



Fall 2012 BS Physics - Concentration in Physical Science Education: (Gen Ed 2002)
Montclair State University - Department of Mathematical Sciences
BS Physics - Concentration in Physical Science Education (GenEd 2002)
(PHPS)

<p>I. Major Requirements 38 sh</p> <p>A. Physics Core (24 sh)</p> <p>PHYS 191 University Physics I 4</p> <p>PHYS 192 University Physics II 4</p> <p>PHYS 210 Mechanics 4</p> <p>PHYS 240 Electricity and Magnetism 4</p> <p>PHYS 350 Optics 4</p> <p>PHYS 460 Modern Physics 4</p> <p>B. Physics Electives (14 sh)</p> <p>Select a minimum of 14 sh from the list below</p> <p>PHYS 242 Circuit Theory 3</p> <p>PHYS 245 Electronics and Digital Circuits 3</p> <p>PHYS 247 Microprocessors and Applications 3</p> <p>PHYS 280 Astronomy 4</p> <p>PHYS 310 Advanced Mechanics 3</p> <p>PHYS 320 Thermodynamics 3</p> <p>PHYS 340 Adv. Electricity/Magnetism 3</p> <p>PHYS 368 Fluid Mechanics 3</p> <p>PHYS 377 Mathematical Physics 3</p> <p>PHYS 380 Observational Astronomy 4</p> <p>PHYS 430 Cmpt Simulations of Phys Systems 3</p> <p>PHYS 462 Nuclear Physics 4</p> <p>PHYS 464 Quantum Mechanics 3</p> <p>PHYS 470 Solid State Physics 3</p> <p>PHYS 480 Astrophysics 3</p> <p>PHYS 490 Literature Research in Physics 2</p> <p>PHYS 495 Laboratory Research in Physics 1-4</p> <p>EAES 105 Physical Geology 4</p> <p>II. Collateral Requirements 40-42 sh</p> <p>MATH 122 Calculus I 4</p> <p>MATH 221 Calculus II 4</p> <p>MATH 222 Calculus III 4</p> <p>MATH 420 Differential Equations 4</p> <p>CSIT 111 Fundamentals of Programming I 3</p> <p>CHEM 120 General Chemistry I 4</p> <p>CHEM 121 General Chemistry II 4</p> <p>CHEM 230 Organic Chemistry I 3</p> <p>CHEM 231 Organic Chemistry II 3</p> <p>CHEM 232 Experimental Org. Chemistry I 2</p> <p>CHEM 233 Experimental Org. Chemistry II 2</p> <p>CHEM 310 Analytical Chemistry 5</p> <p>OR CHEM 470 Biochemistry 3</p>	<p>III. GenEd Requirement 20 sh</p> <p>A. New Student Experience <i>MATH 102</i> 1</p> <p>C. Communications 9</p> <p style="padding-left: 20px;">C1. College Writing <i>ENWR 105, 106</i></p> <p style="padding-left: 20px;">C2. Speech <i>CMST 101</i></p> <p>D. Fine and Performing Arts 3</p> <p>F. Humanities 3</p> <p style="padding-left: 20px;">F1. World Literature/General Humanities</p> <p style="padding-left: 20px;">F2. Philosophy/Religion <i>EDFD 220 (0)</i></p> <p>G. Computer Science <i>CSIT 111 (0)</i></p> <p>H. Math <i>MATH 122, 221 (0)</i></p> <p>I. Natural/Physical Science <i>PHYS 191 (0)</i></p> <p>J. Physical Education 1</p> <p>K. Social Science 3</p> <p style="padding-left: 20px;">American/European History <i>EDFD 221(0)</i></p> <p style="padding-left: 20px;">Non-Western Culture</p> <p style="padding-left: 20px;">Social Science <i>EDFD 200 (0)</i></p> <p>L. Gen Ed Elective <i>EDFD/READ/SASE 210 (0)</i></p> <p>IV. World Languages and Cultures Requirements 3-9 sh</p> <p>A. World Languages 3-6</p> <p>B. World Cultures 0-3</p> <p style="padding-left: 20px;">(May be fulfilled by a Gen Ed Requirement)</p> <p>V. Teacher Education and Prof. Seq. 42 sh</p> <p style="padding-left: 20px;">(see next page)</p> <p><u>Minimum total required for graduation 143-151 sh</u></p>
--	---

PHYSICS MAJOR – concentration Physical Science Education (PHPS)
Gen Ed 2002) (Professional Sequence)
BACHELOR OF SCIENCE DEGREE REQUIREMENTS

