Proposal for a mathematics BS/MAQRM Combination Degree in Mathematics/Actuarial and Quantitative Risk Management

Contents

1 Program Rationale

The following document presents the rationale and plan for creation of a combined BS/MAQRM degree in mathematics and Actuarial and Quantitative Risk Management (AQRM)), to be implemented in the Autumn of 2026. Currently, the Mathematics Department offers a BS undergraduate degree in Mathematics (with several specializations including an optional financial mathematics specialization) and a professional degree Master in Actuarial and Quantitative Risk Management (MAQRM). After reviewing the curriculum and the advanced courses being taken by high-performing students in the undergraduate major, it is possible for accelerated students to complete the requirements for their undergraduate degree as well as coursework for a MAQRM degree in five years. The plan described below fits the Graduate School's description of the purpose of a combined program as "to give outstanding students an opportunity to pursue simultaneously two degrees in different colleges or schools by reducing the amount of time required to complete both sets of degree requirements."

2 Executive Summary

The proposed combined BS/MAQRM degree program allows students to double-count some 5000 level courses in actuarial science and mathematics, which are normally taken by advanced undergraduate students as electives or by beginning graduate students. By double counting nine credits

of these electives for both the undergraduate and graduate degrees, a student in the combined degree program can fulfill the undergraduate degree requirements generally in their fourth year and be able to complete the remaining requirements for the MAQRM degree in an additional year. Some of the course work at the 5000 level that is approved as an elective for the undergraduate BS is eligible to count towards the 9 credit hours that count towards both the BS and MAQRM. This combined degree plan allows students to enhance their undergraduate training with graduate-level coursework and complete an MAQRM degree with a reduced time commitment.

This program also allows math majors who became aware of a career in actuarial science to pivot into the MAQRM program late in their undergraduate career. Our mathematics major has several specializations, one of which is the Math Financial specialization, and some of these majors already pursue careers in actuarial science. Strong math majors have the option to take 5000 level courses offered in the MAQRM program as electives, and many of them who are considering a career in actuarial science, mathematical finance, or quantitative risk management do. However, mathematics majors who learn about careers in actuarial science in their third year cannot always complete enough coursework in this specialization to be competitive on the job market when they graduate. Thus, the combined degree program will allow them to pivot into the quantitative finance or actuarial science career path.

The undergraduate BS degree in Mathematics requires completion of 121 credit hours consisting of at least 34 general education credits and up to 12 world language credits, prerequisite coursework in mathematics and other areas (depending upon specialization), and at least 38 credits specific to the mathematics major, depending upon which specialization they complete (we have 6 specializations, and each specialization has an associated ASC honors specialization, see Appendix A for the requirements for each specialization including the honors specializations). Many students come to Ohio State with Advanced Placement, College Credit Plus, or other college-level credits enabling them to accelerate their progress toward the mathematics major and many take upper-division (5000-level) courses as early as their third year. The MAQRM degree requires 33 credit hours of coursework, and by applying 9 of these credit hours towards the fulfillment of undergraduate major credits, students can complete the combined degree in five years. Overviews and advising materials for the BS and MS programs are found in Appendices A-E.1.

Student enrolled in the ASC Honors Program are required to complete all requirements for ASC honors. In particular, students need

- a minimum of 18 hours of Honors coursework including:
- All GE Theme courses must be Honors or Honors-quality courses
- At least one Honors or Honors-quality course in EACH of the following disciplines
  - Natural and Mathematical Sciences
  - Arts and Humanities
  - Social and Behavioral Sciences
- The ASC Honors survey course
- An Honors enhanced ePortfolio
- Honors Project
- Honors requirements within the math major.

The department offers a Math Honors track (without ASC GE Honors) which is not included in this proposal. This is a small program designed for strong students interested in matriculating directly into PhD programs (primarily in mathematics). Students in this track have additional course requirements which do not overlap with the MAQRM program. We do not anticipate students in this track are interested in the MAQRM degree, and as such, we will not offer the combined degree for these students.

The first semester of graduate study in MAQRM includes 9-12 credit hours of 5000-level math courses (Appendix E). The combined degree program will allow accelerated undergraduate students to take the first semester of graduate coursework and apply 9 of these credit hours towards the fulfillment of the 9 undergraduate major elective credits. The remaining requirements for the

MAQRM degree include 24 credits of additional coursework which can be completed in an additional year and a master level examination or completion of a master level thesis and defense (description found in Appendix E.1). Students must complete all requirements for the MAQRM degree. Students pursuing the combined degree option would take all of the BA degree requirements with the following exceptions:

1. Math 3607 Beginning Scientific Computing (3 cr. hrs.):
   - Math 3607 Beginning Scientific Computing (3 cr. hrs.) can be substituted with Math 5601 Essentials of Numerical Computing (3 cr. hrs.). Both courses serve as first courses in numerical methods. Math 5601 covers the material, albeit with more applications. This exception already exists in the ASC honors versions of the mathematics major specializations.
2. Math 4547 Introduction to Analysis I (3 cr. hrs.):
   - Math 4547 Introduction to Analysis I (3 cr. hrs.) can be substituted with Math 5201 Real Analysis I (5 cr. hrs.). Both courses are first courses in real analysis, with Math 5201 covering more material and in greater depth and detail. Math 5201 and 5202 are honors eligible courses.
3. Math 4548 Introduction to Analysis II (3 cr. hrs.):
   - Math 4548 Introduction to Analysis II (3 cr. hrs.) can be substituted with Math 5202 Real Analysis II (5 cr. hrs.). Both courses are second courses in real analysis, with Math 5202 covering more advanced topics. Math 5201 and 5202 are honors eligible courses.
4. Mathematics Biology, Applied Chemistry or Applied Physics specializations
   - For students in the Mathematics Biology, Mathematics Applied Chemistry or Mathematics Applied Physics specializations, students can replace the choice of two applied math courses and two electives, with the four or five courses in one of the "Paths" (Path A, B or C) available to students enrolled in the respective ASC honors version of the major specialization. The department has previously decided that this substitution covers the same material in more detail and depth. See the requirement sheets in Appendix A for details on the paths.

The MAQRM program is not designed as an online master's degree program, and we have no intentions of allowing this to become an optionally distance learning degree. The courses in the mathematics department approved for 100% distance learning are: Math 2568, Math 5630, Math 5631, Math 5632, Math 5633, and Math 5634. For a complete list of mathematics and statistics courses approved for distance learning, see Appendix H. It would not currently be possible for students in the combined degree to obtain the MAQRM degree as a distance learning degree.

Sample schedules for each specialization in the math major is found in Appendix B. Sample schedules for the combined BS/MAQRM degree for ASC Honors versions of the math specializations are presented in Appendix C, and a complete listing of course options and requirements for the MAQRM degree is contained in Appendix E. Students who choose the thesis option typically select a thesis advisor and begin work on the thesis no later than their third semester in the program. For students in the combined program who choose the thesis option, they must do so their first semester in the MAQRM program. ASC Honors students who complete a thesis cannot use the same work to complete an MAQRM thesis. Description of requirements for students in the combined degree who optionally choose the thesis option is contained in Appendix E.1. The advising sheet for the MAQRM program is in Appendix D. Goals and assessment plans for the MAQRM program are found in Appendix F, while goals and assessment plans for the BS degree are found in Appendix G.

In summary, the total BS degree minimum credit hours is 121, the total MAQRM degree minimum credit hours is 33. With no more than 9 credit hours double counted, this yields the unique combined program minimum credit hours of 145.

Students will be made aware of the opportunity to participate in the combined degree program at the point of declaring their major in Mathematics and during appointments with advisors. It is

anticipated that most candidates will apply during the Spring semester of the student's third year following consultation with the major advisor or honors advisor for admission to the program at the beginning of the student's fourth year. By the time of admission, applicants to the combined degree program must:

1. be in good academic standing (at least 3.5 GPA)
2. have completed 90 credit hours of coursework or more
3. have completed the major core course (Math 4530 or Stat 4201)

Additionally, students will be required to complete Math 3618 or pass actuarial exam FM administered by the SOA to graduate with the combined degree, though they can be accepted to the combined degree before completing this course.

GRE scores will not be required for the combined BS/MS degree. Applications will be reviewed by the Mathematics Department MAQRM Committee to determine if the student is ready and capable of accelerated studies. Upon admission, the Director of the actuarial science MAQRM program, or another Mathematics faculty member designated by the GSC Chair after consultation with the student, will serve as the students BS/MAQRM advisor. Both thesis and non-thesis Masters degree candidates will complete a Masters examination in accordance with the existing MAQRM program requirements. (Department of Mathematics Graduate Program Handbook section 9.4.3).

Based on mathematics advising reports, 5-15 students each year are interested in completing the MAQRM degree if they were able to begin the program as an undergraduate student. We anticipate this number will enroll in the combined program.

A student in the combined degree program can elect to leave the program without penalty. The completed graduate courses will continue to count as elective credits towards the student's undergraduate BS degree.

Admission to the program results in enrollment as a graduate student. Credit hours for graduate-level courses required to complete the MAQRM program will be charged at the University's graduate tuition rate, while credit hours for undergraduate courses that are used towards the completion of the undergraduate degree will be charged at the undergraduate rate (including those that are double counted towards both degrees). Additionally, as graduate students, the undergraduate course prerequisite requirements for graduate courses (5000 and above) will be waved, as is the case for new graduate students in the MAQRM program from outside the university. The MAQRM program does not provide financial support through graduate teaching assistants.

We believe the opportunity to obtain a BS and MAQRM degree will be attractive to ambitious students at Ohio State University preparing for employment in actuarial science and mathematical finance fields where a master's degree will position them ahead of or open better career-related positions than those available to BS degree-holding graduates. It will also prepare and enable students who wish to matriculate into advanced PhD programs to be competitive in actuarial science programs. In addition, the advanced knowledge and training of graduates with an MS degree will enhance the reputation of Ohio State University programs in scientific fields and industries.

Appendix A Requirements for BS major specializations

In this appendix, we include the requirement sheets for the math major specializations, with separate requirement sheets for the ASC honors versions of these specializations immediately following for easy comparison. There are some general differences between the requirements for major specializations and the ASC honors versions of the same math specializations.

Differences in Major Supporting Courses: While all math major specializations require Math 1295, this is not required for the ASC honors versions of the same math specializations. Additionally, Math 1151-1152 can be replaced with Math 1181H.

Differences in Major Coursework: The ASC Honors version of the math major specializations require at least 5 honors courses in the major. At most 2 courses can count from Math 2182H, 2568H, or 3345H. The various specializations have different electives and paths students can pursue to complete this requirement.

Bachelor of Science
Major: Mathematical Biology

Students in this major will complete a minimum of 121 hours outlined as follows.

