College of Arts & Sciences

Astrophysics

The Department of Physics intend to offer three-year Bachelor of Science degrees in Physics (BS3331), Physics Applied Physics (BS3332) and Physics Astrophysics (BS3335) as well as a three-year Bachelor of Arts degree in Physics (BA 3331). The curricula outlined below are semester-by-semester plans of study for the aforementioned degrees in adherence to section 3333.71 of the Revised Code for the three-year baccalaureate degrees.

The curricula given below show that High school students who apply with thirty semester hours of Tier I and Tier II credits (including the year Calculus and the first semester of Calculus-level Physics) from Advanced Placement (AP), transfer credit or other approved equivalent credit, will have finished the equivalent of the first year of our current program and would thus be able to finish the program within three years by successfully taking courses on the following schedules. The number of required credit hours could be reduced if students were able to take Freshman Composition or the Tier II courses or Foreign language in summer session or by taking a heavier course load during the academic year. The absolute minimum requirements to enter the program and graduate on schedule are to have equivalents to the first semester of Calculus (MATH 2301) and the first semester of Physics (PHYS 2051).

Note that these are sample curricula, and minor modifications in ordering of non-physics courses is probably possible while still finishing within the 3-year time frame. It is possible, but not guaranteed, that students with fewer that the suggested requirements for Calculus and Introductory Physics might be able to finish within 3 years, but this would require an intensity of Physics and Mathematics courses in senior year that only a small fraction of students would be able to complete successfully.

BS3338 Physics Meteorology is a program that has parallel versions of the program in Geography and Mathematics. Student take a heavy load of Physics, Math and Geography/Metrology courses. It is possible for an extremely well-prepared student with AP credit for the full year of Calculus, the first semester of calculus-level Physics, the first semester of chemistry, the equivalent of GEOG 1100 (Physical Geography) and computer programming to have the equivalent of the first year courses for this major, but the program has a tight grid of prerequisites and offers many of its courses in alternative years, so a student should only undertake a three-year degree in consultation with an advisor on an ad hominem basis. A detailed 3-year curriculum for this major is not included.

The scheduling scenario below is intended to present an example pattern by which this major can be completed in three years. Those interested in pursuing this option need to work with an academic advisor to develop a specific plan to earn the 121 credit hours required for graduation.

BS3331 Physics Major & BS3332 Applied Physics Major

Post-Secondary Coursework or Transfer/AP/IB Credit

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
Tier I Freshman Composition	3		
Tier 1 Quantitative Skills: Calculus I	4		C
Tier II Applied Science: Calculus II	4		C
Tier II Natural Science: Physics I (Calculus level: PHYS 2051)	5		
Tier II Humanities & Literature	3		
Tier II Social Science	3		
Foreign Language	8		
Total hours (minimum 15)	30		

Semester 1: Fall

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 1901 Seminar	1		
PHYS 2052 Physics II	5		
MATH 3300 Calculus III	4		
Tier II Cross Cultural Perspectives	3	YES	
Arts & Sciences Humanities	3		
Total hours for semester	16		

Semester 2: Spring

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 2053 Contemporary Physics	3		
PHYS 2701 Electronics	2		
MATH 3400 Ordinary Differential Equations	3	YES	
Tier II Fine Arts	3		
Arts & Sciences Social Science	3		
Elective	1		
Total hours for semester	15		

Semester 3: Summer

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 3001 Classical Mechanics	4	YES	
PHYS 3701 Junior Lab I	2	YES	
MATH 3200 Linear Algebra	3	YES	
MATH 3600 Numerical Methods	3	YES	
Arts & Sciences Humanities	3		

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
Total hours for semester	15		

Semester 4: Fall

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 3011 Thermal Physics	3	YES	
PHYS 3702 Junior Lab II	2	YES	
MATH 4410 PDE & Fourier Analysis	3		
Tier I Junior Composition	3		
Arts & Sciences Social Science	3		
Elective	1		
Total hours for semester	15		

Semester 5: Spring

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 4031 Electricity & Magnetism I	3	YES	
PHYS 4021 Quantum Mechanics	3	YES	
Elective	3		
Elective	3		
Elective	3		
Total hours for semester	15		

Semester 6: Summer

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 4032 Electricity & Magnetism II	3	YES	
PHYS 4051 Modern Physics (T3E) or other T3 or T3E	3	YES	
Elective	3		
Elective	3		
Elective	3		
Total hours for semester	15		

NOTE: The requirements for Applied Physics are the same as those for Physics. In consultation with the Applied Physics Advisor, students can replace some of the upper division courses with courses from other majors to provide a more applied focus to their degree.

