

College of Science and Mathematics

The College of Science & Mathematics is home to the departments of Biological and Physical Sciences, 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 Biological and Physical Sciences 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 Biological and Physical Sciences
- The Department of Chemistry and Biochemistry
- The Department of Computer Science and Information Systems
- The Department of Mathematics

Department of Biological & Physical Sciences

(770) 423-6158

biol@kennesaw.edu

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

The Department of Biological and Physical Sciences 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 Biological and Physical Sciences 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

(770) 423-6327

math@kennesaw.edu

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

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

Mathematics encompasses many areas, especially in today's modern culture. The Department of Mathematics offers courses which introduce students to this broad area of knowledge and teach them how mathematics can be used to solve problems.

The Department of Mathematics 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. A certificate program in mathematics of computing is also offered. 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*

- 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

(Programs of Study - cont'd)

- 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 e-Business Systems
- Certificate in Forensic Chemistry
- Certificate in Information Security and Assurance
- Certificate in Information Technology
- Certificate in Mathematics of Computing

Major in Biology, B.S.

Bachelor of Science Degree
College of Science and Mathematics
Department of Biological and Physical Sciences
(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	4
CHEM 1212/L	General Chemistry II/Lab	4
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	
or		
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/L	Ecology/Lab	4
BIOL 3380	Evolutionary Biology	3

Choose one from A and one from B:

A. Anatomy and Physiology 4

BIOL 3320/L	Plant Morphology/Lab	
BIOL 3350/L	Comparative Vertebrate Anatomy/Lab	
BIOL 4420/L	Plant Physiology/Lab	
BIOL 4431/L	Human Physiology/Lab	

B. Cell and Molecular Biology 3-4

BIOL 3338/3338L	Histology/Lab	
BIOL 3340/L	Microbiology/Lab	
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 3370/3370L, 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. MATH 2107 Biostatistics (must pass with a C or better) 3

IV. CHEM 3361/L	Organic Chemistry I/Lab	4
	CHEM 3362/L Organic Chemistry II/Lab	4

V. PHYS 1112	Introductory Physics II	
or		
PHYS 2212	Principles of Physics II	4

RELATED STUDIES 3

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;

(Major in Biology, Related Studies-cont'd)

Credit Hours

GEOG 3320; GEOG 3330; GEOG 4410; GEOG 4415; ENGL 3140;
HIST 3301; POLS 4456; other courses with prior approval of Biology /
Physics Department Chair.

FREE

ELECTIVES Any credit courses in university curriculum.

12

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.

Major in Biology Education, B.S.

Bachelor of Science Degree

Leading to Certification for Grades 6-12

College of Science and Mathematics

Department of Biological and Physical Sciences

(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 Biological and Physical Sciences

(770) 423-6508

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

This program of study, leading to a Bachelor of Science degree, is designed to meet a growing national, regional, and state need in the area of biotechnology. The Cytogenetics track is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). The common requirements and the track-specific requirements are designed to provide graduates with a solid, conceptual foundation as well as practical laboratory skills.

This degree program is designed to fit market needs in the field of biotechnology. However, completion of this degree will also result in the graduate having sufficient conceptual knowledge to pursue advanced graduate or professional degrees.

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

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

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

UPPER DIVISION MAJOR REQUIREMENTS **28**

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 3340/3340L	Microbiology/Lab	3/1
BIOL 3380	Evolution	3
BIOL 4486	Bioethics	3
BTEC 3301	Introduction to Biotechnology	3
BTEC 3400	Regulations/QU/QA	3

Major Electives **17**

(At least 12 of the 17 hours must be BTEC courses; a minimum of 8 hours must be BIOL/BTEC/CHEM courses with labs chosen from this list)

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

(B.S. in Biotechnology, Major Electives - cont'd)

Credit Hours

BTEC 4800	Diagnostics: Infectious Agents	3
BIOL 3327*	Medical Genetics	3
BIOL 3390/3390L	Developmental Biology	3/1
BIOL 4410	Cell and Molecular Biology	3
BIOL 4420/L	Plant Physiology/Lab	3/1
BIOL 4431/L	Human Physiology/Lab	3/1
BIOL 4460	Medical Microbiology	3
BIOL 4465	Immunology	3
BIOL 4475	Virology	3
CHEM 2800/L	Quantitative Analytical Chemistry/Lab	2/2
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

Physics Requirement

4

PHYS 1112	Introductory Physics
<u>or</u>	
PHYS 2212	Principles of Physics II

FREE ELECTIVES

Any credit courses in university curriculum.

