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June 2, 2011

To: W. Randy Smith, Vice Provost, Office of Academic Affairs
 From: Terry L. Gustafson, Special Assistant to the Executive Dean for Semester Conversion
 Re: Arts and Sciences Program Proposals from the Natural and Mathematical Sciences Division

Arts and Sciences is pleased to submit the following programs from the Natural and Mathematical Sciences Division to the Office of Academic Affairs for conversion from quarters to semesters. The programs have been approved by the faculty members and chair of the originating unit, and reviewed and approved by the divisional advisory panel, a subcommittee of the ASC Committee on Curriculum and Instruction (CCI), and the full CCI. The vote for approval of all programs at the full CCI was unanimous.

Program Name	Academic Plan Code	Conversion Designation	CCI Approval	Last Revision
Earth Sciences BA	EARTHSC-BS	Converted	5/2/2011	Prior to 2006
Earth Sciences Minor	EARTHSC-MN	Re-envisioned	5/6/2011	Prior to 2006
Mathematics Minor	MATH-MN	Converted	5/6/2011	8/18/2008
Molecular Genetics BS	MOLGEN-BS	Re-envisioned	5/20/2011	Prior to 2006
Molecular Genetics Minor	MOLGEN-MN	Converted	5/20/2011	Prior to 2006
Plant Cellular and Molecular Biology Minor	PCMB-MN	Converted	5/16/2011	Prior to 2006

Arts and Sciences General Education (GE) Program: The GE program for untagged B.A. and B.S. degrees in Arts and Sciences was approved by the Council on Academic Affairs on May 26, 2010, after receiving approval from the Arts and Sciences Faculty Senate. All the programs presented here follow the approved GE program.

College of Arts and Sciences Transition Policy: The College of Arts and Sciences is committed to the principles outlined in the university's Pledge to Undergraduate Students. Each unit has a plan on how best to assist its majors and minors through the transition. And the Arts and Sciences Academic Advising Services will advise students on how to transition their GE program. Dual advising is the existing process used in Arts and Sciences and will continue under semesters.

Status: PENDING

PROGRAM REQUEST
Mathematics Minor

Last Updated: Andereck, Claude David
04/14/2011

Fiscal Unit/Academic Org	Mathematics - D0671
Administering College/Academic Group	Arts And Sciences
Co-administering College/Academic Group	
Semester Conversion Designation	Converted with minimal changes to program goals and/or curricular requirements (e.g., sub-plan/specialization name changes, changes in electives and/or prerequisites, minimal changes in overall structure of program, minimal or no changes in program goals or content)
Current Program/Plan Name	Mathematics Minor
Proposed Program/Plan Name	Mathematics Minor
Program/Plan Code Abbreviation	MATH-MN
Current Degree Title	

Credit Hour Explanation

Program credit hour requirements		A) Number of credit hours in current program (Quarter credit hours)	B) Calculated result for 2/3rds of current (Semester credit hours)	C) Number of credit hours required for proposed program (Semester credit hours)	D) Change in credit hours
Total minimum credit hours required for completion of program		20	13.3	15	1.7
Required credit hours offered by the unit	Minimum	15	10.0	11	1.0
	Maximum	20	13.3	15	1.7
Required credit hours offered outside of the unit	Minimum	0	0.0	0	0.0
	Maximum	5	3.3	4	0.7
Required prerequisite credit hours not included above	Minimum	15	10.0	10	0.0
	Maximum	15	10.0	10	0.0

Program Learning Goals

Note: these are required for all undergraduate degree programs and majors now, and will be required for all graduate and professional degree programs in 2012. Nonetheless, all programs are encouraged to complete these now.

- Program Learning Goals**
- Learn conceptual frameworks needed to study higher mathematics, including an introduction to mathematical reasoning, and an understanding of how to read and write proofs.
 - Acquire basic mastery of core areas of mathematics, including calculus, analysis and algebra.
 - Develop powerful mathematical problem solving skills.
 - Learn to effectively communicate mathematical understanding.