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice****	4-5
Social & Behavioral Sciences	***Student Choice***	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme**: Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Supporting Courses
***** The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.

Course (hrs)	GE Category
Math 1151 (5)	Mathematical & Quantitative Reasoning/Data Analysis
Math 1152 (5)	Mathematical & Quantitative Reasoning/Data Analysis
Chem 1210 (5)	Natural Science
Biology 1113 (4)	Natural Science
Biology 1114 (4)	Natural Science
Math 1295 (1)	Math Seminar

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xx	**University Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

Major Coursework		
Course	**Title**	**Hours**
Math 2153	Calculus III	4
Math 2568	Linear Algebra	3
Math 3345	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 2255	Ordinary Differential Equations	3
Math 3350	Intro to Math Biology	3
Choose 1: Biology 3401 Molgen 4500	 Integrated Biology General Genetics	3-4
Applied Math: Choose 2 Math 3607 Math 4557 Math 4556	 Beginning Scientific Computing Partial Differential Equations Dynamical Systems	6
Electives: Choose 2 Math 3607 (not before) Math 4557 (not before) Math 4556 (not before) Math 4350 Math 4580 Math 4551 Math 4552 Math 4578 Math 5101 Math 5421 BioChem 4511 Chem 2510 EEOB 3310 EEOB 3420 EEOB 4520	 Beginning Scientific Computing Partial Differential Equations Dynamical Systems Quantitative Neuroscience Abstract Algebra I Vector Analysis Complex Analysis Discrete Math Models Linear Math in Finite Dimensions I Math of Infectious Disease Dynamics Intro to Biological Chemistry Organic Chemistry Evolution Behavioral Ecology Comparative Physiology	6-7
	Credit Hours:	43-44

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**15-24**
Major	**43-44**
Open Electives	**1-29**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 1295 Math Seminar – embedded technology
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

Bachelor of Science
Major: Honors Mathematics Biology

Students in this major will complete a minimum of 121 hours outlined as follows.

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice****	4-5
Social & Behavioral Sciences	***Student Choice***	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme**: Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Supporting Courses* The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.	
Course (hrs)	**GE Category**
Math 1151 (5) and Math 1152 (5), or Math 1181H (5)	Mathematical & Quantitative Reasoning/Data Analysis
Chem 1210 (5)	Natural Science
Biology 1113 & 1114 (8)	Natural Science

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xxH	**University Honors Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

** ASC Honors Program Requirements: Students pursuing such a contract must complete at least "5 honors math eligible courses" (in green) selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. For the remaining 3 courses, one needs to complete one of the paths A, B or C.

Major Coursework		
Course	**Title**	**Hours**
Math 2153 or 2182H**	Calculus III or Honors Calc II	4-5
Math 2568 or 2568H**	Linear Algebra	3
Math 3345 or 3345H**	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 2255	Ordinary Differential Equations	3
Math 3350	Intro to Mathematical Biology	3
Choose 1: Biology 3401 Molgen 4500	 Integrated Biology General Genetics	3/4
Math Bio: Path A Math 4556 Math 5401 Math 5402 Math 5601	 Dynamical Systems Applied Differential Equations I Applied Differential Equations II Essentials of Numerical Methods	12
Math Bio: Path B Math 4556 Math 4557 Math 5601 Math 5602 Math 5401	 Dynamical Systems Partial Differential Equations Essentials of Numerical Methods Computational PDEs Applied Differential Equations I	15
Math Bio: Path C Math 4556 Math 4557 Math 5601 Math 5651 Math 5401	 Dynamical Systems Partial Differential Equations Essentials of Numerical Methods Math Modeling for Biological Processes Applied Differential Equations I	15
	Credit Hours:	38-44

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**18-23**
Major	**38-44**
Open Electives	**0-21**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

ASC Honors Program requirements:

- a minimum of 18 hours of Honors coursework including:
- All GE Theme courses must be Honors or Honors-quality courses
- At least one Honors or Honors-quality course in EACH of the following disciplines
  - Natural and Mathematical Sciences
  - Arts and Humanities
  - Social and Behavioral Sciences
- The ASC Honors survey course
- An Honors enhanced ePortfolio
- Honors Project

Bachelor of Science
Major: Mathematics Applied (Chemistry)

Students in this major will complete a minimum of 121 hours outlined as follows.

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice****	4-5
Social & Behavioral Sciences	***Student Choice***	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme**: Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Supporting Courses* The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.

Course (hrs)	GE Category
Math 1151 (5)	Mathematical & Quantitative Reasoning/Data Analysis
Math 1152 (5)	Mathematical & Quantitative Reasoning/Data Analysis
Chem 1210 & 1220 (10)	Natural Science
Phys 1250&1251 (10)	Natural Science
Biology 1113/1114 (4)	Natural Science
Math 1295 (1)	Math Seminar

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xx	**University Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

Major Coursework		
Course	**Title**	**Hours**
Math 2153	Calculus III	4
Math 2568	Linear Algebra	3
Math 3345	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 2255	Ordinary Differential Equations	3
Math 4557	Partial Differential Equations	3
Applied Math: Choose 2 Math 3607 Math 4552 Math 4556	 Beginning Scientific Computing Complex Analysis Dynamical Systems	6
Electives: Choose 2 Math 3607 (not before) Math 4552 (not before) Math 4556 (not before) Math 4350 Math 4547 Math 4548 Math 4551 Math 4578 Math 5101 Math 5451 Math 5756	 Beginning Scientific Computing Complex Analysis Dynamical Systems Quantitative Neuroscience Intro to Analysis I Intro to Analysis II Vector Analysis Discrete Math Models Linear Math in Finite Dimensions Calculus of Variations and Tensor Calculus Math Methods in Relativity Theory I	6
Chem Electives: Choose 2 Chemistry 2210 (5) Chemistry 4300 (3) Chemistry 4310 (3)	 Analytical Chemistry I Physical Chemistry I Physical Chemistry II	6-8
	Credit Hours:	41-44

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**25-35**
Major	**41-44**
Open Electives	**0-21**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 1295 Math Seminar – embedded technology
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

Bachelor of Science
Major: Honors Mathematics Applied (Chemistry)

Students in this major will complete a minimum of 121 hours outlined as follows.

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice****	4-5
Social & Behavioral Sciences	***Student Choice***	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme**: Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Supporting Courses* The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.

Course (hrs)	GE Category
Math 1151 (5) and Math 1152 (5), or Math 1181H (5)	Mathematical & Quantitative Reasoning/Data Analysis
Chem 1210 & 1220 (10)	Natural Science
Phys 1250&1251 (10)	Natural Science
Biology 1113/1114 (4)	Natural Science

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xxH	**University Honors Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

** ASC Honors Program Requirements: Students pursuing such a contract must complete at least "5 honors math eligible courses" (in green) selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. For the remaining 3 courses, one needs to complete one of the paths A, B or C.

Major Coursework		
Course	**Title**	**Hours**
Math 2153 or 2182H**	Calculus III or Honors Calc II	4-5
Math 2568 or 2568H**	Linear Algebra	3
Math 3345 or 3345H**	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 2255	Ordinary Differential Equations	3
Math 4557	Partial Differential Equations	3
Applied Math: Path A Math 4556 Math 5401 Math 5402 Math 5601	 Dynamical Systems Applied Differential Equations I Applied Differential Equations II Essentials of Numerical Methods	12
Applied Math: Path B Math 4556 Math 5601 Math 5602 Math 5401	 Dynamical Systems Essentials of Numerical Methods Computational PDEs Applied Differential Equations I	12
Applied Math: Path C Math 4556 Math 5756 Math 5757 Math 5601	 Dynamical Systems Math Methods in Relativity Th. I Math Methods in Relativity Th. II Essentials of Numerical Methods	12
Chem Electives: Choose 2 Chemistry 2210 (5) Chemistry 4300 (3) Chemistry 4310 (3)	 Analytical Chemistry I Physical Chemistry I Physical Chemistry II	6-8
	Credit Hours:	41-45

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**29-34**
Major	**41-45**
Open Electives	**0-21**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

ASC Honors Program Requirements:

- a minimum of 18 hours of Honors coursework including:
- All GE Theme courses must be Honors or Honors-quality courses
- At least one Honors or Honors-quality course in EACH of the following disciplines
  - Natural and Mathematical Sciences
  - Arts and Humanities
  - Social and Behavioral Sciences
- The ASC Honors survey course
- An Honors enhanced ePortfolio
- Honors Project

Bachelor of Science
Major: Mathematics Applied (Physics)

Students in this major will complete a minimum of 121 hours outlined as follows.

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice****	4-5
Social & Behavioral Sciences	***Student Choice***	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme**: Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Supporting Courses
***** The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.

Course (hrs)	GE Category
Math 1151 (5)	Mathematical & Quantitative Reasoning/Data Analysis
Math 1152 (5)	Mathematical & Quantitative Reasoning/Data Analysis
Chem 1210 (5)	Natural Science
Phys 1250&1251 (10)	Natural Science
Biology 1113/1114 (4)	Natural Science
Math 1295 (1)	Math Seminar

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xx	**University Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

Major Coursework		
Course	**Title**	**Hours**
Math 2153	Calculus III	4
Math 2568	Linear Algebra	3
Math 3345	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 2255	Ordinary Differential Equations	3
Math 4557	Partial Differential Equations	3
Applied Math: Choose 2 Math 3607 Math 4552 Math 4556	 Beginning Scientific Computing Complex Analysis Dynamical Systems	6
Electives: Choose 2 Math 3607 (not before) Math 4552 (not before) Math 4556 (not before) Math 4350 Math 4547 Math 4548 Math 4551 Math 4578 Math 5101 Math 5451 Math 5756	 Beginning Scientific Computing Complex Analysis Dynamical Systems Quantitative Neuroscience Intro to Analysis I Intro to Analysis II Vector Analysis Discrete Math Models Linear Math in Finite Dimensions I Calculus of Variations and Tensor Calculus Math Methods in Relativity Theory I	6
Physics 2300 & 2301	Intermediate Mechanics I & II	8
	Credit Hours:	43-44

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**21-30**
Major	**43-44**
Open Electives	**0-23**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 1295 Math Seminar – embedded technology
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

Bachelor of Science
Major: Honors Mathematics Applied (Physics)

Students in this major will complete a minimum of 121 hours outlined as follows.

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice****	4-5
Social & Behavioral Sciences	***Student Choice***	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme: **Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Supporting Courses* The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.

Course (hrs)	GE Category
Math 1151 (5) and Math 1152 (5), or Math 1181H (5)	Mathematical & Quantitative Reasoning/Data Analysis
Chem 1210 (5)	Natural Science
Phys 1250 & 1251 (10)	Natural Science
Biology 1113/1114 (4)	Natural Science

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xxH	**University Honors Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

** ASC Honors Program Requirements: Students pursuing such a contract must complete at least "5 honors math eligible courses" (in green) selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. For the remaining 3 courses, one needs to complete one of the paths A, B or C.

