



**2006 – 07 PETITION/PROGRAM SHEET**  
**Degree: Bachelor of Science**  
**Major: Physical Sciences**  
**Concentration: Physics**  
[www.mesastate.edu/schools/snsn/physics](http://www.mesastate.edu/schools/snsn/physics)

**About This Major . . .**

Physics is the study of the universe: what it's made of and how it works, ranging from stars and galaxies to atoms and nuclei and everything in between. Physics forms the foundation of many technical fields including electronics and optics. Physics also features prominently in many of the hottest areas of current research and innovation, such as the multidisciplinary fields of nanotechnology and biophysics.

The physics program serves as a foundation for a wide array of careers. Physics majors from Mesa State have gone on to graduate programs in physics, materials science, aerospace engineering, electrical engineering, and to medical school. They have also gone directly into jobs in engineering, business, and research. Over the last ten years Mesa State physics majors have gone to graduate schools at the University of Colorado Boulder, UC Colorado Springs, the Colorado School of Mines, UNLV, UC at Davis, North Carolina State, and the University of Minnesota.

**POLICIES:**

1. It is your responsibility to determine whether you have met the requirements for your degree. Please see the MSC Catalog for a complete list of graduation requirements.
2. You must turn in your "Intent to Graduate" form to the Registrar's Office **by September 15 if you plan to graduate the following May, and by February 15 if you plan to graduate the following December.**
3. This program sheet must be submitted with your graduation planning sheet to your advisor during the **semester prior to the semester of graduation, no later than October 1 for spring graduates, no later than March 1 for fall graduates.**
4. Your advisor will sign and forward the Program Sheet and Graduation Planning Sheet to the Department Head for signature.
5. Finally, the Department Head or the department administrative assistant will take the signed forms to the Registrar's Office. (Students cannot handle the forms once the advisor signs.)
6. If your petition for graduation is denied, it will be your responsibility to reapply for graduation in a subsequent semester. Your "Intent to Graduate" does not automatically move to a later graduation date.
7. NOTE: The semester before graduation, you will be required to take a Major Field Achievement Test (exit exam).

**NAME:** \_\_\_\_\_ **STUDENT ID #** \_\_\_\_\_

**LOCAL ADDRESS AND PHONE NUMBER:** \_\_\_\_\_

\_\_\_\_\_ ( ) \_\_\_\_\_

I, (Signature) \_\_\_\_\_, hereby certify that I have completed (or will complete) all the courses listed on the Program Sheet. I further certify that the grade listed for those courses is the final course grade received except for the courses in which I am currently enrolled and the courses which I complete next semester. I have indicated the semester in which I will complete these courses.

\_\_\_\_\_  
Signature of Advisor \_\_\_\_\_ 20\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Department Head \_\_\_\_\_ 20\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Registrar \_\_\_\_\_ 20\_\_\_\_\_  
Date

- Must earn 120 semester hours and meet the academic residency requirements to earn a baccalaureate degree at Mesa State College.
- Must earn a minimum of 40 semester hours in upper division courses (i.e., 300-level and 400-level courses).
- A cumulative grade point average of 2.0 or higher must be maintained for all courses.
- A “C” or higher is required in all major courses.
- When filling out this program sheet a course can only be used once, i.e., no double counting is allowed between categories.
- Excess KINA/HPWE courses beyond the two required and pre-collegiate courses (usually numbered below 100) cannot be used for graduation.
- All degree requirements must be completed as described. Any exceptions or substitutions must be recommended in advance by the faculty advisor and approved by the Department Head.
- It is recommended that students work closely with a faculty advisor when selecting courses and scheduling classes prior to registration.
- Students are required to participate in exit examinations or other programs deemed necessary to comply with the college accountability requirement.

**General Education Requirements** (Minimum of 33 semester hours) See the M.S.C. catalog for the list of courses that meet the general education categories.

