Fiscal Unit/Academic Org	Mathematics - D0671
Administering College/Academic Group	Mathematical And Physical Sci
Co-adminstering 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
Proposed Program/Plan Name	Mathematics
Program/Plan Code Abbreviation	MATH-BS
Current Degree Title	Bachelor of Science

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		53	35.3	38	2.7
Required credit hours offered by the unit	Minimum	40	26.7	31	4.3
	Maximum	48	32.0	34	2.0
Required credit hours offered outside of the unit	Minimum	5	3.3	4	0.7
	Maximum	19	12.7	14	1.3
Required prerequisite credit hours not included above	Minimum	15	10.0	10	0.0
	Maximum	15	10.0	10	0.0

Explain any change in credit hours if the difference is more than 4 semester credit hours between the values listed in columns B and C for any row in the above table

Minimum and maximum in row #2 come from different sub-plans. Within each sub-plan the change in semester credit hours is less than 4.

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 communicate mathematical understanding effectively.
- Become proficient in chosen tracks within the major.

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? Yes

Does the degree program or major have an assessment plan on file with the university Office of Academic Affairs? Yes

Summarize how the program's current quarter-based assessment practices will be modified, if necessary, to fit the semester calendar.
Assessment practices will have minimal modifications.

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.

Program Specialization/Sub-Plan Name Theoretical (Existing)
Program Specialization/Sub-Plan Goals

Program Specialization/Sub-Plan Name Education (Existing)
Program Specialization/Sub-Plan Goals

Program Specialization/Sub-Plan Name Bio-Math (Existing)
Program Specialization/Sub-Plan Goals

Program Specialization/Sub-Plan Name Applied (Existing)
Program Specialization/Sub-Plan Goals

Program Specialization/Sub-Plan Name Financial (Existing)
Program Specialization/Sub-Plan Goals

Pre-Major

Does this Program have a Pre-Major? Yes

To enter the Financial Math sub-plan a student must earn a C or better in each of Math 2153, 3345, and 2568.

Attachments

- Math BS.pdf: rationale etc.

(Program Rationale Statement. Owner: Shapiro,Daniel B)

Comments

- Attachment Type does not allow for one document fulfilling several roles. *(by Shapiro,Daniel B on 01/14/2011 08:27 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Shapiro,Daniel B	01/14/2011 08:27 PM	Submitted for Approval
Approved	Shapiro,Daniel B	01/14/2011 08:38 PM	Unit Approval
Pending Approval	Andereck,Claude David	01/14/2011 08:38 PM	College Approval

Department of Mathematics

100 Mathematics Building
231 West 18th Avenue
Columbus, OH 43210-1174

Phone (614) 292-4975

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.

Luis Casian
Professor and Chair

Rationale for semester plans: BS in Math

Tracks (sub-plans) within the mathematics major.
The Department of Mathematics currently offers a BS in Mathematics, with six tracks within that major. With the conversion to semesters we will eliminate the *Applied Discrete Math* track, because of low enrollments. The remaining five tracks are

- Theoretical Mathematics
- Education Mathematics
- Bio-Mathematics
- Applied Mathematics
- Financial Mathematics

These will be implemented as sub-plans within the mathematics major.

Transcript.
The Department requests that the name of the sub-plan appear explicitly on each student's transcript.

Changes in credit hours.
This chart displays the numbers of credit hours required in the different tracks (sub-plans).

Track	Quarter hrs	(2/3)*Quarter	Semester hrs	Δ
Theoretical	53 – 55 5 out & 48 in 10 out & 45 in	35.3 – 36.7	38 – 39 4 out & 34 in 8 out & 31 in	+ 2.7
Education	53 – 55 5 out & 48 in 10 out & 45 in	35.3 – 36.7	39 – 40 4 out & 34 in 8 out & 31 in	+ 3.3 to + 3.7
Bio-Math	56 – 60 19 out & 37 in 26 out & 34 in	38.0 – 40.0	41 – 42* 10 out & 31 in 19 out & 23 in	+ 3 to + 2.0
Applied	58 – 60 14 out & 44 in 19 out & 41 in	38.7 – 40.0	41 – 42 10 out & 31 in 14 out & 28 in	+ 2.3 to + 2.0
Financial	57 – 59 14 out & 43 in 19 out & 40 in	38.0 – 39.3	41 – 42 10 out & 21 in 14 out & 28 in	+ 3 to + 2.7

* Depends on credit hours for the semester versions of Bio 401-412 and MolGen 661-662.

