

College of Sciences and Mathematics

CHARLES E. SAVRDA, *Interim Dean*
LAWRENCE C. WIT, *Associate Dean for Academic Affairs*
CHRIS RODGER, *Associate Dean for Research*

THE COLLEGE OF SCIENCES AND MATHEMATICS provides programs in the physical sciences, life sciences, and mathematics at the undergraduate and graduate levels. The college also offers scientific and mathematical service courses for students enrolled in all of the other colleges and schools. The college includes the departments of Biological Sciences, Chemistry and Biochemistry, Geology and Geography, Mathematics and Statistics, and Physics. The Arboretum and the Leach Science Center are also included in the College of Sciences and Mathematics.

Undergraduate Degrees

- Four-year bachelor's degree programs are offered in two areas:
 - Departmental curricula are available in biomedical sciences, botany, chemistry, biochemistry, geography, geology, laboratory and medical technology, microbiology, molecular biology, marine biology, mathematics, applied mathematics, physics and zoology.
 - Pre-professional curricula are offered in pre-dentistry, pre-medicine, pre-optometry, pre-physical therapy, pre-pharmacy, and pre-veterinary medicine.

Embodied in these curricula are the requirements of the University Core Curriculum.

- Admission - The academic requirements and demands on majors in sciences and mathematics necessitate a high school preparation of high intellectual quality. The following courses are recommended as minimum preparation: English, four units; mathematics (including algebra, geometry, trigonometry and pre-calculus), four units; chemistry, one unit; biology, one unit; history, literature, social science, two or three units. Both physics and foreign language are highly recommended.

COSAM curricula require students to begin with MATH 1610.

Students not prepared for MATH 1610 must first take a lower-numbered course. See advisor for details.

On-campus transfers may declare a major in the College of Sciences and Mathematics if they: (1) have a cumulative Auburn grade-point average of at least 2.0 (on all work attempted) and (2) have completed at least 10 hours of Auburn University course work in the desired major with at least a 2.0 grade-point average in all such courses. Courses in the major are those carrying the appropriate prefix(es) of the specific curriculum. Students not meeting these standards may enroll in the Undeclared Sciences and Mathematics (UNSM) curriculum if they have not reached senior standing. Students in the UNSM curriculum may declare a Sciences and Mathematics major after satisfying the above requirements. A student who enters the UNSM curriculum because he or she is not qualified to declare a major can remain in UNSM for a maximum of one year or until senior standing is reached. After this, if the student is still not qualified to declare a major, he or she will be disenrolled from the College of Sciences and Mathematics.

Graduate Degrees

Master of science and doctor of philosophy degrees are offered in the College of Sciences and Mathematics. Degree programs are described in this *Bulletin*.

Web Page

Additional information about the College of Sciences and Mathematics can be found at: <http://www.auburn.edu/cosam/>.

Minors

Mathematics Minor

Fifteen semester hours of courses labeled MATH or STAT at the level of 3000 or higher; at least three courses must be designated MATH. A minimum grade of C in each of these courses is required.

Physics Minor

15 semester hours in minor

Courses required		Cr. Hr.
PHYS	2200	Introductory Quantum Physics and Relativity3
PHYS	2100	Intermediate Mechanics3
PHYS	3100	Intermediate Electricity & Magnetism3
PHYS	3200	Statistical Thermodynamics3
PHYS	4100	Fundamentals of Quantum Mechanics3

Statistics Minor

Fifteen hours of course from the following list.

Course required: STAT 3600 and 3610 or STAT 3010 and 4020.

Electives: 9 hours from: STAT 4610, 4620, 4630, 5110, 5630.

A minimum grade of C in each of these courses is required.

General Sciences and Mathematics Curriculum (UNSM)

This curriculum is primarily for freshmen who have not decided on a specific major field of study and for transfer students having deficiencies which preclude their acceptance in a degree program. Freshmen entering this curriculum must declare a major by the end of their first year. Transfer students must complete a specific approved program to clear their admission to a major field of study.

The General Curriculum (UNSM)

FR	F	S		F	S
MATH	1610	1620	Calculus I & II	4	4
ENGL	1100	1120	English Composition I & II	3	3
			Science	4	4
			Core Social Science	3	3
			Career Exp	**	**
			Elective	**	2
				16	16

TOTAL HOURS - 32

Departmental Curricula

Departmental curricula leading to the bachelor's degree include botany, chemistry, biochemistry, biomedical sciences, geography, geology, microbiology, molecular biology, marine biology, laboratory and medical technology, mathematics, applied mathematics, physics and zoology.

Botany

The botany major is for students interested in various careers in the plant sciences. Students may pursue either the Ecology and Evolution Track or the Cellular and Molecular Track.

Curriculum in Botany/Ecology and Evolution Track (BTNY, ECEV)

FR	F	S		F	S
BIOL	1020		Principles of Biology and Lab (1021).....	4	**
BIOL		1030	Organismal Biology and Lab (1031).....	**	4
ENGL	1100	1120	English Composition I & II.....	3	3
MATH	1610	1620	Calculus I & II	4	4
CHEM	1030	1040	Fundamentals of Chemistry I & II	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab	1	1
				15	15

SO

			Core History	3	**
			Core History or Literature ¹	**	3
			Core Fine Arts	3	**
			Core Social Science ²	3	3
			Core Literature	3	**
			Core Social Science or Humanities ³	**	3
CHEM	2070	2080	Organic Chemistry I & II	3	3
CHEM	2071	2081	Organic Chemistry I & II Lab	1	1
BIOL		3000	Genetics	**	4
				16	17

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JR	PHYS	1500	1510	General Physics I & II	4	4
				Core Humanities Philosophy ¹	**	3
STAT			3010	Statistics for Engr. & Sci.	**	3
BIOL	3030			Evolution & Systematics	3	**
BIOL	3100			Plant Biology	4	**
BIOL		3060		Principles of Ecology	**	4
				Elective	2	3
					13	17
SR	BIOL	5300		Plant Anatomy & Development	4	**
	BIOL	4950		Undergraduate Seminar	**	1
	BIOL		5120	Systematic Botany	**	4
	BIOL	5130		Plant Physiology	4	**
	BIOL		5140	Plant Ecology	**	4
				Biology Elective⁵	4	4
				Free Elective	**	2
UNIV		4AA0		SM1 Undergraduate Graduation	**	0
					13	14

TOTAL HOURS — 120

- Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- See approved list of approved Biology electives.

Curriculum in Botany/Cellular and Molecular Track (BTNY, CMLB)

FR	F	S		F	S
BIOL	1020		Principles of Biology and Lab (1021)	4	**
BIOL		1030	Organismal Biology and Lab (1031)	**	4
ENGL	1100	1120	English	3	3
MATH	1610	1620	Calculus I & II	4	4
CHEM	1030	1040	Fundamentals of Chemistry I & II	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab	1	1
				15	15

SO				Core History	3	**
				Core History or Literature ¹	**	3
				Core Fine Arts	3	**
				Core Social Science ²	3	3
				Core Literature	3	**
				Core Social Science or Humanities ³	**	3
CHEM	2070	2080		Organic Chemistry I & II	3	3
CHEM	2071	2081		Organic Chemistry I & II Lab	1	1
BIOL		3000		Genetics	**	4
					16	17
JR	PHYS	1500	1510	General Physics I & II	4	4
				Core Humanities Philosophy ⁴	**	3
BIOL	3100			Plant Biology	4	**
BIOL		4100		Cell Biology	**	3
BIOL	3200			General Microbiology	4	**
				Elective	3	4
					15	14
SR	BIOL	5300		Plant Anatomy & Development	4	**
	BIOL		5220	Molecular Genetics	**	3
	BIOL	4950		Undergraduate Seminar	**	1
	BIOL		5120	Systematic Botany	**	4
	BIOL		5130	Plant Physiology	4	**
				Biology Elective⁵	**	4
BCHE	5180	5190		Biochemistry I & II	3	3
BCHE	5181	5191		Biochemistry I & II Lab	1	1
UNIV		4AA0		SM1 Undergraduate Graduation	**	0
					13	15

TOTAL HOURS — 120

- Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- See approved list of approved Biology electives.

