/Lab	4
CHEM 1212/L    General Chemistry II/ Lab	4
CHEM 2800/L    Quantitative Analytical Chemistry/Lab	4
BIOL 2107      Biological Principles	4
Course credit from General Education	2
<b>UPPER DIVISION MAJOR REQUIREMENTS</b>	
<b>30</b>	
CHEM 3361/L    Modern Organic Chemistry I /Lab	4
CHEM 3362/L    Modern Organic Chemistry II/Lab	4
CHEM 3050      Biophysical Chemistry	3
CHEM 3501/L    Biochemistry I/Lab	4
CHEM 3502      Biochemistry II	3
CHEM 3540L    Advanced Biochemistry Lab	
<u>or</u>	
CHEM 4100      Direct Applied Research (on a Biochemistry-Related Topic)	2
CHEM 3110      Bioinorganic Chemistry	3
CHEM 3110L     Bioinorganic Chemistry Lab I	1
CHEM 4500      Methods in Nucleic Acid and Protein Biochemistry	3
CHEMXXXX      Chemistry Elective	3
(Choose from any 3000/4000 level course in chemistry)	

## Credit Hours

**SUPPORTING DISCIPLINES****18**

BIOL 2108	Biological Principles II	4
BIOL 3300	Genetics	4
MATH 2202	Calculus II	4

Electives 6

Three hours must be from: BIOL 3340, BIOL 4410, BIOL 4420/L, BIOL 4465, BIOL 4475, BIOL 4630, BTEC 3301, BTEC 4100. Remainder of hours may be from: MATH 1107, CSIS 1020, CSIS 2300, any of the BIOL or BTEC listed above, or other courses if approved by department chair..

**FREE**

**ELECTIVES** Any courses in university curriculum. **12**

**PROGRAM TOTAL : 123****Chemistry Major****(Professional Chemistry Track)****Bachelor of Science Degree****College of Science and Mathematics****Department of Chemistry and Biochemistry****(770) 423-6159****<http://science.kennesaw.edu/chem>**

## Credit Hours

**GENERAL EDUCATION** (see previous listing of requirements) **42**

**UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT** **3**

**LOWER DIVISION MAJOR REQUIREMENTS (AREA F) 18**

PHYS 2211	Principles of Physics I (if not taken in General Education)	0 - 4
PHYS 2212	Principles of Physics II (if not taken in General Education)	0 - 4
CHEM 1211/1211L	General Chemistry I/Lab (if not taken in General Education)	0 - 4
CHEM 1212/1212L	General Chemistry II/ Lab (if not taken in General Education)	0 - 4
CHEM 2800/2800L	Quantitative Analytical Chemistry /Lab	4
MATH 2202	Calculus II	4
Lab/math credit from General Education <sup>1</sup>		2

**UPPER DIVISION MAJOR REQUIREMENTS 36**

CHEM 3000	Chemical Literature	3 <sup>2</sup>
CHEM 3100	Inorganic Chemistry	3
CHEM 3105L	Inorganic Synthesis	1
CHEM 3361	Modern Organic Chemistry I	3
CHEM 3361L	Modern Organic Chemistry I Lab	1

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(Chemistry Degree, Professional Chemistry Track -Upper Division Major Requirements- cont'd)

		<b>Credit Hours</b>
CHEM 3362	Modern Organic Chemistry II	3
CHEM 3362L	Modern Organic Chemistry II Lab	1
CHEM 3501	Biochemistry I	3
CHEM 3501L	Biochemistry I Lab	1
CHEM 3601	Physical Chemistry I	3
CHEM 3601L	Physical Chemistry I Lab	1
CHEM 3602	Physical Chemistry II	3
CHEM 3602L	Physical Chemistry II Lab	1
CHEM 4100	Chemical Research	2
CHEM 4300	Instrumental Analytical Chemistry	3
CHEM 4300L	Instrumental Analytical Chemistry Lab	1
Chemistry Elective	Any 3000/4000 level chemistry course <sup>3</sup>	3

**SUPPORTING DISCIPLINES****12**

MATH 2203	Calculus III	4
MATH 3310	Differential Equations	3
Electives	Any 3000-4000 level courses	5

Computer Skills: Students are encouraged to take a CS course as a free elective, but considerable skills are developed with computer applications (word processor, spreadsheets, Internet, e-mail, databases, curve fitting, interfacing, etc.) in all of the labs past the freshman year.