VI. Teacher Education Requirements and Professional Semester (43)

Requirements for Teacher Certification in Physical Science

Each student must apply for admission to the teacher education program in physical science. Applications will be considered as early as the second semester of the sophomore year. There are enrollment periods in both the Fall and Spring semesters. Application forms are available from the Center of Pedagogy in University Hall. To be eligible for admission, a student must have a minimum 3.00 cumulative grade point average (GPA), a minimum 2.75 GPA in physics major and collateral courses and have successfully completed 12 semester hours or more of physics major courses. These courses do not have to be taken at Montclair State University. Also, prior to applying, a student must have completed Psychological Foundations of Education, Philosophical Orientation to Education, Historical Foundation of Education and Public Purposes of Education. In addition, in order to remain in the teacher education program students must maintain a 3.00 GPA overall and 2.75 GPA in the major. In addition to General Education, Major and collateral courses, students seeking teacher certification must complete the following required Professional Sequence:

Freshman Year (first or second semester)

EDFD 200 Psychological Foundations of Education (3 Cr.)** (meets Gen. Ed. K3. Requirement)

Sophomore Year (third or fourth semester)

EDFD 220 Philosophical Orientation to Education (3 Cr.)**

EDFD 221 Historical Foundations of Education (3 Cr.) **

EDFD 210 Public Purposes of Education (3 Cr.) or

READ 210 Public Purposes of Education (3 Cr.) or

SASE 210 Public Purposes of Education (3 Cr.)

Fall Semester Junior Year (fifth semester)

EDFD 305 Teaching for Equity and Diversity (3 Cr.) or

READ 305 Teaching for Equity and Diversity (3 Cr.) or

SASE 305 Teaching for Equity and Diversity (3 Cr.)

SASE 310 Inclusion in Middle & Secondary Schools (1 Cr.)

EDFD 312 Educating English Language Learners (1 Cr.) or

READ 312 Educating English Language Learners (1 Cr.) or

SASE 312 Educating English Language Learners (1 Cr.)

Spring Semester Junior Year (sixth semester)

SASE 314 Assessment of Learning (1 Cr.)

SASE 316 Integrating Technology Across the School Curriculum (1 Cr.)

READ 411 Language and Literacy Across the Curriculum (3 Cr.)

Fall Semester Senior Year (seventh semester)

SASE 450 Fieldwork (3 Cr.)

SASE 451 Teaching for Learning I (3 Cr.)

PHED 401 The Teaching of Science in Secondary Schools (4 Cr.)

Spring Semester Senior Year (eighth semester) - The Professional Semester

SASE 452 Teaching for Learning II (3 Cr.)

SASE 453 Student Teaching (8 Cr.) or

SASE 414 In-service Student Teaching (8 Cr.)

** These courses satisfy Gen. Ed. Requirements (III).

Special Requirements:

1. Only grades of "B-" or above are acceptable in professional sequence courses (including methods courses).
2. Teacher education students must successfully complete the state of New Jersey's Physiology and Hygiene requirement. This requirement may be satisfied either by taking an appropriate course or by taking an examination offered by the Center of Pedagogy. Details about courses that satisfy this requirement and the examination are available at the Center of Pedagogy in University Hall.
3. A Field Experiences Application must be submitted the semester prior to the Fieldwork semester. The application is due prior to registration for classes - see Center of Pedagogy for details. Late applications cannot be accepted.
4. The Praxis II Physics: Content Knowledge exam (test code 10261), General Science, Part I, Content Knowledge (test code 10431), and Chemistry: Content Knowledge (test code 20241) are required of all students seeking NJ certification in physics. A hard copy of passing Praxis II scores must be submitted to the Center of Pedagogy prior to the student teaching semester. Consult the Center of Pedagogy for further details and deadlines.
5. Students are not permitted to take additional courses during the student teaching semester.

Suggested Sequence for Four-Year Plan
Physics Major – concentration in Physical Science (PHPS)

The following sequence assumes exemption from all basic skills requirements as a result of meeting or exceeding the required scores on the MSU Basic Skills Placement Test.

First Year

Fall (Freshman) or First Semester (17 credits)	Spring (Freshman) or Second semester (18 credits)
PHYS 191 University Physics I (4) ENWR 105 College Writing I: Intellectual Prose (3) MATH 122 Calculus I (4) * CHEM 120 General Chemistry I (4) MATH 102 New Student Experience for Mathematical Sciences (1) Physical Education Requirement (1)	PHYS 192 University Physics II (4) ENWR 106 College Writing II: Writing and Literary Study (3) MATH 221 Calculus II (4) CHEM 121 General Chemistry II (4) EDFD 200 Educational Psychology (3)

Second Year

Fall (Sophomore) or Third Semester (17 credits)	Spring (Sophomore) or Fourth Semester (16 credits)
PHYS 210 Mechanics (4) MATH 222 Calculus III (4) CHEM 230 Organic Chemistry I (3) Speech Requirement (3) CMST 101 EDFD 221 Historical Foundation of Education (3)	PHYS 240 Electricity and Magnetism (4) CHEM 231 Organic Chemistry II (3) Public Purposes of Education (3) EDFD 220 Philosophical Orientation to Education (3) CSIT 111 Foundations of Computer Science I (3)**