BS Curriculum in Chemistry (CHEM)

FR	F	S		F	S
ENGL	1100	1120	English Composition I & II	3	3
MATH	1610	1620	Calculus I & II	4	4
			Core History I & II	3	3
CHEM	1110	1120	Gen. Chem. for Scientists and Engineers I & II	3	3
CHEM	1111	1121	Gen. Chem. Lab for Scientists and Engrs. I & II	1	1
				14	14

SO	PHYS	1600	1610	Engineering Physics I & II	4	4
				Core Literature I	**	3
				Calculus III	4	**
MATH	2630			Linear Differential Equations	**	3
MATH		2650				
CHEM	2070	2080		Organic Chemistry I & II	3	3
CHEM	2071	2081		Organic Chemistry Lab I & II	1	1
CHEM	3050			Analytical Chemistry	3	**
CHEM	3051			Analytical Chemistry Lab	1	**
				Elective	**	1
					16	15

JR				Core Literature II	**	3
				Core Social Science ¹	**	3
				Topics in Linear Algebra	3	**
MATH	2660					
BCHE	5180	5190		Biochemistry	3	3
BCHE	5181	5191		Biochemistry Lab	1	1
CHEM		3000		Chemical Literature	**	1
CHEM	4070	4080		Physical Chemistry I & II	3	3
CHEM	4071	4081		Physical Chemistry Lab I & II	1	1
				Elective	3	**
					14	15

SR				Core Social Science ¹	3	**
				Core Humanities Philosophy ⁴	**	3
				Core Fine Arts	3	**
CHEM	5280			Computational Chemistry	4	**
CHEM	4950			Undergraduate Seminar	**	1
CHEM	4980			Undergraduate Research in Chemistry	**	3
CHEM	4100	4110		Inorganic Chemistry I & II	3	3
CHEM	4101	4111		Inorganic Chemistry Lab I & II	1	1
CHEM		4130		Instrumental Analysis	**	3
CHEM		4131		Instrumental Analysis Lab	**	1
				Elective	3	**
UNIV		4AA0		SM1 Undergraduate Graduation	**	0
					17	15

TOTAL HOURS — 120

- Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- May take more CHEM 4980 as additional elective hours.
- CHEM 1030/1031 and 1040/1041 sequence can substitute for CHEM 1110/1111 and 1120/1121. See advisor for details.

Curriculum in Biochemistry (BCHM)

FR	F	S		F	S
ENGL	1100	1120	English Composition I & II	3	3
MATH	1610	1620	Calculus I & II	4	4
			Core History I	3	**
BIOL		1020	Principles of Biology and Lab (1021)	**	4
CHEM	1110	1120	Gen. Chem. for Scientists & Engineers I & II⁴	3	3
CHEM	1111	1121	Gen. Chem. Lab for Scientists & Engineers I & II	1	1
				14	15

SO	PHYS	1600	1610	Engineering Physics I & II	4	4
				Core History II	**	3
				Calculus III	4	**
MATH	2630			Linear Differential Equation	**	3
MATH		2650				
CHEM	2070	2080		Organic Chemistry I & II	3	3
CHEM	2071	2081		Organic Chemistry Lab I & II	1	1
CHEM	3050			Analytical Chemistry	3	**
CHEM	3051			Analytical Chemistry Lab	1	**
					16	14

JR	BIOL	3200		General Microbiology	4	**
	BCHE	5180	5190	Biochemistry I & II	3	3
	BCHE	5181	5191	Biochemistry Lab	1	1
	BIOL		3000	Genetics	**	4
	CHEM		3000	Chemical Literature	**	1
	CHEM	4070	4080	Physical Chemistry I & II	3	3
	CHEM	4071	4081	Physical Chemistry Lab I & II	1	1
				Elective	3	**
					15	16

SR				Core Social Science ¹	3	3
				Core Humanities Philosophy ²	**	3
				Core Fine Arts	**	3
				Core Literature II	3	**
CHEM	4950			Undergraduate Seminar	1	**
CHEM	4980			Undergraduate Research in Chemistry³	3	**
CHEM	4100			Inorganic Chemistry	3	**
CHEM	4101			Inorganic Chemistry Lab	1	**
CHEM		4130		Instrumental Analysis	**	3
CHEM		4131		Instrumental Analysis Lab	**	1
				Elective	**	3
UNIV		4AA0		SM1 Undergraduate Graduation	**	0
					14	16

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TOTAL HOURS — 120

- Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- May take more CHEM 4980 as additional elective hours.
- CHEM 1030/1031 and 1040/1041 sequence can substitute for CHEM 1110/1111 and 1120/1121. See advisor for details.

BA Curriculum in Chemistry

This curriculum provides a strong background in chemistry while allowing students to specialize in areas of interest. It is especially well suited for students leaning towards medical sciences while allowing more flexibility than that allowed in the American Chemical Society accredited biochemistry curriculum. The program allows for great versatility in the junior and senior years, allowing the curriculum to be tailored to individual goals. The curriculum prepares students for professional careers in chemistry or biochemistry and advanced degree programs in chemistry, biochemistry and medically related fields.

FR	F	S		F	S
ENGL	1100	1120	English Composition I & II	3	3
MATH	1610	1620	Calculus I & II	4	4
BIOL	1020		Principles of Biology and Lab (1021)	4	**
BIOL		1030	Organismal Biology and Lab (1031)	**	4
CHEM	1110	1120	Gen. Chem. for Scientists & Engineers I & II ¹	3	3
CHEM	1111	1121	Gen. Chem. Lab for Scientists & Engineers I & II	1	**
			Elective	1	**
				16	15

SO					
			Core Literature I	**	3
PHYS	1500	1510	General Physics I & II	4	4
CHEM	2070	2080	Organic Chemistry I & II	3	3
CHEM	2071	2081	Organic Chemistry Lab I & II	1	1
CHEM	3050		Analytical Chemistry	3	**
CHEM	3051		Analytical Chemistry Lab	1	**
COMM		1000	Public Speaking	**	3
			Elective	3	**
				15	14

JR					
			Core Literature II	3	**
			Core Social Science ¹	**	3
			Core Fine Arts	**	3
			Foreign Language	4	4
BCHE	5180		Biochemistry	3	**
BCHE	5181		Biochemistry Lab	1	**
CHEM		3000	Chemical Literature	**	1
CHEM	3160		Survey of Physical Chemistry	3	**
			Elective	3	3
				17	14

SR					
			Core Social Science ¹	3	**
			Core History I & II	3	3
			Core Humanities Philosophy ²	**	3
			CHEM Elective ⁴	4	3
			Electives	6	4
UNIV		4AA0	SM1 Undergraduate Graduation	**	0
				16	13

TOTAL HOURS — 121

- Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- CHEM 1030/1031 and 1040/1041 sequence can substitute for CHEM 1110/1111 and 1120/1121. See advisor for details.
- CHEM Electives are defined as any CHEM course 3000-level and above. A maximum of 3 hours of CHEM 4980 may be counted as a CHEM elective. Additional hours may be used as general elective.

Geography

This curriculum in geography promotes geographic literacy as an indispensable element in any educational program. It focuses on spatial relationships and the view of the Earth as the home of humankind. Geography readies students for careers in public services, consulting companies, state or federal agencies, utilities and other professions, as well as for graduate studies in geography.