**FREE****ELECTIVES** Any courses in university curriculum.**12****PROGRAM TOTAL : 123**

- <sup>1</sup> MATH 1190 must be chosen as general education requirement unless credit for this course is earned as a lower division major requirement. MATH 1190 is a prerequisite for MATH 2202 in lower division major requirements and MATH 1113 is a prerequisite for MATH 1190.
- <sup>2</sup> Students seeking to obtain the ACS certification are required to submit the completed Online-Career Portfolio to the department chair prior to graduation.
- <sup>3</sup> Students planning study in a health-care field are urged to choose, in the appropriate elective areas, those courses required by the appropriate professional school (see advisor for recommended courses).

**(General Chemistry Track)****Bachelor of Science Degree****College of Science & Mathematics****Department of Chemistry and Biochemistry****(770) 423-6159****<http://science.kennesaw.edu/chem>**

<b>GENERAL EDUCATION</b> (see previous listing of requirements) <sup>1</sup>	<b>Credit Hours</b> <b>42</b>
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<b>UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT</b>	<b>3</b>
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## Credit Hours

**LOWER DIVISION MAJOR REQUIREMENTS 18**

PHYS 1111	Introductory Physics I (if not taken in General Education)	0-4
PHYS 1112	Introductory Physics II (if not taken in General Education)	0-4
CHEM 1211/L	General Chemistry I/Lab (if not taken in General Education)	0-4
CHEM 1212/L	General Chemistry II/Lab (if not taken in General Education)	0-4
CHEM 2800/L	Quantitative Analytical Chemistry/Lab	4
ELECTIVES	Any 2000 level courses in the College of Science and Mathematics	4
	Lab/math credit from General Education	2

**UPPER DIVISION MAJOR REQUIREMENTS 24**

CHEM 3000	Chemical Literature	3
CHEM 3361/L	Modern Organic Chemistry I/Lab	4
CHEM 3362/L	Modern Organic Chemistry II/Lab	4
CHEM 3050	Biophysical Chemistry	3
CHEM 3120	Descriptive Inorganic Chemistry	3
CHEM 3105L	Inorganic Synthesis	1
Chemistry Electives	Students must choose either CHEM 3501/L or CHEM 3500 with the remaining credit hours chosen from other 3000-4000 level chemistry courses.	6

**SUPPORTING DISCIPLINES 24**

Electives\* (15 hours must be at the 3000-4000 level)

Sequences of courses from any department (including chemistry) should be taken that reflect and complement the student's chemical interests and career goals.

**FREE**

**ELECTIVES** Any courses in university curriculum. **12**

**PROGRAM TOTAL : 123**

**(Forensic Chemistry Track)**

## Credit Hours

**GENERAL EDUCATION** (see previous listing of requirements)<sup>1</sup> **42**

**Specific General Education requirements for this track**

COM 1129 Public Speaking

**UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT 3****LOWER DIVISION MAJOR REQUIREMENTS (AREA F) 18**

PHYS 1111	Introductory Physics I (if not taken in General Education)	0-4
PHYS 1112	Introductory Physics II (if not taken in General Education)	0-4
CHEM 1211/L	General Chemistry I/Lab (if not taken in General Education)	0-4
CHEM 1212/L	General Chemistry II/Lab (if not taken in General Education)	0-4
MATH 1107	Elementary Statistics (if not taken in General Education)	0-3
MATH 1190	Calculus I (if not taken in General Education)	0-4
CHEM 2800/L	Quantitative Analytical Chemistry/Lab	4
	Lab/math credit from General Education	1-2

## Credit Hours

**UPPER DIVISION MAJOR REQUIREMENTS 32**

CHEM 3361/L	Modern Organic Chemistry I/Lab	4
CHEM 3362/L	Modern Organic Chemistry II/Lab	4
CHEM 3501/L	Biochemistry I/Lab	4
CHEM 3050	Biophysical Chemistry	3
CHEM 3000	Chemical Literature	3
CHEM 3120	Descriptive Inorganic Chemistry	3
CHEM 3105L	Inorganic Synthesis	1
CHEM 3800/L	Forensic Analytical Chemistry	4
CHEM 4300/L	Instrumental Analytical Chemistry/Lab	4
Internship	Forensic Chemistry Intern	2
or CHEM 4100	Direct Applied Research (on a Forensic-Related Topic)	
or CHEM 3540L	Advanced Biochemistry Laboratory	

