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| For Academic Affairs and Research Use Only |
| CIP Code:  |  |
| Degree Code: |  |

 **Course Deletion Proposal Form**

**[X] Undergraduate Curriculum Council**

**[ ] Graduate Council**

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

Email completed proposals to curriculum@astate.edu for inclusion in curriculum committee agenda.

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| John Hershberger | 2/20/2018 |

**Department Curriculum Committee Chair** |

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**COPE Chair (if applicable)** |
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| William Burns | 2/20/2018 |

**Department Chair:**  |

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**Head of Unit (If applicable)**   |
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| David F. Gilmore | 3/1/2018 |

**College Curriculum Committee Chair** |

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**Undergraduate Curriculum Council Chair** |
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| Anne A. Grippo | 3/1/2018 |

**College Dean** |

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**Graduate Curriculum Committee Chair** |
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**General Education Committee Chair (If applicable)**   |

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**Vice Chancellor for Academic Affairs** |

**1. Course Title, Prefix and Number**

Physical Instrumentation I, PHYS 3272 AND Physical Instrumentation II, PHYS 3282

**2. Contact Person** (Name, Email Address, Phone Number)

William Burns, wburns@astate.edu 972-2535

**3. Last semester course will be offered**

Fall 2015

Please clarify by selecting one of the following:

1. [X] Remove BS Physics /PHYS 3272 & PHYS 3282 from bulletin for Fall of 2018
2. [ ] Other - Please clarify - Click here to enter text.

**4. Student Population**

a. The course was initially created for what student population?

BS Physics majors

b. How will deletion of this course affect those students?

No impact. Students will register for PHYS 459V, Research in Physics

**College, Departmental, or Program Changes**

**5.** a. How will this affect the college, department, and/or program?

No impact

b. **Yes / No** Does this program and/or course affect another department? NO

If yes, provide confirmation of acceptance/approval of changes from the Dean, Department Head, and/or Program Director whose area this affects.

 Enter text...

 c. Please provide a short justification for why this course being deleted from program.

 Since Spring 2015 physics faculty have elected to allow students to complete two credit hours of PHYS 459V (Research in Physics) as a substitution for the degree requirements PHYS 3272 (Physical Instrumentation I) and PHYS 3282 (Physical Instrumentation II). PHYS 3272 and 3282 focus on use of instrumentation and data analysis commonly encountered in modern physics research. Students enrolled in these courses typically were exposed to instrumentation and data analysis by actively participating in on-going research projects in individual faculty research labs. Students are exposed to essentially identical experiences when enrolled in PHYS 459V. Thus, it is proposed two credits of PHYS 459V will replace PHYS 3272 and 3282 as BS physics degree requirements, and therefore PHYS 3272 and 3282 will no longer be needed. A Bulletin/Banner Change Transmittal Form has been submitted to replace degree requirements PHYS 3272 and 3282 with two credits of PHYS 459V as a degree requirement. This will reduce BS Physics major requirements by two credit hours, which be added to the degree electives.

**6. Yes / No Is there currently a course listed in the bulletin which is equivalent to this one? NO**

If yes, which course(s)?

 Enter text...

**7. Yes / No Will this course be equivalent to a new course? NO**

If yes, what course?

Enter text...

**Bulletin Changes**

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| **Instructions**  |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Follow the following guidelines for indicating necessary changes.** **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.** - Deleted courses/credit hours should be marked with a red strike-through (~~red strikethrough~~)- New credit hours and text changes should be listed in blue using enlarged font (blue using enlarged font). - Any new courses should be listed in blue bold italics using enlarged font (***blue bold italics using enlarged font***)*You can easily apply any of these changes by selecting the example text in the instructions above, double-clicking the ‘format painter’ icon 🡪 , and selecting the text you would like to apply the change to.**Please visit* [*https://youtu.be/yjdL2n4lZm4*](https://youtu.be/yjdL2n4lZm4) *for more detailed instructions.* |

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**Major in Physics**

**Bachelor of Science**

A complete 8-semester degree plan is available [at http://registrar.astate.edu/.](http://registrar.astate.edu/)