Curriculum in Geography (GEOG)

FR	F	S		F	S
ENGL	1100	1120	English Composition I & II	3	3
MATH	1610		Calculus I	4	**
			Core Social Science	**	3
			Core History	3	**
			Core Humanities Philosophy ²	**	3
COMM		1000	Public Speaking	**	3
			Foreign Language	4	4
				14	16

SO

			Core Literature	3	**
			Core Science ⁴	4	4
			Core Fine Arts	3	**
			Core Social Science or Humanities ³	**	3
GEOG	1010		Global Geography	3	**
			Core Social Science	**	3
STAT		2510 or 2010	Stat. Biol. & Health Sci. or Stat. Beh. & Soc. Sci.	**	3
GEOG	2010		Cultural Geography	3	**
GEOG	2020		Physical Geography	**	3
				16	16

JR					
GEOG	3810		Cart and Graphics	4	**
GEOG	5830		GIS	**	4
			GEOG Elective	3	3
			Social Science Elective	3	**
COMP		1000	Personal Computer Applications ⁵	**	2
			Electives	5	6
				15	15

SR					
GEOG	5820		Remote Sensing	4	**
			GEOG Elective	6	6
			Electives	4	8
UNIV		4AA0	SM1 Undergraduate Graduation	**	0
				14	14

TOTAL HOURS — 120

- Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- CORE Science Sequences: BIOL 1020 – 1030, CHEM 1030/1031 – 1040/1041, CHEM1110/1111 – CHEM1120/1121, GEOL 1100 – 1110, PHYS 1500 – 1510, PHYS 1600 – 1610.
- Elective hours may be substituted upon passing the COMP 1AA0 placement test. See the Computer Science and Engineering Dept. for details.

Geology

This curriculum provides a background in the geosciences and opportunity to specialize in an area of interest (i.e., environmental geology, paleontology) through elective major or related courses. It is designed for those interested in preparation for graduate studies or employment in the field of geology.

Curriculum in Geology (GEOL)

FR	F	S		F	S
CHEM	1030	1040	Fundamentals of Chemistry I & II	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab	1	1
			Core History I & II	3	3
ENGL	1100	1120	English Composition I & II	3	3
GEOL	1100		Physical Geology	4	**
GEOL	1110		Historical Geology	**	4
				14	14

SO					
BIOL	1020		Principles of Biology and Lab (1021)	4	**
BIOL		1030	Organismal Biology and Lab (1031)	**	4
MATH	1610	1620	Calculus I & II	4	4
			World Literature I	3	**
GEOL	2010		Min & Opt Cryst	5	**
GEOL	2050		Ign & Met Petrol	**	4
			Elective	**	3
				16	15

JR					
PHYS	1500	1510	General Physics I & II	4	4
			Core Social Science	**	3
			Core Fine Arts	3	**
			Technical Elective ¹	3	**
GEOL	3200		Principle Paleontology	3	**
GEOL	3400		Structural Geology	**	4
			GEOL Elective ¹	3	4
				16	15

SUMMER					
GEOL	3650		Field Camp	6	
SR					
PHIL	1010 or 1020		Intro to Logic or Intro to Ethics	3	**
ECON		2020	Microeconomics	**	3
			Core Humanities Philosophy ²	**	3
			Technical Elective ¹	4	**
GEOL	4010		Sed Petrol	3	**
GEOL	4110		Stratigraphy	**	3
GEOL	4740		Geology Senior Seminar	**	1
			GEOL Elective ¹	4	3
			Elective	3	3
UNIV		4AA0	SM1 Undergraduate Graduation	**	0
				14	16

TOTAL HOURS — 126

- ¹ See list of approved Technical and Geology electives.
² Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.

Clinical Laboratory Sciences

The Division of Clinical Laboratory Sciences has two curricula leading to the degree of bachelor of science in laboratory technology or bachelor of science in medical technology. These curricula prepare students for medical laboratory careers in fields such as public health, bacteriology, environmental testing, industrial quality control, research and forensic science. Graduates may choose to qualify as certified medical technologists, which is accomplished by successfully completing a 12-month training period (rotating hospital internship) in an accredited school of medical technology and passing a national certifying examination.

Curriculum in Laboratory Technology (LABT)

FR	F	S		F	S
BIOL		1020	Principles of Biology and Lab (1021).....	**	4
ENGL	1100	1120	English Composition I & II.....	3	3
HIST	1010	1020	World History I & II.....	3	3
MATH	1610		Calculus I.....	4	**
CHEM	1110	1120	Gen. Chem. for Scientists & Engineers I & II.....	3	3
CHEM	1111	1121	Gen. Chem. Lab for Scientists & Engineers I & II.....	1	1
LABT	1010		Orientation.....	1	**
STAT		2510	Statistics for Biology & Health Sciences.....	**	3
				15	17
SO					
			Core Literature I & II.....	3	3
			Ethics & the Health Sciences.....	3	**
PHIL	1030		Human Anatomy & Physiology I & II.....	4	4
BIOL	2500	2510	Human Anatomy & Physiology I & II.....	4	4
BIOL		3200	General Microbiology.....	**	4
CHEM	2070	2080	Organic Chemistry I & II.....	3	3
CHEM	2071	2081	Organic Chemistry Lab I & II.....	1	1
				14	15
JR					
			Core Fine Arts.....	**	3
			Core Social Science.....	**	3
BIOL	4200		Clinical Microbiology.....	4	**
BIOL		3000	Genetics.....	**	4
BCHE		5180	Biochemistry I.....	**	3
LABT	4010		Hematology.....	5	**
CHEM	3050		Analytical Chemistry.....	3	**
CHEM	3051		Analytical Chemistry Lab.....	1	**
			Electives.....	3	3
				16	16
SR					
			Core Social Science.....	3	**
			Technical Electives ²	6	4
LABT	**	4250	Clinical Biochemistry Instrument.....	**	4
BIOL	5500		Immunology.....	3	**
BIOL	5501		Immunology Lab.....	2	**
LABT		4050	Clinical Immunohematology/Parasit.....	**	5
UNIV		4AA0	SM1 Undergraduate Graduation.....	**	0
				14	13

TOTAL HOURS — 120

- ¹ CHEM 1030/1031 and 1040/1041 sequence can substitute for CHEM 1110/1111 and 1120/1121. See advisor for details.
² See approved list of Tech Electives.

Curriculum in Medical Technology (MEDT)

FR	F	S		F	S
BIOL		1020	Principles of Biology and Lab (1021).....	**	4
ENGL	1100	1120	English Composition I & II.....	3	3
HIST	1010	1020	World History I & II.....	3	3
MATH	1610		Calculus I.....	4	**
CHEM	1110	1120	Gen. Chem. for Scientists & Engineers I & II.....	3	3
CHEM	1111	1121	Gen. Chem. Lab for Scientists & Engineers I & II.....	1	1
LABT	1010		Orientation.....	1	**
			Elective.....	**	3
				15	17
SO					
			Core Literature I.....	**	3
			Ethics & the Health Sciences.....	3	**
PHYS	1500		General Physics I.....	4	**
			Core Social Science.....	**	3
BIOL	2500	2510	Human Anatomy & Physiology I & II.....	4	4
CHEM	2070	2080	Organic Chemistry I & II.....	3	3
CHEM	2071	2081	Organic Chemistry Lab I & II.....	1	1
				15	14
JR					
			Core Literature II.....	**	3
			Core Fine Arts.....	**	3
BCHE	5180	5190	Biochemistry I & II.....	3	3
STAT	2510		Statistics for Biology & Health Sciences.....	3	3
BIOL	3000		Genetics.....	**	4

BIOL	3200	General Microbiology.....	**	4
CHEM	3050	Analytical Chemistry.....	3	**
CHEM	3051	Analytical Chemistry Lab.....	1	**
			14	13
SR				
		Core Social Science.....	**	3
BIOL	4200	Clinical Microbiology.....	4	**
BIOL	5500	Immunology.....	3	**
BIOL	5501	Immunology Lab.....	2	**
LABT	4010	Hematology.....	5	**
LABT	4050	Clinical Immunohematology/Parasit.....	**	5
LABT	4250	Clinical Biochemistry/Instrument.....	**	4
		Elective.....	**	3
UNIV	4AA0	SM1 Undergraduate Graduation.....	**	0
			14	15

PROFESSIONAL YEAR

Degree is granted upon successful completion of a clinical internship at an approved school of medical technology affiliated with Auburn University. Clinical Internship - 22 hrs.

TOTAL HOURS — 139

- ¹ CHEM 1030/1031 and 1040/1041 sequence can substitute for CHEM 1110/1111 and 1120/1121. See advisor for details.

Department of Mathematics and Statistics

The Department of Mathematics and Statistics offers degree curricula in mathematics and in applied mathematics (with its various options), as well as minors and a minor in statistics. Majors acquire a firm foundation in mathematics preparing them for further study, or for careers in mathematics or statistics, and related fields. For a minor in MATH or STAT see the "Minors" heading earlier in this section.

