

Possible Sequences for the Physics Major (Revised Spring 2014)

REQUIREMENTS FOR THE MAJOR: All courses on the “required” list below, three courses from “core” list, one additional course from either the “core” or “elective” lists, a *Complementary Lab Science* course (see catalog for a list), Math 30, 31, 32 or 107, and Math 60 (Linear Algebra).

REQUIREMENTS FOR THE MINOR: Intro courses from the “required” list, Physics 101&lab, at least one core course, and two other upper-division course credits from core, laboratory and elective courses, and Math 30, 31, 32 or 107, & 60.

Required courses for the major (*offered every year*):

Intro Courses

Physics 70&lab	Spacetime, Quanta, and Entropy (general introduction for all potential majors)	} or 41/42
Physics 71 (half)*	Introduction to Mechanics	
Physics 72 (half)*	Introduction to Electrodynamics	

*or passing score on the relevant placement test

Other Required Courses

Physics 101&lab	Atomic and Nuclear Physics (<i>requires 41/42 or 70, at least concurrent Math 32 or 107</i>)
Physics 128&lab	Digital and Analog Electronics (<i>requires 70</i>)
Physics 174	Contemporary Experimental Physics (<i>requires 101, must be taken prior to senior year</i>)
Physics 190	Senior seminar (<i>requires 101</i>)
Physics 191	Senior Thesis (<i>may be elected to be a half course instead of a full course, may be repeated once</i>)
Physics 193	Senior comprehensive exam (<i>requires 101, no credit</i>)

Core Courses

 (*all 4 recommended for those pursuing advanced physics studies.*)

Physics 125	(Intermediate Newtonian) Mechanics (<i>requires 41/42 or 70, Math 32 or 107, Math 60; one of Math 32, 60, or 107 completed prior to taking 125</i>)	[spring]
Physics 142	Electricity and Magnetism (<i>requires same as Mechanics</i>)	[spring]
Physics 170	Quantum Mechanics (<i>requires 101, Math 60</i>)	[fall]
Physics 175	Statistical Physics (<i>requires 101, Math 60</i>)	[spring]

Upper-Division Elective courses

Physics 148	Computational Methods (<i>requires Math 60</i>)	[odd falls]
Physics 160	General Relativity (<i>requires 125</i>)	[even springs]
Physics 165	Fluid Mechanics (<i>requires 125 and Math 60</i>)	[even falls]
Physics 171	Advanced Quantum (<i>requires 170</i>)	
Physics 180	Applied Mathematics (<i>requires 41/42 or 70, Math 102</i>)	[odd falls]
Astronomy 101	Observational Astronomy (<i>requires 41/42 or 70, Astro 51 or 62</i>)	[fall]
Astronomy 12x/12y	Pair of Astro Upper-Div half courses (<i>requires Phys 101, Astro 51 or 62</i>)	[spring]

STANDARD PHYSICS MAJOR SEQUENCE: (assumes core of 125, 170)

	Fall	Spring
FRESHMAN YEAR:	Physics 70 Math 30 [or higher] ID 1 Language 1	Physics 71 and/or 72 (or 125) Math 31 [or higher] Open Language 2
SOPHOMORE YEAR:	Physics 101 Math 32 Complementary Lab Science Language 33	Physics 125 [or 128 or 175] Math 60 (Linear Algebra) Physics 128 Open
JUNIOR YEAR:	Physics 170 or STUDY ABROAD Open or SA (or 148, 165, 180, or Astr 101) Open or SA Open or SA	Physics 174 Physics 142, 160, 171, 175, or Astr 12x&12y Open (or another course from the line above) Open
SENIOR YEAR:	Physics 190 and 193 Open or Physics 191 Open (or Physics 170 if SA last year) Open, Physics 148, 165, 180, or Astr 101	Physics 191 Physics 142, 160, 171, 175, or Astr 12x&12y Open (or another course from the line above) Open

Note that Physics majors planning to study abroad should go abroad in the **fall of their junior year** (the only alternative is to take the required 174 course spring of the sophomore year, which is not recommended).