Honors.
Honors versions of courses are not mentioned explicitly within this documentation of the math major tracks.
The Department of Mathematics has an active honors program, allowing strong undergraduate students to take four full years of honors math courses. To be an honors math major (in any track), a student must pass two sequences of honors math courses, replacing the corresponding non-honors courses required for that track. The first honors course sequence must be either 161.01H - 162.01H - 263.01H or 190H - 191H - 264H.
In the semester system, those sequences will become 1181H - 2182H or 4190H - 4191H.

Grade Prerequisites.
Academically weak students sometimes encounter serious difficulties in math course sequences, because success in each course requires mastery of the central ideas taught in the preceding course. To improve success rates in those courses, we will implement the "C-minus Rule":

A student may enter a given math course only with the grade of C – or better in the prerequisite math course.

This rule has been in place for several years for the transitions from 150 to 151, from 151 to 152, and from 152 to 153. We will impose this rule on all the mainstream undergraduate math courses. Similar rules are standard practice at many colleges and universities in Ohio and in other states.

Changes in individual math course credits.
The Department of Mathematics embraces the idea that most upper division semester courses should be **3 credits**, running MWF for the whole semester.

Course sequences running for three quarters naturally transform into two-semester sequences. Individual 5-credit quarter courses typically become 3-credit semester courses. But in some cases the semester version of a course involves an increase in credit hours. Math major tracks that require several of those courses might end up with fairly large increases in credit hours. Here is a list of the math courses in question, along with credit hours, quarter → semester.

254 → 2153	calculus 3	5 → 4
350 → 3350	intro to math biology	3 → 3
556 → 4556	dynamical systems	3 → 3
530 → 3530	probability	3 → 3
589 → 3589	intro to financial math	3 → 3
512 (557) → 4512	partial differential eqs	3 → 3
513 (551) → 4551	vector analysis	3 → 3
514 (552) → 4552	complex analysis	3 → 3
568 (571 – 572) → 2568	linear algebra	3 → 3
578 → 4578	discrete math models	5 → 4
647 → 5001	set theory	3 → 3

Here are short explanations for those course transitions.

254: The sequence 1151 – 1152 – 2153 of standard calculus courses has topics specified by the Ohio Transfer Assurance Guides (TAGs), as posted at

http://regents.ohio.gov/transfer/tags/course_descriptions/omt/courses.php.

The semester credits 5, 5, 4 are in line with recommendations from the Board of Regents.

350 and **556:** These courses are part of the newly developed bio-mathematics curriculum. Course developers are using the semester conversion as an opportunity to expand those courses to include more topics useful for students studying mathematical biology.

530: This probability course is sometimes used as an alternative to Stat 420 even though there are some differences in content. The expanded course 3530 will include all the probability needed for math and actuarial science majors, so that Stat 4201 will not be needed for students in those majors. This increase in content has been recommended by leaders of both the financial math track and the actuarial science major.

589: Those course is heavily used in the actuarial science major. Its expansion better matches the material that appears on the professional exams for actuaries.

512, 513, and **514** are 3-credit courses taken mostly by engineering students. There are corresponding 5-credit courses (557, 551, and 552) taken primarily by math and science majors and some graduate students in engineering. With semester conversion, we will reduce the number of courses by combining each of these pairs into one 3-credit semester course.

568 is a 3-credit linear algebra course very crowded with topics. For many years, client engineering departments have insisted on a 3-credit course (in quarters), rather than the more natural 5-credit course needed to explain the ideas appropriately. With semesters, that pressure should decrease because engineering students will have the option of Math 2174: half linear algebra and half differential equations.

The two-course sequence Math 571-572 will also convert to Math 2568.

578 is a 5-credit course with a computer science course prerequisite. Inclusion of training in linear algebra software (e.g. MATLAB) in the semester course helps justify 4 semester credits rather than 3. That increase is balanced by the omission of a CSE course prerequisite.

