



This course plan is a recommended sequence for this major. Courses designated as critical (!) may have a deadline for completion and/or affect time to graduation. Please see the Program Notes section for details regarding "critical courses" for this particular Program of Study.

Critical	Course Subject and Title	Credit Hours	Min. Grade ¹	Major GPA ²	Code	Prerequisites	Notes
Semester One (17 Credit Hours)							
!	ENGL 101 Critical Reading and Composition	3	C		CC-CMW		
!	MATH 141 Calculus I ³	4	C		CC-ARP	C or better in Math 112/115/116 or placement through the MAP	
	CHEM 111 & CHEM 111L – General Chemistry I	4	C		PR	C or higher in MATH 111 or higher (or by placement into MATH 115 or higher)	
	Carolina Core Requirement ⁴	3			CC		
	UNIV 101 The Student in the University or Carolina Core Requirement ⁴	3			PR/CC		
Semester Two (15 Credit Hours)							
!	ENGL 102 Rhetoric and Composition	3	C		CC-CMW CC-INF	C or better in ENGL 101	
!	MATH 142 Calculus II	4	C		CC-ARP	C or better in MATH 141	
	ASTR 101 Intro. to Astronomy or SCHC 115 HNRS: Descriptive Astronomy	4	C		MR		
!	PHYS 211 & PHYS 111L Essentials of Physics I	4	C		CC-SCI	C or better in MATH 141	
Semester Three (16 Credit Hours)							
!	MATH 241 Vector Calculus	3	C		PR	C or better in MATH 142	
!	PHYS 212 & PHYS 212L Essentials of Physics II	4	C		CC-SCI	C or better in PHYS 211 & MATH 142	
	CSCE 106 Sci. Applications Programming	3	C		CR	Prereq or Coreq: C or better in MATH 111 or higher or by MAP score into MATH 115 or higher)	
	ASTR 201 Intro. to Astr. II: The Dark Universe	3	C		MR	ASTR 101 or SCHC 115	
	Foreign language ⁵ or other Carolina Core Req. ⁴	3			CC-GFL		
Semester Four (15 Credit Hours)							
!	MATH 242 Elementary Differential Equations or MATH 520 Ordinary Differential Equations	3	C		PR	C or better in MATH 142 (<i>MATH 242</i>); C or better in MATH 344 or 544 (<i>MATH 520</i>)	
!	PHYS 307 Intro. to Modern Physics (<i>offered spring only</i>)	3	C		MR	C or better in PHYS 212 & MATH 241	
	STAT 509 Statistics for Engineers or STAT 515 Statistical Methods I	3	C		CR	MATH 142 or equiv. (<i>STAT 509</i>); C or better in MATH 112, 115, 122 or 141, or in both STAT 110 or higher & MATH 111 or placement through the MAP (<i>STAT 515</i>)	
	ASTR 301 Galactic Astrophysics	3	C		MR	C or better in ASTR 201 & PHYS 212	
	Foreign language ⁵ or other Carolina Core Req. ⁴	3			CC-GFL		
Semester Five (15 Credit Hours)							
	MATH 300 Transition to Adv. Mathematics or MATH 344 Applied Linear Algebra or MATH course (<i>500-level or above</i>)	3	C		PR	C or better in MATH 142 (<i>MATH 300 and 344</i>)	
	PHYS 306 Principles of Physics III (<i>offered fall only</i>)	3	C		PR	C or better in PHYS 212 & MATH 142; Prereq or Co-req: MATH 241	
	PHYS 501 Quantum Physics I (<i>offered fall only</i>)	3	C		MR	C or better in PHYS 307 & MATH 242 or 520	
	ASTR 302 Extragalactic Astronomy	3	C		MR	C or better in ASTR 101 or SCHC 115; C or better in ASTR 201	
	Foreign language ⁵ or Carolina Core Req. ⁴	3			CR/CC		
Semester Six (16 Credit Hours)							
	PHYS 310 Intermediate Exper. Physics	4	C		MR	C or better in PHYS 212 & STAT 509 or 515	
	PHYS 506 Thermal Physics & Statistical Mechanics (<i>offered spring only</i>)	3	C		MR	C or better in PHYS 306, 307, MATH 241 and MATH 242 or 520	
	ASTR 320 Intro. to Radio Astronomy	3	C		MR	C or better in ASTR 201, MATH 115 or equiv., & in PHYS 202 or 212	
	ASTR 340 Intro. to Relativistic Astrophysics	3	C		MR	C or better in ASTR 201, MATH 115, & in PHYS 202 or 212	
	History ⁶	3			CR		
Semester Seven (14-17 Credit Hours)							
	ASTR 510 Observational Astronomy	3	C		MR	C or better in CSCE 106 & ASTR 101 or 201	
	PHYS 503 Mechanics (<i>offered fall only</i>)	4	C		MR	C or better in PHYS 211 & MATH 242 or 520	
	MATH 300 Transition to Adv. Mathematics or MATH 344 Applied Linear Algebra or MATH course (<i>500-level or above</i>)	3	C		PR	C or better in MATH 142 (<i>MATH 300 and 344</i>)	
	Astronomy & Astrophysics Concentration Elective ⁷	1-4	C		MR CC-INT		
	Carolina Core Requirement ⁴	3			CC		