Mathematics

This curriculum provides students with a general background in Mathematics preparing them for graduate studies in Mathematics, or careers that require mathematical knowledge and problem solving skills, and is well suited for students who wish to pursue career in teaching Mathematics in a university/college, or who desire more flexibility or emphasis in liberal arts.

Curriculum in Mathematics (MATH)

FR	F	S		F	S
ENGL	1100	1120	English Composition I & II.....	3	3
			Core Science ⁶	4	4
			Core Humanities (Philosophy) ⁴	3	**
			Core History.....	3	**
			Core History or Literature ¹	**	3
MATH	1610	1620	Calculus I & II.....	4	4
COMP		1200	Computer Science.....	**	2
				17	16
SO					
			Core Literature.....	3	**
			Core Social Science ²	3	**
			Core Social Science or Humanities ³	**	3
			Calculus III.....	4	**
MATH	2630		Linear Differential Equations.....	**	3
MATH	2660		Topics in Linear Algebra.....	3	**
MATH		3100	Introduction to Advanced Math.....	**	3
STAT		3600	Probability & Statistics.....	**	3
			Elective.....	3	3
				16	15

JR					
			Core Fine Arts.....	**	3
			Core Social Science ²	3	**
			Foreign Language ⁵	4	4
MATH	5200	5210	Analysis I & II.....	3	3
MATH	5310	5320	Introduction to Abstract Algebra I & II.....	3	3
			Elective.....	3	3
				16	16
SR					
			Applied Math Elective ⁸	3	**
MATH	5500		Introduction to Topology.....	3	**
			Math Elective ⁷	3	9
			Elective.....	3	3
UNIV		4AA0	SM1 Undergraduate Graduation.....	**	0
				12	12

TOTAL HOURS - 120

- ¹ Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
² Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
³ If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
⁴ Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
⁵ FOREIGN LANGUAGE: 1010-1020 series in French, Greek, German, Italian, Latin, Japanese, Russian, or Spanish.

College of Sciences and Mathematics

- 6 CORE SCIENCE: PHYS 1600-1610, BIOL 1020-1030, CHEM 1030-1040 with labs, or GEOL 1100-1110.
- 7 Math Requisite: Courses designated MATH or STAT at the level of 3000 or higher, no more than one 3000-level course. Subject to advisor's approval.
- 8 Applied Math Requisite: MATH 5630, 5640, 5670, or 5000.

Applied Mathematics

The Department of Mathematics and Statistics offers three options in the field of Applied Mathematics. The option in Applied Mathematics is suitable for students who are preparing for graduate work in mathematics, or applied mathematics, as well as for those anticipating careers which are supported by significant applied mathematics such as engineering, physical sciences, or computer science, and the more recently mathematicized fields of biological, behavioral, or managerial sciences.

The option in Discrete Mathematics prepares students for graduate work in mathematics or theoretical computer science, and for careers in industry supported by discrete mathematics dealing with problems in graph theory, operations research, discrete optimization, computer science, communications and information sciences.

The option in Actuarial Science prepares students for a career in the insurance industry and in other businesses relying on the expertise of actuaries, but is at the same time flexible enough to allow its graduates to enter graduate programs in mathematics and related areas.

Students should consult the departmental advisor to determine appropriate technical electives for the emphasis of their choice.

Option in Applied Mathematics (AMTH)				
FR	F	S	F	S
ENGL	1100	1120	English Composition I & II.....	3 3
			Core Humanities (Philosophy)4.....	3 **
			Core Science5.....	4 4
			Core History or Literature1.....	** 3
			Core History.....	3 **
MATH	1610	1620	Calculus I & II.....	4 4
COMP		1200	Computer Science.....	** 2
				17 16
SO			Core Literature.....	3 **
			Core Social Science2.....	3 **
			Core Social Science or Humanities3.....	** 3
MATH	2630		Calculus III.....	4 **
MATH		2650	Linear Differential Equations.....	** 3
MATH	2660		Topics in Linear Algebra.....	3 **
MATH		3100	Introduction to Advanced Math.....	** 3
STAT		3600	Probability & Statistics I.....	** 3
			Interdisciplinary Elective6.....	3 3
				16 15
JR			Core Fine Arts.....	** 3
			Core Social Science2.....	3 **
MATH	5200	5210	Analysis I & II.....	3 3
MATH	5630	5640	Numerical Analysis I & II.....	3 3
			Interdisciplinary Elective6.....	3 3
			Electives.....	4 4
				16 16
SR			Math Modeling.....	3 **
MATH	5000		Probability & Stochastic Proc I.....	3 **
MATH	5670		Math Elective6.....	3 9
			Interdisciplinary Elective6.....	** 3
			Elective.....	** 3
UNIV		4AA0	SM1 Undergraduate Graduation.....	** 0
				12 12

TOTAL HOURS - 120

- 1 Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- 2 Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- 3 If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- 4 Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- 5 Core Science: One of the sequences PHYS 1600/1610, BIOL 1020 /1030, CHEM 1030/1040 with labs, or GEOL 1100/1110.
- 6 Guidelines for Math Elective and Interdisciplinary Elective are on the back of this sheet.

Option in Applied Discrete Mathematics (ADSM)				
FR	F	S	F	S
ENGL	1100	1120	English Composition I & II.....	3 3
			Core Science5.....	4 4
			Core History.....	** 3
			Core History or Literature1.....	** 3
			Core Humanities (Philosophy) 4.....	3 **
COMP		1200	Introduction to Computer Engr. & Sci.....	** 2
MATH	1610	1620	Calculus I & II.....	4 4
				17 16

SO			Core Literature.....	3 **
			Core Social Science2.....	3 **
			Core Social Science or Humanities3.....	** 3
COMP	2000		Programming with HTML & Java.....	3 **
COMP		3000	Object Oriented Program Engr. & Sci.....	** 3
MATH	2660		Topics in Linear Algebra.....	3 **
MATH		3710	Discrete Math.....	** 3
MATH		2630	Calculus III.....	4 **
MATH		2650	Linear Differential Equations.....	** 3
STAT		3600	Probability & Statistics I.....	** 3
				16 15
JR			Core Social Science2.....	3 **
			Core Fine Arts.....	** 3
MATH	5750		Graph Theory.....	3 **
MATH		5330	Computational Algebra.....	** 3
MATH		5310	Algebra I.....	3 **
			Analysis Elective6.....	** 3
			Elective.....	4 4
			Interdisciplinary Elective6.....	3 3
				16 16
SR			Algebra/Linear Algebra Elective6.....	3 **
			Discrete Math Electives6.....	6 3
			Elective.....	** 3
			Interdisciplinary Elective6.....	3 **
			Math Elective6.....	** 6
UNIV		4AA0	SM1 Undergraduate Graduation.....	** 0
				12 12

TOTAL HOURS - 120

- 1 Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- 2 Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- 3 If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- 4 Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- 5 Core Science: One of the sequences PHYS 1600/1610, BIOL 1020 /1030, CHEM 1030/1040 with labs, or GEOL 1100/1110.
- 6 Guidelines for Discrete Math electives, Math Electives, Applied Analysis Elective, Algebra/Linear Algebra Elective and Interdisciplinary Electives are on the back of this sheet.