COMMENTS on changes in the tracks (sub-plans).

Theoretical track.
Currently the requirement of Math 530 or Stat 420 is hidden, since the required course Stat 421 has one of those two courses as a prerequisite. With semester conversion, we will list an explicit requirement: Math 5530 or Stat 4201. This decision increases the official hours within the major. The increase in core requirements is mitigated by a small decrease in elective hours.

Education track.
This option is a fairly small alteration of the theoretical track: Differential Equations is not required, but three courses are listed explicitly as required (instead of elective) because they are important for high school teaching: geometry, discrete modeling, and history of math.

Applied track.
The added credits from various individual course conversions are balanced by moving a few courses from required to elective, and adjusting the total number of elective hours.

Biology track.
Similar shifts in required and elective courses were done for this sub-plan.

Financial track.
This track involves the largest total increase in individual course credits: each of the required courses Math 512, 530, 568, 589, and Stat 420, 421 increases the count by one credit. The current 57 to 59 quarter credits, correspond to 38 to 39.3 semester credits, but a direct conversion leads to 44 to 45 semester credits. This impact is lessened by erasing Math 3588 (Practicum in Actuarial Science) from the required list.

Detailed plans for the conversion.
The four appendices below contain more detailed plans for each of the five tracks in both quarter and semester format.

Appendix A:
Major Program Forms for each track, in both the quarter and semester systems.

Appendix B:
A *Curriculum Map* for each track. That map lists the quarter and semester courses in each track of the major, and indicates which Program Learning Goals are emphasized in each semester course.

Appendix C:
Sample *Four-Year Plans* for each track are provided, for both quarters and semesters.

Appendix D:
Transition Policies for math majors. In most cases the transition will involve straightforward, one-for-one substitutions of courses and course sequences. Two course upper division course sequences require bridging plans. Plans for transition of the mainstream freshman calculus courses is described there as well.

Transition plans for other calculus and lower-level courses are not included in this document since they do not involve any math majors.

MAJOR PROGRAM FORM (QUARTERS)

Colleges of the Arts and Science

			Mathematics Major – Theoretical Track
Name: last	first	middle	Major

Local Address:		Degree Sought: BA	BS

City, State:	Zip	e-mail address

Phone: residence	business	Expected Date of Graduation: quarter/yr

Have you filed a degree application in the college office? (NOTE: This form is NOT a degree application)		X
	yes	no

If completing two majors, list both below and file a separate form for each one:

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 151 (GEC)	5		Math 153 (GEC)	5	
Math 152 (GEC)	5				

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)
Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 254	5		Math 345	4	
Math 568 or 571	3		Stat 421 (GEC)	5	

Required Courses for Traditional Track:

Math 255	5		Math 530 or Stat 420	3 or 5	
Math 547	3		Math 580	3	
Math 548	3		Math 581	3	
Math 549	3		Math 582	3	
Electives (10 credit hours)					

53 or 55

Total of Part B only

Check whether this is:	x	
	original	revision

See back for information about major programs.
Distribution: One copy each - Faculty adviser, Student, College Office, 130 Denney Hall

Signature of faculty adviser	
Name of adviser (please print)	
Mathematics	292-
Department	Campus phone
	Date:

MAJOR PROGRAM FORM (SEMESTERS)

Colleges of the Arts and Science

			Mathematics Major – Theoretical Track
Name: last	first	middle	Major

Local Address:		Degree Sought: BA	BS

City, State:	Zip	e-mail address

Phone: residence	business	Expected Date of Graduation: semester/year

Have you filed a degree application in the college office? (NOTE: This form is NOT a degree application)		X
	yes	no

If completing two majors, list both below and file a separate form for each one:

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 1151 (GEC)	5		Math 1152 (GEC)	5	

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)
Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 2153	4		Math 3345	3	
Math 2568	3		Stat 4202	4	

Required Courses for Traditional Track:

Math 2255	3		Math 4530 or Stat 4201	3 or 4	
Math 4547	3		Math 4580	3	
Math 4548	3		Math 4581	3	
Electives (6 credit hours)					

38 or 39
Total of Part B only

Check whether this is:	x	
	original	revision

See back for information about major programs.
Distribution: One copy each - Faculty adviser, Student, College Office, 130 Denney Hall