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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 Degree)

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
Specific General Education requirements for this major:	
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
LOWER DIVISION MAJOR REQUIREMENTS (AREA F)	18
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
UPPER DIVISION MAJOR REQUIREMENTS	27
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

(B.S. Biochemistry, - cont'd)

		Credit Hours
CHEM 3502	Biochemistry II	3
CHEM 3540L	Advanced Biochemistry Lab	
or		
CHEM 4100	Direct Applied Research (on a Biochemistry-Related Topic)	2
CHEM 3110	Biological Inorganic Chemistry	3
CHEM 3105L	Inorganic Synthesis	1
CHEMXXXX	Chemistry Elective	3
Choose from these courses: CHEM 3010, CHEM 4510, CHEM 4100, CHEM 3396, CHEM 3398, CHEM 4400. Other courses may be approved by department chair.		

SUPPORTING DISCIPLINES 21

BIOL 2108	Biological Principles II	4
BIOL 3300	Genetics	4
BIOL 4415	DNA Technology	
or		
BIOL 4410	Cell and Molecular Biology	3
BTEC 4100	Molecular Methods: DNA	3
MATH 2202	Calculus II	4

Electives (Choose 3 hours from): 3
 BIOL 3340/3340L, BIOL 4420/4420L, BIOL 4630, BIOL 4465, BIOL 4475, BIOL 3396, BIOL 3398, BIOL 4400, BIOL 4450, MATH 1107, CSIS 1020, CSIS 2300. Other courses may be approved by department chair.

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

PROGRAM TOTAL : 123

(Chemistry Degree)

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)		19
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 1110	Chemistry Career Seminar	1

Credit Hours

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 ¹		2

UPPER DIVISION MAJOR REQUIREMENTS**35**

CHEM 3000	Chemical Literature	2
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
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 3990	Seminar	1
CHEM 4100	Chemical Research	2
CHEM 4300	Instrumental Analytical Chemistry	2
CHEM 4300L	Instrumental Analytical Chemistry Lab	2
Chemistry Elective	Any 3000/4000 level chemistry course ^{2,3}	2

SUPPORTING DISCIPLINES**12**

MATH 2203	Calculus III	4
MATH 3310	Differential Equations	3
Electives	Any 3000-4000 level courses other than chemistry	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**

- ¹ 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.
- ² Students planning graduate study in chemistry should choose, in the appropriate elective areas, CHEM 3700, and three hours of CHEM 4100. Courses in computer science and additional courses in mathematics and physics are recommended.
- ³ 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>**

	Credit Hours
GENERAL EDUCATION (see previous listing of requirements) ¹	43
UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT	3
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 course from biology, computer science, math, physics, or foreign language	4
Lab/math credit from General Education	2
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 Biological Inorganic Chemistry	3-4
CHEM 3105/L Inorganic Synthesis	1
Chemistry Elective Choose 3000-4000 level chemistry course(s)	5
SUPPORTING DISCIPLINES	24
Electives*	
*See advisor for proper career option and recommendations for computer skills courses.	
FREE ELECTIVES Any courses in university curriculum.	12

PROGRAM TOTAL : 123**Forensic Chemistry Track**

	Credit Hours
GENERAL EDUCATION (see previous listing of requirements) ¹	42
UNIVERSITY-WIDE FITNESS FOR LIVING REQUIREMENT	3

Credit Hours

LOWER DIVISION MAJOR REQUIREMENTS (AREA F) 18

(Same as General Chemistry track except the following course replaces the four (4) hours of electives.)