Option in Actuarial Science (ACTU)

FR	F	S	F	S
ENGL	1100	1120	English Composition I & II.....	3 3
			Core Science5.....	4 4
			Core History.....	3 **
			Core History or Literature1.....	** 3
			Core Humanities (Philosophy) 4.....	3 **
COMP		1200	Introduction to Computer Engr. & Sci.....	** 2
MATH	1610	1620	Calculus I & II.....	4 4
				17 16
SO			Core Literature.....	3 **
			Core Social Science or Humanities3.....	** 3
ECON	2020	2030	Prin. of Microeconomics & Macroeconomics.....	3 3
ACCT	2910		Fundamentals of Accounting.....	3 **
MATH		2790	Mathematics of Interest Theory.....	** 3
MATH		2630	Calculus III.....	4 **
MATH		2650	Linear Differential Equations.....	** 3
MATH		2660	Topics in Linear Algebra.....	3 **
MATH		3100	Introduction to Advanced Math.....	** 3
				16 15
JR			Core Social Science2.....	3 **
			Core Fine Arts.....	3 **
FINC		3610	Principles of Business Finance.....	** 3
			Statistics Requisite7.....	** 3
STAT		3600	Probability & Stats I.....	3 **
MATH		4820	Actuarial Seminar Probability.....	** 3
MATH		4790	Actuarial Seminar Finance.....	3 **
			Math Elective6.....	** 3
			Electives.....	4 4
				16 16
SR			Advanced Business Finance.....	3 **
FINC	3630		Modeling.....	3 **
MATH	5000		Actuarial Mathematics I & II.....	3 3
MATH	5800	5810	Math Elective6.....	** 6
			Electives.....	3 3
UNIV		4AA0	SM1 Undergraduate Graduation.....	** 0
				12 12

TOTAL HOURS - 120

- 1 Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- 2 Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.

- ³ If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- ⁴ Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- ⁵ Core Science: One of the sequences PHYS 1600/1610, BIOL 1020 /1030, CHEM 1030/1040 with labs, or GEOL 1100/1110.
- ⁶ MATH or STAT courses at the 3000 level or higher; no more than one 3000-level course. Subject to advisor's approval.
- ⁷ Any course that will serve as the statistics prerequisite for FINC-3630. See advisor for approved courses, currently STAT 2610 or 3610.

Microbial, Cellular and Molecular Biology

The Microbial, Cellular and Molecular Biology major provides students with an excellent foundation in the areas of microbiology, cellular and molecular biology that emphasizes the understanding of life at the cellular and molecular level. The choice of a formal option within the major allows students to concentrate on a particular area of interest. Each option provides a wide variety of courses and opportunities for undergraduate research. Students selecting the Microbiology option will be well prepared for postgraduate work or career advancement in a number of areas including food, environmental and medical microbiology. Students selecting the Cell and Molecular Biology option would also be well prepared for postgraduate study or career advancement in any area of eukaryotic cell or molecular biology. Both options provide excellent preparation for students interested in biotechnology or professional programs in the health sciences.

Microbial, Cellular & Molecular Biology Microbiology Option (MCMB)

FR	F	S		F	S
BIOL	1020		Principles of Biology and Lab (1021).....	4	**
BIOL		1030	Organismal Biology and Lab (1031).....	**	4
ENGL	1100	1120	English Composition I & II.....	3	3
CHEM	1030	1040	Fundamentals of Chemistry I & II.....	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab.....	1	1
MATH	1610	1620	Calculus I & II.....	4	4
				15	15
SO					
			Core Literature	3	**
			Core History	**	3
PHYS	1500	1510	General Physics I & II	4	4
CHEM	2070	2080	Organic Chemistry I & II.....	3	3
CHEM	2071	2081	Organic Chemistry I & II Lab.....	1	1
BIOL	3000		Genetics	4	**
BIOL		3200	General Microbiology	**	4
				15	15
JR					
			Core Social Science or Humanities ³	**	3
			Core Fine Arts	**	3
			Core History or Lit ¹	3	**
BIOL	4100		Cell Biology	**	3
BIOL	4101		Cell Biology Lab	2	**
			CMBL Elective⁵	3	**
BIOL		5220	Introduction to Molecular Genetics	**	3
BIOL		5521	Gene Expression & Rec DNA Lab	**	2
BCHE	5180	5190	Biochemistry I & II	3	3
BCHE	5181		Biochemistry I Lab	1	**
			Elective.....	**	2
				15	16
SR					
			Core Social Science ²	3	3
			Core Humanities (Philosophy) ⁴	3	**
			Core Social Science ²	**	3
BIOL	4100		Cell Biology	**	3
BCHE	5180	5190	Biochemistry I & II	3	3
BCHE	5181		Biochemistry I Lab	1	**
BIOL	4200		Clinical Micro	4	**
BIOL	5260		Prokaryotic Mol. Gene	3	**
BIOL		5521	Recombinant DNA Lab	**	2
			Electives.....	2	2
				14	16
SR					
			Core Social Science or Humanities ³	3	**
			Core Humanities (Philosophy) ⁴	3	**
			Core Social Science ²	**	3
BIOL	5250		Micro. Evo. & Diversity	4	**
BIOL	4950		Undergraduate Seminar	**	1
BIOL	5210		Microb. Phys.	**	3
			MICR Electives⁵	6	3
			MCMB/MCCM Electives⁵	**	6
UNIV	4AA0		SM1 Undergraduate Graduation	**	0
				16	16

TOTAL HOURS - 122

- ¹ Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
 - ² Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
 - ³ If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
 - ⁴ Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
 - ⁵ Core Science: One of the sequences PHYS 1600/1610, BIOL 1020 /1030, CHEM 1030/1040 with labs, or GEOL 1100/1110.
- Students either pass the computer competency test or take COMP 1000 as one of their electives.
Biology Electives: See advisor for approved course listing.

Microbial, Cellular & Molecular Biology Cell & Molecular Biology Option: (MCCM)

FR	F	S		F	S
BIOL	1020		Principles of Biology and Lab (1021).....	4	**
BIOL		1030	Organismal Biology and Lab (1031).....	**	4
ENGL	1100	1120	English Composition I & II.....	3	3
CHEM	1030	1040	Fundamentals of Chemistry I & II.....	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab.....	1	1
MATH	1610	1620	Calculus I & II.....	4	4
				15	15
SO					
			Core Literature	3	**
			Core History	**	3
PHYS	1500	1510	General Physics I & II	4	4
CHEM	2070	2080	Organic Chemistry I & II.....	3	3
CHEM	2071	2081	Organic Chemistry I & II Lab.....	1	1
BIOL	3000		Genetics	4	**
BIOL		3200	General Microbiology	**	4
				15	15
JR					
			Core Social Science or Humanities ³	**	3
			Core Fine Arts	**	3
			Core History or Literature ¹	3	**
BIOL	4100		Cell Biology	**	3
BIOL	4101		Cell Biology Lab	2	**
			CMBL Elective⁵	3	**
BIOL		5220	Introduction to Molecular Genetics	**	3
BIOL		5521	Gene Expression & Rec DNA Lab	**	2
BCHE	5180	5190	Biochemistry I & II	3	3
BCHE	5181		Biochemistry I Lab	1	**
			Elective.....	**	2
				15	16
SR					
			Core Social Science ²	3	3
			Evolution Elective⁵	3	**
			CMBL Elective⁵	3	3
BIOL	4950		Undergraduate Seminar	**	1
			Biodiversity Electives	3	**
			Physiology Electives	**	3
			MCMB Electives	**	6
			Core Humanities (Philosophy) ⁴	3	**
UNIV	4AA0		SM1 Undergraduate Graduation	**	0
				15	16

TOTAL HOURS - 122

- ¹ Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- ² Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- ³ If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- ⁴ Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- ⁵ Approved Biology electives are on the back of this sheet.

Physics

Physics majors acquire a firm foundation for careers in physics and related fields and excellent preparation for further study. Through the judicious use of electives, this curriculum provides not only a thorough understanding of physics, but also the ability to solve problems in other fields of interest to the student.

Curriculum in Physics (PHYS)

FR	F	S		F	S
ENGL	1100	1120	English Composition I & II.....	3	3
MATH	1610	1620	Calculus I & II OR	4	4
MATH	1710	1720	Calc Eng. Science I & II		
PHYS	1607	1617	Honors Physics I & II OR	4	4
PHYS	1600	1610	Engineering Physics I & II OR		
			Core Humanities (Philosophy) ²	**	3
			Core Fine Arts	3	**
				14	14
SO					
			Core Literature	3	3
COMM	1000		Public Speaking.....	3	**
			Core History I & II.....	3	3
MATH	2630/2730		Calculus III or Calc. Eng. Science III	4	**
MATH		2650	Differential Equations	**	3
PHYS	2200		Intro. Quantum Physics & Relativity	3	**
PHYS		2300	Physics Laboratory Skills	**	2
PHYS		2100	Intermediate Mechanics	**	3
				16	14

College of Sciences and Mathematics

- 1 Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- 2 Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- 3 If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- 4 Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- 5 See list of approved Biology electives.

