

Physics, BS - Optics Concentration

- All College of Science degrees require at least 120 credit hours.
- 36 of those 120 credit hours must be taken at 300 level or higher.
- 12 credit hours of 300 level and above must be taken in the major or 6 credit hours in the major and 6 credit hours in the minor (if chosen).
- 12 of the last 18 credit hours must be taken at UAH, with an overall 25% of coursework taken at UAH.
- No more than 60 credit hours from a two-year college can be applied toward a UAH degree.
- A C- or better is required for all College of Science prerequisite courses, unless otherwise noted.

For UAH degree requirements and graduation application instructions, see here (<http://catalog.uah.edu/undergrad/policies-procedures/application-graduation/>).

Charger Foundations

Code	Title	Semester Hours
Area I: Freshman Composition		3-6
EH 101 or EH 101S	COLLEGE WRITING I COLLEGE WRITING I W/STUDIO	
EH 102	COLLEGE WRITING II	
EH 103	ACCELERATED COLLEGE WRITING	
EH 105	HONORS ENGLISH SEMINAR	
Area II: Humanities and Fine Arts*		12
Fine Arts		3
ARH 100	ARH SUR: ANCIENT-MEDIEVAL	
ARH 101	ARH SUR: RENAISSANCE-MODERN	
ARH 103	ARH SUR: WORLD ART	
ARS 160	DRAWING: FOUNDATIONS	
TH 122	THEATRE APPRECIATION	
TH 123	INTRO TO FILM STUDIES	
MU 100	INTRO TO MUSIC LITERATURE	
Literature		3-6
EH 207	READINGS LITERATURE/CULTURE I	
EH 208	READINGS LITERATURE/CULTURE 2	
EH 241	LITERATURE WITHOUT BORDERS	
EH 242	MYTHOLOGY	
EH 243	PROTEST LITERATURE	
EH 244	HEROES &/OR MONSTERS	
EH 245	LOVE &/OR ROMANCE	
EH 246	SPECULATIVE REALITIES	
Humanities and Fine Arts		3-6
CM 113	Intro to Rhetorical Communication	
WLC 101S or WLC 101A or WLC 101F or WLC 101G or WLC 101J or WLC 101R	INTRO FOREIGN LANG I: SPANISH INTRO FOREIGN LANG I: ARABIC INTRO FOREIGN LANG I:FRENCH INTRO FOREIGN LANG I:GERMAN INTRO FOREIGN LANG I:JAPANESE INTRO FOREIGN LANG I:RUSSIAN	
WLC 102S or WLC 102A or WLC 102F	INTRO FOREIGN LANG II:SPANISH INTRO FOREIGN LANG II: ARABIC INTRO FOREIGN LANG II:FRENCH	

or WLC 102G	INTRO FOREIGN LANG II:GERMAN
or WLC 102J	INTRO FOREIGN LANG II:JAPANESE
or WLC 102R	INTRO FOREIGN LANG II:RUSSIAN
WLC 201S	INTERM FOREIGN LANG:SPANISH
or WLC 201A	INTERM FOREIGN LANG I: ARABIC
or WLC 201F	INTERM FOREIGN LANG:FRENCH
or WLC 201G	INTERM FOREIGN LANG:GERMAN
or WLC 201J	INTERM FOREIGN LANG: JAPANESE
or WLC 201R	INTERM FOREIGN LANG:RUSSIAN
WLC 202S	INTERM FOREIGN LANG II:SPANISH
or WLC 202A	INTERM FOREIGN LANG II: ARABIC
or WLC 202F	INTERM FOREIGN LANG II:FRENCH
or WLC 202G	INTERM FOREIGN LANG II:GERMAN
or WLC 202J	INTERM FORGN LANG II:JAPANESE
or WLC 202R	INTERM FOREIGN LANG II:RUSSIAN
WLC 204	INTERNATIONAL CINEMA
PHL 101	INTRODUCTION TO PHILOSOPHY
PHL 102	INTRO TO ETHICS
PHL 103	INTRODUCTION TO LOGIC
PHL 150	TECH, SCIENCE & HUMAN VALUES
WGS 200	INTRO WOMENS/GENDER/SEXLTY STU
AMS 229	ANCIENT & MEDIEVAL WORLDS
ARH 100	ARH SUR: ANCIENT-MEDIEVAL
ARH 101	ARH SUR: RENAISSANCE-MODERN
ARH 103	ARH SUR: WORLD ART
ARS 160	DRAWING: FOUNDATIONS
TH 122	THEATRE APPRECIATION
TH 123	INTRO TO FILM STUDIES
MU 100	INTRO TO MUSIC LITERATURE
Area III: Mathematics and Sciences	11-12
Mathematics	3-4
MA 105	NATURE OF MATHEMATICS
MA 107	ALGEBRA WITH APPLICATIONS
MA 110	FINITE MATHEMATICS
MA 112	PRECALCULUS ALGEBRA
MA 113	PRECALCULUS TRIGONOMETRY
MA 115	PRECALCULUS ALGEBRA & TRIG
MA 120	MATH PROFESSIONAL APPLICATIONS
MA 171	CALCULUS A
MA 181	INTRODUCTION TO STATISTICS
Natural Sciences (Lab)	8
AST 100	SURVEY OF ASTRONOMY
AST 106	EXPLORING THE COSMOS I
AST 107	EXPLORING THE COSMOS II
BYS 109	FUNDAMENTALS OF BIOLOGY
BYS 119 & BYS 121	PRINCIPLES OF BIOLOGY and LABORATORY
BYS 120 & BYS 122	ORGANISMAL BIOLOGY and ORGANISMAL BIOLOGY LAB
BYS 215	HUMAN ANATOMY & PHYSIOLOGY I
CH 101 & CH 105	INTRO TO CHEMISTRY and INTRO CHEMISTRY LAB