ASTROPHYSICS OPTION:

Required Courses (see previous side for prerequisites)

Physics Introductory Sequence and Physics 101	
Astronomy 62	Introduction to Astrophysics (<i>requires Intro Physics</i>)
Astronomy 101	Observational Astronomy
Advanced Astronomy	Two half-courses from the Astr 120 series or Astr 051 and one from the Astr 120 series
Physics Core (2 courses)	Physics core: any two of 125,142,170,175
Physics Adv. Lab	Physics 128 or Physics 174
Advanced Physics	Courses from the following: Physics 125, 128, 142, 148, 160, 165, 170, 171, 175, 180
Physics 190,191&193	Senior Seminar, Senior Thesis, & Senior Exercise

Astrophysics majors are encouraged to take an introductory Computer Science course with an Open slot.

	Fall	Spring
SOPHOMORE YEAR:	Physics 101 Math 32 (or Astro 101) Open Language 33	Physics 125 Math 60 (Linear Algebra) Astronomy 62 Open or Physics 128
JUNIOR YEAR:	Astronomy 101 (or Open) Physics 148, 165, 170, or 180 Open Open	Astronomy 12x & 12y Physics 174 or Physics 128 Physics 142, 160, or 175 Open
SENIOR YEAR:	Physics 190 and 193 Open or Physics 191 Open or Physics 148, 165, 170, or 180 Open	Physics 191 Physics 142, 160, 171 or 175 Open Open

PHYSICS MAJOR STARTING IN THE 2ND SEMESTER OF FRESHMAN YEAR

	Fall	Spring
FRESHMAN YEAR:	Unknown Math 30 [or higher] ID 1 Unknown	Physics 71/72 Math 31 [or higher] Open Language 2
SOPHOMORE YEAR:	Physics 70 Math 32 Complementary Lab Science Language 33	Physics 52/54 @ HMC (PHYS101 replacement) Math 60 (Linear Algebra) Physics 128 Open
JUNIOR YEAR:	Physics 170 or STUDY ABROAD Open or SA (or 148, 165, 180, or Astr 101) Open or SA Open or SA	Physics 174 Physics 125, 142, 171, 175, or Astr 12x&12y Open (or another course from the line above) Open
SENIOR YEAR:	Physics 190 and 193 Open or Physics 191 Open (or Physics 170 if SA last year) Physics 148, 165, 180, or Astr 101	Physics 191 Physics 142, 160, 171, 175, or Astr 12x&12y Open (or another course from the line above) Open

PHYSICS MAJOR STARTING IN THE SOPHOMORE YEAR (Assumes that one has two semesters of calculus)

SOPHOMORE YEAR:	Physics 70 Math 32 Complementary Lab Science Language 33	Physics 71, 72 if needed Math 60 Physics 125 or 128 Open
JUNIOR YEAR:	Physics 101 Open (or Physics 148, 165, or 180) Open Open	Physics 128 or 125 Physics 174 Physics 142, 160, or 175 Open
SENIOR YEAR:	Physics 190&193 Physics 191 Physics 170 (or maybe 148, 165, or 180) Open	Physics 191 Physics 142, 160, or 175 Open or Physics 142, 160, 171 or 175 Open

A student planning to go to graduate school in physics should take Physics 142 before taking the GRE exam fall term senior year. In other cases, it might be all right to delay taking Physics 142 until spring term senior year.

TEACHING OPTION: People interested in a career in high-school teaching may substitute *two* introductory courses in other sciences (or one introductory course and Math 102) in place of an upper-division elective. Psychology is recommended. Education 170G and 375 count towards an MA in Education and teaching credential through CGU. CGU's 4+1 Pathway for Teachers has paid internships and scholarships specifically for future science teachers.