Zoology/Ecology, Evolution & Behavior Track (ZOOL, ECEB)

FR	F	S		F	S
BIOL	1020		Principles of Biology and Lab (1021).....	4	**
BIOL		1030	Organismal Biology and Lab (1031).....	**	4
CHEM	1030	1040	Fundamentals of Chemistry I & II.....	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab.....	1	1
ENGL	1100	1120	English Composition I & II.....	3	3
MATH	1610	1620	Calculus I & II.....	4	4
			Core Social Science ²	**	3
				15	18
SO			Core History	3	**
			Core Fine Arts	3	**
			Core History or Literature ¹	**	3
			Core Social Science ²	**	3
			Core Humanities (Philosophy) ⁴	3	**
			Core Literature	3	**
BIOL		3000	Genetics	**	4
CHEM	2070		Organic Chemistry.....	3	**
STAT		3010	Stats for Eng. & Sci.	**	3
PHYS		1500	General Physics	**	4
				15	17
JR			Undergraduate Seminar	1	**
BIOL	4950		Cell Biology	3	**
BIOL	4100		Evolution & Systematics	**	3
BIOL	3060	3030	Ecology	**	4
BIOL	4020		Vertebrate Biodiversity	4	**
BIOL		5240	Animal Physiology*	**	4
BIOL	4010		Invert Biodiversity	4	**
			Elective.....	**	5
				12	16
SR			Core Social Science or Humanities ³	3	**
BIOL	5650		Ethology	**	4
BIOL		5140	Plant Ecology	**	4
			Ecology Elective⁵	3	**
			Anat/Cell Phys Elective⁵	4	3
			Diversity Elective⁵	4	4
UNIV	4AA0		SM1 Undergraduate Graduation	**	0
				14	15

TOTAL HOURS - 122

- 1 Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- 2 Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- 3 If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- 4 Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- 5 See list of approved Biology elective.

Curriculum in Marine Biology (MARB)

FR	F	S		F	S
BIOL	1020		Principles of Biology and Lab (1021).....	4	**
BIOL		1030	Organismal Biology and Lab (1031).....	**	4
ENGL	1100	1120	English Composition I & II.....	3	3
			Core Social Science ²	**	3
MATH	1610		Calculus I.....	4	**
CHEM	1030	1040	Fundamentals of Chemistry I & II.....	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab.....	1	1
				15	14
SO			Core Literature	3	**
PHYS	1500	1510	General Physics I & II	4	4
			Core History	3	**
BIOL		3000	Genetics	4	**
BIOL		3060	Ecology	**	4
CHEM		2030	Survey of Organic Chem.	**	3
				14	14
			SUMMER MARINE LAB⁶	8	**
JR			Core History or Literature ¹	3	**
BIOL	3030		Evolution & System	3	**
BIOL	4010		Invert. Biodiversity	4	**
BIOL		3200	General Microbiology	**	4
BIOL		4100	Cell Biology	**	3

STAT	2510	Statistics for Biol/Health	**	3
BCHE	3200	Core Social Science or Humanities ³	**	3
		Prin. Of Biochemistry.....	3	**
			13	13
		SUMMER MARINE LAB⁶	8	**
SR		Core Humanities (Philosophy) ⁴	3	**
		Core Fine Arts	3	**
		BIOL Physiology Elective⁵	4	**
		BIOL Ecology & Evol. Elective⁵	3	**
BIOL	4950	Undergraduate Seminar	**	1
		Biology Elective⁵	**	3
		Molecular Biology Elective⁵	**	3
		Core Social Science ²	**	3
UNIV	4AA0	SM1 Undergraduate Graduation	**	0
			13	10

TOTAL HOURS - 122

- 1 Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- 2 Students who complete a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- 3 If a LIT sequence is chosen, this course must be a CORE SOCIAL SCIENCE. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- 4 Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- 5 See list of approved Biology electives.
- 6 All courses taken at a Summer Marine Lab must receive departmental approval.

Curriculum in Biomedical Sciences

FR	F	S		F	S
ENGL	1100	1120	English Composition I & II.....	3	3
MATH	1610		Calculus I.....	4	**
			Core History I	**	3
CHEM	1030	1040	Fundamental Chemistry I & II.....	3	3
CHEM	1031	1042	Fundamental Chemistry I & II Lab.....	1	1
SCMH	1890		Prehealth Orientation	1	**
BIOL	1020		Principles of Biology and Lab (1021)	4	**
BIOL	1030		Organismal Biology and Lab (1031)*	**	4
				16	14
SO			General Physics I & II	4	4
PHYS	1500	1510	Core Literature	3	**
			Core History II.....	3	**
CHEM	2070	2080	Organic Chemistry I & II	3	3
CHEM	2071	2081	Organic Chemistry I & II Lab	1	1
COMM	1000		Public Speaking.....	**	3
BIOL	3000		Genetics	**	4
				14	15
JR			Ethics & the Health Sciences	**	3
PHIL	1030		Introduction to Psychology	3	**
PSYC	2010		Core Fine Arts	3	**
STAT	2510		Statistics for Biology & LS	3	**
			Major (Prof. Elec)	**	4
BIOL	3200		Microbiology	4	**
BIOL	4100		Cell Biology	**	3
BIOL	4101		Cell Biology Lab	**	2
			Core Social Science.....	**	3
				13	15
SR			Biochemistry I & II	3	3
BCHE	5180	5190	Comparative Anatomy OR BIOL 4000 Histology	**	4
BIOL		3010	Vertebrate Development	5	**
BIOL	4410		Immunology	3	**
BIOL	5500		Mammalian Physiology	**	6
BIOL		4980	Undergraduate Research	**	2
			Electives	4	3
UNIV	4AA0		SM1 Undergraduate Graduation	**	0
				15	18

TOTAL HOURS - 120

Options for courses labeled CORE are in the Auburn University *Bulletin*, under Core Curriculum.
 * The Chemistry 1110/1111-1120/1121 sequence can substitute for CHEM1030/1031-1040/1041. See advisor.

Pre-Health Professional Curricula

Pre-health professional curricula are offered in pre-dentistry, pre-medicine, pre-optometry, pre-physical therapy, pre-pharmacy and pre-veterinary medicine. Advisors are available to guide the students concerning admissions requirements to the professional schools. The department in which students major will advise them where applicable. Completion of these curricula does not assure admission to a professional school. Competition for admission to professional schools is keen; the number of qualified applicants exceeds the number of places available.

Pre-Dentistry and Pre-Medicine

These programs are designed to prepare students for medical and dental schools and lead to a bachelor of science in one of several majors offered through the college. The requirements are very exacting and demand high scholastic competence and performance.

Most American dental and medical schools recommend that applicants have two semesters of freshman biology, general chemistry, organic chemistry, and physics with labs; (2) breadth in the educational experience; and (3) in-depth experience in a single discipline. Auburn University students complete these recommendations by enrolling in a core of courses shown in the curriculum model below. Each student also declares a major; the most common majors selected by students in the College of Sciences and Mathematics are biomedical sciences, chemistry, microbiology, physics and zoology. Students should confer with the COSAM pre-health advisors for specific course requirements since these can vary from school to school. Students may choose to major in a curriculum in another college or school, but they should meet with the Director of Pre-Health Programs for assistance with preparing to apply.

Early in the junior year, students should attend the mandatory meetings concerning the application process that are conducted by the chairman of the Premedical Professions Advisory Committee (PPAC). Also, students in pre-dentistry or pre-medicine should take the Dental Admission Test or the Medical College Admission Test at least a year before the date of entry to professional school and submit applications to the professional schools of their choice at that time.

