

ADD, CHANGE OR DELETE UNIT, PROGRAM REQUIREMENTS, OR ACADEMIC POLICIES

Complete this form consistent with the instructions in Academic Policy 1622.20. Use the form to add, change, or delete a program or unit or to change program policies. Proposed additions and changes must be consistent with Academic Policies 1100.40 and 1621.10 and any other policies which apply.

SECTION I: Approvals

Department / Program Chair _____	Date Submitted _____	Graduate Council Chair _____	Date _____
College Dean _____	Date _____	Faculty Senate Chair _____	Date _____
Honors College Dean _____	Date _____	Provost _____	Date _____
Core Curriculum Committee _____	Date _____	Board of Trustees Approval/Notification Date _____	
University Course and Programs Committee _____	Date _____	Arkansas Higher Education Coordinating Board Approval/Notification Date _____	

SECTION II: Profile Data - Required Information and Name Change Information

Academic Unit: Major/Field of Study Minor Other Unit _____ Policy

Level: Undergraduate Graduate Law Effective Catalog Year _____

Program changes are effective with the next available catalog. See Academic Policy Series 1622.20

Current Name **BS, Physics**

College, School, Division **ARSC**

Department Code **PHYS**

Current Code (6 digit Alpha) **PHYSBS**

Proposed Code (6 digit Alpha) _____
Prior approval from the Office of the Registrar is required.

Interdisciplinary Program

CIP Code **40.0801**
Prior assignment from Office of Institutional Research is required.

Proposed Name _____
When a program name is changed, enrollment of current students reflects the new name.

SECTION III: Add a New Program/Unit

For new program proposals, complete Sections II and VII and use as a cover sheet for a full program proposal as described in 'Criteria and Procedures for Preparing Proposals for New Programs in Arkansas.' ADHE
http://www.adhe.edu/divisions/academicaffairs/Pages/aa_academicproposals.aspx

Program proposal uses courses offered by another academic college, and that college dean's office has been notified. The signature of the dean of that academic college is required here: _____

SECTION IV: Eliminate an Existing Program/Unit

Code/Name _____ Effective Catalog Year _____

No new students admitted to program after Term: ____ Year: _____

Allow students in program to complete under this program until Term: ____ Year: _____

SECTION V: Proposed Changes to an Existing Program or Program Policies

Insert here a statement of the exact changes to be made: 1) Adding an Astronomy option to the B.S. in Physics program. Requesting that a subplan code "ASTR" be created for advising/tracking purposes. 2) The new course PHYS 3213 replaces existing courses PHYS 220V and PHYS 320V, which are being deleted.

Check if either of these boxes apply and provide the necessary signature:

- Program change proposal adds courses offered by another academic college, and that college dean's office has been notified. The signature of the dean of that academic college is required here: _____
- Program change proposal deletes courses offered by another academic college, and that college dean's office has been notified. The signature of the dean of that academic college is required here: _____

Check all the boxes that apply and complete the required sections of the form:

- Change of Name and Code (Complete only sections I, II, V and VII.)
- Change Course Requirements: (Complete all sections of the form except "Proposed Name" in II, section III, and section IV.)
- Change Delivery Site/Method (Complete all sections of the form except "Proposed Name" in II, section III, and section IV.)
- Change Total Hours (Complete all sections of the form except "Proposed Name" in II, section III, and section IV.)
- Change in Program Policies

SECTION VI: Justification

Justify this change and state its likely effect on any other degree program (including those outside the school or college). Identify any program or program components (other than courses) to be eliminated if this program is implemented. (Program and course change forms must also be submitted for such related changes.)

1.) We propose to create an additional option (Astronomy) for the B.S. Degree with a Major in Physics. This new option would serve those students wishing to attend graduate schools in astronomy or astrophysics by improving their chances of acceptance. This change should have no change on other programs.

