



**Spring 2014 BS Mathematics - concentration Mathematics Education: (Gen Ed 2002)**  
**Montclair State University - Department of Mathematical Sciences**  
**BS Mathematics - concentration in Mathematics Education (GenEd 2002)**  
**(MATE)**

<p><b>I. Major Requirements</b> <span style="float: right;"><b>40 sh</b></span></p> <p><b>A. Mathematics Core</b> <span style="float: right;"><b>(19 sh)</b></span></p> <p>MATH 122 Calculus I <span style="float: right;">4</span></p> <p>MATH 221 Calculus II <span style="float: right;">4</span></p> <p>MATH 222 Calculus III <span style="float: right;">4</span></p> <p>MATH 335 Linear Algebra <span style="float: right;">4</span></p> <p>MATH 340 Probability <span style="float: right;">3</span></p> <p><b>B. Mathematics Specialization</b> <span style="float: right;"><b>(18 sh)</b></span></p> <p>MATH 320 Transition to Adv. Mathematics <span style="float: right;">3</span></p> <p>STAT 330 Fund. of Modern Statistics I <span style="float: right;">3</span></p> <p>MATH 350 College Geometry <span style="float: right;">3</span></p> <p>MATH 370 Mathematics for Teaching <span style="float: right;">3</span></p> <p>MATH 431 Foundations of Modern Algebra <span style="float: right;">3</span></p> <p>MATH 475 History of Mathematics <span style="float: right;">3</span></p> <p><b>C. Mathematics Electives</b> <span style="float: right;"><b>(3 sh)</b></span></p> <p><b>Select 3 or more sh, not counted in above, from MATH 320-469, 471-499 &amp; STAT 330-499. Must be accepted into the Teacher Education Program before registering for MATH 471.</b></p> <p>MATH 323 Complex Variables <span style="float: right;">3</span></p> <p>MATH 368 Fluid Mechanics <span style="float: right;">3</span></p> <p>MATH 398 Vector Calculus <span style="float: right;">3</span></p> <p>MATH 420 Ordinary Differential Equations <span style="float: right;">4</span></p> <p>MATH 421 Partial Differential Equations <span style="float: right;">3</span></p> <p>MATH 425 Advanced Calculus <span style="float: right;">3</span></p> <p>MATH 426 Advanced Calculus II <span style="float: right;">3</span></p> <p>MATH 433 Theory of Numbers <span style="float: right;">3</span></p> <p>MATH 436 Elements of Logic <span style="float: right;">3</span></p> <p>MATH 450 Foundations of Geometry <span style="float: right;">3</span></p> <p>MATH 451 Topology <span style="float: right;">3</span></p> <p>MATH 460 Intro to Applied Math <span style="float: right;">3</span></p> <p>MATH 463 Numerical Analysis <span style="float: right;">3</span></p> <p>MATH 464 Operations Research I <span style="float: right;">3</span></p> <p>MATH 465 Operations Research II <span style="float: right;">3</span></p> <p>MATH 466 Mathematics of Finance I <span style="float: right;">3</span></p> <p>MATH 467 Mathematics of Finance II <span style="float: right;">3</span></p> <p>MATH 469 Mathematical Modeling <span style="float: right;">3</span></p> <p>MATH 471 Selected Topics in Modern Math <span style="float: right;">3</span></p> <p>MATH 485 Appl. Comb. and Graph Theory <span style="float: right;">3</span></p> <p>MATH 487 Intro to Math Cryptography <span style="float: right;">3</span></p> <p>MATH 490 Honors Seminar <span style="float: right;">3</span></p> <p>MATH 495 Topics for Undergraduates <span style="float: right;">1-3</span></p> <p>MATH 497/8 Undergraduate Research I/II <span style="float: right;">1-3</span></p> <p>STAT 441 Statistical Computing <span style="float: right;">3</span></p> <p>STAT 442 Fund. of Modern Statistics II <span style="float: right;">3</span></p> <p>STAT 443 Intro. to Mathematical Statistics <span style="float: right;">3</span></p> <p>STAT 481 Intro. to Statistical Data Mining <span style="float: right;">3</span></p> <p>STAT 487 Statistical Genomics <span style="float: right;">3</span></p> <p>STAT 495 Topics in Statistical Science <span style="float: right;">1-3</span></p> <p>STAT 497 Undergrad Res. in Stat Science <span style="float: right;">1-3</span></p>	<p><b>II. Collateral Requirements</b> <span style="float: right;"><b>11 sh</b></span></p> <p>PHYS 191-192 University Physics I and II <span style="float: right;">8</span></p> <p>CSIT 111 Fundamentals of Programming I <span style="float: right;">3</span></p> <p><b>III. GenEd Requirement</b> <span style="float: right;"><b>20 sh</b></span></p> <p>A. New Student Experience <i>MATH 102</i> <span style="float: right;">1</span></p> <p>C. Communications <span style="float: right;">9</span></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 <span style="float: right;">3</span></p> <p>F. Humanities <span style="float: right;">3</span></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 <span style="float: right;">1</span></p> <p>K. Social Science <span style="float: right;">3</span></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><b>IV. World Languages and Cultures Requirements 3-9 sh</b></p> <p>A. World Languages <span style="float: right;">3-6</span></p> <p>B. World Cultures <span style="float: right;">0-3</span></p> <p style="padding-left: 20px;">(May be fulfilled by a Gen Ed Requirement)</p> <p><b>V. Free electives</b> <span style="float: right;"><b>0-3 sh</b></span></p> <p><b>VI. Teacher Education and Prof. Seq.</b> <span style="float: right;"><b>43 sh</b></span></p> <p style="padding-left: 20px;">(see next page)</p> <p><b>Minimum total required for graduation</b> <span style="float: right;"><b>120 - 123sh</b></span></p>
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MATHEMATICS MAJOR – concentration Mathematics Education (MTED)  
(Gen Ed 2002) (Professional Sequence)  
BACHELOR OF SCIENCE DEGREE REQUIREMENTS