**SUPPORTING DISCIPLINES 18**

CRJU 1101	Foundations of Criminal Justice	3
CRJU 3320	Criminal Investigation	3
BIOL 2107	Biological Principles I	4
BIOL 2108	Biological Principles II	4
BIOL 3340	Microbiology	4
or BIOL 3338	Histology	

**FREE**

<b>ELECTIVES</b>	Any courses in university curriculum. See adviser for recommendations.	<b>10</b>
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**PROGRAM TOTAL : 123****(Chemistry Education Track)**

## Credit Hours

**GENERAL EDUCATION** (see previous listing of requirements) **44****UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT 3****LOWER DIVISION MAJOR REQUIREMENTS (AREA F) 18**

(Same as General Chemistry track except the following specific electives added for this track:

EDUC 2110	Investigating Critical and Contemporary Issues in Education	3
EDUC 2130	Exploring Teaching and Learning	3

**UPPER DIVISION MAJOR REQUIREMENTS 24**

CHEM 3361/L	Modern Organic Chemistry I/Lab	4
CHEM 3362/L	Modern Organic Chemistry II/Lab	4
CHEM 3050	Biophysical Chemistry	3
CHEM 3501/L	Biochemistry I/Lab	4
CHEM 3110	Bioinorganic Chemistry	3
CHEM 3110L	Bioinorganic Chemistry Lab	1

Credit Hours

CHEM 3400	The Teaching and Learning of Chemistry	3
CHEM 4100	Directed Research	2

**SUPPORTING DISCIPLINES 34**

INED 3304	Education of Exceptional Students	3
EDUC 2120	Sociocultural Influences on Teaching and Learning	3
SCED 4415	Teaching Science (6-12)	9
SCED 4475	Student Teaching Science (6-12)	12

**Physical Sciences Elective Emphasis**

MATH 2202	Calculus II	4
PHYS or ASTR	Any 3000 course in physics or astronomy	3

or

**Life Sciences Elective Emphasis**

BIOL 2107	Biological Principles I	4
BIOL 2108	Biological Principles II	3
or		
BIOL 2221	Human Anatomy & Physiology	3
or		

Another sequence of science or math courses (at least seven hours) approved by the education faculty. 7

**PROGRAM TOTAL : 123**

**Major in Computer Science, B.S.**

**Bachelor of Science Degree  
College of Science and Mathematics  
Department of Computer Science and Information Systems  
(770) 423-6005  
<http://science.kennesaw.edu/csis>**

The B.S. in computer science program is fully accredited by ABET, the Accreditation Board for Engineers & Technology.

The program in computer science (CS) provides a blend of the foundations of CS and applications in the information technology (IT) industry. The CS program emphasizes the study of computer systems architecture, software development, and data communications. Core technology areas include programming, computer architecture, operating systems, data communication, database systems, and systems analysis. This is supported by a strong foundation in computing principles such as the design of programming languages, data structures, and operating system principles. The program includes a significant mathematics component and mathematics concepts are incorporated into many of the major courses. A certificate in Mathematical Foundations of Computing is also available. CS majors are strongly advised to take advantage of this new option for credentialing their academic accomplishments.

(Major in Computer Science - cont'd)

Graduates of the CS program are prepared for a variety of careers in CS and IT, especially in software design application architecture. Example job titles from KSU graduates of the CS program include information technology specialist, programmer analyst, software engineer, network administrator, and software consultant. This program also prepares students for graduate studies in IT-related fields.

**Credit Hours****GENERAL EDUCATION** (see previous listing of requirements) **44****UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT** **3**  
**Specific General Education requirements for this major**

Math: CS majors are encouraged to take Math 1190 Calculus I as the first math course. However, it is acceptable to start with Math 1113 Pre-calculus.

Science: CS majors should take either physics sequences, that is PHYS 1111, PHYS 1112, or PHYS 2211, PHYS 2212.