CH 121 & CH 125	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB I
CH 123 & CH 126	GENERAL CHEMISTRY II and GENERAL CHEMISTRY LAB II
CH 151 & CH 105	GENERAL, ORGANIC, BIOCHEMISTRY and INTRO CHEMISTRY LAB
PH 100	CONCEPTUAL PHYSICS
PH 101	GENERAL PHYSICS I
PH 102	GENERAL PHYSICS II
PH 111 & PH 114	GEN PHYSICS W/CALCULUS I and GENERAL PHYSICS LAB I
PH 112 & PH 115	GEN PHYSICS W/CALC II and GENERAL PHYSICS LAB II
PH 113 & PH 116	GEN PHYSICS W/CALC III and GENERAL PHYSICS LAB III

Area IV: History and Social and Behavioral Sciences* **12**

History 3-6

HY 103	WORLD HISTORY TO 1500
HY 104	WORLD HISTORY SINCE 1500
HY 221	UNITED STATES TO 1877
HY 222	UNITED STATES SINCE 1877

Social and Behavioral Sciences 6-9

AES 105	WORLD REGIONAL GEOGRAPHY
AES 110	PRINCIPLES OF HUMAN GEOGRAPHY
ECN 142	PRINCIPLES OF MACROECONOMICS
ECN 143	PRINCIPLES OF MICROECONOMICS
GS 200	GLOBAL SYSTEMS AND CULTURES
PSC 101	INTRO TO AMERICAN GOVERNMENT
PSC 102	INTRO TO COMPARATIVE POLITICS
PSC 260	INTRODUCTION TO INTERNATIONAL RELATIONS
PY 101	GENERAL PSYCHOLOGY I
PY 201	LIFE-SPAN DEVELOPMENT
SOC 100	INTRODUCTION TO SOCIOLOGY
SOC 103	INTRODUCTION TO CRIMINOLOGY

Area V: Pre-Professional

Code	Title	Semester Hours
For Physics & Astronomy Majors (OPY)		30
Courses in this area may also fulfill Charger Foundations requirements		
First Year Experience:		1
FYE 101S	CHARGER SUCCESS - SCIENCE	
Computer Programming: choose one		3
CS 102	INTRO TO C PROGRAMMING	
or CS 103	INTRO PROGRAMMING USING JAVA	
or CS 104	INTRO TO CS USING PYTHON	
Chemistry Sequence:		8
CH 121 & CH 125	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB I	
CH 123 & CH 126	GENERAL CHEMISTRY II and GENERAL CHEMISTRY LAB II	
Mathematics: **		18
MA 171	CALCULUS A	
MA 172	CALCULUS B	

