TEACHING, WITH TEACHER CERTIFICATION IN BIOLOGICAL SCIENCE (PRESCHOOL-GRADE 12) (M.A.T.)

Students with a baccalaureate degree and interest in teaching may pursue the Post-BA program for certification only or the Master of Arts in Teaching (MAT) which simultaneously leads to certification and Master's Degree. The content area program is open to students who wish to teach one of the following content areas in K-12 schools:

- Art
- Biology
- Chemistry
- Earth Science
- English
- French
- Health & Physical Education
- Mathematics
- Music
- Physical Education
- Physical Science
- Social Studies
- Spanish
- Teacher of English as a Second Language

Montclair State University's Teacher Education Program is one of the most highly-regarded teacher preparation programs in the country. It has been consistently recognized both nationally and regionally for its unique features, including its structure, partnerships, and curricular emphases. The program is considered a model for other colleges and universities and has continuously been accredited by the National Council for the Accreditation of Teacher Education (NCATE) since 1954.

The Teacher Education Program's professional course sequence and field experiences emphasize teaching for critical thinking and culturally responsive teaching. The professional component for both graduate students addresses four broad areas:

1. Student development and learning
2. The classroom and the school
3. The curriculum
4. Effective teaching skills

Program Requirements

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td></td>
<td><strong>Additional Requirements for State Certification</strong></td>
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<td></td>
<td><strong>Speech</strong></td>
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<tr>
<td>CMST 101</td>
<td>Fundamentals of Speech: Communication Requirement</td>
<td>3</td>
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<td><strong>Physiology and Hygiene</strong></td>
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Pass the MSU Health Knowledge Test available through the COP or have UG equivalent course approved by advisor.

**Educational Psychology**

EDFD 582  Learning Theories  3
or PSYC 560  Advanced Educational Psychology

**Program Requirements**

**Graduate Professional Sequence**

**Introductory Sequence**

EDFD 505  Teaching, Democracy, and Schooling  3
or SASE 505  Teaching, Democracy, and Schooling
SASE 518  Technology Integration in the Classroom  1

**Diversity and Instructional Sequence**

EDFD 509  Sociocultural Perspectives on Curriculum and Assessment  3
or SASE 509  Sociocultural Perspectives on Curriculum and Assessment
EDFD 516  Meeting the Needs of English Language Learners  1
or SASE 516  Meeting the Needs of English Language Learners
SASE 517  Inclusive Classrooms in Middle and Secondary Schools  1
READ 501  Techniques of Reading Improvement in the Secondary School  3

EDFD 519  Assessment for Authentic Learning  3
or SASE 519  Assessment for Authentic Learning

**Pedagogical Sequence I**

SASE 526  Seminar in Inclusive Pedagogy  3
SASE 527  Clinical Practice I  3

**Pedagogical Sequence II**

SASE 514  In-Service Graduate Clinical Practice II  6
or SASE 529  Clinical Practice II
SASE 543  Advanced Seminar in Inclusive Pedagogy  3

**Comprehensive Examination**

In the term that you will sit for exam, register for the section which matches your major & advisor. Successfully pass exam.

GRAD CMP  Comprehensive Examination  0

Total Credits  36

1  May be completed by examination.
2  SASE 514 is for in-service teachers.

**Teaching Field Requirements**

**Biology Requirements**

BIOL 112  Principles of Biology I  4
BIOL 113  Principles of Biology II  4
BIOL 213  Introduction to Ecology  4
BIOL 230  Cell and Molecular Biology  4
BIOL 380  Genetics  4

**Collateral Chemistry Courses**

CHEM 120  General Chemistry I  4
CHEM 121  General Chemistry II  4
CHEM 230  Organic Chemistry I  3
CHEM 231  Organic Chemistry II  3
CHEM 232  Experimental Organic Chemistry I  2

**Collateral Mathematics Courses**
**Biology Electives**

Select 3 credits of Biology Content Area Courses (from list below)