Assessment

Assessment plan includes student learning goals, how those goals are evaluated, and how the information collected is used to improve student learning. An assessment plan is required for undergraduate majors and degrees. Graduate and professional degree programs are encouraged to complete this now, but will not be required to do so until 2012.

Is this a degree program (undergraduate, graduate, or professional) or major proposal? No

Program Specializations/Sub-Plans

If you do not specify a program specialization/sub-plan it will be assumed you are submitting this program for all program specializations/sub-plans.

Pre-Major

Does this Program have a Pre-Major? No

Attachments

- Math Minor.pdf: documentation
(Program Rationale Statement. Owner: Shapiro,Daniel B)
- Mathematics minor cover letter.doc: NMS Division of Arts and Sciences cover letter
(Letter from the College to OAA. Owner: Andereck,Claude David)

Comments

- Attachment fulfills several categories. *(by Shapiro,Daniel B on 01/14/2011 08:28 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Shapiro,Daniel B	01/14/2011 08:28 PM	Submitted for Approval
Approved	Shapiro,Daniel B	01/14/2011 08:38 PM	Unit Approval
Revision Requested	Andereck,Claude David	01/19/2011 03:12 PM	College Approval
Submitted	Shapiro,Daniel B	03/17/2011 08:46 PM	Submitted for Approval
Approved	Shapiro,Daniel B	03/17/2011 10:22 PM	Unit Approval
Approved	Andereck,Claude David	04/14/2011 03:51 PM	College Approval
Pending Approval	Hanlin,Deborah Kay Vankeerbergen,Bernadette Chantal Meyers,Catherine Anne Jenkins,Mary Ellen Bigler Nolen,Dawn	04/14/2011 03:51 PM	ASCCAO Approval

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April 14, 2011

Larry Krissek
Chair, Arts and Sciences CCI

Dear Larry:

It is a pleasure to forward to you the proposal for the minor in Mathematics under semesters. The program has been converted in a straightforward manner, the hours being slightly higher under semesters than the simplest conversion would call for to allow for some flexibility. Please note that, as is true under quarters, there are two versions of the minor, one being for honors students. The difference is in the level of rigor achieved, either by the student taking additional hours or by taking honors versions of at least two courses.

Beyond my own review of the documents, the proposal has been discussed by colleagues from other NMS units at a meeting on January 19, 2011. Feedback from these discussions has been incorporated in the proposal.

If you have any questions, I would be happy to address them.

Sincerely,



David Andereck
Professor of Physics
Associate Dean of Natural and Mathematical Sciences, College of Arts and Sciences



To: Office of Academic Affairs
From: Luis Casian, Chair, Department of Mathematics
Date: January 2011
Re: Semester program proposals for degree programs in the Department of Mathematics

The following programs in the Department of Mathematics are being converted from the quarter system to the semester system, with minimal changes:

1. BS in Mathematics
2. BA in Mathematics
3. Minor in Mathematics
4. BS in Actuarial Science
5. BA in Actuarial Science
6. MS in Mathematics
7. MMS in Mathematics
8. PhD in Mathematics

During the past year, the Department's Undergraduate Committee and Graduate Studies Committee have worked on semester conversions of those programs. This process involved frequent consultations with faculty members involved with particular courses or course sequences, and involved repeated editing of the conversion documents.

Many changes will also be made to the structure and flow of freshman-level math courses. Since those courses do not involve students enrolled in those eight programs, their changes are not discussed in these program conversion documents.

These proposed conversion plans and transition policies were approved by the Undergraduate and Graduate Committees, and were discussed during a faculty meeting in December 2, 2010. The semester conversion plans were approved by the Department's tenure-track faculty, by a vote of 49 yes and 0 no.

A handwritten signature in blue ink, appearing to read "Luis Casian".

Luis Casian
Professor and Chair

Rationale for semester plans: Minors in Math

The *standard minor in math* and *honors minor in math* for semesters are direct conversions from previous minor programs in the quarter system.