**LOWER DIVISION MAJOR REQUIREMENTS (AREA F)** **16**

MATH 2202	Calculus II	4
CSIS 2300	Principles of Computing	3
CSIS 2301	Programming Principles I	3
CSIS 2302	Programming Principles II	3
CSIS 2520	Introduction to Data Communications	3

**UPPER DIVISION MAJOR REQUIREMENTS** **43**

CSIS 3150	Programming Languages	3
CSIS 3310	Introduction to Database Systems	3
CSIS 3401	Introduction to Data Structures	3
CSIS 3402	Advanced Data Structures and Algorithms	3
CSIS 3510	Organization and Architecture	3
CSIS 3530	Operating Systems	3
CSIS 3600	Systems Analysis and Design	3
CSIS 4500	Data Communications Protocols	3
CSIS 4850	Computer Science Senior Project	2
MATH 3322	Discrete Modeling I	3
MATH 3323	Computer Applications of Discrete Modeling	1
MATH 3332	Probability and Statistics	3
MATH 4322	Discrete Modeling II	3
<u>or</u> MATH 3260	Linear Algebra	
COM 3385	Organizational Presentation	3
<u>or</u> WRIT 3140	Technical Writing	
PHYS 3340	Electronics	4
<u>or</u> CHEM 3361/L	Modern Organic Chemistry and Lab	4
<u>or</u> BIOL 3300	Genetics	4

**Credit Hours**

**MAJOR ELECTIVES** (Three 3-hour classes chosen from): **9**

CSIS 3650	Object Oriented Software Development	3
CSIS 4491	Special Topics in Computer Science	3
CSIS 4520	Web Applications with Java	3
CSIS 4580	Web Services with Java	3
CSIS 4610	Human Computer Interface	3
CSIS 4620	Object-Oriented Methods	3
CSIS 4650	Advanced Object-Oriented Software Development	3
CSIS 4730	Real-Time Systems and Simulation	3

**FREE ELECTIVES** Any courses in the university curriculum. **8**

**PROGRAM TOTAL: 123**

**Major in Information Security and Assurance, B.S.**

**Bachelor of Science Degree**  
**College of Science and Mathematics**  
**Department of Computer Science and Information Systems**  
**(770) 423-6005**  
<http://science.kennesaw.edu/csis>

The purpose of the Bachelor of Science in Information Security and Assurance (BS-ISA) program is to create technologically proficient, business-savvy information security professionals capable of applying policy, education & training, and technology solutions to protect information assets from all aspects of threats, and to manage the risks associated with modern information usage. Information security is the protection of the confidentiality, integrity, and availability of information while in transmission, storage or processing, through the application of policy, technology, and education and awareness. Information assurance concerns information operations that protect and defend information and information systems by ensuring availability, integrity, authentication, confidentiality, and nonrepudiation. This program spans both areas in its approach to the protection of information in the organization.

The Committee on National Security Systems and the National Security Agency have certified that Kennesaw State University offers a set of courseware that has been reviewed by National Level Information Assurance Subject Matter Experts and determined to meet National Training Standard for Information Systems Security Professionals (NSTISSI 4011, 4012, 4013, 4014). KSU is also designated as a National Center of Academic Excellence in Information Assurance as recognized by the National Security Agency and the Department of Homeland Security.

**GENERAL EDUCATION** (see previous listing of requirements) **42**

**UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT** **3**

**Specific General Education requirements for this major**  
 Information Security and Assurance majors must take MATH 1101 and MATH 1106.

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(Major in Information Security and Assurance, Lower Division Major Requirements - cont'd)

### Credit Hours

#### **LOWER DIVISION MAJOR REQUIREMENTS (AREA F) 18**

ACCT 2100	Introduction to Financial Accounting	3
ACCT 2200	Introduction to Managerial Accounting	3
CSIS 2300	Principles of Computing	3
<u>or</u> BISM 2100	Business Information Systems and Communication	
BLAW 2200	Legal and Ethical Environment of Business	3
CSIS 2301	Programming Principles I	3
CSIS 2520	Introduction to Data Communications	3