VI. Teacher Education Requirements and Professional Semester (43)

Requirements for Teacher Certification in Mathematics.

Each student must apply for admission to the teacher education program in mathematics. 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 mathematics major and collateral courses and have successfully completed 11 semester hours or more of mathematics major courses. In particular, he or she must have completed Calculus I, Calculus II, and an additional course or courses that have Calculus II as a prerequisite. 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.)

MATH 470 The Teaching of Mathematics (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 Mathematics: Content Knowledge exam (test code 0061) is required of all students seeking NJ certification in mathematics. 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  
Mathematics Major – concentration Mathematics Education (MATE)

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 (15 credits)**

ENWR 105 College Writing I: Intellectual Prose (3)  
MATH 122 Calculus I (4) \*  
CSIT 111 Foundations of Computer Science I (3)\*\*  
PHYS 191 University Physics I (4)  
MATH 102 New Student Experience for  
Mathematical Sciences (1)

**Spring (Freshman) or Second semester (17 credits)**

ENWR 106 College Writing II: Writing and  
Literary Studies (3)  
MATH 221 Calculus II (4)  
EDFD 200 Psychological Foundations of Education(3)  
PHYS 192 University Physics II (4)  
CMST 101 Fundamentals of Speech: Communication  
Requirement (3)

**Second Year**

**Fall (Sophomore) or Third Semester (16 credits)**

EDFD 220 Philosophical Orientation to Education (3)  
MATH 222 Calculus III (4)  
MATH 320 Transition to Adv. Mathematics (3)  
EDFD 221 Historical Foundation of Education (3)  
SASE 210 Public Purposes of Education (3)

**Spring (Sophomore) or Fourth Semester (17 credits)**

MATH 335 Linear Algebra (4)  
MATH 340 Probability (3)  
Language Requirement (3)  
General Education course (3)  
General Education Courses (3)  
Physical Education Requirement (1)

**Third Year**

**Fall (Junior) or Fifth Semester (17 credits)**

MATH 431 Foundations of Modern Algebra (3)  
MATH 350 College Geometry (3)  
Language Requirement (3)  
STAT 330 Fund. of Modern Statistics I (3)  
SASE 305 Teaching for Equity and Diversity (3)  
SASE 310 Inclusion in Middle &  
Secondary Schools (1)  
SASE 312 Educating English Language Learners (1)

**Spring (Junior) or sixth Semester (14 credits)**

MATH 370 Mathematics for Teaching (3)  
MATH 475 History of Mathematics (3)  
SASE 314 Assessment of Learning (1)  
SASE 316 Integrating Technology Across School (1)  
READ 411 Language & Literacy Across  
Curriculum (3)  
General Education courses (3)

**Fourth Year**

**Fall (Senior) or Seventh Semester (13 credits)**

MATH Elective (3)  
SASE 450 Fieldwork (3)  
SASE 451 Teaching for Learning I (3)  
MATH 470 The Teaching of Mathematics (4)

**Spring (Senior) or Eighth Semester (11 credits)**

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

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## 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.

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**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.**

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**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