MA 201	CALCULUS C
MA 238	APPL DIFFERENTIAL EQUATIONS
MA 244	INTRO TO LINEAR ALGEBRA

Major Requirements

Code	Title	Semester Hours
Physics Core:		28
PH 110	FRONTIERS IN SCIENCE	
PH 111 & PH 114	GEN PHYSICS W/CALCULUS I and GENERAL PHYSICS LAB I	
PH 112 & PH 115	GEN PHYSICS W/CALC II and GENERAL PHYSICS LAB II	
PH 113 & PH 116	GEN PHYSICS W/CALC III and GENERAL PHYSICS LAB III	
PH 251	SPECIAL RELATIVITY	
PH 301	INTERMEDIATE MECHANICS	
PH 305	MATH METHODS IN PHYSICS	
PH 351	INTRODUCTION TO MODERN PHYSICS	
PH 499	PHYSICS PRACTICUM	
Optics Concentration Requirements:		9
OPT 341	GEOMETRICAL OPTICS	
OPT 342	PHYSICAL OPTICS	
OPT 411	OPTICS LAB	
Optics Concentration Elective Requirements:		6
PH/OPT 300+ level or higher course		
PH/OPT 400+ level or higher course		

General Electives

Code	Title	Semester Hours
Additional courses to reach 120 credit hours. Electives can be taken from any department and do not have to be taken in your major or minor. No more than 4 credits of 100-level HPE courses can count toward degree requirements.		
Total Degree Hours		120

* Students must take one literature and one history course. Students must also take either a second literature or history course. If two history courses are taken, a sequence is required. Acceptable history sequences are (HY 103 + HY 104) and (HY 221 + HY 222).

** Based on Math placement, (<http://www.uah.edu/science/departments/math/undergraduate-students/placement/>) prerequisite MA 112 and/or MA 113 Mathematics courses may be required.

Note: This is only an example and variations are possible. Please work with your advisor (<https://www.uah.edu/science/academic-advising/>) as some courses are only offered one semester out of the academic year.

Year 1		Semester Hours
Fall		
FYE 101S	CHARGER SUCCESS - SCIENCE ^{FA}	1
CH 121 & CH 125	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB I	4
MA 171	CALCULUS A	4
PH 110	FRONTIERS IN SCIENCE ^{FA}	3

EH 101	COLLEGE WRITING I	3
Term Semester Hours:		15
Spring		
CH 123 & CH 126	GENERAL CHEMISTRY II and GENERAL CHEMISTRY LAB II	4
MA 172	CALCULUS B	4
PH 111 & PH 114	GEN PHYSICS W/CALCULUS I and GENERAL PHYSICS LAB I	4
EH 102	COLLEGE WRITING II	3
Term Semester Hours:		15
Year 2		
Fall		
CS 104 or CS 102	INTRO TO CS USING PYTHON or INTRO TO C PROGRAMMING	3
MA 201	CALCULUS C	4
PH 112 & PH 115	GEN PHYSICS W/CALC II and GENERAL PHYSICS LAB II	4
Social and Behavioral Science		3
General Elective		1
Term Semester Hours:		15
Spring		
MA 238	APPL DIFFERENTIAL EQUATIONS	3
PH 113 & PH 116	GEN PHYSICS W/CALC III and GENERAL PHYSICS LAB III	4
PH 251	SPECIAL RELATIVITY ^{SP}	1
Literature		3
Social and Behavioral Science		3
Term Semester Hours:		14
Year 3		
Fall		
MA 244	INTRO TO LINEAR ALGEBRA	3
PH 351	INTRODUCTION TO MODERN PHYSICS ^{FA}	3
Fine art		3
History		3
Non-Literature Humanity		3
Term Semester Hours:		15
Spring		
PH 301	INTERMEDIATE MECHANICS ^{SP}	3
PH 305	MATH METHODS IN PHYSICS ^{SP}	3
Humanities, 2nd Fine art or 2nd Literature		3
History		3
General Elective		3
Term Semester Hours:		15
Year 4		
Fall		
OPT 341	GEOMETRICAL OPTICS ^{FA}	3
Optics Concentration Elective (300+ or 400+ course)		3
General Elective (300+ or 400+ course)		3

General Elective (300+ or 400+ course)		3
General Elective		4
Term Semester Hours:		16
Spring		
OPT 342	PHYSICAL OPTICS ^{SP}	3
OPT 411	OPTICS LAB ^{SP}	3
PH 499	PHYSICS PRACTICUM	3
Optics Concentration Elective (300+ or 400+ course)		3
General Elective (300+ or 400+ course)		3
Term Semester Hours:		15
Total Semester Hours:		120

FA Course is historically offered only in Fall semesters.

SP Course is historically offered only in Spring semesters.