In quarters, the standard math minor requires 20 credit hours, corresponding to 13.3 semester hours. This minimum is increased to 15 semester hours in order to allow a comparable number of elective courses:

Required Courses in quarters are 60% of the program (12 hours out of 20).

Required Courses in semesters are 66.7% of the program (10 hours out of 15).

The honors math minor involves a similar conversion. The second of three options is eliminated because in the semester system the amount of flexibility in course choices is reduced.

Transition plans.

This minor program requires no special plans for the transition from quarters to semesters. All of the courses involved have analogues in both systems. For students involved in the year of transition, credit hours will be converted using the standard conversion factor.

The appendices below contain more detailed plans for the minor program.

Appendix A:

Requirements for a standard minor and an honors minor, in both quarter and semester systems.

Appendix B:

An advising sheet for the minor program.

Appendix C:

A Curriculum Map listing quarter and semester courses. Program Learning Goals are indicated for each semester course.

Appendix D:

A list of all undergraduate math courses proposed for the semester system.

APPENDIX A:**Math Minor (Standard): QUARTERS****Requirements for a MATHEMATICS MINOR (non-Honors students)**

Mathematical methods are used today in the social sciences as well as the physical and biological sciences. A minor program in mathematics is a useful supplement to a major program in many different areas. The Mathematics Department has a list of suggested electives to complement various major programs.

The minor must include at least 20 credit hours of mathematics or statistics courses, as listed below. At least 15 of those 20 hours must be from math courses. To count toward the minor, each course must have a grade of C- or better. In addition, the CPHR for courses counted toward the minor must be at least 2.0.

0. Prerequisite courses

Calculus: 151 – 152 - 153.

I. REQUIRED COURSES

A. Calculus: 254 (or the corresponding accelerated or honors courses).

B. Foundations of Higher Mathematics: 345 or 190H.

[Note: Math 366 may fulfill this requirement only if it is required for the student's major. Credits for 366 will not count toward the minor.]

C. Linear Algebra: 568 or 571 or 520H (Math 568 and 571 cannot both count on minor.)

II. ELECTIVE COURSES

To reach the 20 credit hour minimum, students may select courses from the following list.

- Differential Equations: 255 or 415 or 521H.
- Any 500 level math course, excluding 532 and 588. (Math 568 and 571 cannot both count in the minor.)
- Math 601, 602, 603.02, 606, 607, 618, 647, 648, 649, 665, 666, 701.
- Statistics 420, 421, or 610. Note: At least 15 of the 20 hours counted toward the minor must be in Math.

III. RESTRICTIONS

• Courses used to fulfill a student's major requirements **may not** be included in the 20 credit hours required for the minor. Such major courses may be used to fulfill requirements in part I, but none of those credit hours will count toward the minor.

• Each course counted toward the minor must have a grade of C- or better, and the CPHR for all courses counted toward this minor must be at least 2.0.

• Math 487H, 593, or 693 may not be counted in the mathematics minor.

• No more than 10 hours of transfer credit may count toward the mathematics minor.

Math Minor (Honors): QUARTERS
Requirements for an HONORS MATHEMATICS MINOR

Mathematical methods are used today in the social sciences as well as the physical and biological sciences. A minor program in mathematics is a useful supplement to a major program in many different areas. The Mathematics Department has a list of suggested electives to complement various major programs.

Honors students are expected to complete the Honors Mathematics Minor and are required to fulfill one of the following additional requirements.

Option #1:

- Complete at least 20 hours of math at the 200 level or above, including the REQUIRED COURSES.
- At least TWO of the courses **must be** Honors math courses.
- Courses that constitute the minor must have a CPHR of at least a 3.0.

Option #2:

- Complete at least 22 hours of math at the 200 level or above to include the REQUIRED COURSES
- At least ONE of the courses MUST BE an Honors math course
- Courses that constitute the minor must have a CPHR of at least a 3.2.

Option #3:

- Complete at least 25 hours of math at the 200 level or above to include the REQUIRED COURSES
- Courses that constitute the minor must have a CPHR of at least a 3.3.

