

Montclair State University
Department of Mathematical Sciences
5-Year Combined BS Math and MS Mathematics with Concentration Pure and Applied Mathematics
Undergraduate Requirements (MMBM)

<p>I. Major Requirements 43 sh</p> <p>A. Mathematics Core (19 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 335 Linear Algebra 4</p> <p>MATH 340 Probability 3</p> <p>B. Mathematics Specialization (12 sh)</p> <p>MATH 320 Transition to Adv Math 3</p> <p>MATH 425 Advanced Calculus I 3</p> <p>MATH 426 Advanced Calculus II 3</p> <p>MATH 431 Foundations of Modern Algebra 3</p> <p>C. Mathematics Electives (12 sh)</p> <p>Select 12 sh, not already counted above, from MATH 320-349, 351-469, 480-499 and STAT 330-499.</p> <p>MATH 323 Complex Variables 3</p> <p>MATH 368 Fluid Mechanics 3</p> <p>MATH 398 Vector Calculus 3</p> <p>MATH 420 Ordinary Differential Equations 4</p> <p>MATH 421 Partial Differential Equations 3</p> <p>MATH 436 Elements of Logic 3</p> <p>MATH 450 Foundations of Geometry 3</p> <p>MATH 451 Topology 3</p> <p>MATH 460 Intro to Applied Math 3</p> <p>MATH 463 Numerical Analysis 3</p> <p>MATH 464 Operations Research I 3</p> <p>MATH 465 Operations Research II 3</p> <p>MATH 466 Mathematics of Finance I 3</p> <p>MATH 467 Mathematics of Finance II 3</p> <p>MATH 469 Mathematical Modeling 3</p> <p>MATH 485 Appl. Comb. and Graph Theory 3</p> <p>MATH 487 Intro to Math Cryptography 3</p> <p>MATH 490 Honors Seminar 3</p> <p>MATH 495 Topics for Undergraduates 1-3</p> <p>MATH 497/8 Research I/II 1-3</p> <p>STAT 330 Fund. of Modern Statistics I 3</p> <p>STAT 441 Statistical Computing 3</p> <p>STAT 442 Fund. of Modern Statistics II 3</p> <p>STAT 443 Intro. to Mathematical Statistics 3</p> <p>STAT 481 Intro. to Statistical Data Mining 3</p> <p>STAT 487 Statistical Genomics 3</p> <p>STAT 495 Topics in Statistical Science 1-3</p> <p>STAT 497 Undergrad Res. in Stat Science 1-3</p>	<p>II. Collateral Requirements 11 sh</p> <p>PHYS 191-192 University Physics I and II 8</p> <p>CSIT 111 Fundamentals of Programming I 3</p> <p>III. GenEd Requirement 32 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 6</p> <p style="padding-left: 20px;">F1. World Literature/General Humanities</p> <p style="padding-left: 20px;">F2. Philosophy/Religion</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 9</p> <p style="padding-left: 20px;">American/European History</p> <p style="padding-left: 20px;">Non-Western Culture</p> <p style="padding-left: 20px;">Social Science</p> <p>L. Gen Ed Elective 3</p> <p>IV. World Languages and Cultures Requirement 3-9 sh</p> <p>A. World Languages 3-6</p> <p>B. World Cultures 0-3</p> <p>V. Graduate Requirements for BS/MS degree 12 sh</p> <p>Prerequisites are required in the BS Mathematics</p> <p>Select 12 sh from the following list</p> <p>MATH 521 Real Variables I 3</p> <p>MATH 525 Complex Variables I 3</p> <p>MATH 530 Mathematical Computing 3</p> <p>MATH 531 Abstract Algebra I 3</p> <p>MATH 535 Linear Algebra I 3</p> <p>MATH 560 Numerical Analysis 3</p> <p>MATH 584 Operations Research 3</p> <p>MATH 591 Applied Industrial Mathematics 3</p> <p>VI. Free Electives 13-19 sh</p> <p>Minimum total required for graduation 120 sh</p>
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**Montclair State University
Department of Mathematical Sciences**
**5-Year Combined BS Math and MS Mathematics with Concentration Pure and Applied Mathematics
Graduate Requirements (MPBM)**