Semester Eight (16 Credit Hours)						
ASTR 499 Undergraduate Research	3	C		MR		
ASTR 546 Intro. to Astrophysics	3	C		MR	C or better in PHYS 307	
PHYS 504 Electromagnetic Theory (<i>offered spring only</i>)	4	C		MR	C or better in PHYS 503	
Humanities or Fine Arts	3			CR		
Social Science	3			CR		

Graduation Requirements Summary

Minimum Total Hours	Minimum Major Requirements Hours	College & Program Requirements Hours	Carolina Core Hours	Minimum Institutional GPA
120	50	34-40	34-40	2.000

- Regardless of individual course grades, students must maintain a minimum 2.000 cumulative GPA.
- Some colleges require a minimum GPA for major courses. Courses indicated in this column are included in the major GPA for this program of study.
- Students who do not place into MATH 141 will be required to successfully complete MATH 112, 115, or 116 before taking MATH 141.
- The [Carolina Core](#) provides the common core of knowledge, skill and academic experience for all Carolina undergraduate students.
- Students in the McCausland College of Arts and Sciences are required to demonstrate proficiency in one foreign language equivalent to the 122 course through course credit or the corresponding foreign language placement score.
- The McCausland College of Arts and Sciences requires one U.S. History and one non-U.S. History course, both of which must be chosen from the approved Carolina Core GHS courses. Whichever is not fulfilled through the Carolina Core GHS requirement must be fulfilled through this college requirement.
- Astronomy & Astrophysics Concentration Elective (4 hours): **ASTR** 103, 499, 534, 599; **PHYS** 311, 502, 541, 542.
- No courses of a remedial, developmental, skill-acquiring, or vocational nature may apply as credit toward degrees in the McCausland College of Arts and Sciences. The McCausland College of Arts and Sciences allows the use of the Pass-Fail option on elective courses. Further clarification on inapplicable courses can be obtained from the McCausland College of Arts and Sciences.

Program Notes:

- ENGL 101 and ENGL 102 must be completed in the student's first 60 semester hours of work in order for these courses to be credited toward graduation. Other courses designated as critical are prerequisites for subsequent courses, and a delay in completion of these courses may affect time to graduation.
- All undergraduate students must take a 3-credit course or its equivalent with a passing grade that covers the founding documents. This course may fulfill any requirement in the program of study. Courses that meet this requirement are listed in the academic [bulletin](#).
- The last 30 credit hours toward your degree must be earned in residence at the University of South Carolina-Columbia.

University Requirements: Bachelor's degree-seeking students must meet Carolina Core (general education) requirements. For more information regarding these requirements, please visit the [Carolina Core](#) page on the University website.

Codes:			
CC	Carolina Core	CC-INF	Carolina Core – Information Literacy
CC-AIU	Carolina Core-Aesthetic and Interpretive Understanding	CC-INT	Carolina Core – Integrative Course
CC-ARP	Carolina Core-Analytical Reasoning and Problem-Solving	CC-SCI	Carolina Core – Scientific Literacy
CC-CMS	Carolina Core-Effective, Engaged, and Persuasive Communication: Spoken Component	CC-VSR	Carolina Core – Values, Ethics, and Social Responsibility
CC-CMW	Effective, Engaged, and Persuasive Communication: Written Component	CR	College Requirement
CC-GFL	Carolina Core-Global Citizenship and Multicultural Understanding: Foreign Language	MR	Major Requirement
CC-GHS	Carolina Core – Historical Thinking	PR	Program Requirement
CC-GSS	Carolina Core – Social Sciences		

Disclaimer: Major maps are only a suggested or recommended sequence of courses required in a program of study. Please contact your academic advisor for assistance in the application of specific coursework to a program of study and course selection and planning for upcoming semesters.