Bachelor of Science in Applied Physics AY25/26

Note - this document is intended as a guide, not a substitute for meeting with your academic advisor. Please see your academic advisor for more information about your major.

University of Arizona Graduation Requirements

Grade Point Average (GPA) Requirements: 2.0 cumulative GPA (all UA courses), 2.0 major GPA, and 2.0 minor GPA
Minimum units required: 120 total units [1]
Minimum upper-division units required: 42 upper-division units [1]
Minimum UA units: 30 units of University Credit completed at the University of Arizona
Minimum Major coursework: 18 units of major coursework must be University Credit from the University of Arizona
Residency Requirement: 18 of the final 30 units must be University Credit from the University of Arizona
Mid-Career Writing Assessment (*"B" or higher in ENGL 102, 108, or 109H, or approved Writing Emphasis course*) [2]

1 - students majoring in only Applied Physics may need to take additional "electives" or pursue a minor to meet the minimum 120 total units or the 42 upper-division units requirement.
2 - the approved "Writing Emphasis" course for Applied Physics is PHYS 381 or 382.

General Education Curriculum

✓	Course Number & Title	Units	Semester
	First-Year Composition ENGL 101/102, ENGL (106)107/108, or ENGL 109H	3-9	
	Second Language [3] Second Semester Level or Higher (ex: SPAN 102)	0-10	
	UNIV 101 - Introduction to General Education [4]	1	
	Exploring Perspectives: Artist	3	
	Exploring Perspectives: Humanist	3	
	Exploring Perspectives: Social Scientist	3	
	Exploring Perspectives: Natural Scientist [5]	3	
	Building Connections #1	3	
	Building Connections #2	3	
	Building Connections #3	3	
	UNIV 301 [4]	1	

3 - Students can also satisfy their second language requirement through proficiency tests or AP/IB/Transfer credit. International students may have their second language satisfied by TOEFL or IELTS tests.
4 - Transfer students do not need to complete either UNIV 101 or 301
5 - Students majoring in Applied Physics will have the "Natural Scientist" requirement satisfied by PHYS 161H.

Mathematics Requirements

✓	Course Number & Title	Units	Semester
	MATH 122B or MATH 125 - Calculus I	3-5	
	MATH 129 - Calculus II	3	
	MATH 223 - Vector Calculus	4	
	MATH 254 - Introduction to Differential Equations MATH 355 - Analysis of Differential Equations [7]	3	

7 - Students interested in a double major in Mathematics should consider taking MATH 355; talk to your math advisor for more information/advice.

Programming Requirement

✓	Course Number & Title	Units	Semester
	ECE 101 - Programming I [6]	4	

6 - ECE 101 is strongly encouraged, especially for students who want to participate in the Senior Design project. CSC 110 and PHYS 105A are acceptable substitutes.

Introduction to Physics

✓	Course Number & Title	Units	Semester
	PHYS 120 - Careers and Skills in Physics [7]	1	

7 - New students in Physics are required to take this 1-unit class in their first semester.

Introductory Physics Requirements

✓	Course Number & Title	Units	Semester
	PHYS 161H - Accelerated Introductory Mechanics [8]	4	
	PHYS 162H - Accelerated Introductory Optics & Thermodynamics	4	
	PHYS 261H - Accelerated Introductory Electricity & Magnetism [8]	4	
	PHYS 263H - Accelerated Introductory Relativity & Quantum Physics	3	

8 - Ideally, students would take PHYS 161H and 261H, but if students have transfer credit or take PHYS 141 or 241 in Summer, we will accept them instead of PHYS 161H and 261H.

Physics Core Requirements

✓	Course Number & Title	Units	Semester
	PHYS 204 - Mathematical Techniques in Physics	3	
	PHYS 305 - Computational Physics	3	
	PHYS 321 - Theoretical Mechanics	3	
	PHYS 331 - Electricity & Magnetism I	3	
	PHYS 371 - Quantum Theory I	3	
	PHYS 381 - Methods of Mathematical Physics I	2	
	PHYS 382 - Methods of Mathematical Physics II	2	

Communications Requirement (*select one from below*) [9]

✓	Course Number & Title	Units	Semester
	COMM 119, ENGL 308, ENGL 340, JOUR 455, JOUR 472, PR 119 [9]	3	

9 - Please note that this is not a complete list of available courses that can be taken to satisfy the Communications requirement. Please check with your academic advisor if you feel there is a class that better fits your goals.

Data/Statistics/Modeling Requirement (select one from below) [10]

✓	Course Number & Title	Units	Semester
	ISTA 311, ISTA 350, ISTA 421, MATH 263 [10]	3	

10 - Please note that this is not a complete list of available courses that can be taken to satisfy the Data/Statistics/Modeling requirement. Please check with your academic advisor if you feel there is a class that better fits your goals.

