

Division of Natural Sciences and Mathematics

Mission Statement

In keeping with the Mission of the College, the Division of Natural Sciences and Mathematics will strive to continue to add well prepared, energetic and enthusiastic faculty to all departments. The faculty is dedicated to preparing students for graduate and professional studies leading to careers in their respective disciplines. The Division will continue to establish dual-degree linkage programs in collaboration with other schools.

The Division provides undergraduate research opportunities for its students. Science and mathematics scholarships and stipends are available to eligible students. The Division is committed to aiding students in locating employment, participating in extramural enrichment and research programs during the summer.

BIOLOGY DEPARTMENT

Purpose

The Biology Department prepares students for graduate and professional studies, as well as careers in biology. It also provides courses for students as part of their liberal arts education.

Required Courses*

BIO 101 Principles of Life
BIO 102 Organismal Biology
BIO 223 Comparative Vertebrate Zoology OR
BIO 443 Human Anatomy
BIO 320 Botany
BIO 432 Cell Biology OR
BIO 452 Biochemistry
BIO 494 Senior Seminar
Departmental Electives (12 semester hours)

*A grade of "C" or better is required for biology department courses (BIO) only.

The minimum number of semester hours in major needed for graduation is 34.

The minimum total number of semester hours needed for graduation is 126.

BIOLOGY MAJOR

Fall

Freshman

HUM 101 Humanities	3
COM 101 Communications	3
SS Elective*	3
MTH 103 College Algebra	3
BIO 101 Prin. of Life	4
PE 101 Physical Ed	1
EDU 100 College Orient.	<u>1</u>
	18

Sophomore

CHE 101 Chemistry	4
COM Elective*	3
PSY 100 Intro. to Psych.	3
CS Computer Science OR	
Foreign Language**	3
MTH 205 Calculus I	<u>4</u>
	17

Junior

CHE 201 Organ. Chem.	4
PHY 101 Physics	4
BIO 223 Comp. Vert. Zool. OR	
BIO 443 Human Anat.	4
Computer Science OR	
Foreign Language**	<u>3</u>
	15

Senior

Depart. Electives	12
Elective	<u>4</u>
	16

Spring

HUM 102 Humanities	3
COM 102 Communications	3
SS Elective*	3
MTH 105 Precalculus	3
BIO 102 Organ. Biology	4
PE 102 Physical Ed.	<u>1</u>
	17

CHE 102 Chemistry	4
HUM Elective* OR	
SS Elective*	3
CS Computer Science OR	
Foreign Language**	3
MTH 206 Calculus II OR	4
Elementary Statistics	–
	14

CHE 202 Org. Chem.	4
PHY 102 Physics	4
BIO 320 Botany	4
Computer Science OR	
Foreign Language**	<u>3</u>
	15

BIO 494 Senior Seminar	2
BIO 432 Cell Biology OR	
BIO 452 Biochemistry	4
Electives	<u>8</u>
	14

*See General Requirements.

*Initial math course is based on math placement test.

**Student may take 2 years of a foreign language (German/French/Spanish) or computer science or one year of each.

NOTE: Especially well-prepared students, anticipating majoring in one of the sciences, may be allowed to modify the freshman plan to take two beginning level

science courses. Consultation with the Academic Vice President and the Dean of the Natural Sciences Division is required to exercise this option.

Suggested Departmental Electives

BIO 214 Int. to Env. Scien BIO 331 Com. Ver. Embr. BIO 444 Hum. Phys.
 BIO 225 Invert. Zoology BIO 334 Hist.& Micr. BIO 452 Biochem.
 BIO 231 Genetics BIO 351 Microbiology BIO 495A/B Research

Biology Minor: A student is required to take the following:

BIO 101 Principles of Life BIO 223 Comp. Ver. Zoo.
 BIO Elect. 8 sem. hrs.
 BIO 102 Organismal Biology BIO 320 Botany

CHEMISTRY DEPARTMENT

Purpose

The goal of the Chemistry Department is to provide majors with strong competitive backgrounds in chemistry which are adequate to pursue further study or gain immediate employment in the work force.