Major Coursework		
Course	**Title**	**Hours**
Math 2153 or 2182H**	Calculus III or Honors Calc II	4-5
Math 2568 or 2568H**	Linear Algebra	3
Math 3345 or 3345H**	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 2255	Ordinary Differential Equations	3
Math 4557	Partial Differential Equations	3
Applied Math: Path A Math 4556 Math 5401 Math 5402 Math 5601	 Dynamical Systems Applied Differential Equations I Applied Differential Equations II Essentials of Numerical Methods	12
Applied Math: Path B Math 4556 Math 5601 Math 5602 Math 5401	 Dynamical Systems Essentials of Numerical Methods Computational PDEs Applied Differential Equations I	12
Applied Math: Path C Math 4556 Math 5756 Math 5757 Math 5601	 Dynamical Systems Math Methods in Relativity Th. I Math Methods in Relativity Th. II Essentials of Numerical Methods	12
Physics Physics 2300 Physics 2301	 Intermediate Mechanics I Intermediate Mechanics II	8
	Credit Hours:	43-45

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**24-29**
Major	**43-45**
Open Electives	**0-21**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 1295 Math Seminar – embedded technology
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

ASC Honors Program requirements:

- a minimum of 18 hours of Honors coursework including:
- All GE Theme courses must be Honors or Honors-quality courses
- At least one Honors or Honors-quality course in EACH of the following disciplines
  - Natural and Mathematical Sciences
  - Arts and Humanities
  - Social and Behavioral Sciences
- The ASC Honors survey course
- An Honors enhanced ePortfolio
- Honors Project

Bachelor of Science
Major: Mathematics - Education

Students in this major will complete a minimum of 121 hours outlined as follows.

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice***	4-5
Social & Behavioral Sciences	***Student Choice***	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme**: Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Supporting Courses
***** The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.

Course (hrs)	GE Category or Course Title
Math 1151 (5)	Mathematical & Quantitative Reasoning/Data Analysis
Math 1152 (5)	Mathematical & Quantitative Reasoning/Data Analysis
Math 1295 (1)	Math Seminar
Choose 1: **(3)** **CSE 1222** **CSE 1223** **CSE 2221**	Computer Programming in C++ Computer Programming in Java Software I

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xx	**University Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

Major Coursework		
Course	**Title**	**Hours**
Math 2153	Calculus III	4
Math 2568	Linear Algebra	3
Math 3345	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 4547	Intro to Analysis I	3
Math 4548	Intro to Analysis II	3
Math 4580	Abstract Algebra I	3
Math 4581	Abstract Algebra II	3
Math 4504	History of Mathematics	3
Math 4507	Geometry	3
Math 4578	Discrete Mathematical Models	3
	Credit Hours:	38-39

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**9-14**
Major	**38-39**
Optional M.Ed. Program Req	**0-9**
Open Electives	**7-40**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 1295 Math Seminar – embedded technology
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

Preparation Requirements for OSU Master of Education - optional		
Requirement	**Course Options**	**Hours**
ESEPSY 5401/PSYCH 3551	Adolescent Learning & Development	3
EDUTL 5442	Teach Reading Across the Curriculum	3
ESSPED 2251/EDUTL 5501	Special Educ Profession/Inclusion	3
	Credit Hours:	**0-12**

Bachelor of Science
Major: Honors Mathematics Education

Students in this major will complete a minimum of 121 hours outlined as follows.

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice****	4-5
Social & Behavioral Sciences	***Student Choice***	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme**: Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Supporting Courses* The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.	
Course (hrs)	**GE Category**
Math 1151 (5) and Math 1152 (5), or Math 1181H (5)	Mathematical & Quantitative Reasoning/Data Analysis
Choose 1: **(3)** **CSE 1222** **CSE 1223** **CSE 2221**	Computer Programming in C++ Computer Programming in Java Software I
Biology 1113 & 1114 (8)	Natural Science

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xxH	**University Honors Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

** ASC Honors Program Requirements: Students pursuing such a contract must complete at least "5 honors math eligible courses" (in green) selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. Students must take at least one honors sequence in analysis or abstract algebra.

Major Coursework		
Course	**Title**	**Hours**
Math 2153 or 2182H**	Calculus III or Honors Calc II	4-5
Math 2568 or 2568H**	Linear Algebra	3
Math 3345 or 3345H**	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 4547 & 4548 Or Math 4181H & 4182H	Introductory Analysis I & II Honors Analysis I & II	6 10
Math 4580 & 4581 Or Math 5590H & 5591H	Abstract Algebra I & II Honors Abstract Algebra I & II	6 10
Math 4504	History of Mathematics	3
Math 4507	Geometry	3
Math 4578	Discrete Mathematical Models	3
	Credit Hours:	42-48

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**16-21**
Major	**42-48**
Open Electives	**0-21**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

ASC Honors Program requirements:

- a minimum of 18 hours of Honors coursework including:
- All GE Theme courses must be Honors or Honors-quality courses
- At least one Honors or Honors-quality course in EACH of the following disciplines
  - Natural and Mathematical Sciences
  - Arts and Humanities
  - Social and Behavioral Sciences
- The ASC Honors survey course
- An Honors enhanced ePortfolio
- Honors Project

Bachelor of Science
Major: Mathematics - Financial

Students in this major will complete a minimum of 121 hours outlined as follows.

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice***	4-5
Social & Behavioral Sciences	***Student Choice****	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme**: Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Coursework		
Course	**Title**	**Hours**
Math 2153	Calculus III	4
Math 2568	Linear Algebra	3
Math 3345	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 2255	Ordinary Differential Equations	3
Math 3589	Intro to Financial Mathematics	3
Math 3607	Beginning Scientific Computing	3
Math 3618	Theory of Interest	3
Math 5632	Financial Economics for Actuaries	3
Choose 1: Math 4557 Math 4512 Math 4547	 Partial Differential Equations Partial Differential Equations for Sci & Eng Intro to Analysis I	3
Choose 1: BusFin 3120 BusFin 3220	 Foundations of Finance Business Finance	3
	Credit Hours:	38-39

Major Supporting Courses
***** The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.

Course (hrs)	GE Category or Course Title
Math 1151 & 1152 (10)	Mathematical & Quantitative Reasoning/Data Analysis
Econ 2001 & 2002 (6)	Social & Behavioral Sciences
CSE 2111 (3)	Spreadsheets and Databases
CSE 1222/1223 (3)	Computer Programming in C++/Java
ACCTMIS 2000/ (3-6) ACCTMIS 2200 & 2300	Foundations of Accounting/Intro to Accounting I & II
Math 1295 (1)	Math Seminar

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**24-32**
Major	**38-39**
Open Electives	**0-25**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 1295 Math Seminar – embedded technology
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xx	**University Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

Bachelor of Science
Major: Honors Mathematics - Financial

Students in this major will complete a minimum of 121 hours outlined as follows.

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice****	4-5
Social & Behavioral Sciences	***Student Choice***	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme**: Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Supporting Courses* The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.	
Course (hrs)	**GE Category**
Math 1151 and Math 1152 (10), or Math 1181H (5)	Mathematical & Quantitative Reasoning/Data Analysis
Econ 2001 & 2002 (6)	Social & Behavioral Sciences
CSE 2111 (3)	Spreadsheets and Databases
CSE 1222/1223 (3)	Computer Programming in C++/Java
ACCTMIS 2000/ (3-6) ACCTMIS 2200 & 2300	Foundations of Accounting/Intro to Accounting I & II

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xxH	**University Honors Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

** ASC Honors Program Requirements: Students pursuing such a contract must complete at least "5 honors math eligible courses" (in green) selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H.

Major Coursework		
Course	**Title**	**Hours**
Math 2153 or 2182H**	Calculus III or Honors Calc II	4-5
Math 2568 or 2568H**	Linear Algebra	3
Math 3345 or 3345H**	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 2255	Ordinary Differential Equations	3
Math 3589	Intro to Financial Mathematics	3
Math 3607 or 5601	Scientific/Numerical Computing	3
Math 3618	Theory of Interest	3
Math 5632	Financial Economics for Actuaries	3
Choose one of: Math 4557 Math 4512 Math 4547	 Partial Differential Equations PDE for Sci & Eng Introductory Analysis I	3
Choose a sequence: Math 5633 & 5634 Math 5401 & 5402 Math 5635 & 5636 Math 4181H & 4182H	 Loss Models I & II Applied Differential Equations I & II Stochastic Calculus for Finance I & II Honors Analysis I & II	 6 6 6 10
Choose one of: BusFin 3120 BusFin 3220	 Foundations of Finance Business Finance	 3 3
	Credit Hours:	44-50

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**20-28**
Major	**44-50**
Open Electives	**0-21**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

ASC Honors Program requirements:

- a minimum of 18 hours of Honors coursework including:
- All GE Theme courses must be Honors or Honors-quality courses
- At least one Honors or Honors-quality course in EACH of the following disciplines
  - Natural and Mathematical Sciences
  - Arts and Humanities
  - Social and Behavioral Sciences
- The ASC Honors survey course
- An Honors enhanced ePortfolio
- Honors Project

Bachelor of Science
Major: Mathematics - Theoretical

Students in this major will complete a minimum of 121 hours outlined as follows.

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice***	4-5
Social & Behavioral Sciences	***Student Choice***	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme**: Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Supporting Courses
***** The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.

Course (hrs)	GE Category or Course Title
Math 1151 (5)	Mathematical & Quantitative Reasoning/Data Analysis
Math 1152 (5)	Mathematical & Quantitative Reasoning/Data Analysis
Math 1295 (1)	Math Seminar

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xx	**University Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

Major Coursework		
Course	**Title**	**Hours**
Math 2153	Calculus III	4
Math 2568	Linear Algebra	3
Math 3345	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 2255	Ordinary Differential Equations	3
Math 4547	Intro to Analysis I	3
Math 4548	Intro to Analysis II	3
Math 4580	Abstract Algebra I	3
Math 4581	Abstract Algebra II	3
Electives: Choose 2 Math 3589 Math 3607 Math 3618 Math 4350 Math 4504 Math 4507 Math 4556 Math 4557 Math 4551 Math 4552 Math 4573 Math 4575 Math 4578 Math 5632	 Intro to Financial Mathematics Beginning Scientific Computing Theory of Interest Quantitative Neuroscience History of Mathematics Geometry Dynamical Systems Partial Differential Equations Vector Analysis Complex Analysis Elementary Number Theory Combinatorics Discrete Mathematical Models Financial Economics for Actuaries	6
	Credit Hours:	38-39

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**6-11**
Major	**38-39**
Open Electives	**25-43**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 1295 Math Seminar – embedded technology
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

Bachelor of Science
Major: Honors Mathematics - Theoretical

Students in this major will complete a minimum of 121 hours outlined as follows.