Summer School (15 credits)

Language Requirement (6)	General Education Courses (9)
--------------------------	-------------------------------

Third Year

Fall (Junior) or Fifth Semester (14 credits)	Spring (Junior) or sixth Semester (18 credits)
PHYS 350 Optics (4) Physics Elective Course (3) CHEM 232 Experimental Organic Chemistry I (2) Teaching for Equity and Diversity (3) SASE 310 Inclusion in Middle&Secondary Schools (1) Educating English Language Learners (1)	PHYS 460 Modern Physics (4) Physics Elective Courses (3) CHEM 233 Experimental Organic Chemistry II (2) MATH 420 Differential Equations (4) SASE 314 Assessment of Learning (1) SASE 316 Integrating Technology Across School (1) READ 411 Language & Literacy Across Curriculum(3)

Fourth Year

Fall (Senior) or Seventh Semester (20 or 22 credits)	Spring (Senior) or Eighth Semester (11 credits)
Physics Elective Courses (8) CHEM 310 Analytical Chemistry (5) OR CHEM 470 Biochemistry (3) SASE 450 Fieldwork (3) SASE 451 Teaching for Learning I (3) PHED 401 The Teaching of Science in Secondary Schs(3)	SASE 452 Teaching for Learning II (3) SASE 453 Student Teaching (8)

* Students who do not have a strong (4 year) background in high school mathematics, including exponential, logarithmic, and trigonometric functions are advised to take MATH 112 Precalculus Mathematics or MATH 111 Applied Precalculus before Calculus I. ** Prerequisite MATH 112 Precalculus Mathematics, or MATH 111 Applied Precalculus, or equivalent

ADDITIONAL CURRICULAR SUGGESTIONS

- ✓ Students who have taken high school courses in Calculus or Computer Science may receive advanced standing with credit based upon either the Advanced Placement Exams or departmental exams. Consult the Department Coordinator of Undergraduate Advising for further details.
- ✓ Students are urged to take as many additional courses as possible in the areas of statistics, computer science, business administration, economics and natural sciences. This will insure maximum flexibility in employment opportunities and professional growth.
- ✓ Students may elect to do independent study in advanced areas of mathematics under MATH 495 "Topics in Mathematics for Undergraduates" and statistics under STAT 495 "Topics in Statistics for Undergraduates."
- ✓ Students interested in the honors program in mathematics should contact the department chairperson for further information.

NOTES

This worksheet, the Montclair State University undergraduate catalog, and the semester schedule booklets contain the important advising and academic information necessary for an accurate understanding of the degree requirements. Students with questions are urged to consult the Department Coordinator of Undergraduate Advising.

FAILURE TO BE AWARE OF AND FOLLOW UNIVERSITY ACADEMIC AND ADMINISTRATIVE POLICIES AS OUTLINED HERE AND IN THE UNIVERSITY UNDERGRADUATE CATALOG AND SEMESTER SCHEDULE OF COURSES BOOKLETS MAY RESULT IN LOSS OF CREDIT AND/OR DELAYED GRADUATION.

RESTRICTIONS - The following courses MAY NOT BE TAKEN FOR GRADUATION CREDIT BY MATHEMATICS MAJORS: MATH 100, MATH 103, MATH 106, MATH 109, MATH 114, MATH 116, MATH 270, INFO 270, INFO 273.

PASS/FAIL LIMITATIONS - Those courses that meet the major, collateral, teacher certification, or general education requirements may not be taken pass/fail.

WORLD CULTURES REQUIREMENT - All students are required to take one course that satisfies the university world cultures requirement. Refer to the current university undergraduate catalog for a complete listing of acceptable courses.

PREREQUISITES - It is the student's responsibility to ensure that courses are taken in the academically correct order. A current list of prerequisites for these and other courses may be found in the current university undergraduate catalog or through the office of the offering department.

BASIC SKILLS - Students placed into basic skills courses as a result of the MSU Basic Skills Placement Test are required to enroll in those courses the first semester and continue in sequence each semester until required work is completed. All basic skills course work is counted in the cumulative grade-point-average, but only ENGL 100 "Basic Composition" may be used toward the 128 credits degree requirement.

FINAL EVALUATION - Students who are eligible for graduation must file an "Application for Final Evaluation" in the Office of the Registrar according to the following deadlines: October 1 for May graduation, March 1 for August graduation, June 1 for January graduation.

RESIDENCE REQUIREMENTS - A minimum of 32 credits must be taken at MSU. This must include at least 18 credits of mathematical sciences courses in the major, of which at least 12 credits must be at the junior (300-399) or senior level (400-499). The last 24 credits must be taken at MSU and cannot be acquired through transfer.

FREE ELECTIVES - Free electives are defined as credits not applicable to general education or major requirements.

IN ALL CASES, THE MINIMUM NUMBER OF CREDITS REQUIRED TO GRADUATE IS 120