Required Courses*

CHE 101-102 General Chemistry
 CHE 201-202 Organic Chemistry
 CHE 301 Quantitative Analysis
 CHE 302 Instrumental Analysis
 CHE 401-402 Physical Chemistry
 CHE 494 Senior Seminar

*A grade of "C" or better is required.

The minimum number of semester hours in major needed for graduation is 34.

The minimum total number of semester hours needed for graduation is 128/129.

CHEMISTRY MAJOR

Fall		Spring	
Freshman	Credits		Credits
HUM 101 Humanities	3	HUM 102 Humanities	3
COM 101 Communications	3	COM 102 Communications	3
SS Elective	3	SS Elective	3
MTH 205 Calculus I ^a	4	MTH 206 Calculus II	4
CHE 101 Chemistry	4	CHE 102 Chemistry	4
EDU 100 College Orient.	1	PE 102 Physical Ed.	<u>1</u>
PE 101 Physical Ed.	<u>1</u>		18
	19		

Sophomore

COM Elective ^b	3	CHE 202 Organ. Chem.	4
CHE 201 Organ. Chem.	4	BIO 102 Organ. Biology	4
BIO 101 Prin. of Life	4	HUM Elective OR	
HUM Elect. OR SS Elect. OR		SS Elective	3
MTH Elective ^b	3	CS 254, CS 354 OR	
CS 250 Basic Program OR		German or French	3
German or French ^c	<u>3</u>	Elective*	<u>3</u>
	17		17

Junior

CHE 301 Quant. Analy.	4	CHE 302 Instru. Analy.	4
PHY 101 Physics	4	PHY 102 Physics	4
Elective*	3/4	Electives*	6
Computer Science OR		Computer Science OR	
Foreign Lang.	<u>3</u>	Foreign Lang.	<u>3</u>
	14/15		17

Senior

CHE 401 Physical Chem.	4	CHE 402 Physical Chem.	4
Electives*	<u>10</u>	CHE 494 Senior Seminar	2
	14	Electives*	<u>6</u>
			12

^aChemistry majors should take Math 205 in the freshman year because they are expected to complete MTH 206 Calculus II by the end of the second year. If a student is not qualified to start calculus in the freshman year, the curriculum pattern will have to be modified to accommodate the necessary mathematics courses.

^bSee General Requirements. The faculty advisor will assist the student in planning to include the mathematics and general requirements according to individual circumstances.

^cStudents may take two years of foreign language, two years of computer science or one year of each.

*Electives depend on career option, i.e., graduate school, industry, or medical school.

Chemistry Minor: Students are required to take the following:

CHE 101-102 General Chemistry	CHE 301 Quantitative Analysis
CHE 201-202 Organic Chemistry	

PHYSICS DEPARTMENT

Purpose

The Physics Program is designed to prepare students for graduate and professional studies, as well as careers in physics.

Required Courses*

PHY 101-102 Introductory Physics
PHY 210 Optics
PHY 220 Electronics
PHY 240 Modern Physics
PHY 312 Electricity and Magnetism I
PHY 320 Heat and Thermodynamics
PHY 322 Mechanics I
PHY 330 Intermediate Laboratory
PHY 412 Electricity and Magnetism II
PHY 422 Mechanics II
PHY 432 Atomic and Quantum Physics OR
PHY 440 Special Topics

*A grade of "C" or better is required.

The minimum number of semester hours in major needed for graduation is 44.

The minimum total number of semester hours needed for graduation is 130.

