# Combined BS Mathematics with Concentration: Mathematics of Finance and MS Statistics

**Undergraduate Requirements (MFBM)**

## I. Major Requirements 44 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 Concentration (16 sh)
- MATH 420 Ordinary Differential Equations 4
- MATH 466 Mathematics of Finance I 3
- MATH 467 Mathematic of Finance II 3
- STAT 330 Fund of Modern Statistics I 3
- STAT 443 Intro. to Mathematical Statistics 3

### C. Mathematics Electives (9 sh)
Select 9 or more sh, not already counted in above from MATH 320-349, 351-469, 480-499, and STAT 330-499.
- MATH 320 Transition to Adv. Math 3
- MATH 323 Complex Variables 3
- MATH 368 Fluid Mechanics 3
- MATH 398 Vector Calculus 3
- MATH 421 Partial Differential Equations 3
- MATH 425 Advanced Calculus I 3
- MATH 426 Advanced Calculus II 3
- MATH 431 Foundations of Modern Algebra 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 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 Research I/II 1-3
- STAT 441 Statistical Computing 3
- STAT 442 Fund. of Modern Statistics II 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 18 sh

<table>
<thead>
<tr>
<th>Course</th>
<th>Sh</th>
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</thead>
<tbody>
<tr>
<td>CSIT 111 Fundamentals of Programming I</td>
<td>3</td>
</tr>
<tr>
<td>CSIT 112 Fundamentals of Programming II</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 204 Fundamentals of Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 101 Principles of Economics: Macro</td>
<td>3</td>
</tr>
<tr>
<td>ECON 102 Principles of Economics: Micro</td>
<td>3</td>
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<tr>
<td>FINC 321 Fundamentals of Finance</td>
<td>3</td>
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## III. GenEd Requirement 30 sh

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Sh</th>
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<tbody>
<tr>
<td>A. New Student Experience MATH 102</td>
<td>1</td>
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<tr>
<td>C. Communications</td>
<td>9</td>
</tr>
<tr>
<td>College Writing ENWR 105, 106</td>
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<tr>
<td>Speech CMST 101</td>
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<tr>
<td>D. Fine and Performing Arts</td>
<td>3</td>
</tr>
<tr>
<td>F. Humanities</td>
<td>6</td>
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<tr>
<td>World Literature/General Humanities Philosophy/Religion</td>
<td></td>
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<tr>
<td>G. Computer Science CMPT 183 (0)</td>
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<tr>
<td>H. Math MATH 122, 221 (0)</td>
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</tr>
<tr>
<td>I. Natural/Physical Science</td>
<td>4</td>
</tr>
<tr>
<td>J. Physical Education</td>
<td>1</td>
</tr>
<tr>
<td>K. Social Science</td>
<td></td>
</tr>
<tr>
<td>American/European History</td>
<td>3</td>
</tr>
<tr>
<td>Non-Western Culture</td>
<td>3</td>
</tr>
<tr>
<td>Social Science</td>
<td>0</td>
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<tr>
<td>ECON 101 (included in Collateral Req.)</td>
<td></td>
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<tr>
<td>L. GenEd Elective 2nd collateral course (0)</td>
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</table>

## IV. World Languages and Cultures Requirement 3-9 sh

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Sh</th>
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</thead>
<tbody>
<tr>
<td>A. World Languages</td>
<td>3-6</td>
</tr>
<tr>
<td>B. World Cultures</td>
<td>0-3</td>
</tr>
</tbody>
</table>

## V. Graduate Requirements for BS/MS degree 12 sh

**Complete 4 of the following courses:**

- If equivalent of STAT 541 has been taken previously, see the department for substitution
- STAT 541 Applied Statistics
- STAT 542 Statistical Theory I
- STAT 544 Statistical Computing
- STAT 548 Applied Regression Analysis
- STAT 552 Intermediate Statistical Methods

## VI. Free Electives 7-13 sh

Undergraduate MAFI degree

Minimum total required for graduation 120 sh
Montclair State University
Department of Mathematical Sciences
5-Year Combined BS Mathematics with Concentration: Mathematics of Finance and MS Statistics
Graduate Requirements – (MSBM)