2.) We propose to replace the courses PHYS 220V Introduction to Electronics I and PHYS 320V Introduction to Electronics II by a new course PHYS 3213 Electronics in Experimental Physics. The contents of the old courses have become dated due to rapid advances in this field, and a new course is warranted to update the course contents. The old courses were based on Radio Shack textbooks from the 1970's, so are now archaic. This change will affect the BA Physics program course requirements as well as the BS Physics program requirements for some concentrations.

SECTION VII: Catalog Text and Format

In the box below, insert the current catalog text which is to be changed, with changes highlighted with the color yellow. Include all proposed changes identified in Section V. Only changes explicitly stated in Section V will be considered for approval by the University Course and Programs Committee, the Graduate Council and the Faculty Senate. If you are proposing a new program, give proposed text with all of the elements listed below. If you are proposing modified text, include these elements as appropriate.

Include the following elements, in order, in the catalog text for proposed undergraduate program(s) or program changes:

- State complete major/program name
- Briefly define or describe the major/program or discipline.
- Identify typical career goals or paths for graduates. (Optional)
- State admission requirements (if any) for entry or entry into upper/advanced level of major/program.
- Identify location in catalog of university, college/school, and department/program requirements which the student must meet in addition to hours in the major, but do not restate these requirements.
- State course requirements in the major and any allied areas, giving number of hours and specific courses; specify electives or elective areas and give numbers of hours and courses in elective pools or categories; identify any other course requirements.
- State any other requirements (required GPA, internship, exit exam, project, thesis, etc.).
- Identify name and requirements for each concentration (if any).
- Specify whether a minor or other program component is allowed or required and provide details.
- State eight-semester plan requirements

For minors, state requirements in terms of hours, required courses, electives, etc.

For graduate program/units, include elements (as needed) parallel to those listed for undergraduate programs above.

For Law School program/units, prepare text consistent with current catalog style.

For centers, prepare text consistent with current catalog style.

Requirement for B.S. Degree with a Major in Physics: In addition to the university/state core requirements (see page 39) and the Fulbright College of Arts and Sciences Graduation Requirements (see page 126 under Fulbright College Academic Regulations and Degree Completion Program Policy), the following course requirements must be met. Bolded courses from the list below may be applied to portions of the University/state minimum core requirements.

The student must present a minimum of 40 semester hours in physics including **PHYS 2054, PHYS 2074**, PHYS 2094, PHYS 3414, PHYS 3614, PHYS 4073, PHYS 4991 and courses in one of six concentrations:

Professional: PHYS 3113, PHYS 4333, and 10 semester hours numbered 3000 and above in physics or astronomy.

Astronomy: **PHYS 3544 plus 6 semester hours of ASTR courses numbered 3000 or above (3033, 4013, 4073).**

Optics: PHYS 3544, any 1 course selected from PHYS 4734 or PHYS 4774, and 8 semester hours numbered 3000 and above in physics or astronomy.

Electronics: **PHYS 3213**, PHYS 4333, and 6 semester hours numbered 3000 and above in physics or astronomy.

Computational: PHYS 3113 and 13 semester hours including courses numbered 3000 and above in physics, astronomy, advanced computer science, or mathematics chosen with the adviser's permission.

Biophysics: PHYS 3113 and 13 semester hours including courses numbered 3000 and above in physics, astronomy, biology, and chemistry chosen with the adviser's permission.

For all six of the possible concentrations the following mathematics courses are required: MATH 2554, MATH 2564, MATH 2574, MATH 3404, and MATH 3423. CSCE 3513, CSCE 4423, or MEEG 2703 can be substituted for MATH 3423 with the adviser's approval. In addition, **CHEM 1103/1101L** and **CHEM 1123/1121L**, or an approved 8 hours of laboratory-based courses in CSCE 2004 and CSCE 2014 are required.

Majors must propose participation in a research experience project no later than the end of their junior year of study. A written report of the results must be submitted during Senior Seminar (PHYS 4991).

Physics B.S.