0. Prerequisite courses

Calculus: 151 – 152 - 153.

I. REQUIRED COURSES

A. Calculus: 254 (or the corresponding accelerated or honors courses).

B. Foundations of Higher Mathematics: 345 or 190H.

[Note: Math 366 may fulfill this requirement only if it is required for the student's major. Credits for 366 will not count toward the minor.]

C. Linear Algebra: 568 or 571 or 520H (Math 568 and 571 cannot both count on minor.)

II. ELECTIVE COURSES

To reach the stated minimum hours in Option 1, 2 or 3, students may select courses from the following list.

- Differential Equations: 255 or 415 or 521H
- Any 500 level math course, excluding 532 and 588. (Math 568 and 571 cannot both count in the minor.)
- Math 601, 602, 603.02, 606, 607, 618, 647, 648, 649, 665, 666, 701.
- Statistics 420, 421, or 610. Note: At least 15 of the credit hours counted toward the minor must be in Math.

III. RESTRICTIONS

• Courses used to fulfill a student's major requirements **may not** be included in the credit hours required for the minor. Such major courses may be used to fulfill requirements in part I, but none of those credit hours will count toward the minor.

• Each course counted toward the minor must have a grade of C- or better, and the CPHR for all courses counted toward this minor must be at least at the level referenced in Option 1, 2 or 3.

• Math 487H, 593, or 693 may not be used on a minor.

• At least 15 of the credit hours counted toward the minor must be in Math.

• No more than 10 hours of transfer credit may be used on a minor.

Math Minor (Standard): SEMESTERS**Requirements for a MATHEMATICS MINOR (non-Honors students)**

Mathematical methods are used today in the social sciences as well as the physical and biological sciences. A minor program in mathematics is a useful supplement to a major program in many different areas.

The minor must include at least 15 semester hours of mathematics or statistics courses, as listed below. At least 11 of those 15 hours must be from math courses. The student must have credit for the Required Courses, and each course counted toward the minor must have a grade of C- or better. In addition, the CPHR for courses counted toward the minor must be at least 2.0.

0. Prerequisite courses

Calculus: 1151 – 1152.

I. REQUIRED COURSES (10 credit hours)

- A. Calculus: 2153 (or the corresponding accelerated or honors course)
- B. Foundations of Higher Mathematics: 3345 or 4190H.
- C. Linear Algebra: 2568 or 5520H.

II. ELECTIVE COURSES (at least 5 credit hours)

To reach the 15-semester hour minimum, students may select courses from the following:

- Differential Equations: 2255 or 2415.
- Any 3000 - 5000 level math course, excluding Math 3532 or 3588.
- Statistics 4201, 4202. Note: At least 11 of the 15 credit hours counted toward the minor must be in Math.

III. RESTRICTIONS

• Courses used to fulfill a student's major requirements **may not** be included in the 15 credit hours counted toward the minor. Such major courses may be used to fulfill requirements in part I, but none of those credit hours will count toward the minor.

- Math 2193 and 5193 may not be counted in the mathematics minor.
- No more than 8 hours of transfer credit may be counted toward the mathematics minor.

Math Minor (Honors): SEMESTERS**Requirements for an HONORS MATHEMATICS MINOR**

Mathematical methods are used today in the social sciences as well as the physical and biological sciences. A minor program in mathematics is a useful supplement to a major program in many different areas.

Honors students who minor in mathematics are expected to complete the Honors Mathematics Minor.

To complete the Honors Mathematics Minor a student must take the Required Courses and fulfill one of the following additional requirements.

Option #1:

- Complete at least 15 semesters hours of math at the 2000 level or above, chosen from the Required and Elective courses listed below.
- At least TWO of those courses **must be** honors math courses.
- Courses that constitute the minor must have a CPHR of at least a 3.0.
- Each course counted toward the minor must have a grade of at least C-.

Option #2:

- Complete at least 18 semester hours of math at the 2000 level or above, chosen from the Required and Elective courses listed below.
- Courses that constitute the minor must have a CPHR of at least a 3.3.
- Each course counted toward the minor must have a grade of at least C-.