Technical Electives (select four from below, at least two must be upper-division) [11]

✓	Course Number & Title	Units	Semester
	AME 320 - Aerodynamics AME 331 - Introduction to Fluid Mechanics BIOC 384 - Foundations in Biochemistry	3	
	CHEE 302 - Carbon Audits and Sustainability CHEM 325 - Analytical Chemistry ECE 304A - Design of Electronic Circuits ECE 362	3	
	ENGR/SIE 414 - Law for Engineers and Scientists ENVS/HWRS 340 - Environmental Chemistry MSE 331R - Fundamentals of Materials for Engineers OPTI 206 OPTI 341 - Semiconductor Physics and Lasers	3	
	SIE 305 - Introduction to Engineering Probability and Statistics	3	

11 - Please note that this is not a complete list of all available technical electives, students should work with their faculty advisor and academic advisor to determine the best set of technical electives for their goals.

Application Requirement [12] [13] [14]

✓	Course Number & Title	Units	Semester
	ENGR 498A	3	
	ENGR 498B	3	

12 - The minimum prerequisites to be eligible for ENGR 498A (Senior Design) are PHYS 305 & PHYS 381. It is highly recommended that Applied Physics students complete PHYS 382 AND have a background in programming, particularly ECE 101, to be the most ready for ENGR 498A.
13 - Applied Physics majors interested in an internship can satisfy their Application requirement with 6 units of internship (PHYS 493). Students will need to work with their faculty advisor and academic advisor.
14 - Honors Applied Physics students will complete the (ENGR 498A/B) Senior Design with honors to fulfill their Honors Thesis/Capstone requirement

Double-Dipping Policy

Physics does not permit Applied Physics majors to double-dip courses for their four (4) technical electives in double majors or double degrees with MATH or ASTR. Students may double-dip one 3-unit pre-approved technical elective in MATH, ASTR, or PHYS, but they cannot double-dip courses that fulfill other major or minor requirements in those degree programs.

Applied Physics 4-Year Plan (Calculus II Start)

Note - this document is intended as a guide, not a substitute for meeting with your academic advisor. Please see your academic advisor for more information about your major.
Note - this four-year plan is not a “one-size fits all”, this is a listing of all the required courses to meet graduation requirements; students may need to adjust their plan

First Year					
First Semester			Second Semester		
Course #	Course Title	Units	Course #	Course Title	Units
PHYS 161H	Accelerated Introductory Mechanics (GE1)	4	PHYS 162H	Accelerated Introductory Optics & Thermodynamics	4
MATH 129	Calculus II	3	MATH 223	Vector Calculus	4
ENGL 101	English Composition I	3	ENGL 102	English Composition II	3
Language	1st Semester Second Language	4-5	Language	2nd Semester Second Language	4-5
PHYS 120	Careers and Skills in Physics	1	UNIV 101	Introduction to General Education	1
	Total Units	15-16		Total Units	16-17
Second Year					
Third Semester			Fourth Semester		
Course #	Course Title	Units	Course #	Course Title	Units
PHYS 261H	Accelerated Introductory Electricity & Magnetism	4	PHYS 204	Mathematical Techniques in Physics	3
PHYS 263H	Accelerated Introductory Relativity & Quantum Physics	3	**PHYS 321**	**Theoretical Mechanics**	**3**
MATH 254	Introduction to Differential Equations	3	AP D/S/M	Data/Statistics/Modeling Course	3
AP Comm	Communications Course	3	Gen Ed	General Education Course (GE2)	3
ECE 101	Programming I	4	Gen Ed	General Education Course (GE3)	3
	Total Units	17		Total Units	15
Third Year					
Fifth Semester			Sixth Semester		
Course #	Course Title	Units	Course #	Course Title	Units
PHYS 305	**Computational Physics**	**3**	**PHYS 331**	**Electricity & Magnetism I**	**3**
PHYS 381	**Methods of Experimental Physics I**	**2**	**PHYS 382**	**Methods of Experimental Physics II**	**2**
AP Tech	AP Technical Elective #1	3	**AP Tech**	**AP Technical Elective #2**	**3**
Gen Ed	General Education Course (GE4)	3	Gen Ed	General Education Course (GE6)	3
Gen Ed	General Education Course (GE5)	3	Gen Ed	General Education Course (GE7)	3
			UNIV 301	**General Education Portfolio**	**1**
	Total Units	14		Total Units	15
Fourth Year					
Seventh Semester			Eighth Semester		
Course #	Course Title	Units	Course #	Course Title	Units
ENGR 498A	**Senior Design**	**3**	**ENGR 498B**	**Senior Design**	**3**
PHYS 371	**Quantum Theory I**	**3**	**AP Tech**	**AP Technical Elective #4**	**3**
AP Tech	**AP Technical Elective #3**	**3**	**Elective**	**Upper-Division Elective**	**3**
Elective	**Upper-Division Elective**	**3**	**Elective**	**Upper-Division Elective**	**3**
Elective	**Upper-Division Elective**	**3**	Elective	Elective Course	3
	Total Units	15		Total Units	15

Applied Physics 4-Year Plan (Calculus I Start)

Note - this document is intended as a guide, not a substitute for meeting with your academic advisor. Please see your academic advisor for more information about your major.
Note - this four-year plan is not a “one-size fits all”, this is a listing of all the required courses to meet graduation requirements; students may need to adjust their plan