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| **University Requirements:** |  |
| See University General Requirements for Baccalaureate degrees (p. 41) |  |
| **First Year Making Connections Course:** | **Sem. Hrs.** |
| PHSC 1003, Making Connections - Chemistry and Physics | **3** |
| **General Education Requirements:** | **Sem. Hrs.** |
| See General Education Curriculum for Baccalaureate degrees (p. 84)**Students with this major must take the following:***MATH 2204, Calculus I**PHYS 2034 University Physics I**COMS 1203, Oral Communication (Required Departmental Gen. Ed. Option)* | **36** |
| **Major Requirements:** | **Sem. Hrs.** |
| CHEM 1013 **AND** 1011, General Chemistry I and Laboratory | 4 |
| CHEM 1023 **AND** 1021, General Chemistry II and Laboratory | 4 |
| CS 2114, Structured Programming | 4 |
| MATH 2214, Calculus II | 4 |
| MATH 3254, Calculus III | 4 |
| MATH 4403, Differential Equations | 3 |
| PHYS 2044, University Physics II | 4 |
| PHYS 3103, Thermal Physics | 3 |
| PHYS 3153, Mechanics | 3 |
| PHYS 3203, Electromagnetic Theory | 3 |
| PHYS 3303, Modern Physics | 3 |
| PHYS 3253, Optics | 3 |
| ~~PHYS 3272 Physical Instrumentation I~~ | ~~2~~ |
| ~~PHYS 3282, Physical Instrumentation II~~ | ~~2~~ |
| PHYS 4353, Mathematical Physics | 3 |
| PHYS 4553, Principles of Quantum Mechanics | 3 |
| PHYS 4693, Research in Physics - Capstone | 3 |
| **Sub-total** | **55** |
| **Electives:***Ten hours of the electives below must be upper-level.* | **Sem. Hrs.** |
| Electives | **26** |
| **Total Required Hours:** | **120** |

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**PHYS 2064. General Physics II** Continuation of PHYS 2054, the essentials of electricity, mag­netism, wave motion, light and modern physics in a unified lecture and laboratory format utilizing multimedia computers at each student station. Six hours per week. PHYS 2044 may be substituted for this course. Special course fees may apply. Prerequisite, PHYS 2054 or 2034. Fall, Spring, Summer. (ACTS#: PHYS 2024)

**PHYS 2071. Fundamental Physics I Laboratory** Two hours per week. Special course fees may apply. Credit for this course is contingent upon earlier or simultaneous completion of PHYS 2073. Demand.

**PHYS 2073. Fundamental Physics I** Basic principles of mechanics, special relativity, thermo­dynamics, and wave motion utilizing calculus. Lecture three hours per week. Special course fees may apply. Students enrolling in this course should enroll in Laboratory for Fundamental Physics I. Corequisite, MATH 2204. Demand.

**PHYS 2081. Fundamental Physics II Laboratory** Two hours per week. Special course fees may apply. Prerequisites, PHYS 2071 and 2073. Credit for this course is contingent upon earlier or simultaneous completion of PHYS 2083. Demand.

**PHYS 2083. Fundamental Physics II** Continuation of PHYS 2073. Covering electricity, mag­netism, optics, and modern physics. Lecture three hours per week. Special course fees may apply. Students enrolling in this course should enroll in Laboratory for Fundamental Physics II. Corequisite, MATH 2214. Prerequisites, PHYS 2071 and 2073. Demand.

**PHYS 2133. Survey of Physics for the Health Professions** A survey for introductory mechan­ics, waves, electricity, magnetism, optics and modern physics with applications for students of the health professions. Special course fees may apply. Fall.

**PHYS 2393. Special Topics** Selected special or current topics of interest to faculty and students that require no prerequisite courses. This course is appropriate for a general student audience. See individual semester schedules for more information about each offering. Demand.

**PHYS 3043. Atmospheric Dynamics** A study of the physical dynamics of the at­mosphere and the oceans and the interactions between the two. Topics to be discussed include basic atmospheric and geophysical fluid dynamics, An integrated laboratory component will have students build analyze the local atmosphere. Prerequisite, PHYS 2034 or 2054. Spring.

**PHYS 3052. Relativity** Quantitative introduction to the special theory of relativity with a brief qualitative introduction to general relativity. Special course fees may apply. Prerequisites, PHYS 2044 or 2064 or PHYS 2081 and 2083. Demand.