BIOL 2107 Biological Principles I 4

UPPER DIVISION MAJOR REQUIREMENTS 27

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 3010 Pharmacological Chemistry 3

CHEM 4300/L Instrumental Analytical Chemistry/Lab 4

Internship Forensic Chemistry Intern 5

SUPPORTING DISCIPLINES 21

CRJU 1101 Foundations of Criminal Justice 3

CRJU 3320 Criminal Investigation 3

BIOL 2108 Biological Principles II 4

BIOL 3300 Genetics 4

BIOL 4415 DNA Technology

or

BIOL 4490 Forensic DNA Analysis

or

ANTH 4490 Forensic Anthropology 3

Electives 4

FREE ELECTIVES Any courses in university curriculum. 12**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 2201 Teaching and Schools in Changing Society 3

EDUC 2202 Life Span Development: Adolescent and Young Adulthood
Emphasis 3**UPPER DIVISION MAJOR REQUIREMENTS 31**

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	Biological Inorganic Chemistry	3
CHEM 3105L	Inorganic Synthesis Lab	1
CHEM 3700	Environmental Chemistry	3
CHEM 4100	Directed Research	2
Electives	3000-4000 level chemistry	7

SUPPORTING DISCIPLINES**27**

EXC 3304	Education of Exceptional Students	3
EDUC 3308	Learning, Motivation, and Classroom Management	3
SCED 4415	Teaching Science (6-12)	9
SCED 4475	Student Teaching Science (6-12)	12

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, data base 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.

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 physic sequences, that is PHYS 1111,1112, or PHYS 2211, 2211L, 2212, 2212L.

		Credit Hours
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	Database Design and Management	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	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> ENGL 3140	Technical Writing	
PHYS 3340	Electronics	4
MAJOR ELECTIVES (Three-3 hour classes chosen from):		9
CSIS 4610	Human Computer Interface	3
CSIS 4730	Real-Time Systems and Simulation	3
CSIS 3650	Object Oriented Software Development	3
CSIS 4620	Object-Oriented Methods	3
CSIS 4650	Advanced 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
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.

Credit Hours

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.

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
MATH 3400	Computer Applications in 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	Applications of Information Security and Assurance	3
ISA 3300	Policy and Administration in Information Security and Assurance	3
ISA 3350	Computer Forensics	3
ISA 4210	Client Operating System Security	3
ISA 4220	Server Operating System Security	3
ISA 4330	Incident Response & Contingency Planning	3
ISA 4820	Insurance 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 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.

(Major in Information Systems - cont'd)

Credit Hours

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

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

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
CSIS 2301	Programming Principles I	3
CSIS 2302	Programming Principles II	3
CSIS 2520	Introduction to Data Communication	3

UPPER DIVISION MAJOR REQUIREMENTS **30**

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	IT Connections Lecture Series	1
ENGL 3140	Technical Writing	3
MATH 3400	Computer Applications in Statistics	3
MGT 3100	Management and Behavioral Sciences	3

MAJOR ELECTIVES (Six 3-hour classes chosen from): **18**

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

Credit Hours

CSIS 4610	Human Computer Interface	
CSIS 4620	Object-Oriented Methods	
CSIS 4490	Special Topics in Information Systems	
ISA 3100	Introduction to Information Security and Assurance	
ISA 3200	Applications in Information Security and Assurance	
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
(770) 423-6327
<http://science.kennesaw.edu/math>

The program of study leading to the Bachelor of Science degree in Mathematics allows students great flexibility in designing a course of study which will provide a solid foundation in the application of analytical, geometrical, and numerical methods in problem solving and logical deduction. Mathematics majors will work closely with a faculty advisor in formulating a course of study which has Mathematics as its centerpiece but which also includes courses in computer science and in another area of concentration based on the student's interests and career goals. During the Senior year, students will complete a capstone experience which might be an internship, a project, or a course which provides a synthesis of the various concepts and skills which have been mastered during the program.