Eight-Semester Degree Program

Students wishing to follow the eight-semester degree plan should see page 40 in the Academic Regulations chapter for university requirements of the program as well as page 126 of this chapter for College requirements.

Physics offers six concentrations: biophysics, computational, electronics, optics and professional. The eight-semester plan for each is listed below.

Core requirement hours may vary by individual, based on placement and previous credit granted. Once all core requirements are met, students may substitute a three-hour (or more) general elective in place of a core area. Well prepared students may skip BIOL 1543/1541L, and go immediately into the biology core courses. Students should consult their advisers.

Astronomy Concentration	
Fall Semester Year 1	
3	ENGL 1013 Composition I
4	†MATH 2554 Calculus I
3	University/state core US History requirement
4	†PHYS 2054 University Physics I
1	General Elective
15	Semester Hours
Spring Semester Year 1	
3	ENGL 1023 Composition II
4	†MATH 2564 Calculus II
3	University/state core fine arts or humanities requirement
2	General Electives
4	†PHYS 2074 University Physics II
16	Semester Hours
Fall Semester Year 2	
4	†PHYS 2094 University Physics III
4	CHEM 1103/1101L University Chemistry I and Lab
4	†MATH 2574 Calculus III

3	University/state core humanities or fine arts requirement (as needed)	
1	General Elective	
16	Semester Hours	
Spring Semester Year 2		
4	‡PHYS 3614 Modern Physics	
3	University/state core social science requirement	
4	‡MATH 3404 Differential Equations	
4	CHEM 1123/1121L University Chemistry II and Lab	
15	Semester Hours	
Fall Semester Year 3		
4	‡PHYS/ASTR Group A	
3	‡MATH 3423 Advanced Applied Math I	
4	‡PHYS/ASTR Group A or General Elective	
3	PHYS 3213 Electronics	
14	Semester Hours	
Spring Semester Year 3		
4	‡PHYS 3414 Electromagnetic Theory	
3	University/state core social science requirement	
3	General Elective or ‡PHYS/ASTR Group A (as needed)3	General
3	University/state core social science requirement	
16	Semester Hours	
Fall Semester Year 4		
3	‡PHYS 4073 Introduction to Quantum Mechanics	
4	‡PHYS 3544 Optics	
3	ASTR 4073 Cosmology	
6	General Electives	
16	Semester Hours	
Spring Semester Year 4		
1	‡PHYS 4991 Senior Seminar	
4	‡PHYS Optics Elective (4734or 4774)	
3	ASTR 4013 Astrophysics	
8	General Electives	
16	Semester Hours	
124	Total Hours	
?	Meets 40-hour advanced credit hour requirement. See College Academic Regulations on page 124 of this chapter	
‡	Meets 24-hour rule (24 hours of 3000-4000 level courses in Fulbright College), in addition to meeting the 40-hour rule. See College Academic Regulations on page 124 of this chapter.	

Physics B.S. with Biophysics Concentration

Fall Semester Year 1

- 3 ENGL 1013 Composition I
- 4 BIOL 1543/1541L Principles of Biology
- 4 †MATH 2554 Calculus I
- 4 †PHYS 2054 University Physics I

15 Semester Hours

Spring Semester Year 1

3 ENGL 1023 Composition II
4 †MATH 2564 Calculus II
3 BIOL 2533 Cell Biology*
4 †PHYS 2074 University Physics II
3 University/state core fine arts or humanities

17 Semester Hours**Fall Semester Year 2**

4 †PHYS 2094 University Physics III
4 †MATH 2574 Calculus III
4 CHEM 1103/1101L University Chemistry I
3 University/state core humanities or fine arts requirement (as needed)

15 Semester Hours**Spring Semester Year 2**

4 †PHYS 3614 Modern Physics
4 CHEM 1123/1121L University Chemistry II
4 †MATH 3404 Differential Equations
4 †BIOL 2013/2011L General Microbiology*