*Students earning Honors in the Arts & Sciences must complete the Honors Curricular Requirements and the Honors Project.****

General Education Requirements		
Requirement	**Course Options**	**Hours**
GE Launch Seminar	***General Education Seminar***	1
Writing and Information Literacy	***Student Choice***	3
Mathematical & Quantitative Reasoning/Data Analysis	***Student Choice****	5
Literary, Visual and Performing Arts	***Student Choice***	3
Historical & Cultural Studies	***Student Choice***	3
Natural Science	***Student Choice****	4-5
Social & Behavioral Sciences	***Student Choice***	3
Race, Ethnic and Gender Diversity	***Student Choice***	3
Theme: **Citizenship for a Diverse & Just World** [a]	***Student Choice***	4-6
Theme: **Student Choice** [a]	***Student Choice***	4-6
GE Reflection	***Understanding a Diverse & Just World***	1
	General Education Credit Hours:	**33-39**

Major Supporting Courses* The following courses are prerequisites and/or corequisites to this major and can also fulfill certain GE Requirements above.	
Course (hrs)	**GE Category**
Math 1151 and Math 1152 (10), or Math 1181H (5)	Mathematical & Quantitative Reasoning/Data Analysis

College/Degree Requirements		
Requirement	**Course Options**	**Hours**
World Language*	**1101**	4
	1102 or 1155	4
	1103	4
ASC 1100.xxH	**University Honors Survey**	1
***Based upon student's language placement**	**Credit Hours:**	**1-13**

[a] Students complete either a 4-credit course or two 3-credit courses in each of two General Education Theme areas: Citizenship for a Diverse & Just World (required), and the student's choice of available GE Themes. If any major-required courses are identified as a GE Theme course, one course in each GE Theme area may double count in the GE and major hours. Theme courses are identified with a ❖ symbol.

** ASC Honors Program Requirements: Students pursuing such a contract must complete at least "5 honors math eligible courses" (in green) selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. Students must take at least one honors sequence in analysis or abstract algebra.

*** Students earning Honors in the Arts and Sciences must complete the Honors Curricular Requirements (a minimum of 18 hours of Honors coursework; all GE Theme courses must be Honors or Honors-quality courses; at least one Honors or Honors-quality course must be completed in each of the following disciplines - Natural and Mathematical Sciences, Arts and Humanities, Social and Behavioral Sciences; the ASC Honors survey course; an Honors enhanced ePortfolio) and the Honors Project.

Major Coursework		
Course	**Title**	**Hours**
Math 2153 or 2182H**	Calculus III or Honors Calc II	4-5
Math 2568 or 2568H**	Linear Algebra	3
Math 3345 or 3345H**	Foundations of Higher Mathematics	3
Math 4530/Stat 4201	Probability/Statistics I	3/4
Stat 4202	Statistics II	4
Math 2255	Ordinary Differential Equations	3
Math 4547 & 4548 Or Math 4181H & 4182H	Introductory Analysis I & II Honors Analysis I & II	6 10
Math 4580 & 4581 Or Math 5590H & 5591H	Abstract Algebra I & II Honors Abstract Algebra I & II	6 10
Electives: Choose 2 Math 3589 Math 3607 (if no 5601) Math 5601 (if no 3607) Math 3618 Math 4350 Math 4504 Math 4507 Math 4556 Math 4557 Math 4551 Math 4552 Math 4573 Math 4575 Math 4578 Math 5632	 Intro to Financial Mathematics Beginning Scientific Computing Essentials of Numerical Methods Theory of Interest Quantitative Neuroscience History of Mathematics Geometry Dynamical Systems Partial Differential Equations Vector Analysis Complex Analysis Elementary Number Theory Combinatorics Discrete Mathematical Models Financial Economics for Actuaries	6
	Credit Hours:	38-46

General Education	**33-39**
College/Degree Requirements	**1-13**
Major Supporting Courses	**5-10**
Major	**38-46**
Open Electives	**0-21**
Minimum Total Credit Hours	**121**

Embedded Literacies:
- Math 3345 Foundations of Higher Math – embedded writing
- Stat 4202 Statistics II – embedded data

ASC Honors Program requirements:

- a minimum of 18 hours of Honors coursework including:
- All GE Theme courses must be Honors or Honors-quality courses
- At least one Honors or Honors-quality course in EACH of the following disciplines
  - Natural and Mathematical Sciences
  - Arts and Humanities
  - Social and Behavioral Sciences
- The ASC Honors survey course
- An Honors enhanced ePortfolio
- Honors Project

Appendix B Sample Schedules Non-Honors specializations

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Mathematics Biology Combined Degree Sample Schedule

	Autumn		Spring	
Year 1	Math 1151*	5	Math 1152	5
	Bio 1113	4	Math 1295	1
	World Language	4	World Language	4
	ARTSSCI 1100.10	1	Bio 1114	4
			GE Launch Seminar (GENED 1201	1
	Semester Credit Hours	14	Semester Credit Hours	15
Year 2	Math 2153	4	Math 2568	3
	GE WIL (English 1110 recommended)	3	Math 4530	3
	World Language	4	Math 3345	3
	Chem 1210**	5	Math 2255	3
			Molgen 4500	3
			Elective	2
	Semester Credit Hours	16	Semester Credit Hours	17
Year 3	Stat 4202	4	GE Race, Ethnicity, and Gender	3
	Math 3350	3	World Language	4
	GE Citizenship for a Diverse and Just W	4	Math 4556 (Honors Path A)	3
	GE Theme Student Choice	4	GE Social and Behavioral Sciences	3
			GE Historical and Cultural	3
	Semester Credit Hours	15	Semester Credit Hours	16
Year 4	Elective	3	Elective	3
	Math 5601 (Honors Path A)	3	Elective	3
	GE Literary, Visual and Performing Art	3	**Math 5402 (Honors Path A)**	3
	Math 5401 (Honors Path A)	3	GE Reflection (GENED 4001)	1
	Elective	3	Elective	3
	Semester Credit Hours	15	Semester Credit Hours	13
Year 5	Math 5630	3	Math 5631	3
	Stat 6301	3	Stat 6302	3
	Math 5633	3	Math 5634	3
	Math 5632	3	Math 5588	3
	Semester Credit Hours	12	Semester Credit Hours	12

*Math 1151 fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement

**Chem 1210 fulfulls GEN Natural Science

Credits By Year 4	**93**
Total BS Credits	**121**
Total MAQRM Credits	**33**
Total Credits	**145**

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Applied Math: Chemistry Combined Degree Sample Schedule

	Autumn		Spring	
Year 1	Math 1151*	5	Math 1152	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	Chem 1210**	5	Chem 1220	5
	ARTSSCI 1100.10	1	World Language	4
	Math 1295	1		
	Semester Credit Hours	16	Semester Credit Hours	15
Year 2	Math 2153	3	Math 2255	3
	World Language	4	Math 4530	3
	GE WIL (English 1110 recommended)	3	Math 2568	3
	Phys 1250	5	Phys 1251	5
			GE Historical and Cultural Studies	3
	Semester Credit Hours	15	Semester Credit Hours	17
Year 3	Stat 4202	4	GE Race, Ethnicity, and Gender	3
	Math 4557	3	GE Citizenship for a Diverse and J	4
	Math 3345	3	Chem 4300	3
	Chem 2210	5	Bio 1113	4
			Math 3607	3
	Semester Credit Hours	15	Semester Credit Hours	17
Year 4	**Math 5401 (Honors Path A)**	3	**Math 5402 (Honors Path A)**	3
	Elective: Math 3618	3	**Math 5601 (Honors Path A)**	3
	GE Literary, Visual and Performing Art	3	GE Social and Behavioral Sciences	3
	Math 4556 (Honors Path A)	3	GE Reflection (GENED 4001)	1
			GE Theme Student Choice	4
	Semester Credit Hours	12	Semester Credit Hours	14
Year 5	Math 5630	3	Math 5631	3
	Stat 6301	3	Stat 6302	3
	Math 5633	3	Math 5634	3
	Math 5632	3	Math 5588	3
	Semester Credit Hours	12	Semester Credit Hours	12

*Math 1151 fulfills GEN Mathematical & Quantitative Researoning/Data Analysis requirement

**Chem 1210 fulfulls GEN Natural Science requirement

Credits By Year 4	**95**
Total BS Credits	**121**
Total MAQRM Credits	**33**
Total Credits	**145**

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Applied Math: Physics Combined Degree Sample Schedule

	Autumn		Spring	
Year 1	Math 1151*	5	Math 1152	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	Chem 1210**	5	CSE 1222	3
	ARTSSCI 1100.10	1	World Language	4
	Math 1295	1		
	Semester Credit Hours	16	Semester Credit Hours	13
Year 2	Math 2153	3	Math 2255	3
	World Language	4	Math 4530	3
	GE WIL (English 1110 recommended)	3	Math 2568	3
	Phys 1250	5	Phys 1251	5
			GE Historical and Cultural Studies	3
	Semester Credit Hours	15	Semester Credit Hours	17
Year 3	Stat 4202	4	GE Race, Ethnicity, and Gender	3
	Math 4556 (Honors Path A)	3	GE Citizenship for a Diverse and Ji	4
	Math 3345	3	Physics 2301	4
	Physics 2300	4	Bio 1113	4
	Math 4557	3		
	Semester Credit Hours	17	Semester Credit Hours	15
Year 4	**Math 5401 (Honors Path A)**	3	**Math 5402 (Honors Path A)**	3
	Elective	3	GE Theme Student Choice	4
	GE Literary, Visual and Performing Art	3	GE Social and Behavioral Sciences	3
	Elective: Math 3618	3	GE Reflection (GENED 4001)	1
	Elective	3	**Math 5601 (Honors Path A)**	3
	Semester Credit Hours	15	Semester Credit Hours	14
Year 5	Math 5630	3	Math 5631	3
	Stat 6301	3	Stat 6302	3
	Math 5633	3	Math 5634	3
	Math 5632	3	Math 5588	3
	Semester Credit Hours	12	Semester Credit Hours	12

*Math 1151 fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement

**Chem 1210 fulfulls GEN Natural Science Requirement

Credits By Year 4	**93**
Total BS Credits	**122**
Total MAQRM Credits	**33**
Total Credits	**146**

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Math Education Combined Degree Sample Schedule

	Autumn		Spring	
Year 1	Math 1151*	5	Math 1151	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	CSE 1222	3	World Language	4
	ARTSSCI 1100.01H	1	GE Social and Behavioral Science	3
	Math 1295	1	Elective	3
	Semester Credit Hours	14	Semester Credit Hours	16
Year 2	Math 2153	3	GE Race, Ethnicity, and Gender	3
	World Language	4	Math 2568	3
	English 1110**	3	Math 3345	3
	Elective	3	GE Literary, Visual and Performin	3
	Elective	3	GE Historical and Cultural Studies	3
	Semester Credit Hours	16	Semester Credit Hours	15
Year 3	GE Natural Sciences	4	Elective	3
	Math 4530	3	GE Theme Student Choice	4
	GE Citizenship for a Diverse and Just W	4	Math 4504	3
	Elective: Math 3618	3	Stat 4202	3
			Elective	3
	Semester Credit Hours	14	Semester Credit Hours	16
Year 4	Math 4580	3	Math 4581	3
	Math 5201 (Replace 4547)	5	**Math 5202 (Replace 4548)**	5
	Math 4507	3	Math 4578	3
	Elective	3	GE Reflection (GENED 4001)	1
	Semester Credit Hours	14	Semester Credit Hours	12
Year 5	Math 5630	3	Math 5631	3
	Stat 6301	3	Stat 6302	3
	Math 5633	3	Math 5634	3
	Math 5632	3	Math 5588	3
	Semester Credit Hours	12	Semester Credit Hours	12

*Math 1181H fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement

** English 1110 fulfills GEN Writing and Information requirement

Note: only 9 of the 10 credits for Math 5201-5202 will count towards both degrees.