PHYSICS MAJOR

Fall

Freshman

	Credits
HUM 101 Humanities	3
COM 101 Communications	3
MTH 205 Calculus I	4
PHY 101 Physics	4
PE 101 Physical Ed.	1
EDU 100 College Orient.	1
	16

Spring

Credits

HUM 102 Humanities	3
COM 102 Communications	3
MTH 206 Calculus II	4
PHY 102 Intro. Physics	4
PE 102 Physical Ed.	1
	15

Sophomore

COM Elective*	3
SS Elective*	3
Foreign Language ^a	3
MTH 207 Linear Algebra	3
CS 250 Basic Program.	3
PHY 210 Optics	4
	19

SS Elective*	3
Foreign Language ^a	3
MTH 208 Calculus III	4
PHY 220 Electronics	4
PHY 240 Modern Physics	4
	18

Junior

Foreign Language ^a	3	Foreign Language ^a	3
MTH 311 Analysis I	3	MTH 321 Different. Equ.	3
CHE 101 General Chem.	4	CHE 102 Dif. Chem	4
PHY 322 Mechanics I	4	PHY 312 Elec. & Mag. I	4
PHY 320 Heat & Thermo	<u>3</u>	PHY 330 Inter. Lab	<u>2</u>
	17		16

Senior

HUM Elective OR		HUM Elective OR	
SS Elective*	3	SS Elective*	3
PHY 422 Mechanics II	4	PHY 412 Elec. & Mag. II	4
PHY 432 Atomic & Quan.		MCS 265 Num. Analysis	3
Phys. OR		PHY 496 Research OR	
PHY 440 Spec. Topics	3	Elective	<u>3</u>
MCS 485 Sci./Engin. Math	3		13
PHY 495 Research OR			
Elective	<u>3</u>		
	16		

*See General Requirements.

^aStudents can take either foreign language or computer language (Pascal, Fortran, C, or Programming Languages).

Physics Minor: A student is required to take the following:

PHY 101-102 Introductory to Physics

PHY 312 Electricity and Magnetism I

PHY 322 Mechanics I

PHY Elective (4 semester hours): PHY 210, PHY 220 OR PHY 320

MATHEMATICS AND COMPUTER SCIENCE DEPARTMENT

Purpose: Computer Science

The Computer Science Program is designed to prepare students for graduate and professional studies, as well as careers in computer technology and/or research. Upon graduation, Computer Science majors and minors will be prepared to assume strategic leadership positions in a computer-oriented field, as well as entering a graduate school to pursue a more advanced degree. Opportunities for research and internships are readily available both on-campus and externally. Overall, the emphasis of the department is on planning, management, and general problem solving, using the most current hardware and software technology, in addition to the skills of coding in particular computer languages.

Required Courses*

CS 150 Intro. to Computers	CS 411 Systems Anal. and Design
CS 250 Basic Programming	CS 412 Database Management
CS 251 Object Oriented Programming.	CS 431 Operating Systems
CS 309 Algor. and Data Structures	CS 432 Computer Architecture
CS 351 Programming Languages	MCS 212 Formal Thinking
CS 361 Advanced Programming	MCS 262 Discrete Mathematics
CS 358 Business Java	MCS 265 Numerical Analysis
CS 430 Computer Network	MCS 401 Selected Topics

*A grade of "C" or better is required.

The minimum number of semester hours in major needed for graduation is 48.

The minimum total number of semester hours needed for graduation is 128.

COMPUTER SCIENCE MAJOR

Fall		Spring	
Freshman	Credits		Credits
HUM 101 Humanities	3	HUM 102 Humanities	3
COM 101 Communications	3	COM 102 Communications	3
NS 101 Biological Sci.	4	CS 150 Intro. Comp.	3
SS Elective*	3	SS Elective*	3
MTH 105 Precalculus	3	MTH 205 Calculus I	4
PE 101 Physical Ed.	1	PE 102 Physical Ed.	<u>1</u>
EDU 100 College Orient.	<u>1</u>		17
	18		
Sophomore			
COM Elective*	3	MCS 212 Formal Think.	3
MTH 206 Calculus II	4	MCS 262 Discrete Math	3
Foreign Language**	3	Foreign Language**	3
CS 250 Basic Programming	3	CS 251 Object Oriented Prog.	3
HUM Elective* OR		HUM Elective* OR	
SS Elective*	<u>3</u>	SS Elective*	<u>3</u>
	16		15
Junior			
PHY 101 Physics	4	PHY 102 Intro. Physics	4
Foreign Language**	3	Foreign Language**	3
CS 309 Algo. & Data St.	3	MCS 265 Numer. Analy.	3
CS 351 Prog. Lang.	3	CS 361 Advanced Prog.	3
MTH 207 Linear Algebra	<u>3</u>	MTH 200 Elem. Statistics	<u>3</u>
	16		16