Signature of faculty adviser
Name of adviser (please print)

Mathematics	292-
Department	Campus phone

	Date:

MAJOR PROGRAM FORM (QUARTERS)

Colleges of the Arts and Science

			Mathematics Major: Education Track

Name: last first middle Major

Local Address: **Degree Sought: BA BS**

City, State: **Zip** **e-mail address**

Phone: residence **business** **Expected Date of Graduation: quarter/yr**

Have you filed a degree application in the college office? **(NOTE: This form is NOT a degree application)**		**X**
	yes	**no**

If completing two majors, list both below and file a separate form for each one:

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 151 (GEC)	5		Math 153 (GEC)	5	
Math 152 (GEC)	5				

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)
Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 254*	5		Math 345*	4	
Math 568* or 571*	3		Stat 421* (GEC)	5	

Required Courses for Educational Track:

Math 547	3		Math 580*	3	
Math 548	3		Math 581*	3	
Math 549	3		Math 582	3	
Math 530 or Stat 420	3 or 5		Math 507*	5	
Math 504*	5		Math 578*	5	
* needed for OSU MEd program					

53 or 55

Total of Part B only

Check whether this is:	**x**	
	original	**revision**

See back for information about major programs.
Distribution: One copy each - Faculty adviser, Student, College Office, 130 Denney Hall

Signature of faculty adviser

Name of adviser (please print)

Mathematics	**292-**
Department	**Campus phone**

	Date:

MAJOR PROGRAM FORM (SEMESTERS)

Colleges of the Arts and Science

			Mathematics Major: Education Track

Name: last first middle Major

Local Address: **Degree Sought: BA BS**

City, State: **Zip** **e-mail address**

Phone: residence business **Expected Date of Graduation: semester/year**

Have you filed a degree application in the college office? **(NOTE: This form is NOT a degree application)**		**X**
	yes	**no**

If completing two majors, list both below and file a separate form for each one:

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 1151 (GEC)	5		Math 1152 (GEC)	5	

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)
Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 2153*	4		Math 3345*	3	
Math 2568*	3		Math 4530 or Stat 4201*	3 or 4	
			Stat 4202*	4	

Required Courses for Education Track:

Math 4547	3		Math 4580*	3	
Math 4548	3		Math 4581*	3	
Math 4504*	3		Math 4507*	3	
			Math 4578*	4	
* needed for OSU MEd program					

39 or 40
Total of Part B only

Check whether this is:	**x**	
	original	**revision**

See back for information about major programs.
Distribution: One copy each - Faculty adviser, Student, College Office, 130 Denney Hall

Signature of faculty adviser

Name of adviser (please print)

Mathematics	**292-**
Department	**Campus phone**

	Date:

MAJOR PROGRAM FORM (QUARTERS)

Colleges of the Arts and Science

			Mathematics Major: Bio-Math Track
Name: last	first	middle	Major

Local Address:		Degree Sought: BA	BS

City, State:	Zip	e-mail address

Phone: residence	business

Expected Date of Graduation: quarter/yr

Have you filed a degree application in the college office? (NOTE: This form is NOT a degree application)		X
	yes	no

If completing two majors, list both below and file a separate form for each one:

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 151 (GEC)	5		Chem 121 (GEC)	5	
Math 152 (GEC)	5		Bio 113 (GEC)	5	
Math 153 (GEC)	5		Bio 114 (GEC)	5	

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)
Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 254	5		Math 255	5	
Math 345	4		Math 530 or Stat 420	3 or 5	
Math 571	3		Stat 421 (GEC)	5	
Math 572	3				

Required Courses for Bio-Mathematics Track

Math 350	3		Bio 401 & 402	5, 5	
Two of the following three:			or MG 660 & 661	5, 5	
Math 512	3				
Math 556	3		Electives (9 credit hours)		
Math 607	5				

56 - 60	
Total of Part B only	

Check whether this is:	X	
	original	revision

See back for information about major programs.