I. Statistics Core 15 - 18 sh

- If equivalent of STAT 541 has been taken previously, see the department for substitution
- STAT 541 Applied Statistics 3
- STAT 542 Statistical Theory I 3
- STAT 543 Statistical Theory II 3
- STAT 544 Statistical Computing 3
- STAT 547 Design of Experiments 3
- STAT 548 Applied Regression Analysis 3

II. Statistics Electives 12 sh

A. Select one (1) of the following courses: (3 sh)
- STAT 640 Biostatistics I 3
- STAT 646 Multivariate Analysis 3
- STAT 648 Adv Statistical Methods 3

B. Select three (3) courses from (9 sh)
- STAT 545 Practicum in Statistics I 3
- STAT 546 Non-Parametric Statistics 3
- STAT 549 Sampling Techniques 3
- STAT 561 Statistical Data Mining I 3
- STAT 562 Statistical Data Mining II 3
- STAT 570 Statistical Consulting 3
- STAT 595 Topics in Statistics 3
- STAT 597 Research Methods in Stat Science 3
- STAT 640 Biostatistics I 3
- STAT 641 Biostatistics II 3
- STAT 642 Introduction to Stochastic Processes 3
- STAT 644 Advanced Topics in Statistics 3
- STAT 646 Multivariate Analysis 3
- STAT 647 Practicum in Statistics II 3
- STAT 648 Advanced Statistical Methods 3
- STAT 649 Independent Study in Statistics 3
- STAT 698 Master’s Thesis 3

III. Comp Science, Math, and/or Stat Electives 3 - 6 sh

- CMPT 578 Introduction to Artificial Intelligence 3
- CMPT 583 Computer Algorithms 3
- CMPT 586 File Structures and Databases 3
- CMPT 589 Comp Sim of Discrete Systems 3
- CMPT 590 Comp Sim of Continuous Systems 3
- CMPT 592 Data Base Design & Implementation 3
- CMPT 593 Structured System Dsgn & Analysis 3
- CMPT 594 Software Engineering & Reliability 3
- CMPT 683 Advanced Computer Algorithms 3
- MATH 540 Probability 3
- MATH 560 Numerical Analysis 3
- MATH 568 Applied Mathematics: Continuous 3
- MATH 569 Applied Mathematics: Discrete 3
- MATH 580 Combinatorial Mathematics 3
- MATH 584 Operations Research 3
- STAT 542 Statistical Theory I 3
- STAT 543 Statistical Theory II 3
- STAT 544 Statistical Computing 3
- STAT 545 Practicum in Statistics I 3
- STAT 546 Non-Parametric Statistics 3
- STAT 547 Design and Analysis of Exp 3
- STAT 548 Applied Regression Analysis 3
- STAT 549 Sampling Techniques 3
- STAT 552 Intermediate Statistical Methods 3
- STAT 561 Statistical Data Mining I 3
- STAT 562 Statistical Data Mining II 3
- STAT 570 Statistical Consulting 3
- STAT 595 Topics in Statistics 3
- STAT 597 Research Methods in Stat Science 3
- MATH 540 Probability 3
- MATH 560 Numerical Analysis 3
- MATH 568 Applied Mathematics: Continuous 3
- MATH 569 Applied Mathematics: Discrete 3
- MATH 580 Combinatorial Mathematics 3
- MATH 584 Operations Research 3
- STAT 542 Statistical Theory I 3
- STAT 543 Statistical Theory II 3
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- STAT 646 Multivariate Analysis 3
- STAT 647 Practicum in Statistics II 3
- STAT 648 Advanced Statistical Methods 3
- STAT 649 Independent Study in Statistics 3
- STAT 698 Master’s Thesis 3

IV. Capstone Requirement 0 sh

Choose option A or B:
A. Master’s Thesis (requires STAT 698)
B. Comprehensive Examination
   (Three-hour written examination in statistics)

Graduate degree
Minimum total required for graduation 33 sh
**Suggested Sequence for Five-Year Plan**

