



2014-2015 PETITION/PROGRAM SHEET
Degree: Bachelor of Science
Major: 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 Colorado Mesa University have gone on to graduate programs in physics, astrophysics, chemistry, 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 Colorado Mesa physics majors have gone to graduate schools at the University of Colorado Boulder, University of Utah, Purdue University, and Washington State University. For more information on what you can do with this major, go to <http://www.coloradomesa.edu/career/whatmajor.html>.

All CMU baccalaureate graduates are expected to demonstrate proficiency in critical thinking, communication fluency, quantitative fluency, and specialized knowledge/applied learning. In addition to these campus-wide student learning outcomes, graduates of this major will be able to:

1. Show fluency with the major fields of physics (classical mechanics, electromagnetism, statistical physics, and quantum theory). (Specialized Knowledge)
2. Use mathematical representations to analyze physical scenarios. (Quantitative Fluency)
3. Use laboratory techniques to investigate experimentally physical phenomena. (Applied Learning)
4. Communicate effectively about topics in physics. (Communication Fluency)
5. Execute a project which addresses a significant and complex issue in physics. This project will integrate knowledge and techniques from different areas of physics. (Specialized Knowledge/Applied Learning)

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 have read and understand the policies listed on the last page of this 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

Students should work closely with a faculty advisor when selecting and scheduling courses prior to registration.

Degree Requirements:

- 120 semester hours total (Students must complete a minimum of 30 of the last 60 hours of credit at CMU, with at least 15 semester hours in major discipline courses numbered 300 or higher).
- 40 upper division credits (A minimum of 15 taken at the 300-400 course levels within the major at CMU).
- 2.00 cumulative GPA or higher in all CMU coursework
- 2.00 cumulative GPA or higher in coursework toward the major content area. A "C" or higher is required in all major courses.
- Pre-collegiate courses (usually numbered below 100) cannot be used for graduation.
- When filling out the program sheet a course can be used only once.
- A student must follow the CMU graduation requirements either from 1) the program sheet for the major in effect at the time the student officially declares a major; or 2) a program sheet for the major approved for a year subsequent to the year during which the student officially declares the major and is approved for the student by the department head. Because a program may have requirements specific to the degree, the student should check with the faculty advisor for additional criteria. It is the student's responsibility to be aware of, and follow, all requirements for the degree being pursued. Any exceptions or substitutions must be approved by the student's faculty advisor and Department Head.
- See the "Undergraduate Graduation Requirements" in the for additional graduation information.

GENERAL EDUCATION REQUIREMENTS (31 semester hours)

See the current catalog for a list of courses that fulfill the requirements below. If a course is on the general education list of options and a requirement for your major, you must use it to fulfill the major requirement and make a different selection within the general education requirement.

Course No	Title	Sem.hrs	Grade	Term/Trns
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English (6 semester hours, must receive a grade of "C" or better and must be completed by the time the student has 60 semester hours.)

ENGL 111	English Composition	3	_____	_____
ENGL 112	English Composition	3	_____	_____

Math: (3 semester hours, must receive a grade of "C" or better, must be completed by the time the student has 60 semester hours.)

MATH 151	Calculus I	5*	_____	_____
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*3 credits apply to the General Ed requirements and 2 credits apply to elective credit

Humanities (3 semester hours)

Social and Behavioral Sciences (6 semester hours)

Natural Sciences (7 semester hours, one course must include a lab)

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History (3 semester hours)

HIST _____

Fine Arts (3 semester hours)

Course No	Title	Sem.hrs	Grade	Term/Trns
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OTHER LOWER DIVISION REQUIREMENTS (6 semester hours)

Kinesiology (3 semester hours)

KINE 100	Health and Wellness	1	_____	_____
KINA 1	_____	1	_____	_____
KINA 1	_____	1	_____	_____

Applied Studies (3 semester hours)

PHYSICAL SCIENCES – PHYSICS MAJOR REQUIREMENTS

(60 semester hours) Must pass all courses with a grade of "C" or higher.

PHYS 131	Fundamental Mechanics	4	_____	_____
PHYS 131L	Fundamental Mechanics Lab	1	_____	_____
PHYS 132	Electromagnetism and Optics	4	_____	_____
PHYS 132L	Electromagnetism and Optics Lab	1	_____	_____
PHYS 230	Intermediate Dynamics	3	_____	_____
PHYS 231	Modern Physics	3	_____	_____
PHYS 251	Electronics for Scientists	3	_____	_____
PHYS 252	Intermediate Lab	2	_____	_____
PHYS 311	Electromagnetic Theory I	3	_____	_____
PHYS 321	Quantum Theory	3	_____	_____
PHYS 331	Advanced Laboratory I	2	_____	_____
PHYS 342	Advanced Dynamics	3	_____	_____
PHYS 362	Statistical & Thermal Physics	3	_____	_____
PHYS 422	Quantum Theory II	3	_____	_____
PHYS 473	Modern Optics	3	_____	_____
PHYS 482	Senior Research	1	_____	_____
PHYS 482	Senior Research	1	_____	_____
PHYS 494	Seminar	1	_____	_____
PHYS 494	Seminar	1	_____	_____
(PHYS 482 and 494 are taken twice)				
MATH 152	Calculus II	5	_____	_____
MATH 253	Calculus III	4	_____	_____
MATH 260	Differential Equations	3	_____	_____
MATH 360	Methods of Applied Mathematics	3	_____	_____

ELECTIVES (All college level courses appearing on your final transcript, **not listed above** that will bring your total semester hours to 120 hours.) (23 semester hours; 13 hours upper division may be needed.)

*MATH 151	Calculus I	2	_____	_____
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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 the assigned advisor and check the 2 year course matrix on the Colorado Mesa 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
MATH 151 Calculus I	5	MATH 152 Calculus II	5
ENGL 111 English Composition	3	ENGL 112 English Composition	3
General Education Applied Studies	<u>3</u>	General Education History	<u>3</u>
	16		16

SOPHOMORE YEAR

Fall Semester	Hours	Spring Semester	Hours
PHYS 230 Intermediate Dynamics	3	PHYS 231 Modern Physics	3
PHYS 251 Electronics for Scientists	3	PHYS 252 Intermediate Lab	2
MATH 253 Calculus III	4	MATH 260 Differential Equations	3
General Education Natural Science	3	General Education Social/Behavioral Science	3
KINE 100 Health and Wellness	1	General Education Humanities	3
KINA Activity	<u>1</u>	KINA Activity	<u>1</u>
	15		15

JUNIOR YEAR

Fall Semester	Hours	Spring Semester	Hours
PHYS 311 Electromagnetic Theory I	3	PHYS 342 Advanced Dynamics	3
PHYS 321 Quantum Theory I	3	PHYS 362 Statistical and Thermal Physics	3
PHYS 331 Advanced Laboratory	2	General Education Social/Behavioral Science	3
MATH 360 Methods of Applied Mathematics	3	General Education Natural Science with lab	4
General Education Fine Arts	<u>3</u>	Electives (unrestricted)	<u>3</u>
	14		16

SENIOR YEAR

Fall Semester	Hours	Spring Semester	Hours
PHYS 473 Modern Optics	3	PHYS 422 Quantum Theory II	3
PHYS 482 Senior Research	1	PHYS 482 Senior Research	1
PHYS 494 Seminar	1	PHYS 494 Seminar	1
Electives (unrestricted)	<u>9</u>	Electives (unrestricted)	<u>9</u>
	14		14

POLICIES:

1. It is your responsibility to determine whether you have met the requirements for your degree. Please see the 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).