Senior

MCS 401 Selected Topics	3	CS 430 Computer Network	3
CS 411 Systems Anal.	3	CS 432 Comp. Architect.	3
CS 431 Operat. Systems	3	CS 412 Database Manage.	3
CS 358 Business Java	3	Electives	<u>6</u>
Elective	<u>3</u>		15
	15		

*See General Requirements

**See Language Requirements

Computer Science Minor: Students are required to take the following:

Science Majors

CS 150 Intro. to Computers
 CS 250 Basic Programming
 CS 251 Object Oriented Programming

Plus 3 of the following:

CS 309 Algorithms & Data Systems
 CS 351 Program. Languages
 CS 431 Operating Systems
 CS 432 Computer Architecture
 CS 361 Advanced Programming

Business Majors

CS 150 Intro. to Computers
 CS 250 Basic Programming
 CS 358 Business Java

Plus 3 of the following:

CS 430 Computer Network
 CS 412 Database Management
 CS 351 Program. Languages
 CS 411 Syst. Analy. & Design

Required courses for other majors are available upon request.

Purpose: Mathematics

The bachelor's degree program in mathematics prepares graduates for careers in both pure and applied fields. All students utilize the computer. Experience in computing has provided excellent job opportunities both before and after graduation. It is recommended that all math majors double major in math and computer science due to the nature of each curriculum content.

Required Courses*

MTH 205 Calculus I
 MTH 206 Calculus II
 MTH 207 Linear Algebra
 MTH 208 Calculus III
 MTH 311 Analysis I
 MTH 321 Differential Equations
 MTH 341 Modern Abstract Algebra I
 MTH 480 Senior Course
 CS 250 Basic Programming
 MTH 312 Analysis II OR
 MTH 342 Modern Abstract Algebra II
 Departmental Electives: 9 semester hours.

At least one from first two from list below AND two more electives.

Select from Electives:

MTH 312 Analysis II OR
 MTH 342 Modern Abstract Algebra II
 MTH 361 Probability and Statistics
 MTH 494 Senior Seminar
 MCS 485 Science and Engineering Mathematics
 MCS 495/496 Research

*A grade of “C” or better is required.

The minimum number of semester hours in major needed for graduation is 42.

The minimum total number of semester hours needed for graduation is 128.

MATHEMATICS MAJOR

Fall		Spring	
Freshman	Credits		Credits
HUM 101 Humanities	3	HUM 102 Humanities	3
COM 101 Communications	3	COM 102 Communications	3
SS Elective*	3	SS Elective*	3
MTH 205 Calculus I	4	MTH 206 Calculus II	4
PHY 101 Physics	4	PHY 102 Physics	4
PE 101 Physical Ed.	1	PE 102 Physical Ed.	<u>1</u>
EDU 100 College Orient.	<u>1</u>		18
	19		
Sophomore			
COM Elective*	3	CS 150 Intro. to Comp. Sci.	3
For. Lang. or Comp. Sci.**	3	For. Lang. or Comp. Sci.**	3
HUM Elective OR		HUM Elective OR	
SS Elective*	3	SS Elective*	3
MTH 207 Linear Algebra	3	MTH 208 Calculus III	4
Free Elective	<u>3</u>	Free Elective	<u>3</u>
	15		16
Junior			
MTH 341 Mod. Abs. Alg. I	3	MTH 321 Diff. Equa.	3
CS 250 Computer Prog.	3	For. Lang. or Comp. Sci.**	3
For. Lang. or Com. Sci.**	3	Departmental Electives***	6
MTH 311 Analysis I	3	Free Elective	<u>3</u>
Free Elective	<u>3</u>		15
	15		
Senior			
MTH 480 Senior Course	3	MTH 312 Analysis II OR	
Departmental Elective***	3	MTH 342 Mod. Ab. Alg. II	3
Electives	<u>9</u>	Electives	<u>12</u>
	15		15

*See General Requirements.

