

SCHMID COLLEGE OF SCIENCE & TECHNOLOGY – SCHOOL OF COMPUTATIONAL SCIENCES
 BACHELOR OF SCIENCE IN PHYSICS AND COMPUTATIONAL SCIENCE FALL2015 / SPRING 2016
 PHYSICS FACULTY

Yakir Aharonov, Ph.D.	Roman Buniy, Ph.D.	Justin Dressel, Ph.D.	Hesham El-Askary, Ph.D.
Ali Nayeri, Ph.D.	Jeff Tollaksen, Ph.D.		

Office: Dana Dacier (ph: 714-744-7644); email: dacier@chapman.edu

WEB <http://www.chapman.edu/scst/undergraduate/bs-physics-computational-science.aspx>

Using the guidelines below, students design their physics computational science program in consultation with their academic advisor. To graduate, physics and computational science majors are required to complete a minimum of 65-66 credits.

lower-division requirements (38 credits)

Course Number	Course Title	Credits	When Offered
Physics 101/101L	General Physics I/Lab-General Physics I*	3, 1	Fall semester
Physics 102/102L	General Physics II/Lab-General Physics II*	3, 1	Spring semester
Mathematics 110	Single Variable Calculus I [^GE]	3	Every semester
Mathematics 111	Single Variable Calculus II	3	Every semester
Mathematics 210	Multivariable Calculus	3	Every semester
Mathematics 211	Linear Algebra	3	Every semester
Physics 201	General Physics III	3	Fall semester
Physics 202	Modern Physics	3	Spring semester
Mathematics 270	Computational Mathematics Tools	3	As needed
Computer Science 230	Computer Science I [^GE]	3	Every semester
Computer Science 231	Computer Science II	3	Every semester
Physics 250	Mathematical Methods in Physics	3	Spring semester

* Physics 107/107L General Physics for the Life Sciences I/Laboratory, and Physics 108/108L General Physics for the Life Sciences II/Laboratory may be substituted for Physics 101/101L General Physics I/Lab-General Physics I, and Physics 102/102L General Physics II/Lab-General Physics II by petition.

upper-division requirements (21 credits)

Course Number	Course Title	Credits	When Offered
Physics 320	Mechanics I	3	Fall semester, alternate years
Mathematics 350	Differential Equations	3	Fall semester
Physics 405	Seminar in Multidisciplinary Perspectives	3	Fall semester
Physics 421	Electricity and Magnetism I	3	Fall semester, alternate years
Physics 430	Thermodynamics	3	As needed
Physics 451	Quantum Mechanics	3	Fall semester, alternate years
Physics 498	Senior Capstone Research and Seminar	3	Spring semester

upper-division electives (6-7 credits)

two of the following

Physics 321	Mechanics II	3	As needed
Physics 326	Astronomy and Cosmology	3	Spring semester
Physics 330/330L	Digital Logic Design I/Lab-Digital Logic Design I	4	Spring semester
Computer Science 350	Data Structures and Algorithms	3	Every semester
Mathematics 360	Probability Theory	3	Fall semester, alternate years
Physics 370	Special Topics in Physics	3	As needed
Mathematics 390	Introduction to Differential Geometry	3	As needed
Physics 422	Electricity and Magnetism II	3	As needed
Physics 431	Statistical Physics	3	As needed
Physics 452	Quantum Mechanics II	3	As needed
Physics 499	Individual Study	3	As needed
Physics 520	Physical Principles of Remote Sensing	3	Spring semester

total credits

65-66

Program Learning Outcomes and Educational Effectiveness Evaluation Plans for B.S. Physics and Computational Science.

Note: ^approved for GE Quantitative Inquiry

RECOMMENDED SEQUENCE OF PHYSICS AND COMPUTATIONAL SCIENCE CLASSES FOR MAJORS

	<u>FALL</u>	<u>INTERM</u>	<u>SPRING</u>
<i>Freshman</i>	Single Variable Calculus I, MATH 110 Computer Science I, CpSc230 General Physics I, PHYS 101		Single Variable Calculus II, MATH 111 Computer Science II, CpSc 231 General Physics II, PHYS 102
<i>Sophomore</i>	Multi Variable Calculus, MATH 210 General Physics III, PHYS 201 Scientific Computation, PHYS 227	Computational Tools, MATH270	Linear Algebra, MATH 211 Modern Physics, PHYS 202 Mathematical Methods, PHYS 250
<i>Junior</i>	Differential Equations, MATH 350 Electricity & Magnetism, PHYS 421 Quantum Mechanics, PHYS 451		Electricity & Magnetism II, PHYS 422 Quantum Mechanics II, PHYS 452
<i>Senior</i>	Mechanics, PHYS 320 Cosmology, PHYS 326		Thermodynamics, PHYS 430 Senior Capstone, PHYS 498

ADDITIONAL INFORMATION

GRADE REQUIREMENTS: Students pursuing a BS. in the physics and computational science program must maintain a 2.000 "C" grade point average in the major. All courses in the major must be taken for a letter grade.

PHYSICS AND COMPUTATIONAL SCIENCE HONORS AT GRADUATION Students graduating with a BS physics and computational science will earn school honors at graduation by meeting the following criteria. Students must have a cumulative GPA of a 3.500 or higher and must have completed independent research. Completion of independent research includes the submission of a scientific manuscript to the physics faculty, oral presentation to the faculty, poster presentation at the Schmid College Student Research Day, and a vote by the faculty group that the research, paper, and presentations were of sufficient quality to merit honors.

PLANNING FOR GRADUATE SCHOOL, AIMING FOR PROGRAM HONORS?

GRADES AND THE GRE: Entrance to graduate school is competitive primarily depends on your software engineering course grades, your overall grade point average for your last 60 units of study, and your scores on the Graduate Records Examination (GRE). Most graduate programs require a minimum GPA of 3.0 and GRE scores of 500 or better for verbal and quantitative skills.

RESEARCH EXPERIENCE is essential and available through the senior project/thesis and by completing PHYS499, Individual Research/Study. Check the faculty's web pages to find a research area that interests you and contact the faculty directly to discuss your options. Working closely with faculty on research projects gives you valuable research experiences, looks good on your resume, and is an excellent basis for letters of recommendation.

DEGREE PROGRAM HONORS: Students must have a cumulative GPA of a 3.500 or higher and must have completed a minimum of three credits of independent research. Completion of independent research includes the completion of a scientific paper in the relevant scientific field, oral presentation to the faculty, poster presentation at the Chapman University Student Research Day and a vote by the appropriate faculty group that the research, paper and presentations were of sufficient quality to merit honors. Additional degree program honor requirements, if they exist, are listed under the degree program description.