16 Semester Hours**Fall Semester Year 3**

3 †† PHYS 3113 Analytical Mechanics
3 †MATH 3423 Advanced Applied Math I
3 University/state core social science requirement
4 †CHEM 3603/3601L Organic Chemistry I
1 General Elective

14 Semester Hours**Spring Semester Year 3**

4 †† PHYS 3414 Electromagnetic Theory
4 †CHEM 3613/3611L Organic Chemistry II
3 University/state core US History requirement
3 University/state core social science requirement
3 General Elective

17 Semester Hours**Fall Semester Year 4**

3 †PHYS 4073 Introduction to Quantum Mechanics
3 †BIOL 4003 Laboratory Techniques in Microbiology*
3 University/state core social science requirement
6 General Electives

15 Semester Hours**Spring Semester Year 4**

3 †BIOL 3323 General Genetics
3 †BIOL 3023 Evolutionary Biology
1 †PHYS 4991 Senior Seminar
9 General Electives

16 Semester Hours**124 Total Hours**

* Or another chemistry, biology, astronomy, or physics elective from PHYS/ASTR Group A (below).

† Meets 40-hour advanced credit hour requirement. See College Academic Regulations on page 127 of this chapter

‡ Meets 24-hour rule (24 hours of 3000-4000 level courses in Fulbright College), in addition to meeting the 40-hour rule. See College Academic Regulations on page 127 of this chapter.

Physics B.S. with Computational Concentration**Fall Semester Year 1**

3 ENGL 1013 Composition I
3 †MATH 2554 Calculus I
3 University/state core fine arts or humanities requirement
4 †PHYS 2054 University Physics I
1-3 General Electives (as desired)

14-16 Total Hours**Spring Semester Year 1**

3 ENGL 1023 Composition II
4 †MATH 2564 Calculus II
3 University/state core humanities or fine arts requirement (as needed)
3 University/state core US History requirement or General Elective
4 †PHYS 2074 University Physics II

17 Total Hours**Fall Semester Year 2**

4 †PHYS 2094 University Physics III
4 †MATH 2574 Calculus III
3 General Elective or University/state core US History requirement (as needed)
4 CSCE 2004 Programming Foundations I

15 Total Hours**Spring Semester Year 2**

4 †PHYS 3614 Modern Physics
3 University/state core social science requirement
4 †MATH 3404 Differential Equations
4 CSCE 2014 Programming Foundations II

15 Total Hours

Fall Semester Year 3

3 † PHYS 3113 Analytical Mechanics
3 †MATH 3423 Advanced Applied Math
3 Advanced Level Elective
3 University/state core social science requirement
3 General Electives

15 Total Hours

Spring Semester Year 3

4 † PHYS 3414 Electromagnetic Theory
3 †CSCE 3143 Data Structures (recommended) or PHYS/ASTR Group A or advanced level electives*
3 †PHYS/ASTR Group A or advanced level electives*
3 University/state core social science requirement
3 General Elective

16 Total Hours

Fall Semester Year 4

3 †CSCE 3313 Algorithms or (recommended) PHYS/ASTR Group A or advanced level electives*
4 †PHYS/ASTR Group A or advanced level electives*
3 †PHYS 4073 Introduction to Quantum Mechanics
6 General Electives

16 Total Hours

Spring Semester Year 4

4 †PHYS/ASTR Group A or †3000+ level Fulbright College elective (if needed) or advanced level electives*
1 †PHYS 4991 Senior Seminar
8 †Advanced level electives
3 General Elective

16 Semester Hours

124 Total Hours

* Nine hours of upper division computer science or mathematics courses can count toward the physics major.

† Meets 40-hour advanced credit hour requirement. See College Academic Regulations on page 127 of this chapter

‡ Meets 24-hour rule (24 hours of 3000-4000 level courses in Fulbright College), in addition to meeting the 40-hour rule. See College Academic Regulations on page 127 of this chapter.