First Year					
First Semester			Second Semester		
Course #	Course Title	Units	Course #	Course Title	Units
MATH 122A	Functions for Calculus	1	PHYS 161H	Accelerated Introductory Mechanics/GE2	4
MATH 122B	First-Semester Calculus	4	MATH 129	Calculus II	3
ENGL 101	English Composition I	3	ENGL 102	English Composition II	3
Language	1st Semester Second Language	4-5	Language	2nd Semester Second Language	4-5
PHYS 120	Careers and Skills in Physics	1	Gen Ed	General Education Course (GE3)	3
Gen Ed	General Education Course (GE1)	3	UNIV 101	Introduction to General Education	1
	Total Units	16-17		Total Units	17-18
Second Year					
Third Semester			Fourth Semester		
Course #	Course Title	Units	Course #	Course Title	Units
PHYS 162H	Accelerated Introductory Optics & Thermodynamics	4	PHYS 261H	Accelerated Introductory Electricity & Magnetism	4
ECE 101	Programming I	4	PHYS 263H	Accelerated Introductory Relativity & Quantum Physics	3
MATH 223	Vector Calculus	4	MATH 254	Introduction to Differential Equations	3
Gen Ed	General Education Course (GE4)	3	Gen Ed	General Education Course (GE6)	3
Gen Ed	General Education Course (GE5)	3	Gen Ed	General Education Course (GE7)	3
	Total Units	18		Total Units	16
Third Year					
Fifth Semester			Sixth Semester		
Course #	Course Title	Units	Course #	Course Title	Units
PHYS 204	Mathematical Techniques in Physics	3	**PHYS 305**	**Computational Physics**	**3**
PHYS 321	**Theoretical Mechanics**	**3**	**PHYS 381**	**Methods of Experimental Physics I**	**2**
AP D/S/M	Data/Statistics/Modeling Course	3	AP Comm	Communications Course	3
AP Tech	AP Technical Elective #1	3	**AP Tech**	**AP Technical Elective #2**	**3**
Elective	**Upper-Division Elective**	**3**	**UNIV 301**	**General Education Portfolio**	**1**
	Total Units	15		Total Units	12
Fourth Year					
Seventh Semester			Eighth Semester		
Course #	Course Title	Units	Course #	Course Title	Units
ENGR 498A	**Senior Design**	**3**	**ENGR 498B**	**Senior Design**	**3**
PHYS 331	**Electricity & Magnetism I**	**3**	**PHYS 371**	**Quantum Theory I**	**3**
PHYS 382	**Methods of Experimental Physics II**	**2**	**AP Tech**	**AP Technical Elective #4**	**3**
AP Tech	**AP Technical Elective #3**	**3**	**Elective**	**Upper-Division Elective**	**3**
Elective	**Upper-Division Elective**	**3**	**Elective**	**Upper-Division Elective**	**3**
	Total Units	14		Total Units	15

Applied Physics Prerequisites

Course #	Course Title	Units	Prerequisites	Semesters
ECE 101	Programming I	3	MATH 112, 120R, 122B, 125	Fall, Spring
PHYS 120	Careers and Skills in Physics	1	None	Fall
PHYS 161H	Accelerated Introductory Mechanics	4	MATH 122B or 125	Fall, Spring
PHYS 162H	Accelerated Introductory Optics & Thermodynamics	4	PHYS 141, 140, 161H MATH 129	Fall, Spring
PHYS 204	Mathematical Techniques in Physics	3	PHYS 162H, 261H, 143, 240, 241 MATH 223 © MATH 254, 355	Fall, Spring
PHYS 261H	Accelerated Introductory Electricity & Magnetism	4	PHYS 141, 140, 161H MATH 129	Fall, Spring
PHYS 263H	Accelerated Introductory Relativity & Quantum Physics	3	PHYS 142, 143, or 162H © PHYS 240, 241, or 261H © MATH 254 or 355	Fall, Spring
PHYS 305	Computational Physics	3	© MATH 254, 355 PHYS 105A, ECE 101, ECE 175, CSC 110	Fall, Spring
PHYS 321	Theoretical Mechanics	3	PHYS 142, 143, 162H PHYS 240, 241, 261H MATH 223 © PHYS 204 © MATH 254, 355	Fall, Spring
PHYS 331	Electricity & Magnetism I	3	PHYS 240, 241, 261H PHYS 204 MATH 223 © MATH 254, 355	Fall, Spring
PHYS 371	Quantum Theory I	3	PHYS 321 PHYS 263H PHYS 204	Fall, Spring
PHYS 381	Methods of Experimental Physics I	2	© PHYS 321 © PHYS 305, 320, 331, 371	Fall, Spring
PHYS 382	Methods of Experimental Physics II	2	PHYS 381	Fall, Spring
ENGR 498A	Senior Design I	3	PHYS 305 PHYS 381	Fall, Spring
ENGR 498B	Senior Design II	3	ENGR 498A	Fall, Spring

© indicates a corequisite, meaning the course needs to be taken before or concurrently with the course