

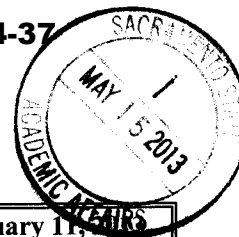


SACRAMENTO
STATE

PHYSB13-14.001

Approved by the Faculty Senate Oct 17, 2013 - Att: FS 13/14-37

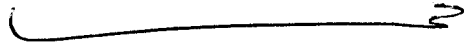
Program Proposal Form B



Academic Group (College): NSM	Date of Submission to College Dean: February 11, 2013
Academic Organization: Physics and Astronomy	Requested Effective: Fall <u>X</u> , Spring __, 2013.
Department Chair: William DeGraffenreid	Contact if not Department Chair:
Title of the Program (Please be specific; indicate minor, undergraduate or graduate degree, etc.): Bachelor of Science in Physics	
Type of Program Proposal:	
<input checked="" type="checkbox"/> Modification in Existing Program: <input checked="" type="checkbox"/> Substantive Change ___ Non-Substantive Change ___ Deletion of Existing Program <input type="checkbox"/> New Programs ___ Initiation (Projection) of New Program on to Master Plan ___ New Degree Programs ___ Regular Process ___ Fast Track Process ___ Pilot Process ___ New Minor, Concentration, Option, Specialization, Emphasis ___ New Certificate Program	
PLEASE NOTE: Form B is to be used only as a Cover Form. Additional information is requested for each of the above as noted in the corresponding procedure in the Policies and Procedures for Initiation, Modification, Review and Approval of Courses and Academic Programs found at: http://www.csus.edu/acaf/academic_resources/policies_and_procedures/Course_and_Program_Proposals/ApprovalProcess.html	
Briefly describe the program proposal (new or change) and provide a justification: We are proposing several changes to our BS program, all are rather non-substantial. 1) Allow students to take either PHYS 105 or MATH 105A. Guidelines currently require PHYS 105, but we've been substituting MATH 105A for some time due to infrequent offering of PHYS 105. 2) We are clarifying the catalog's degree requirements by removing reference classes in common with the BA and by explicitly listing them. 3) We remove the specific list of allowed electives and replace with units chosen in consultation with a Physics Advisor. 4) Clarifying that students can complete their Senior project (PHYS 191) either over one or two semesters. 5) We are also clarifying the requirement of attending physics colloquia. In the current catalog, it is indicated by a note at the end of all degree programs. By moving it into the catalog list of requirements without changes, it is more explicit. 6) Added language about the waiver of the Foreign Language Requirement.	
These changes will allow more flexibility in the degree and therefore are in line with the Graduation Initiative. It also reduces the total number of units to 120 to maintain compliance with the CO's recent mandate. Removing the specific list of electives will simplify the catalog text and provides additional flexibility in the degree. There are no costs associated with these changes. Only Mathematics and Statistics are affected by these changes. They have been consulted and have no objections to them.	

Approvals:

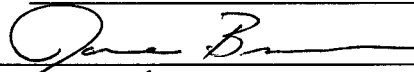
Department Chair:



Date:

5/1/13

College Dean:



Date:

5/14/13

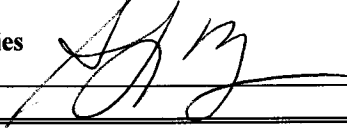
University Committee:

Kate Chalvers

Date:

9-10-13

**Assoc Dean for Undergraduate Studies
or Dean for Graduate Studies:**



Date:

9/11/13

11/08/2012

Requirements - Bachelor of Science Degree - Physics

Proposed catalog copy

Old catalog copy

Units required for Major: 74-76			Units required for Major: 74-75		
Minimum total units required for the BS: 120			Minimum total units required for the BS: 120		
<i>Courses in parentheses are prerequisites.</i>			<i>Courses in parentheses are prerequisites.</i>		
A. Required Lower Division Courses (37 units) +++++			A. Required Lower Division Courses (37 units) Same as Section A for BA in Physics		
(5)	CHEM 1A	General Chemistry I (High school chemistry and college algebra; sufficient performance on the college algebra diagnostic test, or equivalent)	+++	+++++	+++++
(5)	CHEM 1B	General Chemistry II (CHEM 1A with a passing grade of C or better)	+++	+++++	+++++
(4)	MATH 30	Calculus I (MATH 29 or four years of high school mathematics which includes two years of algebra, one year of geometry, and one year of mathematical analysis; completion of ELM requirement and Pre-Calculus Diagnostic Test)	+++	+++++	+++++
(4)	MATH 31	Calculus II (MATH 30 or appropriate high school based AP credit)	+++	+++++	+++++
(4)	MATH 32	Calculus III (MATH 31)	+++	+++++	+++++
(3)	MATH 45	Differential Equations for Science and Engineering (MATH 31)	+++	+++++	+++++
(4)	PHYS 11A	General Physics: Mechanics (MATH 30, MATH 31; or equivalent certificated high school courses; MATH 31 may be taken concurrently)	+++	+++++	+++++
(4)	PHYS 11B	General Physics: Heat, Light, Sound (MATH 31, PHYS 11A)	+++	+++++	+++++
(4)	PHYS 11C	General Physics: Electricity and Magnetism, Modern Physics (MATH 31, PHYS 11A)	+++	+++++	+++++