Curriculum in Pre-Dentistry and Pre-Medicine

FR	F	S		F	S
ENGL	1100	1120	English Composition I & II	3	3
MATH	1610		Calculus I.....	4	**
HIST		1010	Core History I	**	3
CHEM	1030	1040	Fundamentals of Chemistry I & II.....	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab.....	1	1
SCMH	1890		Pre-Health Orientation.....	1	**
BIOL	1020		Principles of Biology and Lab (1021)	4	**
BIOL		1030	Organismal Biology and Lab (1031)	**	4
				16	14
SO					
PHYS	1500	1510	General Physics I & II	4	4
			Core History II.....	3	**
			Core Literature	3	**
CHEM	2070	2080	Organic Chemistry I & II.....	3	3
CHEM	2071	2081	Organic Chemistry I & II Lab.....	1	1
COMM	1000		Public Speaking.....	**	3
BIOL		3000	Genetics	**	4
				14	15
JR					
			Core Social Science.....	**	3
PHIL		1030	Ethics & the Health Sciences	**	3
PSYC	2010		Introduction to Psychology	3	**
			Core Fine Arts	**	3
STAT	2510		Statistics for Biology & Life Sciences	3	**
BIOL	3200		Microbiology	4	**
BIOL		4101	Cell Biology Lab	**	2
BIOL		4100	Cell Biology.....	**	3
BIOL		4410	Vertebrate Development	**	5
				15	14

At the end of the sophomore year, or in the fall of the junior year, the student must declare a major.

¹ The Chemistry 1110/1111-1120/1121 sequence can substitute for CHEM1030/1031-1040/1041. See advisor for details.

² Students who complete a HIST sequence other than HIST 1010 and 1020 should see an advisor for CORE SOC SCI choices.

Pre-Optometry

This program leads to a bachelor of science and prepares students for the rigorous demands of American optometry schools.

Students must select a major; the most common majors selected by students in the College of Sciences and Mathematics are biomedical sciences, chemistry, microbiology, physics and zoology. Students should confer with advisors in the college for specific course requirements since these can vary from school to school. Students may also choose to major in a curriculum in another college or school, but should work with the Director of Pre-Health Programs in COSAM for assistance with preparing to apply.

Pre-optometry students should review the websites of the optometry schools of their choice during the freshman year and determine any special admission requirements of those schools. The prerequisite courses for most

U.S. optometry schools are listed in the curriculum model below, either as required courses or as electives. Early in the junior year, students should attend the mandatory meetings concerning the application process that are conducted by the chairman of the Premedical Professions Advisory Committee (PPAC). Students should take the Optometry Admission Test and complete an official application for admission to the optometry schools of their choice about a year in advance of the expected date of matriculation.

Curriculum in Pre-Optometry (POPT)

FR	F	S		F	S
ENGL	1100	1120	English Composition I & II	3	3
MATH	1610		Calculus I.....	4	**
			Core History I	**	3
CHEM	1030	1040	Fundamentals of Chemistry I & II.....	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab.....	1	1
SCMH	1890		Pre-Health Orientation.....	1	**
BIOL	1020		Principles of Biology and Lab (1021)	4	**
BIOL		1030	Organismal Biology and Lab (1031)	**	4
				16	14
SO					
PHYS	1500	1510	General Physics I & II	4	4
			Core History II.....	3	**
			Core Literature	3	**
CHEM	2070	2080	Organic Chemistry I & II.....	3	3
CHEM	2071	2081	Organic Chemistry I & II Lab.....	1	1
COMM	1000		Public Speaking.....	**	3
BIOL		3000	Genetics	**	4
				14	15
JR					
			Core Social Science.....	**	3
PHIL		1030	Ethics & the Health Sciences	**	3
PSYC	2010		Introduction to Psychology	3	**
			Core Fine Arts	**	3
STAT	2510		Statistics for Biology & Life Sciences	3	**
BIOL	3200		Microbiology	4	**
BIOL		4101	Cell Biology Lab	**	2
BIOL		4100	Cell Biology.....	**	3
BIOL		4410	Vertebrate Development	**	5
				15	14

At the end of the sophomore year, or in the fall of the junior year, the student must declare a major.

¹ The Chemistry 1110/1111-1120/1121 sequence can substitute for CHEM1030/1031-1040/1041. See advisor for details.

² Students who complete a HIST sequence other than HIST 1010 and 1020 should see an advisor for CORE SOC SCI choices.

Pre-Physical Therapy

This program prepares students applying to schools of physical therapy at the master's or doctoral level and leads to a bachelor's degree in one of the majors offered in the College of Sciences and Mathematics or another college. The most common majors selected by students in the College of Sciences and Mathematics are biomedical sciences, chemistry, microbiology, physics and zoology. Students should confer with the COSAM pre-health advisors for specific course requirements since these can vary from school to school. Students may also choose to major in a curriculum in another college or school, but they should meet with the Director of Pre-Health Programs in COSAM for information about the application process. Students should review the websites of the schools of their choice during the freshman year to determine any special admission requirements of those schools.

Curriculum in Pre-Physical Therapy (PPHS)

FR	F	S		F	S
ENGL	1100	1120	English Composition I & II	3	3
MATH	1610		Calculus I.....	4	**
			Core History I	**	3
CHEM	1030	1040	Fundamentals of Chemistry I & II.....	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab.....	1	1
SCMH	1890		Pre-Health Orientation.....	1	**
BIOL	1020		Principles of Biology.....	4	**
BIOL		1030	Organismal Biology	**	4
				16	14
SO					
PHYS	1500	1510	General Physics I & II	4	4
			Core History II.....	3	**
			Core Literature	3	**
PSYC		2010	Introduction to Psychology	**	3
			Core Social Science.....	**	3
CHEM	2070		Organic Chemistry I	3	**
CHEM	2071		Organic Chemistry I Lab.....	1	**
COMM	1000		Public Speaking.....	3	**
BIOL		3000	Genetics	**	4
				17	14

JR					
PHIL	1030	Ethics & Health Sciences	**	3	
		Core Fine Arts	**	3	
STAT	2510	Statistics	**	3	
PSYC	2120	Developmental Psychology	**	3	
BIOL	2500	Anatomy & Physiology I & II.....	4	4	
BIOL	3200	Microbiology	4	**	
		Psychology Elective	**	3	
				17	10

At the end of the sophomore year, or in the fall of the junior year, the student must declare a major.

¹ The Chemistry 1110/1111-1120/1121 sequence can substitute for CHEM1030/1031-1040/1041. See advisor for details.

² Students who complete a HIST sequence other than HIST 1010 and 1020 should see an advisor for CORE SOC SCI choices.

Pre-Pharmacy

This program meets the requirements for admission to the Auburn University Harrison School of Pharmacy, which is fully accredited by the American Council on Pharmaceutical Education. Complete information about the professional curriculum in pharmacy may be found in the Harrison School of Pharmacy section of this *Bulletin*.

To be considered for admission, the applicant must complete the course requirements listed in the curriculum model below and meet other admissions criteria set by the Harrison School of Pharmacy.

Although not required, students may want to complete an undergraduate degree before entering Pharmacy school since the majority of students admitted have a degree. Any major may be acceptable as long as the pre-pharmacy requirements are completed. The College of Sciences and Mathematics offers a major in biomedical sciences that is an excellent choice for students interested in this option. Students should confer with the COSAM pre-health advisors for specific course requirements.

Curriculum in Pre-Pharmacy (PPHR)

FR	F	S		F	S
			Core History I	3	**
MATH	1610		Calculus I	4	**
ENGL	1100	1120	English Composition I & II.....	3	3
CHEM	1030	1040	Fundamentals of Chemistry I & II.....	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab	1	1
			Core Fine Arts	**	3
BIOL		1020	Principles of Biology and Lab (1021).....	**	4
SCMH	1890		Pre-Health Orientation.....	1	**
				15	14
SO					
			Core Literature	3	**
			Core History II	3	**
CHEM	2070		Organic Chemistry I.....	3	**
CHEM	2071		Organic Chemistry I Lab.....	1	**
CHEM		2080	Organic Chem II	**	3
CHEM		2081	Organic Chem II Lab	**	1
BIOL	2500	2510	Anatomy/Physiology I & II	4	4
			Core Soc Sci	**	3
			Core Humanities*	**	3
				14	14
SUMMER					
BIOL	3200		Microbiology	4	
STAT	2510		Statistics	3	
				7	
JR					
BIOL	5600		Mammalian Physiology	6	**
			Core Social Science	3	**
PHIL		1030	Ethics & the Health Sciences	**	3
PHYS	1500		General Physics I	4	**
BCHE		3200	Biochemistry**	**	3
BIOL		3500	Perspectives in Immunology	**	3
BIOL		3020	Genomic Biology	**	4
				13	13

TOTAL HOURS - 90

* Must be CORE ANTH, GEOG, PSYC, or SOCY
 ** Students may choose to take BCHE 5180 and 5190 to complete the Biochemistry requirement for HSOP. This choice fits well if one intends to become a biomedical sciences major.