Distribution: One copy each - Faculty adviser, Student, College Office, 130 Denney Hall

Signature of faculty adviser	
Name of adviser (please print)	
Mathematics	292-
Department	Campus phone
	Date:

MAJOR PROGRAM FORM (SEMESTERS)

Colleges of the Arts and Science

			Mathematics Major: Bio-Math Track
Name: last	first	middle	Major

Local Address:		Degree Sought: BA	BS

City, State:	Zip	e-mail address

Phone: residence	business

Expected Date of Graduation: semester/year

Have you filed a degree application in the college office? (NOTE: This form is NOT a degree application)		X
	yes	no

If completing two majors, list both below and file a separate form for each one:

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 1151 (GEC)	5		Chem 1210	5	
Math 1152 (GEC)	5		Bio 1113	4	
			Bio 1114	4	

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)
Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 2153	4		Math 3345	3	
Math 2568	3		Stat 4202	4	
Math 2255	3				

Required Courses for Bio-Math Track:

Math 3350	3		Math 4530 or Stat 4201	3 or 4	
			Bio 2401 ? ? ?	4 or 6?	
Take 2 courses from:					
Math 3607	3		Electives (6 credit hours)		
Math 4557	3				
Math 4556	3				

41 - 42
Total of Part B only

Check whether this is:	x	
	original	revision

See back for information about major programs.
Distribution: One copy each - Faculty adviser, Student, College Office, 130 Denney Hall

Signature of faculty adviser	
Name of adviser (please print)	
Mathematics	292-
Department	Campus phone
	Date:

MAJOR PROGRAM FORM (QUARTERS)

Colleges of the Arts and Science

			Mathematics Major: Applied Track - Chemistry Option
Name: last	first	middle	Major

Local Address:		Degree Sought: BA	BS

City, State:	Zip	e-mail address

Phone: residence	business

Expected Date of Graduation: quarter/yr

Have you filed a degree application in the college office? (NOTE: This form is NOT a degree application)		X
	yes	no

If completing two majors, list both below and file a separate form for each one:

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 151 (GEC)	5		Physics 131 (GEC)	5	
Math 152 (GEC)	5		Physics 132 (GEC)	5	
Math 153 (GEC)	5		Physics 133 (GEC)	5	
Chem 121 (GEC)	5		Chem 123 (GEC)	5	
Chem 122 (GEC)	5		CSE 202	4	

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)
Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 254	5		Math 345	4	
Math 571	3		Stat 421 (GEC)	5	

Required Courses for Applied Math Track:			Group I Electives: Math courses 9 hours from:		
Math 255 or 415	5 or 4		Math 547, 548, 549	3, 3, 3	
Math 512	3		Math 601, 602, 603.02	3, 3, 3	
Math 514	3		Math 665, 666	4, 4	
Math 572	3		Math 701	5	
Math 530 or Stat 420	3 or 5		Math 513 or 551	3 or 5	
Math 607	5				
Group II Electives: Chemistry. 9 hrs from:					
Chem 221	5		Chem 530-531-532	3, 3, 3	

56 to 59	
Total of Part B only	

Check whether this is:	x	
	original	revision

See back for information about major programs.
Distribution: One copy each - Faculty adviser, Student, College Office, 130 Denney Hall

Signature of faculty adviser	
Name of adviser (please print)	
Mathematics	292-
Department	Campus phone
	Date:

MAJOR PROGRAM FORM (SEMESTERS)

Colleges of the Arts and Science

			Mathematics Major: Applied Track - Chemistry Option
Name: last	first	middle	Major

Local Address:		Degree Sought: BA	BS

City, State:	Zip	e-mail address

Phone: residence	business

Expected Date of Graduation: semester/year

Have you filed a degree application in the college office? (NOTE: This form is NOT a degree application)		X
	yes	no

If completing two majors, list both below and file a separate form for each one:

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 1151 (GEC)	5		Physics 1131 (GEC)	5	
Math 1152 (GEC)	5		Physics 1132 (GEC)	5	
Chem 1210 (GEC)	5		CSE 1222	3	
Chem 1220 (GEC)	5				

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)
Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 2153	4		Math 3345	3	
Math 2568	3		Stat 4202 (GEC)	4	