#### **UPPER DIVISION MAJOR REQUIREMENTS 42**

ENGL 3140	Technical Writing	3
STAT 3010	Computer Applications of Statistics	3
MGT 3100	Management and Behavioral Sciences	3
CSIS 3210	Project Management	3
ISA 3010	Security Script Programming	3
ISA 3100	Principles of Information Security and Assurance	3
ISA 3200	Network Security	3
ISA 3300	Policy and Administration in Information Security and Assurance	3
ISA 4210	Client Operating System Security	3
ISA 4220	Server Operating System Security	3
ISA 4330	Incident Response & Contingency Planning	3
ISA 4810	Cyber Defense	3
ISA 4820	Information Security and Assurance Programs and Strategies	3
IT 3500	Database Technologies	3
<u>or</u> BISM 3200	Advanced Business Application Systems	
<u>or</u> CSIS 3310	Introduction to Database Systems	

#### **MAJOR ELECTIVES (Three-3 hour classes chosen from): 9**

ACCT 3100, ACCT 3300, ACCT 4150, ECON 2200, CRJU 1101, CRJU 3305, CRJU 3320, CRJU 4305, CSIS 3550, CSIS 4420, CSIS 4510, CSIS 4515, CSIS 4555, CSIS 4575, ISA 4350, ISA 4400, ISA 4490, ISA 4700, IT 3300, IT 3700, IT 4525.

#### **FREE ELECTIVES Any courses in the university curriculum. 9**

**PROGRAM TOTAL: 123**

## Major in Information Systems, B.S.

**Bachelor of Science Degree**  
**College of Science and Mathematics**  
**Department of Computer Science and Information Systems**  
**(770) 423-6005**  
<http://science.kennesaw.edu/csis>

The B.S. in information systems program is fully accredited by ABET, the Accreditation Board for Engineers & Technology.

The program in information systems (IS) provides a sound foundation in information technology (IT) principles and practice. The emphasis is on applications of information technology rather than the computer itself. Core technology areas include programming, computer architecture, operating systems, data communication, systems analysis and design, database applications, and project management. The program of study also includes practical statistics, IT organizations, and financial systems. The program also includes a significant general business component, as business topics are integrated into many IS courses.

Graduates of the IS program are prepared for a variety of careers in IS and IT, especially in the design, implementation, and management of IT projects. Example job titles from KSU graduates of the IS program include network integration, application support, client services analyst, project technologist, and database administrator. The program also prepares students for graduate study in IT, business and related fields.

		Credit Hours
<b>GENERAL EDUCATION</b> (see previous listing of requirements)		<b>42</b>
<b>UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT</b>		<b>3</b>
<b>LOWER DIVISION MAJOR REQUIREMENTS (AREA F)</b>		<b>18</b>
ACCT 2100	Introduction to Financial Accounting	3
ACCT 2200	Introduction to Managerial Accounting	3
CSIS 2300	Principles of Computing	3
CSIS 2301	Programming Principles I	3
CSIS 2302	Programming Principles II	3
CSIS 2520	Introduction to Data Communication	3
<b>UPPER DIVISION MAJOR REQUIREMENTS</b>		<b>30</b>
CSIS 3210	Project Management	3
CSIS 3310	Introduction to Database Systems	3
CSIS 3510	Computer Organization and Architecture	3
CSIS 3530	Operating Systems	3
CSIS 3600	Systems Analysis and Design	3
CSIS 4830	IS Integrated Project	3
CSIS 4840	Information Resource Management & Policy	2
CSIS 4841	Information Technology Connections Lectures	1
WRIT 3140	Technical Writing	3
ISA 3100	Principles of Information Security and Assurance	3
STAT 3010	Computer Applications of Statistics	3
MGT 3100	Management and Behavioral Sciences	3

(Major in Information Systems, - cont' d)

Credit Hours

**MAJOR ELECTIVES** (Five 3-hour classes chosen from):**15****Business Electives** (Students must take at least one but not more than three from):

ACCT 3100	Intermediate Financial Accounting & Auditing
ACCT 3300	Accounting Information Systems
ACCT 4150	Auditing and Assurance
COM 3385	Organizational Presentation
FIN 3100	Principles of Finance
MGT 4160	Organizational Behavior
MKGT 3100	Principles of Marketing