Physics B.S. with Electronics Concentration

Fall Semester Year 1

3 ENGL 1013 Composition I
4 †MATH 2554 Calculus I
3 University/state core social science requirement
4 †PHYS 2054 University Physics I
1 General Elective

15 Total Hours

Spring Semester Year 1

3 ENGL 1023 Composition II
4 †MATH 2564 Calculus II
3 University/state core social science requirement
1 General Elective
4 †PHYS 2074 University Physics II

15 Total Hours

Fall Semester Year 2

4 †PHYS 2094 University Physics III
3 University/state core fine arts or humanities requirement
4 †MATH 2574 Calculus III
4 CHEM 1103/1101L University Chemistry I and Lab
1 General Elective

16 Total Hours

Spring Semester Year 2

4 †PHYS 3614 Modern Physics
3 †PHYS 3213 Electronics
4 †MATH 3404 Differential Equations
4 CHEM 1123/1121L University Chemistry II and Lab
1 General Elective

16 Total Hours

Fall Semester Year 3

3 †MATH 3423 Advanced Applied Math I
3 University/state core social science requirement
3 University/state core humanities or fine arts requirement (as needed)

6 General Electives

15 Total Hours

Spring Semester Year 3

4 ‡PHYS 3414 Electromagnetic Theory

3 ‡PHYS 4333 Thermal Physics

3 University/state core social science requirement

3 General Elective

3 General Elective or ‡PHYS/ASTR Group A

16 Total Hours

Fall Semester Year 4

3 ‡PHYS 4073 Introduction to Quantum Mechanics

2-3 ‡PHYS 320V Electronics II1 or other ‡PHYS/ASTR Group A

3 General Elective or ‡PHYS/ASTR Group A or General Elective

6 General Electives

14-15 Total Hours

Spring Semester Year 4

3 ‡PHYS 4713 Introduction to Solid State Physics

3 ‡PHYS/ASTR Group A (as needed) ‡PHYS 320V Electronics II (as needed) or

General Elective

1 ‡PHYS 4991 Senior Seminar

9 General Electives

16 Semester Hours

124 Total Hours

† Meets 40-hour advanced credit hour requirement. See College Academic Regulations on page 127 of this chapter

‡ Meets 24-hour rule (24 hours of 3000-4000 level courses in Fulbright College), in addition to meeting the 40-hour rule. See College Academic Regulations on page 127 of this chapter.

Physics B.S. with Optics Concentration

Fall Semester Year 1

3 ENGL 1013 Composition I

4 †MATH 2554 Calculus I

3 University/state core US History requirement

4 †PHYS 2054 University Physics I

1 General Elective

15 Semester Hours

Spring Semester Year 1

3 ENGL 1023 Composition II

4 †MATH 2564 Calculus II

3 University/state core fine arts or humanities requirement

4 †PHYS 2074 University Physics II

2 General Electives

16 Semester Hours

Fall Semester Year 2

4 †PHYS 2094 University Physics III

4 CHEM 1103/1101L University Chemistry I and Lab

4 †MATH 2574 Calculus III

3 University/state core humanities or fine arts requirement (as needed)

1 General Elective

16 Semester Hours

Spring Semester Year 2

4 ‡PHYS 3614 Modern Physics

3 ‡PHYS 3213 Electronics

4 ‡MATH 3404 Differential Equations

4 CHEM 1123/1121L University Chemistry II and Lab

15 Semester Hours

Fall Semester Year 3

4 ‡PHYS/ASTR Group A

3 ‡MATH 3423 Advanced Applied Math I

4 ‡PHYS/ASTR Group A or General Elective

3 University/state core social science requirement

14 Semester Hours

Spring Semester Year 3

4 ‡PHYS 3414 Electromagnetic Theory

3 University/state core social science requirement

3 University/state core social science requirement

3 General Elective or ‡PHYS/ASTR Group A (as needed)

3 General Electives

16 Semester Hours

Fall Semester Year 4

3 ‡PHYS 4073 Introduction to Quantum Mechanics

4 ‡PHYS 3544 Optics

9 General Electives

16 Semester Hours

Spring Semester Year 4

1 †PHYS 4991 Senior Seminar
4 †PHYS Optics Elective (4734 or 4774)
11 General Electives

16 Semester Hours

124 Total Hours

† Meets 40-hour advanced credit hour requirement. See College Academic Regulations on page 127 of this chapter
‡ Meets 24-hour rule (24 hours of 3000-4000 level courses in Fulbright College), in addition to meeting the 40-hour rule. See College Academic Regulations on page 127 of this chapter.