Credits By Year 4	**91**
Total BS Credits	**117**
Total MAQRM Credits	**33**
Total Credits	**141**

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Financial Math Combined Degree Sample Schedule

	Autumn		Spring	
Year 1	Math 1151*	5	Math 1152	5
	Math 1295	1	AcctMIS 2000	3
	Econ 2001**	3	CSE 1222	3
	ARTSSCI 1100.10	1	World Language	4
	World Language	4	GE Launch Seminar	1
	Semester Credit Hours	14	Semester Credit Hours	16
Year 2	Math 2153	3	Math 2568	3
	Math 3618	3	Math 4530	3
	English 1110***	3	GE Theme Citizenship	3
	World Language	4	Ge Historical and Cultural	3
	CSE 2111	3	GE Race, Ethnicity, and Gender	3
	Semester Credit Hours	16	Semester Credit Hours	15
Year 3	GE Natural Sciences	4	Math 3589	3
	Math 2255	3	BusFin 3120	3
	Math 3345	3	Math 3607	3
	Stat 4202	4	Econ 2002	3
	GE Literary, Visual and Performing Art	3	Elective	3
	Semester Credit Hours	17		15
Year 4	Math 4557	3	Elective	3
	Elective	3	GE Theme Student Choice	3
	Elective	3	GE Reflection (GENED 4001)	1
	Math 5401	3	**Math 5402**	3
	Elective	3	**Math 5632**	3
	Semester Credit Hours	15	Semester Credit Hours	13
Year 5	Math 5630	3	Math 5631	3
	Stat 6301	3	Stat 6302	3
	Math 5633	3	Math 5634	3
	Math 5637	3	Math 5588	3
	Semester Credit Hours	12	Semester Credit Hours	12

*Math 1151 fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement

**Econ 2001 fulfills GEN Social and Behavioral Sciences requirement

** English 1110 fulfills GEN Writing and Information requirement

Credits By Year 4	**93**
Total BS Credits	**121**
Total MAQRM Credits	**33**
Total Credits	**145**

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Theoretical Math Combined Degree Sample Schedule

	Autumn		Spring	
Year 1	Math 1151*	5	Math 1152	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	Math 1295	1	World Language	4
	ARTSSCI 1100.10	1	Elective	3
	Elective	3	Elective	3
	Semester Credit Hours	14	Semester Credit Hours	16
Year 2	Math 2153	4	GE Race, Ethnicity, and Gender	3
	World Language	4	Math 4530	3
	English 1110**	3	Math 3345	3
	Elective	3	Math 2568	3
	GE Social and Behavioral Science	3	Math 2255	3
	Semester Credit Hours	17	Semester Credit Hours	15
Year 3	GE Natural Sciences	4	GE Historical and Cultural Studies	3
	Elective	4	GE Theme Student Choice	4
	GE Literary Visual and Performing Arts	3	GE Citizenship for a Diverse and Ju	3
	Stat 4202	4	Elective	3
			Elective	3
	Semester Credit Hours	15	Semester Credit Hours	16
Year 4	Math 4580	3	Math 4581	3
	Math 5201 (Replace 4547)	5	**Math 5202 (Replace 4548)**	5
	Math 3618	3	Math 3607	3
	Elective	2	GE Reflection (GENED 4001)	1
			Elective	3
	Semester Credit Hours	13	Semester Credit Hours	15
Year 5	Math 5630	3	Math 5631	3
	Stat 6301	3	Stat 6302	3
	Math 5633	3	Math 5634	3
	Math 5632	3	Math 5588	3
	Semester Credit Hours	12	Semester Credit Hours	12

*Math 1151 fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement

** English 1110 fulfills GEN Writing and Information requirement

Note: only 9 of the 10 credits for Math 5201-5202 will count towards both degrees.

Credits By Year 4	**93**
Total BS Credits	**121**
Total MAQRM Credits	**33**
Total Credits	**145**

Appendix C Sample Schedules Honors specializations

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Honors Math Biology Track Sample Schedule

	Autumn		Spring	
Year 1	Math 1181H*	5	Math 2182H	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	Chem 1210**	5	Bio 1113	4
	ARTSSCI 1100.01H	1	World Language	4
	Semester Credit Hours	15	Semester Credit Hours	14
Year 2	Math 2568H	3	Math 2255	3
	World Language	4	Math 4530	3
	GE WIL (English 1110 recommended)	3	Math 3345	3
	Bio 1114	4	MolGen 4500	3
	Elective	3	GE Historical and Cultural Studies	3
	Semester Credit Hours	17	Semester Credit Hours	15
Year 3	Stat 4202	4	GE Race, Ethnicity, and Gender	3
	Math 4556	3	GE Theme Student Choice	4
	GE Citizenship for a Diverse and Just W(	4	Elective	3
	Elective	3	Math 3350	3
	GE Social and Behavioral Sciences	3	Elective	2
	Semester Credit Hours	17	Semester Credit Hours	15
Year 4	Math 4547	3	Math 5602	3
	Math 5401	3	Elective	3
	GE Literary, Visual and Performing Arts	3	Elective	3
	Math 5601	3	GE Reflection (GENED 4001)	1
	Elective	3	Elective	3
	Semester Credit Hours	15	Semester Credit Hours	13

*Math 1181H fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement. Students with credit for math 1151 can start in math 1181H.

**Chem 1210 fulfills GEN Natural Science

Completion of ASC Honors Program requirements: For a full list of requirement, please see the executive summary. Students must complete at least "5 honors math eligible courses" selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. For the remaining 3 courses, one needs to complete one of the paths A, B or C.

Total Credits	**121**

revised 10/20/2025

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Honors Math Applied - Chemistry Track Sample Schedule

	Autumn		Spring	
Year 1	Math 1181H*	5	Math 2182H	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	Chem 1210**	5	Chem 1220	5
	ARTSSCI 1100.01H	1	World Language	4
	Semester Credit Hours	15	Semester Credit Hours	15
Year 2	Math 2568H	3	Math 2255	3
	World Language	4	Math 4530	3
	GE WIL (English 1110 recommended)	3	Math 3345	3
	Phys 1250	5	Phys 1251	5
			GE Historical and Cultural Studies	3
	Semester Credit Hours	15	Semester Credit Hours	17
Year 3	Stat 4202	4	GE Race, Ethnicity, and Gender	3
	Math 4556	3	GE Theme Student Choice	4
	GE Citizenship for a Diverse and Just W(	4	Chem 4300	3
	Chem 2210	3	Bio 1113	4
	GE Social and Behavioral Sciences	3	CSE 1222	3
	Semester Credit Hours	17	Semester Credit Hours	17
Year 4	Math 4547	3	Math 5602	3
	Math 5401	3	Elective	3
	GE Literary, Visual and Performing Arts	3	Elective	3
	Math 5601	3	GE Reflection (GENED 4001)	1
	Elective	3	Elective	3
	Semester Credit Hours	15	Semester Credit Hours	13

*Math 1181H fulfills GEN Mathematical & Quantitative Researoning/Data Analysis requirement. Students with credit for math 1151 can start in math 1181H.

**Chem 1210 fulfills GEN Natural Science

Completion of ASC Honors Program requirements: For a full list of requirement, please see the executive summary. Students must complete at least "5 honors math eligible courses" selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. For the remaining 3 courses, one needs to complete one of the paths A, B or C.

Total Credits	**124**

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Honors Math Applied - Chemistry Combined Degree Sample Schedule

	Autumn		Spring	
Year 1	Math 1181H*	5	Math 2182H	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	Chem 1210**	5	Chem 1220	5
	ARTSSCI 1100.01H	1	World Language	4
	Semester Credit Hours	15	Semester Credit Hours	15
Year 2	Math 2568H	3	Math 2255	3
	World Language	4	Math 4530	3
	GE WIL (English 1110 recommended)	3	Math 3345	3
	Phys 1250	5	Phys 1251	5
			GE Historical and Cultural Studies	3
	Semester Credit Hours	15	Semester Credit Hours	17
Year 3	Stat 4202	4	GE Race, Ethnicity, and Gender	3
	Math 4556	3	GE Theme Student Choice	4
	GE Citizenship for a Diverse and Just W(	4	Chem 4300	3
	Chem 2210	3	Bio 1113	4
	GE Social and Behavioral Sciences	3	CSE 1222	
	Semester Credit Hours	17	Semester Credit Hours	14
Year 4	Math 4547	3	**Math 5602**	3
	Math 5401	3	Elective	3
	GE Literary, Visual and Performing Arts	3	Elective	3
	Math 5601	3	GE Reflection (GENED 4001)	1
	Elective: Math 3618	3	Elective	3
	Semester Credit Hours	15	Semester Credit Hours	13
Year 5	Math 5630	3	Math 5631	3
	Stat 6301	3	Stat 6302	3
	Math 5633	3	Math 5634	3
	Math 5632	3	Math 5588	3
	Semester Credit Hours	12	Semester Credit Hours	12

*Math 1181H fulfills GEN Mathematical & Quantitative Researoning/Data Analysis requirement. Students with credit for math 1151 can start in math 1181H.

**Chem 1210 fulfills GEN Natural Science

Completion of ASC Honors Program requirements: For a full list of requirement, please see the executive summary. Students must complete at least "5 honors math eligible courses" selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. For the remaining 3 courses, one needs to complete one of the paths A, B or C.