Required Courses for Applied Math Track:			Group I Electives: Math. 6 hours from:		
Math 2255	3		Math 4547, 4548	3, 3	
Math 3607	3		Math 5101, 5102	3, 3	
Math 4530 or Stat 4201	3 or 4		Math 5756, 5757	3, 3	
Math 4552	3		Math 5451	3	
Math 4512	3		Math 4551	3	
Group II Electives: Chemistry. 6 hrs from:					
Chem 2210	5		Chem 4300-4310	3, 3	

41 - 42
Total of Part B only

Check whether this is:	x	
	original	revision

See back for information about major programs.
Distribution: One copy each - Faculty adviser, Student, College Office, 130 Denney Hall

Signature of faculty adviser
Name of adviser (please print)

Mathematics	292-
Department	Campus phone

	Date:

MAJOR PROGRAM FORM (QUARTERS)

Colleges of the Arts and Science

			Mathematics Major: Applied Track - Physics Option
Name: last	first	middle	Major

Local Address:		Degree Sought: BA	BS

City, State:	Zip	e-mail address

Phone: residence	business

Expected Date of Graduation: quarter/yr

Have you filed a degree application in the college office? (NOTE: This form is NOT a degree application)		X
	yes	no

If completing two majors, list both below and file a separate form for each one:

Mathematics Major: Applied Track - Physics Option	Physics

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 151 (GEC)	5		Physics 131 (GEC)	5	
Math 152 (GEC)	5		Physics 132 (GEC)	5	
Math 153 (GEC)	5		Physics 133 (GEC)	5	
			CSE 202	4	

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)

Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 254	5		Math 345	4	
Math 571	3		Stat 421 (GEC)	5	

Required Courses for Applied Math Track:			Group I Electives: Math courses 9 hours from:		
Math 255 or 415	5 or 4		Math 547, 548, 549	3, 3, 3	
Math 512	3		Math 601, 602, 603.02	3, 3, 3	
Math 514	3		Math 665, 666	4, 4	
Math 572	3		Math 701	5	
Math 530 or Stat 420	3 or 5		Math 513 or 551	3 or 5	
Math 607	5				
Group II Electives: Physics. 12 hrs from:					
Phys 261	4				
Phys 262	4		Physics 263	4	

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Total of Part B only

Check whether this is:	x	
	original	revision

See back for information about major programs.

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Signature of faculty adviser

Name of adviser (please print)

Mathematics	292-
Department	Campus phone

Date:

MAJOR PROGRAM FORM (SEMESTERS)

Colleges of the Arts and Science

			Mathematics Major: Applied Track - Physics Option
Name: last	first	middle	Major

Local Address:		Degree Sought: BA	BS

City, State:	Zip	e-mail address

Phone: residence	business

Expected Date of Graduation: semester/year

Have you filed a degree application in the college office? (NOTE: This form is NOT a degree application)		X
	yes	no

If completing two majors, list both below and file a separate form for each one:

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 1151 (GEC)	5		Physics 1250 (GEC)	5	
Math 1152 (GEC)	5		Physics 1251 (GEC)	5	
Chem 1210 (GEC)	5		CSE 1222	3	
Chem 1220 (GEC)	5				

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)
Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 2153	4		Math 3345	3	
Math 2568	3		Stat 4202 (GEC)	4	

Required Courses for Applied Math Track:			Group I Electives: Math courses 6 hours from:		
Math 2255	3		Math 4547, 4548	3, 3	
Math 3607	3		Math 5101, 5102	3, 3	
Math 4530 or Stat 4201	3 or 4		Math 5756, 5757	3, 3	
Math 4552	3		Math 5451	3	
Math 4512	3		Math 4551	3	
Group II Electives: Physics. 8 hrs from:					
Physics 2300	4		Physics 5400	4	
Physics 2301	4		Physics 5401	4	
Physics 5300	4		Physics 5500	4	
Physics 5600	4		Physics 5501	4	

43 - 44
Total of Part B only

Check whether this is:	x	
	original	revision

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Signature of faculty adviser
Name of adviser (please print)

Mathematics	292-
Department	Campus phone

	Date:

MAJOR PROGRAM FORM (QUARTERS)

Colleges of the Arts and Science

			Mathematics Major - Financial Track
Name: last	first	middle	Major

Local Address:		Degree Sought: BA	BS

City, State:	Zip	e-mail address

Phone: residence	business

Expected Date of Graduation: quarter/yr

Have you filed a degree application in the college office? (NOTE: This form is NOT a degree application)		X
	yes	no