0. Prerequisite courses

Calculus: 1151 – 1152.

I. REQUIRED COURSES (10 credit hours)

- A. Calculus: 2153.xx (or the corresponding accelerated or honors courses).
- B. Foundations of Higher Mathematics: 3345 or 4190H.
- C. Linear Algebra: 2568 or 5520H.

II. ELECTIVE COURSES (at least 5 credit hours)

To reach the minimum hours for one of the options above, students may select courses from the following:

- Differential Equations: 2255 or 2415
- Any 3000-5000 level math course, excluding Math 3532 or 3588
- Statistics 4201, 4202. Note: At least 11 of the 15 credit hours counted toward the minor must be in Math.

III. RESTRICTIONS

• Courses used to fulfill a student's major requirements **may not** be counted toward the minor. (They are not included in the credit hours counted in Option 1 or Option 2.) Such major courses may be used to fulfill requirements in part I, but none of those credit hours will count toward the minor.

- Math 2193 and 5193 may not be counted in the mathematics minor.
- No more than 8 hours of transfer credit may be counted toward the mathematics minor.
- At most 4 of the credit hours counted toward the minor can be in courses outside of Math.
- No more than 4 hours of Statistics courses may be counted toward the minor.

APPENDIX B: Mathematics Minor Program Form

The Ohio State University
College of the Arts and Sciences

Name _____

OSU ID _____ Phone _____

Local Address _____

E-Mail _____

This form should be submitted to your college or school office.

College/School of enrollment _____ Major _____

Expected date of graduation _____

Have you filled a degree application in your college office? YES ___ NO ___

Circle one: Standard Minor Honors Minor Option #1 Honors Minor Option #2

Course	Hours	Final Grade
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Total Hours _____ GPA in Minor Courses _____ . Circle One: Original Revision

Signature of Faculty Advisor or College/School Counselor _____ Date _____

Print Name of Faculty Advisor or College/School Counselor _____

Academic Unit _____ Campus phone and/or e-mail _____

APPENDIX C. Curriculum Map.