**PHYS 3103. Thermal Physics** The first and second laws of thermodynamics, the kinetic theory of gases, and an introduction to statistical mechanics. Lecture three hours per week. Special course fees may apply. Corequisite, MATH 3254. Prerequisites, PHYS 2044 or 2064. Spring, even.

**PHYS 3133. Astronomy** Theories of the origin, development, present state, and future of the universe, with special emphasis on the place of astronomy in mans cultural and scientific develop­ment. Special course fees may apply. Demand.

**PHYS 3153. Mechanics** Particle dynamics in inertial and accelerated reference frames. Newtons law of gravitation, orbit theory, and elementary rigid body dynamics. Lecture three hours per week. Special course fees may apply. Prerequisites, MATH 2214 and PHYS 2044. Fall.

**PHYS 3203. Electromagnetic Theory** Electrostatics, electric and magnetic properties of materi­als. Amperes and Faradays laws, and Maxwells equations. Lecture three hours per week. Special course fees may apply. Prerequisites, MATH 3254 and PHYS 2044. Spring.

**PHYS 3253. Optics** Geometrical optics and physical optics, including interference, diffraction, dispersion, absorption, and polarization of light. Lecture three hours per week. Special course fees may apply. Prerequisites, MATH 2214 and PHYS 2044. Spring, odd.

**~~PHYS 3272. Physical Instrumentation I~~** ~~Design and use of physical instruments, including data reduction. Laboratory four hours per week. Special course fees may apply. Prerequisites, PHYS 2044. Fall, odd.~~

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**~~PHYS 3282. Physical Instrumentation II~~** ~~A continuation of PHYS 3272, including advanced data reduction techniques. Laboratory four hours per week. Special course fees may apply. Prerequi­sites, PHYS 2044. Spring, even~~.

**PHYS 3303. Modern Physics** An elementary study of the atomic nature of matter and nuclear structure of the atom. Lecture three hours per week. Special course fees may apply. Prerequisites, MATH 2214, and PHYS 2044. Fall.

**PHYS 4353. Mathematical Physics** The mathematical aspects of classical physics including Newtons laws, Lagrangian and Hamiltonian dynamics, Electrodynamics and Relativity. Lecture three hours per week. Special course fees may apply. Prerequisites, PHYS 3303 and MATH 3254. Fall, even.

**PHYS 4393. Special Topics** Selected special or current topics of interest to faculty and students that require prerequisite coursework. See individual semester schedules for more information about each offering. Registration restricted by permission of instructor. Demand.

**PHYS 4403. Nuclear and Particle Physics** Introduction to the structure of the nucleus, nuclear scattering and decay processes, mesons, nucleons, and quarks. Lecture three hours per week. Special course fees may apply. Prerequisite, PHYS 3303. Spring, odd.

**PHYS 4463. Advanced Mechanics** The Lagrangian and Hamiltonian formulations, rigid body mechanics, and special relativity. Special course fees may apply. Prerequisite, PHYS 3153. Demand.

**PHYS 4513. Advanced Electromagnetic Theory** Maxwells equations as applied to waveguides, radiation, and wave propagation in various media. Lecture three hours per week. Special course fees may apply. Prerequisite, PHYS 3203. Demand.

**PHYS 4533. Solid State Physics** Introductory study of the structure and physical properties of crystalline solids, including x-ray diffraction, specific heats, free electron theory, and band approxi­mation. Lecture three hours per week. Special course fees may apply. Prerequisite, 20 hours of physics. Demand.

**PHYS 4553. Principles of Quantum Mechanics** Solutions of the Schrodinger wave equation, including the harmonic oscillator, the hydrogen atom, and perturbation theory, and associated topics. Lecture three hours per week. Special course fees may apply. Prerequisite, 20 hours of physics. Spring, even.

**PHYS 4571. Physics Seminar** Prerequisite, Fourteen hours of physics. Special course fees may apply. Demand.

**PHYS 459V. Research in Physics** Prerequisite, Fourteen hours of physics. Special course fees may apply. Demand.

**PHYS 4693. Research in Physics-Capstone** Students will conduct research with a physics faculty member, write a paper and present a talk on their research, and take an exit exam. Phys­ics majors are required to take this course in their senior year. Special course fees may apply. Prerequisite, Twenty hours of Physics. Fall, Spring.