I. Major Requirements 40 sh
   A. Mathematics Core (19 sh)
      MATH 122 Calculus I 4
      MATH 221 Calculus II 4
      MATH 222 Calculus III 4
      MATH 335 Linear Algebra 4
      MATH 340 Probability 3

   B. Mathematics Specialization (18 sh)
      MATH 320 Transition to Adv. Mathematics 3
      STAT 330 Fund. of Modern Statistics I 3
      MATH 350 College Geometry 3
      MATH 370 Mathematics for Teaching 3
      MATH 431 Foundations of Modern Algebra 3
      MATH 475 History of Mathematics 3

   C. Mathematics Electives (3 sh)
      Select 3 or more sh, not counted in above, from
      Must be accepted into the Teacher Education
      Program before registering for MATH 471.
      MATH 323 Complex Variables 3
      MATH 368 Fluid Mechanics 3
      MATH 398 Vector Calculus 3
      MATH 420 Ordinary Differential Equations 4
      MATH 421 Partial Differential Equations 3
      MATH 425 Advanced Calculus 3
      MATH 426 Advanced Calculus II 3
      MATH 433 Theory of Numbers 3
      MATH 436 Elements of Logic 3
      MATH 450 Foundations of Geometry 3
      MATH 451 Topology 3
      MATH 460 Intro to Applied Math 3
      MATH 463 Numerical Analysis 3
      MATH 464 Operations Research I 3
      MATH 465 Operations Research II 3
      MATH 466 Mathematics of Finance I 3
      MATH 467 Mathematics of Finance II 3
      MATH 469 Mathematical Modeling 3
      MATH 471 Selected Topics in Modern Math 3
      MATH 485 Appl. Comb. and Graph Theory 3
      MATH 487 Intro to Math Cryptography 3
      MATH 490 Honors Seminar 3
      MATH 495 Topics for Undergraduates 1-3
      MATH 497/8 Undergraduate Research I/II 1-3
      STAT 441 Statistical Computing 3
      STAT 442 Fund. of Modern Statistics II 3
      STAT 443 Intro. to Mathematical Statistics 3
      STAT 481 Intro. to Statistical Data Mining 3
      STAT 487 Statistical Genomics 3
      STAT 495 Topics in Statistical Science 1-3
      STAT 497 Undergrad Res. in Stat Science 1-3

II. Collateral Requirements 11 sh
   PHYS 191-192 University Physics I and II 8
   CSIT 111 Fundamentals of Programming I 3

III. GenEd Requirement 20 sh
   A. New Student Experience MATH 102 1
   C. Communications
      C1. College Writing ENWR 105, 106
      C2. Speech CMST 101
   D. Fine and Performing Arts 3
   F. Humanities 3
      F1. World Literature/General Humanities
      F2. Philosophy/Religion EDFD 220 (0)
   G. Computer Science CSIT 111 (0)
   H. Math MATH 122, 221 (0)
   I. Natural/Physical Science PHYS 191 (0)
   J. Physical Education 1
   K. Social Science 3
      American/European History EDFD 221(0)
      Non-Western Culture
      Social Science EDFD 200 (0)
   L. Gen Ed Elective EDFD/READ/SASE 210 (0)

IV. World Languages and Cultures Requirements 3-9 sh
   A. World Languages 3-6
   B. World Cultures 0-3
      (May be fulfilled by a Gen Ed Requirement)

V. Free electives 0-3 sh

VI. Teacher Education and Prof. Seq. 43 sh
   (see next page)

Minimum total required for graduation 120 - 123 sh
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)

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
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 in 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