** Student may take two years of French or German, two years of computer science or one year of each.

***See departmental electives under Required Courses.

Mathematics Minor: Students are required to take the following:

MTH 205-206 Calculus I-II MTH 207 Lin. Alg. MTH Elect.: 9 sem. hrs.

Pre-Professional Studies

The Division of Natural Sciences and Mathematics, through combinations of courses in the basic disciplines of biology, chemistry, computer science, mathematics, and physics and through special arrangements with other institutions, provide curricula and programs tailored for specific career interests.

Pre-Professional Studies. Students who wish to pursue careers in allied health, engineering, veterinary medicine and geology follow pre-professional curricula in these areas. However, they have a choice of remaining at Talladega College and receiving a degree in one of the sciences then applying to professional school.

Health Careers. Talladega College has earned an excellent reputation for preparing students for pursuit of careers in health and allied health areas.

Pre-medicine and Pre-dentistry. The pre-medicine/pre-dental program is a four-year curriculum designed to prepare students for entry into medical, dental and other health profession schools. The Health Careers Advisory Committee provides guidance and assistance throughout each student's academic career at Talladega College. Graduates have received degrees from medical schools, such as Harvard, Dartmouth, the University of Alabama and many others.

Marine Sciences Certificate Program. Talladega College is a member of the Marine Environmental Sciences Consortium (MESCC). Students interested in marine sciences may enroll in such courses during the summer. The courses are taught at the Dauphin Island Sea Lab on Dauphin Island. (Courses listed in Course Descriptions: Marine Sciences and MESCC.)

Pre-Nursing Linkage with Professional School. A dual degree linkage program allows a pre-professional student to transfer to a cooperating professional school after two or three years to complete the professional phase of study. These types of programs are called 2+2 and 2+3 linkages. After a student has completed an appropriate course of 2+2 at cooperating or linkage institution, he or she will receive an undergraduate degree from Talladega College and a professional degree from the linkage school.

Project Management

Talladega College offers a minor in project management through courses offered in the Division of Natural Sciences and Mathematics. These skills are offered to students in Science, Technology, Engineering and Mathematics (STEM) and to other students who desire to pursue a minor in this area. Obtaining these skills enhance student's marketability.

Required Courses

CS 215A Essentials of Project Management
CS 315A Project Cost and Schedule Management
CS 316A Project Risk and Leadership Management
Internship

Research Opportunities

MBRS. The Talladega College Minority Biomedical Research Support Program (MBRS) provides faculty and students the opportunity to engage in year round biomedical research. Students who are selected to work on a research project as assistants to MBRS investigators receive a salary and, in some instances, course credits for their efforts. The enrichment phase of the program includes a seminar series and participation in national and regional scientific meetings and symposia. The MBRS program is supported by the Division of Research Resources, National Institutes of Health.

The MARC U*STAR Program is designed to foster research in basic medical, biological, preclinical and related natural and behavioral sciences. At Talladega College trainees participate in specially structured courses and activities beyond the regular requirements for a major. Research at Talladega College and/or a research facility outside of Talladega College, and the presentation of a paper before a learned audience are part of the program.

MARC trainees have spent research summers at Purdue, U. C. Berkeley, Sloan Kettering, University of Florida, Atlanta University, University of Alabama at Birmingham, University of Rochester, and MIT. (Courses listed in Course Descriptions: Biomedical Research and Training.)

NOTE: The MBRS and MARC Programs are supported by grants from the National Institutes of Health.