Course   No.   Credit   Grade   Term   Year   Trns/Subs

**English:** ENGL 111 and 112 (6 semester hours, must receive a “C” or higher, must be completed by the time the student has 60 semester hours)

\*ENGL    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

\*ENGL    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

\*ENGL 129, Honors English, may be substituted for ENGL 111 and ENGL 112. Must earn a grade of “C” or better. May need to take additional electives.

**Humanities:** (6 semester hours)

\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_  
 \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

**Social and Behavioral Sciences:** (6 semester hours)

\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_  
 \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

Course   No.   Credit   Grade   Term   Year   Trns/Subs

**Humanities or Social/Behavioral Science:** (3 semester hours)

\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

**Fine Arts:** (3 semester hours)

\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_  
 \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

**Natural Sciences:** (minimum 6 semester hours, at least one course must include a lab)

\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_  
 \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_  
 \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

**Applied Studies:** (3 semester hours)

\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

**Other Requirements** (13 semester hours)

**Kinesiology:** (3 Semester Hours)

Course   No.   Credit   Grade   Term   Year   Trns/Subs

KINE/HPWA    100    1    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

KINA/HPWE    \_\_\_\_\_    1    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

KINA/HPWE    \_\_\_\_\_    1    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

See the M.S.C. catalog for the list of approved KINA/HPWE/Selected DANC courses.

**Bachelor of Science Degree Distinction:**

(10 semester hours) Must earn a “C” or better in both courses.

Course   No.   Credit   Grade   Term   Year   Trns/Subs

MATH    151    5    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

MATH    152    5    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

**Physical Sciences – Physics Major Requirements** (55 Semester Hours)

A “C” or higher is required in all major courses.

Course   No.   Credit   Grade   Term   Year   Trns/Subs

PHYS    131    4    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    131L    1    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    132    4    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    132L    1    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    231    3    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    232    3    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    251    3    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    252    2    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    311    3    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    321    3    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    331    2    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

Course   No.   Credit   Grade   Term   Year   Trns/Subs

PHYS    342    3    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    362    3    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    422    3    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    473    3    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    482    1    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    482    1    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    494    1    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

PHYS    494    1    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

(PHYS 482 and 494 are taken twice)

MATH    253    4    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

MATH    260    3    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

MATH    360    3    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

**Electives** (All college level courses appearing on your final transcript, **not listed above** that will bring your total semester hours to 120 hours. Excludes KINA/HPWE activity courses.) (19 semester hours; 11 hours upper division may be needed.)

<u>Course</u>	<u>No.</u>	<u>Credit</u>	<u>Grade</u>	<u>Term</u>	<u>Year</u>	<u>Trns/Subs</u>	<u>Course</u>	<u>No.</u>	<u>Credit</u>	<u>Grade</u>	<u>Term</u>	<u>Year</u>	<u>Trns/Subs</u>
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

### GRADUATION INFORMATION

See the “Undergraduate Graduation Requirements” in the Mesa State College catalog for additional graduation information.

**GENERAL EDUCATION REQUIREMENTS** (Minimum of 33 Semester Hours) See current Mesa State College catalog for list of courses that fulfill the requirements below. If one (or more) of the selections below is required in your major, you must use it to fulfill the major requirement and **make a different selection to meet the general education requirement. The courses may not be used to fulfill both requirements.**

**English – 6 Semester Hours** (Must be **completed** before student has 60 semester hours. Must receive grade of “C” or above.)  
ENGL 111 **and** ENGL 112 **or** ENGL 129 (*by permission*)

**Humanities – 6 semester hours**

**Social and Behavioral Sciences – 6 semester hours**

**Humanities or Social/Behavioral Sciences – 3 semester hours**

**Fine Arts – 3 semester hours**

**Natural Sciences – 6 semester hours** (At least one course must include a lab.)

**Applied Studies – 3 semester hours**

### OTHER REQUIREMENTS (13 Semester Hours)

**Kinesiology – 3 Semester Hours**

Each student must take KINE/HPWA 100 together with two KINA/HPWE/Selected DANC courses. See current catalog for listing.