Students who plan to finish the biomedical sciences degree must choose COMM1000.
 Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.

Pre-Veterinary Medicine

Students in the Pre-Veterinary Medicine (PVET) curriculum must select a major by the end of their sophomore year. Students in Sciences and Mathematics may select microbiology (MCMB, PVET) or zoology (ZOOL, PVET) as majors. Pre-Veterinary options in the College of Agriculture include animal sciences (ANDS, PVET) and poultry science (POUL, PVET), A pre-vet option in wildlife (WILD, PVET) sciences also exists in the School of Forestry and Wildlife Sciences. The minimum requirements for admission to the College of Veterinary Medicine at Auburn University are incorporated into the curriculum models for all of these majors.

It is possible to gain admission to the College of Veterinary Medicine by completing only the minimum requirements listed. However, it is preferable to select a major and earn a baccalaureate degree. If a student is admitted to the College of Veterinary Medicine prior to completion of the full four years, he or she may obtain a BS degree by successfully completing the first three years of some of the Pre-Veterinary curricula and the first year of veterinary school. Students should consult their advisors regarding which curricula offer this option.

Application for admission to the College of Veterinary Medicine must be submitted to the dean of that college. A minimum grade-point average of 2.5 is required for application; D grades in required courses are unacceptable. All minimum requirements, including courses repeated due to time limitations, must be completed by the end of the spring term preceding the date of admission, and all advanced required courses in physical and biological sciences (organic chemistry and physics) must have been completed within six calendar years prior to the anticipated entrance date. Competition for admission to the professional schools is keen with the number of qualified applicants exceeding the number of places available. For additional information, see College of Veterinary Medicine section and the Pre-Veterinary Medicine curricula in the College of Agriculture.

Curriculum in Pre-Veterinary Medicine (PVET)

FR	F	S		F	S
MATH		1150	Pre-Calculus Algebra & Trigonometry*	4	**
			Core History I.....	**	3
ENGL	1110	1120	English Composition I & II.....	3	3
BIOL	1020		Principles of Biology and Lab (1021).....	4	**
BIOL		1030	Organismal Biology and Lab (1031).....	**	4
CHEM	1030	1040	Fundamentals of Chemistry I & II.....	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab.....	1	1
				15	14
SO					
			CORE Social Science	3	**
			Core Literature	3	**
			Core History or Literature.....	3	**
			Core Philosophy	**	3
			Core Social Science or Hum**	**	3
CHEM	2070	2080	Organic Chemistry I & II	3	3
CHEM	2071	2081	Organic Chemistry I & II Lab	1	1
BIOL		3000	Genetics	**	4
				13	14
JR					
PHYS	1500	1510	General Physics I & II.....	4	4
			Core Social Science	**	3
BCHE	3200		Principles of Biochemistry	3	**
BIOL	3200		Microbiology	**	4
			Elective.....	3	**
ANSC		3400	Animal Nutrition	**	4
			Core Fine Arts	3	**
				13	15

TOTAL HOURS - 84

* Students must also take MATH 1610 Calculus I to receive a degree from the College of Sciences and Mathematics.

** If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE Humanities.

College of Sciences and Mathematics

**Curriculum in Microbiology/
Pre-Veterinary Medicine Option (MCMB, PVET)**

FR	F	S		F	S
BIOL	1020		Principles of Biology and Lab (1021).....	4	**
BIOL		1030	Organismal Biology and Lab (1031).....	**	4
ENGL	1100	1120	English Composition I & II.....	3	3
CHEM	1030	1040	Fundamentals of Chemistry I & II.....	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab.....	1	1
			Core History	**	3
MATH	1610		Calculus I.....	4	**
				15	14
SO			Core Literature	3	**
PHYS	1500	1510	General Physics I & II	4	4
CHEM	2070	2080	Organic Chemistry I & II.....	3	3
CHEM	2071	2081	Organic Chemistry I & II Lab.....	1	1
BIOL	3000		Genetics	4	**
			Core History or Literature ¹	**	3
BIOL		3200	General Microbiology	**	4
				15	15
JR			Core Humanities (Philosophy) ⁴	**	3
			Core Fine Arts	**	3
			Core Social Science ²	3	3
			Core Social Science or Humanities ³	3	**
BIOL	4100		Cell Biology	3	**
BCHE	3200		Principles of Biochemistry ⁶	3	**
BIOL	4200		Clinical Microbiology	4	**
BIOL		5220	Introductory Molecular Genetics	*	3
BIOL		5210	Microbial Physiology	**	3
BIOL		4950	Undergraduate Seminar	**	1
				16	16
SR			Biochemistry I & II	3	3
BCHE	5180	5190	Biochemistry I Lab.....	1	**
BIOL		5230	Virology	**	3
BIOL	5500		Immunology	3	**
BIOL	5501		Immunology Lab	2	**
			Biology Elective ⁵	3	3
			ROTC/Free Elective	4	4
UNIV		4AA0	SM1 Undergraduate Graduation	**	0
				16	13

TOTAL HOURS - 120

- Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- See approved list of Biology electives.
- Students should consult an advisor before scheduling.

**Curriculum in Zoology/
Pre-Veterinary Medicine Option (ZOOL, PVET)**

FR	F	S		F	S
MATH	1610		Calculus I.....	4	**
ENGL	1100	1120	English Composition I & II	3	3
CHEM	1030	1040	Fundamentals of Chemistry I & II.....	3	3
CHEM	1031	1041	Fundamentals of Chemistry I & II Lab.....	1	1
			Core History	**	3
BIOL		1020	Principles of Biology and Lab (1021)	4	**
BIOL		1030	Organismal Biology and Lab (1031)	**	4
				15	14
SO			Core Literature	3	**
			Core Fine Arts	**	3
			Core Social Science ²	3	**
			Core History or Literature ¹	**	3
PHYS	1500	1510	General Physics I & II	4	4
CHEM	2070	2080	Organic Chemistry I & II	3	3
CHEM	2071	2081	Organic Chemistry I & II Lab	1	1
			Elective.....	3	**
				17	14
JR			Core Social Science or Humanities ³	3	**
			Core Humanities (Philosophy) ⁴	**	3
			Core Social Science ²	**	3
			Core Social Science or Humanities ³	**	3
BCHE	3200		Principles of Biochemistry	3	**
BIOL	3000		Genetics	4	**
BIOL		3030	Evolution and Systematics	**	3
BIOL			BIOL 4010 OR 4020 OR Vert BIOL	4	**
BIOL		4950	Undergraduate Seminar	1	**
BIOL		3060	Ecology	**	4
			Free Elective (ANSC 3400) ⁶	**	4
				15	17
SR			Stat for Engr. & Sci.....	3	**
STAT	3010			3	**
BIOL	3200		Microbiology	4	**
BIOL	4100		Cell Biology	3	**
BIOL		5240	Animal Physiology	**	4
			Biology Elective ⁵	**	9
			Elective.....	**	3
UNIV		4AA0	SM1 Undergraduate Graduation	**	0
				15	16

TOTAL HOURS - 123

- Students must complete a two-course sequence in either HIST or LIT (for example, World History 1 and 2 or American Lit 1 and 2). For complete HIST and LIT sequence options, see the *Bulletin*.
- Students who choose a HIST sequence other than HIST 1010 and 1020 should talk to an advisor about CORE SOC SCI choices.
- If a LIT sequence is chosen, this course must be a CORE SOC SCI. If a HIST sequence is chosen, this course must be a CORE HUMANITIES.
- Choose from PHIL 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100 or HONRS 1007 or 1017.
- See list of approved Biology electives.
- ANSC 3400 is a requirement for Auburn's vet school.