JUNIOR YEAR:	Physics 170 (or STUDY ABROAD) Psych 51 Open or Education 170G Open	Physics 174 Physics 142, 160, 171, 175, or Astr 12x&12y Open or other intro science Open
SENIOR YEAR:	Physics 190 and 193 Open or Physics 191 Open (or Physics 170 if not taken) Open or Education 170G or 375	Physics 191 Physics 142, 160, 171, 175, or Astr 12x&12y Open Open

PRE-MED/PHYSICS OPTION:

FRESHMAN YEAR:	Physics 70 Math 30 [or higher] ID 1 Chemistry 1a (or 51)	Physics 71 and/or 72 (or 125) Math 31 [or higher] Open Chemistry 1b (unless 51 completed)
SOPHOMORE YEAR:	Physics 101 Math 32 Bio 40 Language 1	Physics 125 Biology 41C Math 60 Language 2
JUNIOR YEAR:	Chemistry 110a Language 33 Open Open	Chemistry 110b Physics 128 Physics 174 Open
SENIOR YEAR:	Physics 190&193 Physics 170 Open Open	Physics 191 Physics 175 Open Open

ENGINEERING PHYSICS OPTION:

	<i>Fall</i>	<i>Spring</i>
FRESHMAN YEAR:	Physics 70 Math 30 [or higher] ID 1 Language 1	Physics 71 and/or 72 (or 125) Math 31 [or higher] Open Language 2
SOPHOMORE YEAR:	Physics 101 Math 32 Open or SA Language 33	Physics 125 [or 128 or 175] Math 60 (Linear Algebra) Physics 128 Open
JUNIOR YEAR:	Physics 170 HMC Engr 59 (Math 102 co-req) Open or SA Open or SA	Physics 174 Physics 142, 160, 175, or Astr 12x&12y Open (or another course from the line above) HMC Engr 82 or 83 or 85 (Eng 59 pre-req)
SENIOR YEAR:	Physics 190 and 193 Open or Physics 191 Open (or Physics 170 if SA last year) Open, Physics 148, 165, 180, or Astr 101	Physics 191 Physics 142, 160, 171, 175, or Astr 12x&12y Open (or another course from the line above) Open

3-2 PRE-ENGINEERING OPTION:

	<i>Fall</i>	<i>Spring</i>
FRESHMAN YEAR:	Physics 70 Math 30 [or higher] ID 1 Language 1	Physics 71 and/or 72 (or 125) Math 31 [or higher] Open Language 2
SOPHOMORE YEAR:	Physics 101 Math 32 Chem 1a Language 33	Physics 125 [or 128 or 175] Math 60 (Linear Algebra) Chem 1b Physics 128
JUNIOR YEAR:	Physics 170 Math 102 Open or SA Open or SA	Physics 174 Physics 142, 160, 171, 175, or Astr 12x&12y Open (or another course from the line above) Open
SENIOR YEAR:	Transfer to either Caltech or Washington University (St. Louis).	

2-1-1-1 DARTMOUTH PRE-ENGINEERING OPTION:

	<i>Fall</i>	<i>Spring</i>
FRESHMAN YEAR: POMONA	Physics 70 Math ID 1 Language	Physics 71 / 72 Math General Education Language
SOPHOMORE YEAR: POMONA	Physics 101 Math Chemistry Language	Physics 174 Math General Education Computer Science
JUNIOR YEAR: DARTMOUTH*	ENGS 31 / ENGS 32 – Digital Electronics / Electronics: Intro to Linear and Digital Circuits Upper Division Elective { ENGS 36 / ENGS 25 – Chemical Engineering / Intro to Thermodynamics or ENGS 33 / ENGS 34 – Solid Mechanics / Fluid Dynamics ENGS 21 ENGS 22	
SENIOR YEAR: POMONA	Physics 190 Clinic General Education	Clinic Physics 142 Physics 125 or 175 (prefer 125 @ Pomona) Physics 191
BACHELOR OF ENGINEERING DARTMOUTH*		

Pomona Substitution Rules

- Physics 142 must be taken at POMONA ONLY
- Physics 174 must be taken at POMONA ONLY
- Physics 128 can be substituted with Dartmouth ENGS 31/ENGS 32
- Upper division elective can be taken at Dartmouth
- { Physics 175 can be substituted with Dartmouth ENGS 36/ENGS 25 (sub 175 or 125, not both)
or
Physics 125 can be substituted with Dartmouth ENGS 33/ENGS 34 (sub 125 or 175, not both)(prefer 125 @ Pomona)

***Please note that Dartmouth is on the quarter system and not semesters. It may be necessary for you to take classes during the summer quarter in order to meet all requirements. Please see the link below for sample schedules at Dartmouth.**

<http://engineering.dartmouth.edu/images/uploads/dual-degree-sample-programs.pdf>