BA3331 Physics Major

Post-Secondary Coursework or Transfer/AP/IB Credit

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
Tier I Freshman Composition	3		
Tier 1 Pre-Calculus (AP)	4		
Tier II Humanities & Literature	3		
Tier II Social Sciences	3		
Foreign Language (1st year)	8		
Electives	9		
Total hours (minimum 15)	30		

Semester 1: Fall

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 1901 Seminar	1		
MATH 2301 Calculus I (Tier II Applied Science)	4		
Foreign Language (2nd year; Tier II Cross Cultural Perspectives)	4		
Arts & Sciences Social Science	3		
Arts & Sciences Humanities	3		
Total hours for semester	15		

Semester 2: Spring

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 2051 Physics I (Tier II Natural Science)	5		
MATH 2302 Calculus II	4		
Foreign Language (2nd year)	4		
Tier II Fine Arts	2		
Total hours for semester	15		

Semester 3: Summer

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 2051 Physics II	5		
MATH 3400 Ordinary Differential Equations	3	YES	
Arts & Sciences Humanities	3		
Arts & Sciences Social Science	3		
Elective	1		
Total hours for semester	15		

Semester 4: Fall

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 2053 Contemporary Physics	3		
PHYS 2701 Electronics	2		
Tier I Junior Composition	3	YES	
Arts & Sciences Social Science	3		
Elective	3		
Elective	1		
Total hours for semester	15		

Semester 5: Spring

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 3001 Classical Mechanics	3	YES	
PHYS 3701 Junior Lab I	3	YES	
Elective	3		
Elective	3		
Elective	3		
Total hours for semester	15		

Semester 6: Summer

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 3702 Junior Lab II	3	YES	
T3 or T3E	3	YES	
Elective	3		
Elective	3		
Elective	3		
Total hours for semester	15		

Note: The Physics BA is designed as preparation for high school teaching or for students in other majors who are looking for a second major. The program requires students to complete at least 24 credit hours of PHYS or ASTR courses including PHYS 1902, 2051, 2052, 2053 and MATH 2301. The curriculum above meets these requirements. Many other selections are also possible.

BA3335 Physics Astrophysics Major

Post-Secondary Coursework or Transfer/AP/IB Credit

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
Tier I Freshman Composition	3		
Tier 1 Quantitative Skills: Calculus I	4		C

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
Tier II Applied Science: Calculus II	4		C
Tier II Natural Science: Physics I (Calculus level: PHYS 2051)	5		
Tier II Humanities & Literature	3		
Tier II Social Science	3		
Foreign Language	8		
Total hours (minimum 15)	30		

Semester 1: Fall

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 1901 Seminar	1		
PHYS 2052 Physics II	5		
MATH 3300 Calculus III	4	YES	
Tier II Cross Cultural Perspectives	3		
Arts & Sciences Humanities	3		
Total hours for semester	16		

Semester 2: Spring

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 2053 Contemporary Physics	3		
PHYS 2701 Electronics	2		
MATH 3400 Ordinary Differential Equations	3	YES	
ASTR 3251 Fundamentals of Astrophysics	3	YES	
Tier II Fine Arts	3		
Elective	1		
Total hours for semester	15		

Semester 3: Summer

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 3001 Classical Mechanics	4	YES	
PHYS 3701 Junior Lab I	2	YES	
MATH 3200 Linear Algebra	3	YES	
ASTR 4201 Stellar Astrophysics	3	YES	
Arts & Sciences Humanities	3		
Total hours for semester	15		

Semester 4: Fall

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 3011 Thermal Physics	3	YES	

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 3702 Junior Lab II	2	YES	
MATH 4410 PDE & Fourier Analysis	3	YES	
Tier I Junior Composition	3	YES	
Arts & Sciences Social Science	1		
ASTSR 4202 Galaxies	3		
Total hours for semester	15		

Semester 5: Spring

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 4031 Electricity & Magnetism I	3	YES	
ASTR 4271 Observational Astrophysics	3	YES	
Arts & Sciences Social Science	3		
Elective	3		
Elective	3		
Total hours for semester	15		

Semester 6: Summer

Course Subject and Title (Or General Tier/Major Requirement)	Credit Hours	Upper Division	Minimum Grade
PHYS 4031 Electricity & Magnetism I	3	YES	
T3 or T3E	3	YES	
Arts & Sciences Social Science	3		
Elective	3		
Elective	3		
Total hours for semester	15		

Note: ASTR 4201 & 4202 will be taught in Academic years that start with even numbers (e.g. 2012, 2014 etc.). ASTR 4271 will be offered in odd number years (e.g. 2013, 2015 etc.). Depending on the year they enter, students will thus take ASTR 4201 & 4202 in their junior or senior years.