Credits By Year 4	**93**
Total BS Credits	**121**
Total MAQRM Credits	**33**
Total Credits	**145**

10/23/2025

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Honors Math Applied - Physics Track Sample Schedule

	Autumn		Spring	
Year 1	Math 1181H*	5	Math 2182H	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	Chem 1210**	5	Bio 1113	4
	ARTSSCI 1100.01H	1	World Language	4
	Semester Credit Hours	15	Semester Credit Hours	14
Year 2	Math 2568H	3	Math 2255	3
	World Language	4	Math 4530	3
	GE WIL (English 1110 recommended)	3	Math 3345	3
	Phys 1250	5	Phys 1251	5
			GE Historical and Cultural Studies	3
	Semester Credit Hours	15	Semester Credit Hours	17
Year 3	Stat 4202	4	GE Race, Ethnicity, and Gender	3
	Math 4556	3	GE Theme Student Choice	4
	GE Citizenship for a Diverse and Just W(	4	Physics 2301	4
	Physics 2300	4	CSE 1222	3
	GE Social and Behavioral Sciences	3		
	Semester Credit Hours	18	Semester Credit Hours	14
Year 4	Math 4547	3	Math 5602	3
	Math 5401	3	Elective	3
	GE Literary, Visual and Performing Arts	3	Elective	3
	Math 5601	3	GE Reflection (GENED 4001)	1
	Elective	3	Elective	3
	Semester Credit Hours	15	Semester Credit Hours	13

*Math 1181H fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement. Students with credit for math 1151 can start in math 1181H.

**Chem 1210 fulfills GEN Natural Science

Completion of ASC Honors Program requirements: For a full list of requirement, please see the executive summary. Students must complete at least "5 honors math eligible courses" selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. For the remaining 3 courses, one needs to complete one of the paths A, B or C.

Total Credits	**121**

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Honors Math Applied - Physics Combined Degree Sample Schedule

	Autumn		Spring	
Year 1	Math 1181H*	5	Math 2182H	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	Chem 1210**	5	Bio 1113	4
	ARTSSCI 1100.01H	1	World Language	4
	Semester Credit Hours	15	Semester Credit Hours	14
Year 2	Math 2568H	3	Math 2255	3
	World Language	4	Math 4530	3
	GE WIL (English 1110 recommended)	3	Math 3345	3
	Phys 1250	5	Phys 1251	5
			GE Historical and Cultural Studies	3
	Semester Credit Hours	15	Semester Credit Hours	17
Year 3	Stat 4202	4	GE Race, Ethnicity, and Gender	3
	Math 4556	3	GE Theme Student Choice	4
	GE Citizenship for a Diverse and Just W(	4	Physics 2301	4
	Physics 2300	4	CSE 1222	3
	GE Social and Behavioral Sciences	3		
	Semester Credit Hours	18	Semester Credit Hours	14
Year 4	Math 4547	3	**Math 5602**	3
	Math 5401	3	Elective	3
	GE Literary, Visual and Performing Arts	3	Elective	3
	Math 5601	3	GE Reflection (GENED 4001)	1
	Elective: Math 3618	3	Elective	3
	Semester Credit Hours	15	Semester Credit Hours	13
Year 5	Math 5630	3	Math 5631	3
	Stat 6301	3	Stat 6302	3
	Math 5633	3	Math 5634	3
	Math 5632	3	Math 5588	3
	Semester Credit Hours	12	Semester Credit Hours	12

*Math 1181H fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement. Students with credit for math 1151 can start in math 1181H.

**Chem 1210 fulfills GEN Natural Science

Completion of ASC Honors Program requirements: For a full list of requirement, please see the executive summary. Students must complete at least "5 honors math eligible courses" selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. For the remaining 3 courses, one needs to complete one of the paths A, B or C.

Credits By Year 4	**93**
Total BS Credits	**121**
Total MAQRM Credits	**33**
Total Credits	**145**

revised 10/20/2025

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Honors Math Education Track Sample Schedule

	Autumn		Spring	
Year 1	Math 1181H*	5	Math 2182H	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	CSE 1222	3	World Language	4
	ARTSSCI 1100.01H	1	GE Social and Behavioral Science	3
	Elective	3	Elective	3
	Semester Credit Hours	16	Semester Credit Hours	16
Year 2	Math 2568H	3	GE Race, Ethnicity, and Gender	3
	World Language	4	Math 4530	3
	English 1110**	3	Math 3345	3
	Elective	3	GE Literary, Visual and Performing	3
	Elective	3	GE Historical and Cultural Studies	3
	Semester Credit Hours	16	Semester Credit Hours	15
Year 3	GE Natural Sciences	4	Elective	3
	Math 5520H	5	GE Theme Student Choice	4
	GE Citizenship for a Diverse and Ju	4	Math 4504	3
	Elective	3	Stat 4202	3
	Semester Credit Hours	16	Semester Credit Hours	13
Year 4	Math 5590H	5	Math 5591H	5
	Math 4507	3	Math 4548	3
	Math 4547	3	Math 4578	3
	Elective	3	GE Reflection (GENED 4001)	1
			Elective	3
	Semester Credit Hours	14	Semester Credit Hours	15

*Math 1181H fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement

** English 1110 fulfills GEN Writing and Information requirement

Completion of ASC Honors Program requirements: For a full list of requirement, please see the executive summary. Students must complete at least "5 honors math eligible courses" selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. Students must take at least one honors sequence in analysis or abstract algebra.

Total Credits	**121**

revised 10/20/2025

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Honors Math Education Track Sample Schedule Combined Degree

	Autumn		Spring	
Year 1	Math 1181H*	5	Math 2182H	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	CSE 1222	3	World Language	4
	ARTSSCI 1100.01H	1	GE Social and Behavioral Science	3
			Elective	3
	Semester Credit Hours	13	Semester Credit Hours	16
Year 2	Math 2568H	3	GE Race, Ethnicity, and Gender	3
	World Language	4	Math 4530	3
	English 1110**	3	Math 3345	3
	Elective	3	GE Literary, Visual and Performing	3
	Elective	3	GE Historical and Cultural Studies	3
	Semester Credit Hours	16	Semester Credit Hours	15
Year 3	GE Natural Sciences	4	Elective	3
	Math 5520H	5	GE Theme Student Choice	4
	GE Citizenship for a Diverse and Ju	4	Math 4504	3
	Stat 4202	3	Elective	2
			Elective	3
	Semester Credit Hours	16	Semester Credit Hours	15
Year 4	Math 5590H	5	Math 5591H	5
	Math 4507	3	**Math 5202**	5
	Math 5201	5	Math 4578	3
	Elective: Math 3618	3	GE Reflection (GENED 4001)	1
	Semester Credit Hours	16	Semester Credit Hours	14
Year 5	Math 5630	3	Math 5631	3
	Stat 6301	3	Stat 6302	3
	Math 5633	3	Math 5634	3
	Math 5632	3	Math 5588	3
	Semester Credit Hours	12	Semester Credit Hours	12

*Math 1181H fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement. Students with credit for math 1151 can start in math 1181H.

** English 1110 fulfills GEN Writing and Information Literacy requirement

Completion of ASC Honors Program requirements: For a full list of requirement, please see the executive summary. Students must complete at least "5 honors math eligible courses" selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. Students must take at least one honors sequence in analysis or abstract algebra.

Note: only 9 of the 10 credits earned for Math 5201-5202 count towards the MAQRM degree.

Credits By Year 4	**91**
Total BS Credits	**121**
Total MAQRM Credits	**33**
Total Credits	**145**

revised 10/20/2025

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Honors Math Financial Track Sample Schedule

	Autumn		Spring	
Year 1	Math 1181H*	5	Math 2182H	5
	CSE 1222	3	AcctMIS 2000	3
	Econ 2001H or 2002H**	3	Econ 2001H or 2002H**	3
	ARTSSCI 1100.01H	1	World Language	4
	World Language	4	GE Launch Seminar	1
	Semester Credit Hours	16	Semester Credit Hours	16
Year 2	Math 2568H	3	Math 3345	3
	Math 3618	3	Math 4530	3
	English 1110***	3	GE Theme Citizenship	3
	World Language	4	Ge Historical and Cultural	3
	CSE 2111	3	GE Race, Ethnicity, and Gender	3
	Semester Credit Hours	16	Semester Credit Hours	15
Year 3	GE Natural Sciences	4	Math 3589	3
	Math 2255	3	BusFin 3120	3
	Open elective	3	Math 3607	3
	Stat 4202	4	Open elective	3
	GE Literary, Visual and Performing Arts	3	Open elective	3
	Semester Credit Hours	17		15
Year 4	Math 4557	3	Open elective	3
	Open elective	3	GE Theme Student Choice	3
	Open elective	3	GE Reflection (GENED 4001)	1
	Math 5401	3	Math 5402	3
	Open elective	1	Math 5632	3
	Semester Credit Hours	13	Semester Credit Hours	13

*Math 1181H fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement. Students entering OSU with credit for Math 1151 can start in math 1181H.

**Econ 2001 or 2002 fulfills GEN Social and Behavioral Sciences requirement

***English 1110 satisfies the GEN Writing and Information Requirement

Completion of ASC Honors Program requirements: For a full list of requirement, please see the executive summary. Students must complete at least "5 honors math eligible courses" selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. Students have a choice of elective sequence in the Math-Financial specialization.

Total Credits	**121**

revised 10/20/2025

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Honors Math Financial Track Sample Schedule for Combined Degree

	Autumn		Spring	
Year 1	Math 1181H*	5	Math 2182H	5
	CSE 1222	3	AcctMIS 2000	3
	Econ 2001H or 2002H**	3	Econ 2001H or 2002H**	3
	ARTSSCI 1100.01H	1	World Language	4
	World Language	4	GE Launch Seminar	1
	Semester Credit Hours	16	Semester Credit Hours	16
Year 2	Math 2568H	3	Math 3345	3
	Math 3618	3	Math 4530	3
	English 1110***	3	GE Theme Citizenship	3
	World Language	4	Ge Historical and Cultural	3
	CSE 2111	3	GE Race, Ethnicity, and Gender	3
	Semester Credit Hours	16	Semester Credit Hours	15
Year 3	GE Natural Sciences	4	Math 3589	3
	Math 2255	3	BusFin 3120	3
	Open elective	3	Math 3607	3
	Stat 4202	4	Open elective	3
	GE Literary, Visual and Performing Arts	3	Open elective	3
	Semester Credit Hours	17		15
Year 4	Math 4557	3	Open elective	3
	Open elective	3	GE Theme Student Choice	3
	Open elective	3	GE Reflection (GENED 4001)	1
	Math 5401	3	**Math 5402**	3
	Open elective	1	**Math 5632**	3
	Semester Credit Hours	13	Semester Credit Hours	13
Year 5	Math 5630	3	Math 5631	3
	Stat 6301	3	Stat 6302	3
	Math 5633	3	Math 5634	3
	Math 5637	3	Math 5588	3
	Semester Credit Hours	12	Semester Credit Hours	12

*Math 1181H fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement. Students entering OSU with credit for Math 1151 can start in math 1181H.