Credit Hours

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

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

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

MATH 2202	Calculus II	4
MATH 2203	Calculus III	4
CSIS 2301	Programming Principles I	2
Guided Electives ¹		6
Math-Science overflow from General Education Core		2

UPPER DIVISION MAJOR REQUIREMENTS (AREA F) **21**

MATH 3260	Linear Algebra	3
MATH 4361	Modern Algebra	3
MATH 4381	Real Analysis	3
Capstone Experience		3

202 College of Science and Mathematics

(Mathematics Major, upper division major requirements- cont'd)

Credit Hours

The following three Applied Math courses:

9

MATH 3310	Differential Equations
MATH 3322	Discrete Modeling I
MATH 3332	Probability and Statistical Inference

MAJOR ELECTIVES (any three of the following courses)

9

MATH 3333	Analysis of Variance and Regression
MATH 3261	Computational Linear Algebra
MATH 4345	Numerical Methods
MATH 4322	Discrete Modeling II
MATH 4400	Directed Study
MATH 4490	Special Topics in Mathematics
MATH 4495	Advanced Perspective on School Mathematics Part II
MATH 3396	Cooperative Study (at most 3 hours)
MATH 3398	Internship (at most 3 hours)
MATH 4416	Teaching of Mathematics (7-12) (at most 3 hours)
MAED 4475	Student Teaching Mathematics (7-12) (at most 3 hours)

INTERDISCIPLINARY ELECTIVES

18

Overflow from lower division major requirement for CSIS 2301

1

Other Interdisciplinary Electives

17

Seventeen hours of Interdisciplinary Electives will be taken to form a cohesive unit that reflects and complements the student's mathematical interests and career goals. The courses may be (Interdisciplinary Electives, Major in Mathematics, B. S. - cont'd)

taken from any department (including Mathematics) but must reflect the student's area of emphasis. Approval of a faculty advisor and the Mathematics Department Chair will be required in determining allowable selections. At least 15 hours must be taken at the upper level (3000 level or above).

FREE

ELECTIVES Any course in the university curriculum.

12

PROGRAM TOTAL: 123

¹ Guided Electives will be selected from among freshman and sophomore level courses based upon student interests and career goals and requiring the approval of a faculty advisor and the Mathematics Department Chair. Students who do not place directly into CSIS 2301 will take CSIS 2300 as one of these electives.

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 e-Business Systems

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

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.

Required Courses:		Credit Hours
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)**Electives (choose one)**

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.

Required Courses:**Credit Hours**

CHEM 4300/L	Instrumental Analytical Chemistry and Lab	4
CHEM 2100/L	Forensic Chemistry and Lab	4
CRJU 3320	Criminal Investigation	3
BIOL 4415	DNA Technology	3
CHEM 3398	Forensic Chemistry Intern	3

PROGRAM TOTAL: 17

Certificate in Information Security and Assurance

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

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.

		Credit Hours
Core: Required Courses		12
ISA 3100	Principles of Information Security and Assurance	
ISA 3200	Applications in Information Security and Assurance	
ISA 3300	Policy & Administration in Information Security and Assurance	
ISA 4330	Incident Response and Contingency Planning	
Elective: One course (3 hours) selected from:		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
Choose 3 from the following (9 semester hours):		9
CSIS 1020	Introduction to Programming Principles (3)	
IT 3300	Web Technologies (3)	

(Certificate in Information Technology-cont'd)

IT 3500	Database Technologies (3)
IT 3700	IT Management (3)
IT 4525	Electronic Commerce (3)

Choose 1 applied learning experience (3 semester hours): 3

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

Mathematics of Computing

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

The certificate in Mathematics of Computing is designed for students with an interest in the role of computing in applied mathematics. This certificate program emphasizes the algorithms, methods, and models (graphical and otherwise) used to find complex mathematical solutions through extensive computing.

Required Courses:

	Credit Hours	
CSIS 2301	Programming Principles I	3
MATH 326	Linear Algebra with Applications	3
MATH 3322	Discrete Modeling I	3
MATH 3332	Probability and Statistical Inference	3

One of the following courses in order to complete a sequence: 3

MATH 2203	Calculus III
MATH 3261	Computational Linear Algebra
MATH 3333	Analysis of Variance and Regression
Math 4322	Discrete Modeling II

One additional elective from the following: 3

MATH 3261	Computational Linear Algebra
MATH 3310	Continuous Modelling: Differential Equations
MATH 3333	Analysis of Variance and Regression
MATH 4322	Discrete Modeling II
MATH 4345	Numerical Methods

PROGRAM TOTAL: 18