I. Pure Mathematics	12 sh	STAT 546 Non-Parametric Statistics	3
MATH 521 Real Variables I	3	STAT 547 Design and Analysis of Exp	3
MATH 525 Complex Variables I	3	STAT 548 Applied Regression Analysis	3
MATH 531 Abstract Algebra I	3	STAT 549 Sampling Techniques	3
MATH 535 Linear Algebra I	3	STAT 595 Topics in Statistics	3
		STAT 597 Research Methods in Stat Science	3
II. Applied Mathematics	12 sh	STAT 640 Biostatistics I	3
MATH 530 Mathematical Computing	3	STAT 641 Biostatistics II	3
MATH 560 Numerical Analysis	3	STAT 642 Introduction to Stochastic Processes	3
MATH 584 Operations Research	3	STAT 645 Advanced Topics in Statistics	3
MATH 591 Applied Industrial Mathematics	3	STAT 646 Multivariate Analysis	3
		STAT 647 Practicum in Statistics II	3
		STAT 648 Advanced Statistical Methods	3
III. Comp Science, Math, and/or Stat Electives	6 sh	STAT 649 Independent Study in Statistics	3
If equivalent courses haven't been previously taken, take the following. Only 6 sh can be used for credit:		CMPT 574 Pixel and Image Processing	3
MATH 515 Intermediate Analysis I	3	CMPT 575 Introduction to Computer Graphics	3
MATH 516 Intermediate Analysis II	3	CMPT 576 Object-Oriented Software Dvlp	3
MATH 518 Found. Of Abstract Algebra	3	CMPT 578 Introduction to Artificial Intelligence	3
		CMPT 580 Machine Org and Architecture	3
Select 2 courses from the following:		CMPT 581 Systems Software Design	3
MATH 520–569, 580–599, 620–669, 680–699;		CMPT 582 Theory Automata & Formal Lang	3
STAT 541–549, 590–599, 640–649, 690; and		CMPT 583 Computer Algorithms	3
CMPT 570–599, 670–690		CMPT 584 Operating System Design	3
		CMPT 585 Topics in Computer Science	3
MATH 520 Set Theory	3	CMPT 586 File Structures and Databases	3
MATH 522 Real Variables II	3	CMPT 587 Microcomputers & Comp Interfaces	3
MATH 526 Complex Variables II	3	CMPT 588 Fund Programming Languages	3
MATH 532 Abstract Algebra II	3	CMPT 589 Comp Sim of Discrete Systems	3
MATH 536 Linear Algebra II	3	CMPT 590 Comp Sim of Continuous Systems	3
MATH 537 Mathematical Logic	3	CMPT 591 Compiler Theory and Construction	3
MATH 540 Probability	3	CMPT 592 Data Base Design & Implementation	3
MATH 551 Topology	3	CMPT 593 Structured System Dsgn & Analysis	3
MATH 554 Projective Geometry	3	CMPT 594 Software Engineering & Reliability	3
MATH 555 Differential Geometry	3	CMPT 596 Principles of Data Communication	3
MATH 564 Ordinary Differential Equation	3	CMPT 678 Neurocomputing	3
MATH 566 Partial Differential Equations	3	CMPT 680 Parallel Architectures & Algorithms	3
MATH 568 Applied Mathematics: Continuous	3	CMPT 683 Advanced Computer Algorithms	3
MATH 569 Applied Mathematics: Discrete	3	CMPT 690 Independent Study in Comp Sci	3
MATH 580 Combinatorial Mathematics	3		
MATH 581 Graph Theory	3	IV. Capstone Requirement	3 sh
MATH 590 Advanced Topics	3	MATH 698 Master's Thesis	
MATH 595 Seminar (1-4 hours seminar)	1-4		
MATH 690 Independent Study in Mathematics	3		
STAT 541 Applied Statistics	3		
STAT 542 Statistical Theory I	3		
STAT 543 Statistical Theory II	3	Graduate degree	
STAT 544 Statistical Computing	3	Minimum total required for graduation	33 sh
STAT 545 Practicum in Statistics I	3		

Suggested Sequence for Five-Year Plan
Combined BS Math and MS Mathematics with Concentration Pure and Applied Mathematics

First Year

Fall	Spring
MATH 122 Calculus I (4) PHYS 191 University Physics I (4) ENWR 105 College Writing I (3) CSIT 1 Fundamentals of Programming I (3) MATH 102 New Student Experience - Math Sciences (1) Total: 15	MATH 221 Calculus II (4) PHYS 192 University Physics II (4) ENWR 106 College Writing II (3) CMST 1015y Fundamentals of Speech: Communications Requirement (3) Physical Education Requirement (1) Total: 15

Second Year

Fall	Spring
MATH 222 Calculus III (4) MATH 320 Transition to Adv Math (3) General Education course (3) Language requirement (3) Free elective (3) Total: 16	MATH 335 Linear Algebra(4) MATH 340 Probability (3) Undergraduate Math Elective (3) Language requirement (3) General Education course (3) Total: 16

Third Year

Fall	Spring
MATH 425 Advanced Calculus I (3) Undergraduate Math Elective (3) Undergraduate Math Elective (3) General Education Course (3) Free elective (4) Total: 16	MATH 426 Advanced Calculus II (3) MATH 431 Abstract Analysis (3) Undergraduate Math Elective (3) General Education Course (3) Free elective (3) Total: 15

Fourth Year

Fall	Spring
MATH 521 or 535* (3) MATH 530 or 560* (3) General Education Course (3) General Education Course (3) Free elective (3) Total: 15	MATH 525 or 531* (3) MATH 591 or 584* (3) Graduate Math Elective (3) General Education Course (3) Free elective (3) Total: 15

Fifth Year

Fall	Spring
MATH 535 or 521* (3) MATH 560 or 530* (3) Graduate Math Elective (3) Total: 9	MATH 531 or 525* (3) MATH 584 or 591* (3) MATH 698 Master's Thesis (3) Total: 9

* The graduate schedule offers these core courses in alternating years. These requirements can be interchanged in the fourth and fifth years so they can be completed.

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 Undergraduate Advisor for further details.

--- Students are urged to take as many additional courses as possible in the areas of computer science, statistics, 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.

NOTES

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

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 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 120 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 ***