B. Required Upper Division Courses (34-36 units)

+++++		
(3)	PHYS 105	Mathematical Methods in Physics (MATH 32; PHYS 11A, PHYS 11B, PHYS 11C or PHYS 5A, PHYS 5B)
OR (4)	MATH 105A	Advanced Mathematics for Science and Engineering I (MATH 32, MATH 45)
(3)	PHYS 106	Introduction to Modern Physics (MATH 31; PHYS 11A, PHYS 11B, PHYS 11C or PHYS 5A, PHYS 5B)
(3)	PHYS 110	Classical Mechanics (MATH 45, PHYS 11C, PHYS 105)
(4)	PHYS 115	Electronics and Instrumentation (PHYS 11C or PHYS 5B with instructor permission)
OR (3)	PHYS 145	Optics (MATH 45, PHYS 11A, PHYS 11B, PHYS 11C)
(3)	PHYS 124	Thermodynamics and Statistical Mechanics (MATH 45, PHYS 11A, PHYS 11B, PHYS 11C)
(3)	PHYS 135	Electricity and Magnetism (MATH 45, PHYS 11C, PHYS 105)
(3)	PHYS 136	Electrodynamics of Waves, Radiation, and Materials (PHYS 135)
(3)	PHYS 150	Quantum Mechanics (MATH 45, PHYS 106, PHYS 110)
(3)	PHYS 151	Advanced Modern Physics (PHYS 150)
(3)	PHYS 156	Classical and Statistical Mechanics (PHYS 110 and PHYS 124)
(2)	PHYS 175	Advanced Physics Laboratory (12 units of upper division physics including PHYS 106 and either PHYS 115 or PHYS 145 and satisfaction of the Advanced Writing requirement)
(1-2)	PHYS 191	Senior Project (Department Chair permission)

C. Elective Upper Division Requirements (3 units)

Three units of upper-division coursework chosen in consultation with physics advisor.

B. Required Upper Division Courses (34-35 units)

Same as Section B for BA in Physics plus the following:		
+++	+++++	+++++
+++	+++++	+++++
+++	+++++	+++++
+++	+++++	+++++
+++	+++++	+++++
+++	+++++	+++++
+++	+++++	+++++
(3)	PHYS 136	Electrodynamics of Waves, Radiation, and Materials (PHYS 135)
(3)	PHYS 150	Quantum Mechanics (MATH 45, PHYS 106, PHYS 110)
(3)	PHYS 151	Advanced Modern Physics (PHYS 150)
(3)	PHYS 156	Classical and Statistical Mechanics (PHYS 110 and PHYS 124)
+++	+++++	+++++
+++	+++++	+++++

C. Elective Upper Division Requirements (3 units)

Three elective units in Physics selected from the following in consultation with an advisor:

++++	++++	++++	(3)	PHYS 116	Advanced Electronics and Instrumentation (PHYS 115)
++++	++++	++++	(3)	PHYS 130	Acoustics (MATH 45, PHYS 11A, PHYS 11B, PHYS 11C)
++++	++++	++++	(3)	PHYS 142	Applied Solid State Physics (MATH 45, PHYS 106)
++++	++++	++++	(3)	PHYS 162	Scientific Computing: Basic Methods (MATH 26A or MATH 30 and PHYS 5A, or MATH 30 and PHYS 11A, or MATH 105A taken concurrently)
++++	++++	++++	(1-3)	PHYS 196 series course	Experimental Offerings in Physics (1-3 units per semester; 4 unit maximum)
++++	++++	++++	(1-3)	PHYS 198	Co-curricular Activities (1-3 units per semester; 4 unit maximum)
++++	++++	++++	(1-3)	PHYS 199	Special Problems (1-3 units per semester; 4 unit maximum)
++++			And whichever of the courses below not previously used to fulfill the upper division requirement:		
++++	++++	++++	(4)	PHYS 115	Electronics and Instrumentation (PHYS 11C or PHYS 5B with instructor permission) OR
++++	++++	++++	(3)	PHYS 145	Optics (MATH 45, PHYS 11A, PHYS 11B, PHYS 11C)
D. Physics Colloquium Attendance			++++		
Majors must fulfill a minimum attendance requirement at Department Colloquia. Students should consult with the Department for details.			++++		
Notes:			Notes:		
Students are required to complete 2 units for their Senior project (PHYS 191) either over one or two semesters.			++++		
++++			In addition to the course requirements listed above, both the BA and BS degree programs in Physics require the fulfillment of a minimum attendance of Department colloquia. Students should consult with the Department Chair on how to fulfill this requirement.		
++++			For the BS degree PHYS 199 may be substituted for PHYS 175, if approved by the department.		
Students with an interest in theoretical physics are encouraged to consider a minor in Mathematics.			Students with an interest in theoretical physics are encouraged to consider a minor in Mathematics.		
++++			For students intending to pursue a graduate degree, the study of one foreign language is recommended. Development of computer skills and the acquisition of various machine shop skills are also recommended. Although a minor is not required for the Physics major, a minor in another science or mathematics is recommended.		
Students graduating with a BS in Physics will not be subject to the University's Foreign Language Graduation Requirement. Students who change major			++++		

may be subject to the University's Foreign Language
Graduation Requirement.