**Econ 2001 or 2002 fulfills GEN Social and Behavioral Sciences requirement

***English 1110 satisfies the GEN Writing and Information Requirement

Completion of ASC Honors Program requirements: For a full list of requirement, please see the executive summary. Students must complete at least "5 honors math eligible courses" selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. Students have a choice of elective sequence in the Math-Financial specialization.

Credits By Year 4	**95**
Total BS Credits	**121**
Total MAQRM Credits	**33**
Total Credits	**145**

revised 10/20/2025

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Honors Math Theoretical Track Sample Schedule

	Autumn		Spring	
Year 1	Math 1181H*	5	Math 2182H	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	Elective	3	World Language	4
	ARTSSCI 1100.01H	1	Elective	3
	Elective	3	Elective	3
	Semester Credit Hours	16	Semester Credit Hours	16
Year 2	Math 2568H	3	GE Race, Ethnicity, and Gender	3
	World Language	4	Math 4530	3
	English 1110**	3	Math 3345	3
	Math 2255	3	GE Citizenship for a Diverse and Ju	4
	GE Social and Behavioral Science	3	GE Historical and Cultural Studies	3
	Semester Credit Hours	16	Semester Credit Hours	16
Year 3	GE Natural Sciences	4	Elective	3
	Math 5520H	5	GE Theme Student Choice	4
	GE Literary Visual and Performing	3	Elective	3
	Stat 4202	4	Elective	3
			Elective	3
	Semester Credit Hours	16	Semester Credit Hours	16
Year 4	Math 5590H	5	Math 5591H	5
	Math 4547	3	Math 4548	3
	Math 3618	3	Math 3607	3
	Elective	2	GE Reflection (GENED 4001)	1
	Semester Credit Hours	13	Semester Credit Hours	12

*Math 1181H fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement. Students with credit for math 1151 can start in math 1181H.

** English 1110 fulfills GEN Writing and Information Literacy requirement

Completion of ASC Honors Program requirements: For a full list of requirement, please see the executive summary. Students must complete at least "5 honors math eligible courses" selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. Students must take at least one honors sequence in analysis or abstract algebra.

Total Credits	**121**

revised 10/20/2025

THE OHIO STATE UNIVERSITY

Department of Mathematics
217 Mathematics Building
231 W. 18th Avenue
Columbus, OH 43210-1174
Math.osu.edu
mathadvisors@math.osu.edu

Honors Math Theoretical Track Sample Schedule for Combined Degree

	Autumn		Spring	
Year 1	Math 1181H*	5	Math 2182H	5
	World Language	4	GE Launch Seminar (GENED 1201	1
	Elective	3	World Language	4
	ARTSSCI 1100.01H	1	Elective	3
	Elective	3	Elective	3
	Semester Credit Hours	16	Semester Credit Hours	16
Year 2	Math 2568H	3	GE Race, Ethnicity, and Gender	3
	World Language	4	Math 4530	3
	English 1110**	3	Math 3345	3
	Math 2255	3	GE Citizenship for a Diverse and Ju	4
	GE Social and Behavioral Science	3	GE Historical and Cultural Studies	3
	Semester Credit Hours	16	Semester Credit Hours	16
Year 3	GE Natural Sciences	4	Elective	3
	Math 5520H	5	GE Theme Student Choice	4
	GE Literary Visual and Performing	3	Elective	3
	Stat 4202	4	Elective	2
	Semester Credit Hours	16	Semester Credit Hours	12
Year 4	Math 5590H	5	Math 5591H	5
	Math 5201	5	**Math 5202**	5
	Math 3618	3	Math 3607	3
	Elective	2	GE Reflection (GENED 4001)	1
	Semester Credit Hours	15	Semester Credit Hours	14
Year 5	Math 5630	3	Math 5631	3
	Stat 6301	3	Stat 6302	3
	Math 5633	3	Math 5634	3
	Math 5632	3	Math 5588	3
	Semester Credit Hours	12	Semester Credit Hours	12

Note: Only 9 of the 10 credit hours for Math 5201-5202 count towards the combined degree.
*Math 1181H fulfills GEN Mathematical & Quantitative Reasoning/Data Analysis requirement. Students with credit for math 1151 can start in math 1181H.

** English 1110 fulfills GEN Writing and Information Literacy requirement

Completion of ASC Honors Program requirements: For a full list of requirement, please see the executive summary. Students must complete at least "5 honors math eligible courses" selected in consultation with an honors math advisor. At most 2 courses can count from 2182H, 2568H, or 3345H. Students also must complete a sequence in analysis or algebra at the honors level.

Credits By Year 4	**92**
Total BS Credits	**121**
Total MAQRM Credits	**33**

Appendix D MAQRM Advising Sheets

Advising Sheet for MAQRM

Prerequisites:

Course	Name	Credits	Semester	Grade	Comments
Math 2153	Calculus III				
Math 4530 or Stat 4201	Probability or Introduction to Math. Stat.				
Math 3618	Theory of Interest				
Econ 2001	Principals of Microeconomics				
Econ 2002	Principles of Macroeconomics				
Programming	(Recommended)				

Master of Actuarial and Quantitative Risk Management (33 credit hours)

Course	Name	Credits	Semester	Grade	Comments
Core					
Stat 6301	Probability for Statistical Inference	3			
Stat 6302	Theory of Statistical Analysis	3			
Math 5588	Practicum in Risk Management	3			
Math 5632	Financial Economics	3			
Sequences	(Choose at least two sequences)				
Math 5630	Life Contingencies I	3			
Math 5631	Life Contingencies II	3			
Math 5633	Loss Models I	3			
Math 5634	Loss Models II	3			
Math 5635	Stochastic Calculus for Finance I	3			
Math 5636	Stochastic Calculus for Finance II	3			
Math 5637	Topics in Pred. Modeling (repeated)	3			
Math 5601	Essentials of Numerical Methods	3			
Math 5602	Computational PDEs	3			
Other Electives					
Math 5201	Real Analysis I	5			
Math 5202	Real Analysis 2	5			
Math 5401	Applied Differential Eq. 1	3			
Math 5402	Applied Differential Eq. 2	3			
Math 5603	Numerical Linear Algebra	3			
Stat 5740	Introduction to SAS Software	2			
Stat 6450	Applied Regression Analysis	4			
Stat 6500	Statistical Machine Learning	3			
Stat 6540	Applied Stochastic Processes	3			
Stat 6550	The Stat Analysis of Time Series	2			
Stat 6560	Applied Multivariate Analysis	3			
Stat 6605	Applied Survival Analysis	3			
Math 6999	Thesis Research	3			

Total Credit Hours _____Name _____ OSU ID _____

Appendix E MAQRM Requirements

MAQRM Prerequisites: Applicants to the MAQRM program should present the following preparation and materials in their applications:

- Strong coursework in calculus, on par with MATH 2153 (4 cr. hrs.) Calculus III
- Solid preparation in calculus-based probability, on par with MATH 4530 (3 cr. hrs.) Probability or STAT 4201 (4 cr. hrs.) Intro to Mathematical Statistics I

Background in interest theory and actuarial science is not required, though strongly recommended. Incoming MAQRM students are expected to have already passed the FM Exam (Financial Mathematics Exam), an actuarial exam administered by the Society of Actuaries and the Casualty Actuarial Society. If a student does not meet this prerequisite, MATH 3618 can be taken during the first semester of a student's MAQRM study.

- MATH 3618 (3 cr. hrs.) Theory of Interest (Required during the first semester in MAQRM if FM Exam not passed)

We strongly recommend proficiency in micro- and macroeconomics at the level of:

- Elementary economics, at the level of ECON 2001.01 or .03H (3 cr. hrs.) Principles of Microeconomics and ECON 2002.01 or .03H (3 cr. hrs.) Principles of Macroeconomics.

We strongly recommend proficiency in a computer programming language at the level of one of the following:

- CSE 1222 (3 cr. hrs.) Intro to Computer Programming in C++
- CSE 1223 (3 cr. hrs.) Intro to Computer Programming in Java
- CSE 1224 (3 cr. hrs.) Intro to Computer Programming in Python

Required Core Courses (12 credit hours): A student will need to pass all required core, required sequences, and elective courses with at least a grade of C- by the end of the Spring Semester of the second year. Students who start during a Spring Semester are expected to complete these requirements by Autumn of the second year Mathematics & Statistics

- MATH 5632 (3 cr. hrs.) Financial Economics for Actuaries
- STAT 6301 (3 cr. hrs.) Probability for Statistical Inference
- STAT 6302 (3 cr. hrs.) Theory of Statistical Analysis
- MATH 5588 (3 cr. hrs.) Practicum in AQRM

Required AQRM Sequences (12+ credit hours): Students must choose at least 2 of the following year-long course sequences. A student may request to use other courses to satisfy the sequence requirement. The request should be submitted by the student and advisor to the Graduate Studies Committee (GSC) for approval.
Life Contingencies

- MATH 5630 (3 cr. hrs.) Life Contingencies I
- MATH 5631 (3 cr. hrs.) Life Contingencies II

Loss Models

- MATH 5633 (3 cr. hrs.) Loss Models I

- MATH 5634 (3 cr. hrs.) Loss Models II

Stochastic Calculus for Finance

- MATH 5635 (3 cr. hrs.) Stochastic Calculus for Finance I
- MATH 5636 (3 cr. hrs.) Stochastic Calculus for Finance II

Topics in Risk Management

- MATH 5637 (3 cr. hrs.) Topics in Risk Management (repeatable up to 6 credit hours)
- MATH 5637 (3 cr. hrs.) Topics in Risk Management (repeatable up to 6 credit hours)

Numerical Analysis

- MATH 5601 (3 cr. hrs.) Essentials of Numerical Methods
- MATH 5602 (3 cr. hrs.) Computational Partial Differential Equations

Elective Courses (6+ credit hours): Elective credit must consist of unused courses from the sequences above or from the listed electives below. The course sequences may be completed in full or may be mixed and matched as electives. Electives courses and if applicable, the Thesis Writing Course (3 cr. hrs.), must add up to the total 33 cr. hrs. required for the MAQRM degree. A student may request to use other courses to satisfy the elective requirement. The request, in the form of a petition, should be submitted to the MAQRM program director for approval.
Real Analysis

- MATH 5201 (5 cr. hrs.) Introduction to Real Analysis I
- MATH 5202 (5 cr. hrs.) Introduction to Real Analysis II

Differential Equations

- MATH 5401 (3 cr. hrs.) Applied Differential Equations I
- MATH 5402 (3 cr. hrs.) Applied Differential Equations II

Numerical Linear Algebra

- MATH 5603 (3 cr. hrs.) Numerical Linear Algebra

Statistics

- STAT 5740 (2 cr. hrs.) Introduction to SAS
- STAT 6450 (4 cr. hrs.) Regression Analysis
- STAT 6540 (3 cr. hrs.) Applied Stochastic Processes I
- STAT 6550 (2 cr. hrs.) Time Series
- STAT 6560 (3 cr. hrs.) Applied Multivariate Analysis

Oral and Comprehensive Examinations: Students in the thesis option need to complete a thesis defense as prescribed by Graduate School rules (details below). Students in the non-thesis option are required to satisfactorily complete the two-part comprehensive examination. Each part of the examination is approximately 2 hours long and tests one of two areas chosen by the student. Students can choose from the following five subjects: 1. Stochastic calculus with applications in Finance 2. Predictive modeling 3. Numerical analysis 4. Life contingencies 5. Loss models. The

two comprehensive exams will fulfill the requirement of the Graduate School master's examination requirement.