**Non-Business Electives** (The remaining major electives are chosen from):

CSIS 3550	Unix Administration & Security
CSIS 4300	Web Development
CSIS 4305	Web Systems Development
CSIS 4310	Advanced Database Systems
CSIS 4400	Directed Study
CSIS 4420	Local Area Networks
CSIS 4500	Data Communication Protocols
CSIS 4510	Computer Law
CSIS 4515	Computer Ethics
CSIS 4555	Electronic Business Systems
CSIS 4575	Technology Commercialization
CSIS 4610	Human Computer Interface
CSIS 4620	Object-Oriented Methods
CSIS 4490	Special Topics in Information Systems
ISA 3200	Network Security
ISA 3300	Policy and Administration in Information Security and Assurance

**FREE****ELECTIVES** Any courses in the university curriculum.**12****PROGRAM TOTAL: 123**

## Major in Mathematics, B.S.

**Bachelor of Science Degree****College of Science and Mathematics****Department of Mathematics and Statistics****(770) 423-6327****<http://science.kennesaw.edu/math>**

The program of study leading to the Bachelor of Science degree in Mathematics provides a solid foundation in the application of analytical, geometrical, and numerical methods in problem solving and logical deduction. In addition to a core set of mathematics courses, the program also includes concentrations of courses in mathematics and mathematics-related disciplines that will prepare the student for employment or for further study at the graduate level in various mathematics-related fields such as, for example, actuarial, financial, pre-engineering, secondary mathematics teacher certification,

and applied statistics. During the Junior or Senior year, students will complete a capstone experience which might be an internship, a faculty-directed research project, or a special topics course.

		<b>Credit Hours</b>
<b>GENERAL EDUCATION</b> (see previous listing of requirements)*		<b>42</b>
<b>Specific General Education requirements for this major</b>		
MATH 1112	(College Trigonometry) or MATH 1113 (Precalculus)	
MATH 1190	(Calculus I)	
<b>UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT</b>		<b>3</b>
<b>LOWER DIVISION MAJOR REQUIREMENTS (AREA F)</b>		<b>18</b>
MATH 2202	Calculus II	4
MATH 2203	Calculus III	4
CSIS 2301	Programming Principles I	3
Lower division concentration-based electives <sup>1</sup>		
Any 2000-level course in the KSU curriculum		6
Math-Science overflow from Area D		1
<b>UPPER DIVISION MAJOR REQUIREMENTS (AREA F)</b>		<b>21</b>
MATH 3260	Linear Algebra	3
MATH 3310	Differential Equations	3
MATH 3322	Discrete Modeling I	3
MATH 3332	Probability and Statistical Inference	3
MATH 4361	Modern Algebra I	3
MATH 4381	Real Analysis I	3
MATH 4700	Capstone Experience <sup>2</sup>	3
<b>Upper division concentration-based electives<sup>1</sup></b>		<b>27</b>
Any 3000 or 4000 level MATH or STAT course except for those MATH courses noted in the catalog as being intended only for Early Childhood Education majors		12-15
Other concentration-based electives		
Any 3000 or 4000 level course in KSU curriculum		12-15
<b>FREE ELECTIVES</b> Any course in the university curriculum.		<b>12</b>
<b>PROGRAM TOTAL: 123</b>		

<sup>1</sup> It is recommended that these courses will be chosen from among those that are specified for one of the specific concentration areas described in the KSU Mathematics Major Handbook. A copy of this handbook can be obtained electronically at <http://math.kennesaw.edu/major-shandbook> or can be obtained from the departmental office (SC 509). The 6 hours of Area F concentration-based electives are 2000 level courses. A minimum of 24 of the 27 hours of upper

division concentration-based electives must be courses at the 3000 or 4000 level. (Up to 3 hours of upper level concentration-based electives can be satisfied using “overflow” hours that have been accumulated from science courses taken in Area D.) Each student is strongly encouraged to meet with his/her advisor at least once per semester in order to ensure that the student remains on track toward completion of the selected program of study.

<sup>2</sup> The capstone experience might be an internship, faculty-directed research project, or special topics course. All Capstone experiences require pre-approval by the department curriculum committee. This approval process must be initiated by the student (through his or her advisor) at least one semester before the capstone experience is to be undertaken.