**Combined BS Mathematics with Concentration: Mathematics of Finance and MS Statistics**

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td><strong>First Year</strong></td>
<td><strong>Fall</strong>&lt;br&gt;ENWR 105 College Writing I (3)&lt;br&gt;MATH 122 Calculus I (4)&lt;br&gt;CSIT 111 Fundamentals of Programming I (3)&lt;br&gt;ECON 101 Principles of Economics: Macro (3)&lt;br&gt;MATH 102 New Student Experience - Math Sciences (1)&lt;br&gt;Physical Education Requirement (1)&lt;br&gt;<strong>Total: 15</strong></td>
<td><strong>Spring</strong>&lt;br&gt;ENWR 106 College Writing II (3)&lt;br&gt;MATH 221 Calculus II (4)&lt;br&gt;CSIT 112 Fundamentals of Programming II (3)&lt;br&gt;ECON 102 Principles of Economics: Micro (3)&lt;br&gt;General Education Course (3)&lt;br&gt;<strong>Total: 16</strong></td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td><strong>Fall</strong>&lt;br&gt;MATH 222 Calculus III (4)&lt;br&gt;STAT 330 Fundamentals of Modern Statistics I (3)&lt;br&gt;ACCT 204 Fundamentals of Accounting (3)&lt;br&gt;Language requirement (3)&lt;br&gt;General Education course (3)&lt;br&gt;<strong>Total: 16</strong></td>
<td><strong>Spring</strong>&lt;br&gt;MATH 335 Linear Algebra (4)&lt;br&gt;MATH 340 Probability (3)&lt;br&gt;FINC 321 Fundamentals of Finance (3)&lt;br&gt;Language requirement (3)&lt;br&gt;General Education course (3)&lt;br&gt;<strong>Total: 16</strong></td>
</tr>
<tr>
<td><strong>Third Year</strong></td>
<td><strong>Fall</strong>&lt;br&gt;MATH 466 Mathematics of Finance I (3)&lt;br&gt;STAT 443 Intro. to Mathematical Statistics (3)&lt;br&gt;BS Math Elective (3)&lt;br&gt;Speech Requirement (3)&lt;br&gt;General Education Natural/Physical Science (4)&lt;br&gt;<strong>Total: 16</strong></td>
<td><strong>Spring</strong>&lt;br&gt;MATH 467 Mathematics of Finance II (3)&lt;br&gt;MATH 420 Differential Equations (4)&lt;br&gt;BS Math Elective (3)&lt;br&gt;BS Math Elective (3)&lt;br&gt;Free Elective (3)&lt;br&gt;<strong>Total: 16</strong></td>
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<tr>
<td><strong>Fourth Year</strong></td>
<td><strong>Fall</strong>&lt;br&gt;STAT 541 Applied Statistics&lt;br&gt;STAT 542 Statistical Theory I (3)&lt;br&gt;Free Elective (3)&lt;br&gt;General Education Course (3)&lt;br&gt;<strong>Total: 15</strong></td>
<td><strong>Spring</strong>&lt;br&gt;STAT 548 Applied Regression Analysis (3)&lt;br&gt;STAT 543 Statistical Theory II (3)&lt;br&gt;Free Elective (4)&lt;br&gt;General Education Course (3)&lt;br&gt;<strong>Total: 16</strong></td>
</tr>
<tr>
<td><strong>Fifth Year</strong></td>
<td><strong>Fall</strong>&lt;br&gt;STAT 552 Intermediate Statistical Methods (3)&lt;br&gt;STAT 547 Design of Experiments (3)&lt;br&gt;MS Statistics Elective (3)&lt;br&gt;<strong>Total: 9</strong></td>
<td><strong>Spring</strong>&lt;br&gt;MS Statistics Elective&lt;br&gt;MS Statistics Elective (3)&lt;br&gt;MS Statistics Elective / Master’s Thesis (3)&lt;br&gt;<strong>Total: 9</strong></td>
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</tbody>
</table>
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.

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FAILURE TO BE AWARE OF AND FOLLOW UNIVERSITY ACADEMIC AND ADMINISTRATIVE POLICIES AS OUTLINED HERE AND IN THE UNIVERSITY UNDERGRADUATE CATALOGS 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 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.