Math Minor (20 quarter credit hours become 15 semester credit hours)								
Segment of minor program	Quarter course #	Quarter course name	Credit hours	Semester course #	Semester course name	Units	Learning outcome	Nature of conversion
Prerequisites (15 quarter credit hours become 10 semester credit hours; some may double-count in GEC)								
	Math 151.xx	Calculus and Analytic Geometry I	5	Math 1151	Calculus 1	5	1, 2*, 3	1151-1152 replace 151-152-153
	Math 152.xx	Calculus and Analytic Geometry II	5	Math 1152	Calculus 2	5	1, 2*, 3	
	Math 153.xx	Calculus and Analytic Geometry III	5					
Core minor requirements (12 quarter credit hours become 10 semester credit hours)								
	Math 254	Calculus and Analytic Geometry IV	5	Math 2153	Calculus 3	4	2*, 3	expands on 254
	Math 345	Foundations of Higher Mathematics	4	Math 3345	Foundations of Higher Mathematics	3	1**, 2**, 3*, 4**	expands on 345
	Math 568	Linear Algebra	3	Math 2568	Linear Algebra	3	2**, 3**, 4*	expands on 568 or 571
Electives (8 quarter credit hours become 5 semester credit hours)								
	Math 255 or Math 415 or	Differential Equations and Their Applications Ordinary and Partial Differential Equations	5 4	Math 2255 Math 2415	Differential Equations and Their Applications Ordinary and Partial Differential Equations	3 3	1, 2*, 3*, 4 1, 2*, 3*, 4	replaces 255 expands on Math 415
	any 500 level course, excluding Math 532 or Math 588 (A list of further possibilities is provided below.)		3, 4, 5	any 4000 or 5000 level course, excluding Math 3532 and Math 3588, (A list of further possibilities is provided below.)		3 or 5		
	Math 601	Mathematical Principles in Science I	3	Math 5101	Linear Mathematics in Finite Dimensions	3	3**, 4	math 5101 & 5102 replace 601, 602 & 603.02
	Math 602	Mathematical Principles in Science II	3	Math 5102	Linear Mathematics in infinite Dimensions	3	3**, 4	
	Math 607	Essentials of Numerical Analysis	5	Math 3607	Beginning Scientific Computing	3	3, 4**	new course, some of math 607 topics
	Math 618	Theory of Interest	4	Math 3618	Theory of Interest	3	3, 4*	replaces Math 618
	Math 647	Set Theory	3	Math 5001	Intro to Set Theory	3	1**, 3**, 4	expands on Math 647
	Math 648	Mathematical Logic I	3	Math 5051	Intro to Mathematical Logic	3	1**, 3**, 4	Math 5051 replaces Math 648 & 649
	Math 649	Mathematical Logic II	3					
	Math 665	Applied Differential Geometry I	4	Math 5756	Math Methods in Relativity Theory 1	3	3*, 4*	replaces 665
	Math 666	Applied Differential Geometry II	4	Math 5757	Math Methods in Relativity Theory 2	3	3*, 4*	replaces 666
	Math 701	Calculus of Variation & Tensors	5	Math 5451	Calculus of Variation & Tensor Calculus	3	3*, 4*	replaces 701
	Stat 420	Introduction to Mathematical Statistics I	5	Stat 4201	Introduction to Mathematical Statistics 1	4	3**	expands on Stat 420
	Stat 421	Introduction to Mathematical Statistics II	5	Stat 4202	Introduction to Mathematical Statistics 2	4	3**	expands on Stat 421
	Stat 610	Probability for Statistical Inference	5	Stat 6301	Probability for Statistical Inference	3	3*	replaces Stat 610
Minor program learning outcomes								
	1	Learn conceptual frameworks needed to study higher mathematics, including an introduction to mathematical reasoning, and an understanding of how to read and write proofs.						
	2	Acquire basic mastery of core areas of mathematics, including calculus, analysis and algebra.						
	3	Develop powerful mathematical problem solving skills.						
	4	Learn to effectively communicate mathematical understanding.						

APPENDIX D.

CHANGES in Math Course Numbers (sort by Semester #) Mar 2011			
key: color = an essentially new course; indent = might not run. (one-time transition courses are not included)			
Semester #	Quarter #	Units	Semester Course Name
1050	50 + part of 75	5	Pre-College Mathematics 1
1075	104	4	Pre-College Mathematics 2
1116	116	3	Excursions in Mathematics
1118	-	3	Mathematics for Architects
1125	105 + part 106	5	Mathematics for Elementary Teachers 1
1126	part 106 + 107	5	Mathematics for Elementary Teachers 2
1130	130 + part 132	4	College Algebra for Business
1131	131 + part 132	5	Calculus for Business
1148	148 + part 150	4	College Algebra
1149	part 150 + 148	3	Trigonometry
1150	150 + 148	5	Pre-Calculus
1151	151 + part 152	5	Calculus 1
1152	part 152 + 153	5	Calculus 2
1156	151.03, 152.03	5	Calculus for the Biological Sciences
1157	-	5	Mathematical Modeling for the Biological Sciences
1161.01	161.01, 162.01	5	Accelerated Calculus 1
1161.02	161.02, 162.02	5	Accelerated Calculus 1 for Honors Engineers
1165	108 + part 110	5	Mathematics for Middle School Teachers 1
1166	109 + part 110	5	Mathematics for Middle School Teachers 2
1172	part 152+153+254	5	Engineering Mathematics A
1181H	161H + part 162H	5	Honors Calculus 1
1187	187	1 – 2	Problem Solving
1187H	187H, 487H	1 – 2	Honors Problem Solving
1193	193	1 – 5	Individual Studies
1194	194	1 – 5	Group Studies
1194H	194H	1 – 5	Honors Group Studies
2153	254	4	Calculus 3
2162.01	162.02, 263.02	5	Accelerated Calculus 2 for Math and Science
2162.02	162.01, 263.02	5	Accelerated Calculus 2 for Honors Engineers
2167	111	3	Calculus for Middle School Teachers
2168	212	3	History of Mathematics for Middle School Teachers
2173	part 152+153+254	3	Engineering Mathematics B
2174	part 568 + 415	3	Linear Algebra and Differential Equations
2177	part 254+568+415	4	Mathematical Topics for Engineers
2182H	part 162H + 263H	5	Honors Calculus 2
2191.01	ASC 489.01	2	Field Experience for credit
2191.02	ASC 489.02	0	Field Experience for non-credit
2193	193	1 – 5	Individual Studies
2194	294	1 – 5	Group Studies
2255	255	3	Differential Equations and Their Applications
2366	366	2	Introduction to Discrete Mathematics (for Business)
2415	415.xx	3	Ordinary and Partial Differential Equations
2566	566 + 366	3	Discrete Mathematics (for CIS, CSE, ECE)
2568	568/ 571, 572	3	Linear Algebra