## Major in Mathematics Education, B.S.

**Bachelor of Science Degree  
Leading to Certification for Grades 6-12  
College of Science & Mathematics  
Department of Biological and Physical Sciences  
(770) 423-6158  
<http://science.kennesaw.edu/math>**

This single field program is designed to prepare mathematics teachers of adolescents, largely at the secondary school level (grades 6 through 12). It leads to 6-12 teacher certification in the teaching field of mathematics in Georgia. Candidates complete the equivalent of a major in mathematics and a second major in pedagogical studies with an emphasis on teaching mathematics.

The B.S. in Secondary Mathematics Education is fully accredited by NCATE, National Council for Accreditation of Teacher Education, is fully approved by Georgia’s Professional Standards Commission for 6-12 teacher certification, and is nationally recognized by NCTM, the National Council of Teachers of Mathematics.

The specific requirements for admission, retention, degree completion and teacher certification in this degree program are listed with all other teacher education programs. See Bagwell College of Education & PTEU.

## Certificate in Applied Mathematics

**Department of Mathematics and Statistics  
(770) 423-6327  
<http://science.kennesaw.edu/math>**

Applied Mathematics is an inherently interdisciplinary topic. All professional disciplines encounter mathematics in different forms. The Certificate In Applied Mathematics is designed to train students to utilize mathematical skills correctly and to apply these skills in their discipline in order to solve problems in the real world. A Certificate in Applied Mathematics will help differentiate the student from others with the same degree when competing for positions after graduation. This Certificate is intended to enhance the value of a student’s degree from any department in any institution, whether a student chooses to enter private industry or graduate school.

Credit Hours

**Required Courses:**

MATH 3000	Introduction to Professional Software of Mathematics	3
MATH 3261	Computational Linear Algebra	3
MATH 3310	Continuous Modeling: Differential Equations	3
MATH 4345	Numerical Methods	3

**Elective Courses (3 credit hours taken from the following)**

Varies	Any other 3000 level or above Mathematics/Statistics course	3
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**PROGRAM TOTAL: 15**

## Certificate in Applied Statistics and Data Analysis

**Department of Mathematics and Statistics**

**(770) 423-6327**

**<http://science.kennesaw.edu/math>**

The certificate in Applied Statistics and Data Analysis is designed for individuals who are non degree-seeking students, with an interest in developing a highly applied set of skills in the area of statistical analysis. This certificate program emphasizes the foundational concepts in descriptive and inferential statistics, as well as the major statistical computing packages – EXCEL, SPSS, Minitab and SAS.

Credit Hours

**Required Courses:**

**12**

STAT 3010	Computer Applications of Statistics	3
STAT 3120	Statistical Methods I	3
STAT 3130	Statistical Methods II	3
STAT 4120	Experimental Design	3

**Elective Courses (3 credit hours taken from the following)**

**3**

STAT 4210	Topics in Regression (3)
STAT 4490	Independent Study in Statistical Analysis (3)

**PROGRAM TOTAL: 15**

## Certificate in e-Business Systems

**Department of Computer Science and Information Systems (CSIS)**

**(770) 423-6005**

**<http://science.kennesaw.edu/csis>**

Internet-based information systems that enable electronic communication and transactions have redefined how organizations compete, interact with value chain partners, and relate to customers. The Certificate in Electronic Business Systems is designed for students who have

an understanding of the importance of Information Technology (IT) and its applications in the dynamic field of electronic business (e-business). The Certificate emphasizes the knowledge and skills necessary to design, create, administer, and maintain interactive web-based systems. Topics covered in required courses include Web development, e-business models, Web services and Web systems development, and enterprise applications. Students who have an existing background in Information Technology will find it possible to earn the certificate while pursuing their current degree programs.

		Credit Hours
<b>Required Courses:</b>		
CSIS 4300	Web Development	3
CSIS 4305	Web Systems Development	3
CSIS 4555	Electronic Business Systems	3
CSIS 4830	IS Integrated Project	3
(e-Business systems certificate program- cont'd)		
<b>Electives (choose one)</b>		3
CSIS 4510	Computer Law	
CSIS 4515	Computer Ethics	
ISA 3100	Principles of ISA	
CSIS 4310	Advanced Database Systems	
CSIS 4575	Technology Commercialization	

**PROGRAM TOTAL: 15**

## Certificate in Forensic Chemistry

**Department of Chemistry and Biochemistry**  
**(770) 423-6158**  
<http://science.kennesaw.edu/chem>

The Certificate in Forensic Chemistry is designed to give students the credentials to function in a forensic science laboratory as part of a team to solve legal problems requiring specific training in chemistry. With the proper choice of electives, the certificate can be earned by someone pursuing a degree in chemistry, biochemistry, or biology. The field of Forensic Chemistry is an exciting application of chemistry that helps serve the judicial system of our country. Modern developments in chemical instrumentation allow for detection of trace amounts of chemical evidence and people completing this certificate will be well trained to use these techniques.