If completing two majors, list both below and file a separate form for each one:

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 151 (GEC)	5		Econ 200 (GEC)	5	
Math 152 (GEC)	5		Econ 201 (GEC)	5	
Math 153 (GEC)	5		Acct 310	5	
			CS&E 200	5	

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)

Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 254	5		Math 345	4	
Math 568 or 571	3		Stat 421 (GEC)	5	

Required Courses for Financial Track

Math 255	5		Math 618	4	
Math 512	3		Math 632	4	
Math 530 or Stat 420	3, 5		CSE 201 or 202	5	
Math 589	3		Bus Fin 420 or 620	4	
Math 607	5		Math 588	4	

57 - 59
Total of Part B only

Check whether this is:	x	
See back for information about major programs.	original	revision

Distribution: One copy each - Faculty adviser, Student, College Office, 130 Denney Hall

Signature of faculty adviser
Name of adviser (please print)

Mathematics	
Department	Campus phone

	Date:

MAJOR PROGRAM FORM (SEMESTERS)

Colleges of the Arts and Science

			Mathematics Major – Financial Track

Name: last first middle Major

Local Address: **Degree Sought: BA BS**

City, State: **Zip** **e-mail address**

Phone: residence business **Expected Date of Graduation: semester/year**

Have you filed a degree application in the college office? **(NOTE: This form is NOT a degree application)**		**X**

yes no

If completing two majors, list both below and file a separate form for each one:

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 1151 (GEC)	5		Math 1152 (GEC)	5	
Acct 2000	3		CSE 1113	4	
Econ 2001.01	3		Econ 2002.01	3	

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)
Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 2153	4		Math 3588	3	
Math 2255	3		Math 3589	3	
Math 2568	3		Math 3607	3	
Math 3345	3		Math 3618	3	
Math 5632	3		Math 4512	3	
Bus Fin 2220 or 3280	3, 3		Math 4530 or Stat 4201	3 or 4	
CSE 1222 or 1223	3, 3		Stat 4202	4	

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Total of Part B only

Check whether this is:	**x**	

original revision

See back for information about major programs.

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Signature of faculty adviser

Name of adviser (please print)

Mathematics	

Department **Campus phone**

	Date:

Math Major, Theoretical Track 53 - 55 quarter hrs become 38 - 39 semester credit hrs.

Segment of major 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	Calculus and Analytic Geometry I	5	Math 1151	Calculus 1	5	1, 2, 3	Math 1151-1152 replaces 151-152-153
	Math 152	Calculus and Analytic Geometry II	5	Math 1152	Calculus 2	5	1, 2, 3	
	Math 153	Calculus and Analytic Geometry III	5					
Core major requirements (20 to 22 quarter credit hours become 17 to 18 semester credit hours)								
	Math 254	Calculus and Analytic Geometry IV	5	Math 2153	Calculus 3	4	1*, 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	1, 2, 3, 5	expands on 568 or 571
	Math 530 or Stat 420	Probability (in Math or Stat)	3 or 5	Math 4530 or Stat 4201	Probability	3 or 4	1*, 2, 3*, 4*, 5*	Math 4530 expands on 530 Stat 4201 replaces Stat 420
	Stat 421	Introduction to Mathematical Statistics II	5	Stat 4202	Introduction to Mathematical Statistics 2	4	1, 3, 5	Stat 4202 replaces Stat 421
Required courses in track (23 quarter credit hours become 15 semester credit hours)								
	Math 255	Differential Equations and Their Applications	5	Math 2255	Differential Equations and Their Applications	3	1, 2*, 3*, 4	replaces 255
	Math 547	Introductory Analysis I	3	Math 4547	Introductory Analysis 1	3	1**, 2**, 3*, 4**, 5	Math 4547-4548 replaces 547-548-549
	Math 548	Introductory Analysis II	3	Math 4548	Introductory Analysis 2	3	1**, 2**, 3*, 4**, 5	
	Math 549	Introductory Analysis III	3					
	Math 580	Algebra I	3	Math 4580	Abstract Algebra 1	3	1**, 2**, 3*, 4**, 5	Math 4580-4581 replaces 580-581-582
	Math 581	Algebra II	3	Math 4581	Abstract Algebra 2	3	1**, 2**, 3*, 4**, 5	
	Math 582	Algebra III	3					
Electives (10 quarter credit hours become 6 semester credit hours)								
	Math 504	History of Mathematics	5	Math 4504	History of Mathematics	3	1**, 2*, 3*, 4**, 5**	replaces 504
	Math 507	Advanced Geometry	5	Math 4507	Geometry	3	1**, 2*, 3*, 4**, 5**	replaces 507
	Math 512	Partial Differential Equations and Boundary Value Problems	3	Math 4557	Partial Differential Equations and Boundary Value Problems	3	1*, 3*, 4*, 5*	replaces 512 or 557
	Math 513 or Math 551	Vector Analysis	3 or 5	Math 4551	Vector Analysis	3	1*, 2*, 3*, 4*, 5*	replaces 513 or 551
	Math 514 or Math 552	Complex Variables	3 or 5	Math 4552	Complex Analysis	3	1*, 2*, 3*, 4*, 5*	replaces 514 or 552
	Math 573	Elementary Number Theory	5	Math 4573	Elementary Number Theory	3	1**, 2*, 3*, 4*, 5*	replaces 573
	Math 575	Combinatorial Mathematics and Graph Theory	5	Math 4575	Combinatorial Mathematics and Graph Theory	3	1*, 2*, 3*, 4*, 5*	replaces 575
	Math 578	Discrete Mathematical Models	5	Math 4578	Discrete Mathematical Models	4	1*, 2*, 3*, 4*, 5**	expands on 578