**Degree Distinction – 10 Semester Hours**

MATH 151 Calculus I (5 semester hours)

MATH 152 Calculus II (5 semester hours)

## Physical Science - Physics (55 Semester Hours)

A "C" or higher is required in all major courses.

### **Required Courses:**

PHYS 131 Fundamental Mechanics  
PHYS 131L Fundamental Mechanics Lab  
PHYS 132 Electromagnetism and Optics  
PHYS 132L Electromagnetism and Optics  
PHYS 231 Modern Physics  
PHYS 232 Modern Physics II  
PHYS 251 Electronics for Scientists  
PHYS 252 Intermediate Lab  
PHYS 311 Electromagnetic Theory I  
PHYS 321 Quantum Theory  
PHYS 331 Advanced Laboratory I  
PHYS 342 Advanced Dynamics  
PHYS 362 Statistical and Thermal Physics  
PHYS 422 Quantum Theory II  
PHYS 473 Modern Optics  
PHYS 482 Senior Research (taken twice)  
PHYS 494 Seminar (taken twice)  
MATH 253 Calculus III  
MATH 260 Differential Equations  
MATH 360 Methods of Applied Mathematics

**General Electives: 19 Semester Hours; 11 hours must be upper division.**

Students are required to participate in exit examinations or other programs deemed necessary to comply with the college accountability requirement. All degree requirements must be completed as described above. Any exceptions or substitutions must be recommended in advance by the faculty advisor and approved by the Department Head.

## SUGGESTED COURSE SEQUENCING FOR A MAJOR IN PHYSICAL SCIENCE - PHYSICS

This is a suggested sequence of course work. Certain courses may have prerequisites or are only offered during the Fall or Spring semesters. It is the student's responsibility to meet with their advisor and check the 2 year course matrix on the Mesa State website for course availability.

### FRESHMAN YEAR

Fall Semester	Hours	Spring Semester	Hours
PHYS 131    Fundamental Mechanics	4	PHYS 132    Electromagnetism and Optics	4
PHYS 131L    Fundamental Mechanics Lab	1	PHYS 132L    Electromagnetism and Optics Lab	1
ENGL 111    English Composition	3	ENGL 112    English Composition	3
MATH 151    Calculus I	5	MATH 152    Calculus II	5
General Education Applied Studies	<u>3</u>	General Education Humanities	<u>3</u>
	16		16

### SOPHOMORE YEAR

Fall Semester	Hours	Spring Semester	Hours
PHYS 231    Modern Physics	3	MATH 260    Differential Equations	3
MATH 253    Calculus III	4	PHYS 232    Modern Physics II	3
PHYS 251    Electronics for Scientists	3	PHYS 252    Intermediate Lab	2
General Education Social/Behavioral Science or Humanities	3	General Education Social/Behavioral Science	3
KINA/HPWE    Activities (2 courses)	<u>2</u>	General Education Humanities	3
	15	KINE/HPWA 100    Health and Wellness	<u>1</u>
			15

### JUNIOR YEAR

Fall Semester	Hours	Spring Semester	Hours
PHYS 311    Electromagnetic Theory I	3	PHYS 331    Advanced Laboratory	2
PHYS 321    Quantum Theory I	3	General Education Social/Behavioral Science	3
MATH 360    Methods of Applied Mathematics	3	General Education Fine Arts	3
Electives (unrestricted)	<u>5</u>	PHYS 342    Advanced Dynamics	3
	14	PHYS 362    Statistical and Thermal Physics	<u>3</u>
			14

### SENIOR YEAR

Fall Semester	Hours	Spring Semester	Hours
PHYS 473    Modern Optics	3	PHYS 483    Senior Research	1
PHYS 482    Senior Research	1	PHYS 494    Seminar	1
PHYS 494    Seminar	1	General Education Natural Science with lab	4
General Education Natural Science	3	Unrestricted Electives	<u>9</u>
Electives (unrestricted)	4		15
PHYS 422    Quantum Theory II	<u>3</u>		
	15		