<b>Specific General Education requirements for Forensic Chemistry Certificate</b>		Credit Hours
COM 1129	Public Speaking	3
MATH 1107	Elementary Statistics	3

**Required Courses:**

CHEM 4300/L	Instrumental Analytical Chemistry and Lab	4
CHEM 3800/L	Forensic Analytical Chemistry and Lab	4
CRJU 3320	Criminal Investigations	3

BIOL 3340 or BIOL 3338	Microbiology Histology	4
CHEM 3398 or CHEM 4100 or CHEM 3540L	Forensic Chemistry Intern Direct Applied Research (on a Forensic-Related Topic) Advanced Biochemistry Laboratory	2

**PROGRAM TOTAL: 17**

## Certificate in Information Security and Assurance

**Department of Computer Science and Information Systems (CSIS)  
(770) 423-6005  
<http://science.kennesaw.edu/csisp/>**

The Certificate in Information Security and Assurance (ISA) is designed for students with an interest in Information Security and its application in the expanding field of technology. The ISA program emphasizes the skills and knowledge necessary to protect and inspect systems, and to detect and react to threats to the security of information in those systems. Students will find it possible to earn the certificate while pursuing their current degree programs with minimal preparatory work.

Each student will be required to complete the 12 hour core (4 courses) and then select and complete one elective (3-hours).

All coursework within the certificate program must be completed with a "C" or better in order to count towards the certificate.

<b>Core: Required Courses</b>	<b>Credit Hours</b>
ISA 3100 Principles of Information Security and Assurance	12
ISA 3200 Applications in Information Security and Assurance	
ISA 3300 Policy & Administration in Information Security and Assurance	
ISA 4330 Incident Response and Contingency Planning	
 <b>Elective: One course (3 hours) selected from:</b>	3
ISA 3350 Computer Forensics	
CRJU 3320 Criminal Investigations	
CSIS 3550 Unix Administration and Security	
CSIS 4510 Computer Law	
CSIS 4515 Computer Ethics	
ISA 3398 Internships in Information Security and Assurance	
ISA 3396 Coop in Information Security and Assurance	

**PROGRAM TOTAL: 15**

## Certificate in Information Technology

**Department of Computer Science and Information Systems (CSIS)  
(770) 423-6005**

**<http://science.kennesaw.edu/csis/itcert>**

Information technology (IT) is rapidly becoming as important to career entry and advancement as oral and written communication. In fact, recruiting experts believe that even a small amount of technology savvy and knowledge opens doors for anyone entering today's work place. This certificate is ideal for students who enjoy working with computers but do not wish to seek a degree in either computer science or information systems. It is also ideal for students who have already completed a bachelor's degree and seek the latest IT expertise. Students with degrees in fields such as accounting, biology, foreign language, English, and sociology will find that the addition of these important IT skills will make them far more marketable.

The IT certificate will offer KSU students knowledge and experience with the latest tools and technologies. Topics include web technologies, database technologies, and electronic commerce. Students are required to receive at least a "C" in courses in order to receive the certificate.

### Credit Hours

**Required Course:**

CSIS 2300	Principles of Computing or equivalent	3
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<b>Choose 3 from the following (9 semester hours):</b>		<b>9</b>
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CSIS 1020	Introduction to Programming Principles (3)	
IT 3300	Web Technologies (3)	
IT 3500	Database Technologies (3)	
IT 3700	IT Management (3)	
IT 4525	Electronic Commerce (3)	

<b>Choose 1 applied learning experience (3 semester hours):</b>		<b>3</b>
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IT 3396	Cooperative Study	
IT 3398	Internship	
IT 4400	Directed study with an applied emphasis	
XX 3398	from major discipline	
XX 3396	from major discipline	
XX 4400	directed study with an applied emphasis from major discipline	

**PROGRAM TOTAL: 15**