- MATH 109 Statistics
- & MATH 111 and Applied Precalculus
- MATH 111 Applied Precalculus
- & MATH 116 and Calculus A
- MATH 112 Precalculus Mathematics
- & MATH 116 and Calculus A
- MATH 122 Calculus I
- & MATH 221 and Calculus II

**Collateral Physics Courses**

- PHYS 191 University Physics I 4
- or PHYS 193 College Physics I 4
- PHYS 192 University Physics II 4
- or PHYS 194 College Physics II 4

**Biology Electives**

Select 12 credits (from Biology Electives list below) 12

**Earth Science Elective**

Select one of the following:

- EAES 101 Planet Earth
- EAES 105 Physical Geology
- EAES 107 Earth and the Environment
- EAES 240 Historical Geology

Select 3 credits of Biology Content Area Courses (from list below) 3

BIOL 503 Teaching Science in Secondary Schools 4

**Total Credits** 75

**Biology Electives**

- BIOL 300 Environmental Biology and Related Controversial Issues 3
- BIOL 330 Introduction to Animal Behavior 3
- BIOL 350 Microbiology 4
- BIOL 360 Introduction to Bio-Imaging 3
- BIOL 370 Principles of Ecology 3
- BIOL 380 Genetics 4
- BIOL 409 Externship in Biological Research (Co-operative Education) 1-4
- BIOL 410 Toxicology 3
- BIOL 411 Introduction to Transmission Electron Microscopy 4
- BIOL 415 Population Genetics 3
- BIOL 417 Evolutionary Biology 3
- BIOL 418 Biology Independent Research 1-4
- BIOL 420 Economic Botany 3
- BIOL 425 Elementary Plant Physiology 3
- BIOL 429 Herpetology 4
- BIOL 430 Ornithology 4
- BIOL 431 Entomology 3
- BIOL 432 Medical Entomology 3
- BIOL 433 Developmental Biology 4
- BIOL 434 Molecular Biology 3
- BIOL 435 Experimental Molecular Biology 3
- BIOL 436 Phylogenetic Zoology 4
- BIOL 439 Biology of Animal Parasites 3
- BIOL 440 Gross Mammalian Anatomy 4
- BIOL 441 Comparative Anatomy of Vertebrates 4
- BIOL 442 Human Physiology 4
- BIOL 443 Vertebrate Embryology 4
- BIOL 444 Cell Physiology 3
- BIOL 445 Immunology 3
- BIOL 446 Endocrinology 3
- BIOL 447 Fundamentals of Pharmacology 3
- BIOL 448 Mammalian Microanatomy 4
- BIOL 450 Medical Microbiology 3
- BIOL 451 Comparative Animal Physiology 3
- BIOL 457 Virology 3
- BIOL 458 Microbial Genetics 3
- BIOL 460 Biological Oceanography 3
- BIOL 461 Aquatic Ecology 3
- BIOL 467 Biology of the Fishes 4
- BIOL 468 Neurobiology 3
- BIOL 471 Biomedical Ethics 2
- BIOL 475 Medical Genetics 3
- BIOL 476 Biology of Cancer 3
- BIOL 480 Research Community I: Organism Biology 4
- BIOL 481 Research Community II: Organism Biology 4
- BIOL 482 Research Community I: Molecular Biology 4
- BIOL 483 Research Community II: Molecular Biology 4
- BIOL 484 Research Community I: Ecology 4
- BIOL 485 Research Community II: Ecology 4
- BIOL 486 Selected Topics in Biology 3-4
- BIOL 487 Statistical Genomics 3
- BIOL 488 Selected Topics in Cell and Molecular Biology 3-4
- BIOL 489 Selected Topics in Organismal Biology 3-4
- BIOL 490 Senior Seminar in Biology 3
- BIOL 491 Research in Biology Literature 1
- BIOL 492 Senior Colloquium 1
- BIOL 493 Molecular Ecology 3
- BIOL 497 Genomics 3
- BIOL 500 Introductory Molecular Cell Biology 1.5
- BIOL 505 Experimental Cell Culture 3
- BIOL 510 Biology Pedagogy for Secondary Teachers 3
- BIOL 512 Topics in Modern Genetics 3
- BIOL 513 Instrumentation and Techniques for Biological Science 4
- BIOL 514 Graduate Seminar in Biology 2
- BIOL 515 Population Genetics 3
- BIOL 518 Strategies for Teaching College Biology 1
- BIOL 520 Plant Physiology 3
- BIOL 521 Field Studies of Flowering Plants 4
- BIOL 522 Plant Pathology 3
- BIOL 529 Advanced Herpetology 4
- BIOL 532 Advanced Entomology 3
- BIOL 533 Advanced Cell Biology 3
- BIOL 540 Mammalian Physiology 3
- BIOL 542 Advanced Endocrinology 3
- BIOL 543 Advances in Immunology 3
- BIOL 544 Clinical Microbiology 3
Biology Content Area Courses