Thesis Option (3 credit hours): The MAQRM degree offers both a non-thesis and a thesis option. Students should decide on which option they elect by the beginning of their second year of study.

Each student must select a thesis advisor by the end of the Autumn Semester of the second year (or the Spring Semester of the second year if the student started during a Spring Semester) and submit a Change of Advisor form to the Graduate Office. The thesis advisor needs to be a Mathematics Department faculty member of category M level or higher. Typically this will be the MAQRM program director. Thesis research and writing will occur during the second year and should be completed by the end of the Spring Break of the second year (or the equivalent timeframe within the alternate semester of graduation). During this time students should generally be signed up for 3 hrs. of MATH 6999 with the supervising Master's Faculty (Thesis) Advisor.

The thesis will be written during the second year under the supervision of the thesis advisor, and prepared in compliance with university rules. All students are expected to apply to graduate with the Master's of Actuarial and Quantitative Risk Management (AQRM-MAQRM) degree via the Thesis-Option before the second Friday of the semester of graduation. In order to apply, a student also has to choose a second member of the examination committee by the beginning of the same semester. This has to be a Graduate Faculty member but may be from another OSU unit related to the specialization. The oral examination has to be scheduled and passed after submission of a draft of the thesis. An additional written examination is not required. The thesis needs to follow university formatting guidelines, be approved by the committee, and be submitted to the Graduate School.

The credits earned from required core, required sequences, and elective courses must be at least 30 credit hours. Additionally, MATH 6999 Thesis Writing counts for 3 more hours toward the degree. Independent studies, group studies, and research credit hours, or hours from unapproved courses do not count toward the required 33 total hours of coursework.

E.1 Thesis option requirements for students in combined degree.

Students in the combined degree may also choose between the non-thesis option and the thesis option. Students who matriculate into the MAQRM program through the combined degree program must select a thesis advisor by the end of the Autumn Semester of the first year in the MAQRM program (typically autumn of their fifth year at OSU) and submit a Change of Advisor form to the Graduate Office if their advisor is not the MAQRM program director. The thesis advisor needs to be a Mathematics Department faculty member of category M level or higher. Thesis research and writing will occur during the fifth year of study at OSU and should be completed by the end of the Spring Break of the fifth year (or the equivalent timeframe within the alternate semester of graduation). During this time students should generally be signed up for 3 hrs. of MATH 6999 with the supervising Master's Faculty (Thesis) Advisor.

- MATH 6999 (3 cr. hrs.) Graduate Thesis Research

The thesis will be written under the supervision of the thesis advisor, and prepared in compliance with university rules. All students are expected to apply to graduate with the Master's of Actuarial and Quantitative Risk Management (AQRM-MAQRM) degree via the Thesis-Option before the second Friday of the semester of graduation. In order to apply, a student also has to choose a second member of the examination committee by the beginning of the same semester. This has to be a Graduate Faculty member but may be from another OSU unit related to the specialization. The oral examination has to be scheduled and passed after submission of a draft of the thesis. An additional written examination is not required. The thesis needs to follow university formatting guidelines, be approved by the committee, and be submitted to the Graduate School. For further details see Section VI of the Graduate School Handbook.

The credits earned from required core, required sequences, and elective courses must be at least 30 credit hours. Additionally, MATH 6999 Thesis Writing counts for 3 more hours toward the degree. Independent studies, group studies, and research credit hours, or hours from unapproved courses do not count toward the required 33 total hours of coursework.

Honors students who complete an honors thesis cannot use the same work for the MAQRM thesis; these works must be completed independently.

Appendix F MAQRM Goals and Assessment Plan

F.1 Program Goals:

The MAQRM program has three unofficial specializations. Students can specialize in actuarial science, mathematical finance, or coursework to prepare for further graduate school. Our goal is to help students succeed in achieving success in whichever path is best for them.

Actuarial Science: Success in actuarial science requires actuaries to progress through a series of actuarial exams (5 exams to reach the first designation of Associate of the Society of Actuaries(ASA)), coursework (called Validation by Educational Experience (VEE)), and success in the Associateship Professionalism Course (APC). The APC is administered by the SOA, and is only available to candidates who meet all other requirements. It typically takes professionals 5 or more years to obtain the ASA designation. After one obtains the designation of ASA, they may then work on the further qualifications of a Chartered Enterprise Risk Analyst (CERA) or Fellow of the Society of Actuaries (FSA).

We provide the opportunity for our students to meet all of the requirements to qualify for the APC before they graduate. Indeed, some MAQRM students even obtain the designation of ASA before they graduate. In particular, we provided courses which cover the material on all preliminary SOA exams, and students who succeed in our courses are prepared to pass the exams and/or earn VEE credit.

Additionally, our department requires MATH 5588: Practicum in Actuarial Science, which covers similar material as the APC. Our graduates are able to succeed in the APC course more easily and obtain the ASA designation quicker. MATH 5588 also trains students to give clear, effective, and persuasive presentations on technical results; a skill which is required in the actuarial science profession.

Mathematical Finance: Mathematical or quantitative finance is a highly competitive field, and successful graduates are rewarded with high salaries and tremendous potential for career development.

In order to succeed, students need to learn a variety of technical skills taught in our required class MATH 5632, as well as our core specializations in Stochastic Calculus for Finance and Topics in Risk Modeling. Students with strong mathematical backgrounds in these areas, who also have a mastery of statistical concepts and techniques, are highly competitive in this field. Additionally, students need to have excellent communication skills.

Preparation for Graduate School: Our goal for students interested in this track is to provide a pathway for students to matriculate into highly competitive graduate schools in areas such as applied mathematics, actuarial science, and agricultural economics. In order to succeed, students need a strong background in Real Analysis (MATH 5201-5202), Numerical Analysis (MATH 5601-5602), probability and statistics (STAT 6301-6302. They also must have the opportunity to demonstrate their potential for success in research (and we often recommend the thesis option for these students).

F.2 Assessment Plan:

In this section, we detail our assessment plan for the MAQRM students.

F.2.1 Outcome: Core Knowledge in Discipline

MAQRM students are expected to acquire proficiency in core subjects of actuarial and financial mathematics.

Assessment Methods:

- Direct-Classroom assessment: Performance in the required and elective courses will be evaluated every semester via the cumulative GPA achieved by the students. This provides a reasonably uniform and objective measure since the curriculum in the MAQRM program is fairly prescribed and grading standards in core course do not vary much.

  Criteria: Minimum criteria is that 60% of students achieve a first year cumulative GPA of 3.5 or higher. Aspirational criteria is that 80% achieve a cumulative GPA of 3.8 or higher.

- Final Exam assessment: All students in the program are required to pass a final exam in two of five areas in order to graduate. Each comprehensive exams provides a uniform and objective measure of subject area mastery in a core AQRM area.

  Criteria: Minimum criteria is that 80% of students pass two final exams on their first attempt. Aspirational criteria is that 100% of students pass two final exams on their first attempt.

Assessment Method Schedule: Every year.

F.2.2 Outcome: Communication and Presentation

Graduates should be able to communicate and to present technical results to both general audience and to professionals effectively and clearly.
Assessment Methods:

- Direct-Practicum Project Presentation: Students need to complete and present two or more projects in the practicum course.

  Criteria: Success in MATH 5588.

Assessment Method Schedule: Every semester.

Appendix G BS Goals and Assessment Plan

Goal 1: Outcome: Math majors will learn conceptual frameworks needed to study higher mathematics, including an introduction to mathematical reasoning, and an understanding of how to read and write proofs.

Assessment Method Category: Indirect - Survey (Student)

Assessment Method: Departmental student exit survey. ASC student exit survey.

Assessment Method Schedule: Survey data is reviewed annually by the department's Undergraduate Committee and used to propose programmatic modifications.

Goal 2: Outcome: Math majors will acquire basic mastery of core areas of mathematics, including calculus, analysis and algebra.

Assessment Method Category: Indirect - Survey (Student)

Assessment Method: Departmental student exit survey. ASC student exit survey.

Assessment Method Schedule: Survey data is reviewed annually by the department's Undergraduate Committee and used to propose programmatic modifications.

Goal 3: Outcome: Math majors will develop powerful mathematical problem solving skills.

Assessment Method Category: Indirect - Survey (Student)

Assessment Method: Departmental exit survey, ASC student exit survey.

Assessment Method Schedule: Exit survey results will be reviewed annually

Goal 4: Outcome: Math majors will learn to communicate mathematical understanding effectively.

Assessment Method Category: Indirect - Survey (Student)

Assessment Method: Departmental exit survey, ASC student exit survey.

Assessment Method Schedule: Exit survey results will be reviewed annually.

Goal 5: Outcome: Math majors will become proficient in chosen specializations within the major.

Assessment Method Category: Indirect - Survey (Student)

Assessment Method: Departmental exit survey, ASC student exit survey.

Assessment Method Schedule: Exit survey results will be reviewed annually.

Appendix H Distance Learning Courses

Courses in the mathematics and statistics departments approved for 100% distance learning are:

1. Math 2568
2. Math 5630
3. Math 5631
4. Math 5632
5. Math 5633
6. Math 5634
7. Statistics 1350.02
8. Statistics 1430.02

9. Statistics 2450.02
10. Statistics 2480.02
11. Statistics 3201
12. Statistics 3202
13. Statistics 3301
14. Statistics 3302
15. Statistics 3440
16. Statistics 3410
17. Statistics 3450.02
18. Statistics 3470.02
19. Statistics 4302
20. Statistics 5301
21. Statistics 5302
22. Statistics 5730
23. Statistics 5731
24. Statistics 5732
25. Statistics 5740
26. Statistics 6201
27. Statistics 6450
28. Statistics 6510
29. Statistics 6550
30. Statistics 6610
31. Statistics 7430