CHANGES in Math Course Numbers (sort by Semester #) Mar 2011

Semester #	Quarter #	Units	Semester Course Name
3345	345	3	Foundations of Higher Mathematics
3350	350	3	Introduction to Mathematical Biology
3532	532	3	Mathematical Foundations of Actuarial Science
3588	588	3	Practicum in Actuarial Science
3589	589	3	Introduction to Financial Mathematics
3607	part of 607	3	Beginning Scientific Computing
3618	618	3	Theory of Interest
4190H	190H, 191H	5	Honors Analysis 1
4191H	264H	5	Honors Analysis 2
4193	593	1 – 5	Individual Studies
4194	594	1 – 5	Group Studies
4504	504	3	History of Mathematics
4507	507	3	Geometry
4512	512 or 557	3	Applied Partial Differential Equations (for engineers)
4530	530	3	Probability
4545	-	4	Survey of topics in analysis (for Stat grad students)
4547	547+ part 548	3	Introductory Analysis 1
4548	part 548 + 549	3	Introductory Analysis 2
4551	513 or 551	3	Vector Analysis
4552	514 or 552	3	Complex Analysis
4556	556	3	Dynamical Systems
4557	557	3	Partial Differential Equations
4568	568/ 571, 572	3	Linear Algebra (for Eng grad students)
4573	573	3	Elementary Number Theory
4575	575	3	Combinatorial Mathematics and Graph Theory
4578	578	4	Discrete Mathematical Models
4580	580 + part 581	3	Abstract Algebra 1
4581	part 581 + 582	3	Abstract Algebra 2
4998	783	1 – 5	Undergraduate Research
4999	783	1 – 5	Undergraduate Thesis
4998H	783H	1 – 5	Honors Undergraduate Research
4999H	783H	1 – 5	Honors Undergraduate Thesis
5193	693	1 – 5	Individual Studies
5194	694	1 – 5	Group Studies
5194H	594H	1 – 5	Honors Group Studies
5520H	520H, 521H	5	Honors Linear Algebra and Differential Equations
5522H	522H	5	Honors Complex Analysis
5529H	594H (575H)	5	Honors Combinatorics
5530H	531H	5	Honors Probability
5540H	540H, 541H	5	Honors Differential Geometry
5576H	576H, 577H	5	Honors Number Theory
5590H	590H, 591H	5	Honors Abstract Algebra 1
5591H	592H	5	Honors Abstract Algebra 2
5630	630	3	Life Contingencies 1
5631	631	3	Life Contingencies 2
5632	632	3	Financial Economics
5633	-	3	Loss Models 1
5634	-	3	Loss Models 2

Freshman & Sophomore Math Course Sequences:

Standard:	1151	-	1152	-	2153	-	2568	-	{2255 or 2415}
Engineering:	1151	-	1172	-	2173	-	2174		
Engineering:	1151	-	1172	-	2177				
FEH:	1161.02	-	2162.02	-	2568	-	2415		
Honors Calculus:	1181H	-	2182H		Honors Analysis:	4190H	-	4191H	