BIOL 500 Introductory Molecular Cell Biology
BIOL 505 Experimental Cell Culture
BIOL 510 Biology Pedagogy for Secondary Teachers
BIOL 512 Topics in Modern Genetics
BIOL 513 Instrumentation and Techniques for Biological Science

BIOL 544 Advanced Comparative Animal Physiology 3
BIOL 545 Experimental Endocrinology 4
BIOL 546 Topics in Physiology 3
BIOL 547 Molecular Biology I 3
BIOL 548 Molecular Biology II 4
BIOL 549 Topics in Developmental Biology 3
BIOL 550 Topics in Microbiology 3
BIOL 551 Intermediary Metabolism I 3
BIOL 552 Biology of Lipids 3
BIOL 554 Microbial Physiology 3
BIOL 555 Medical Genetics 3
BIOL 556 Molecular Biology of Proteins 3
BIOL 557 Virology 3
BIOL 558 Microbial Genetics 3
BIOL 560 Molecular Genetics 3
BIOL 561 Genomics 3
BIOL 562 Short Topics in Molecular Biology 1
BIOL 563 Statistical Genomics 3
BIOL 564 Proteomics 3
BIOL 565 Advanced Plant Molecular Genetics 3
BIOL 566 Bioinformatics 4
BIOL 568 Advanced Neuroscience 3
BIOL 570 Ecology 3
BIOL 571 Physiological Plant Ecology 4
BIOL 572 Wetland Ecology 4
BIOL 573 Shoreline Ecology 4
BIOL 574 Behavioral Ecology 3
BIOL 575 Avian Biology 4
BIOL 576 Biology of Extreme Habitats 3
BIOL 579 Physiological Ecology of Animals 3
BIOL 580 Evolutionary Mechanisms 3
BIOL 586 Selected Advanced Topics in Biology 3-4
BIOL 587 Selected Advanced Topics in Molecular Biology 3-4
BIOL 588 Selected Advanced Topics in Physiology 3-4
BIOL 589 Selected Advanced Topics in Ecology 3-4
BIOL 592 Graduate Colloquium 1
BIOL 593 Molecular Ecology 3
BIOL 594 Signal Transduction 3
BIOL 595 Conservation Biology: The Preservation of Biological Diversity 3
BIOL 596 Selected Techniques in Biology Science Education 1.5
BIOL 597 Research in Biological Literature 1
BIOL 598 Selected Techniques in Molecular Biology 1.5
BIOL 599 Introduction to Biological Research 4
BIOL 601 Advanced Biological Science Education Pedagogy 3

BIOL 514 Graduate Seminar in Biology
BIOL 515 Population Genetics
BIOL 518 Strategies for Teaching College Biology
BIOL 520 Plant Physiology
BIOL 521 Field Studies of Flowering Plants
BIOL 522 Plant Pathology
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