Physics B.S. with Professional Concentration

Fall Semester Year 1

3 ENGL 1013 Composition I
4 †MATH 2554 Calculus I
3 University/state core U.S. History requirement
4 †PHYS 2054 University Physics I
1 General Elective

15 Total Hours

Spring Semester Year 1

3 ENGL 1023 Composition II
4 †MATH 2564 Calculus II
3 University/state core social science requirement
1 General Elective
4 †PHYS 2074 University Physics II

15 Total Hours

Fall Semester Year 2

4 †PHYS 2094 University Physics III
3 University/state core social science requirement
4 †MATH 2574 Calculus III
3 CHEM 1103 University Chem. I (if needed) or Core from areas a, b, c or e (as needed)
2 General Electives

16 Total Hours

Spring Semester Year 2

4 †PHYS 3614 Modern Physics
3 †PHYS 3213 Electronics
4 †MATH 3404 Differential Equations
4 CHEM 1123/1121L University Chemistry II and Lab

15 Total Hours

Fall Semester Year 3

3 †PHYS 3113 Analytical Mechanics
3 †MATH 3423 Advanced Applied Math I
3 †Advanced Level Elective
3 University/state core fine arts or humanities requirement
3 University/state core social science requirement

15 Total Hours

Spring Semester Year 3

4 †PHYS 3414 Electromagnetic Theory
3 †PHYS 4333 Thermal Physics
3 University/state core humanities or fine arts requirement
6 General Electives

16 Total Hours

Fall Semester Year 4

3 †PHYS 4073 Introduction to Quantum Mechanics
3 †PHYS/ASTR Group A
1 †PHYS 4621L Modern Physics Lab
9 General Elective

16 Total Hours

Spring Semester Year 4

3 †PHYS/ASTR Group A
3 †PHYS/ASTR Group A (as needed) or General Electives
1 †PHYS 4991 Senior Seminar
9 General Electives (to total 124 hours)

16 Semester Hours

124 Total Hours

† Meets 40-hour advanced credit hour requirement. See College Academic Regulations on page 127 of this chapter
‡ Meets 24-hour rule (24 hours of 3000-4000 level courses in Fulbright College), in addition to meeting the 40-hour rule. See College Academic Regulations on page 127 of this chapter.

PHYS/ASTR Group A. Variable hours required in consultation with adviser:

ASTR 3033 Solar System Astronomy
PHYS 306V Projects
PHYS 3213 Electronics in Experimental Physics
PHYS 3544 Optics

PHYS 3923H Honors Colloquium
PHYS 399VH Independent Honors Study
PHYS 4213 Physics of Devices
PHYS 4621L Modern Physics Lab
PHYS 4713 Solid State Physics
PHYS 4734 Introduction to Laser Physics
PHYS 4774 Introduction to Optical Properties of Materials
PHYS 4803 Mathematical Physics
PHYS 498V Senior Thesis

SECTION VIII: Action Recorded by Registrar's Office

PROGRAM INVENTORY/DARS

PGRM _____ SUBJ _____ CIP _____ CRTS _____
DGRE _____ PGCT _____ OFFC&CRTY VALID _____

REPORTING CODES

PROG. DEF. _____ REQ. DEF. _____
Initials _____ Date _____

Distribution

Notification to:

(1) College (2) Department (3) Admissions (4) Institutional Research (5) Continuing Education (6) Graduate School
(7) Treasurer (8) Undergraduate Program Committee

5/12/08