Major 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 communicate mathematical understanding effectively.
5	Become proficient in chosen tracks within the major.

* Learning outcomes are indicated for each semester course listed. Number of asterisks indicates level: beginning, intermediate, or advanced.

Math Major, Education Track 53 - 55 quarter hrs become 39 - 40 semester credit hrs.

Segment of major 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	Calculus and Analytic Geometry I	5	Math 1151	Calculus 1	5	1, 2, 3	1151-1152 replaces
	Math 152	Calculus and Analytic Geometry II	5	Math 1152	Calculus 2	5	1, 2, 3	151-152-153
	Math 153	Calculus and Analytic Geometry III	5					
		Computer Problem Solving for Business,	4		Intro Computer Prog in Java	3		
	CSE 201,	Elem Computer Programming	4	CS&E 1223,	Intro Computer Prog in C++	3		
	202, or 221	Software Dev. Using Cmpnts	4	1222, or 2221	Software I	4	3, 4	
Core major requirements (20 to 22 quarter credit hours become 17 to 18 semester credit hours)								
	Math 254•	Calculus and Analytic Geometry IV	5	Math 2153•	Calculus 3	4	1*, 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 or	Linear Algebra or						
	Math 571•	Linear Algebra for Applications I	3	Math 2568•	Linear Algebra	3	1, 2, 3, 5	expands on 568/571
	Math 530	Probability or Statistics	3 or 5	Math 4530	Probability or Statistics	3 or 4		expands on 530;
	or Stat 420			or Stat 4201			1**, 2, 3*, 4*, 5*	Stat 4201 replaces Stat 420
	Stat 421•	Introduction to Mathematical Statistics II	5	Stat 4202•	Introduction to Mathematical Statistics	4	1, 3, 5*	Stat 4202 replaces Stat 421
Required courses in track (33 quarter credit hours become 22 semester credit hours)								
	Math 547	Introductory Analysis I	3	Math 4547	Introductory Analysis 1	3	1**, 2**, 3*, 4**, 5	4547-4548 replaces 547-548-549
	Math 548	Introductory Analysis II	3	Math 4548	Introductory Analysis 2	3	1**, 2**, 3*, 4**, 5	
	Math 549	Introductory Analysis III	3					
	Math 580•	Algebra I	3	Math 4580•	Abstract Algebra 1	3	1**, 2**, 3*, 4**, 5	4580-4581 replaces 580-581-582
	Math 581•	Algebra II	3	Math 4581•	Abstract Algebra 2	3	1**, 2**, 3*, 4**, 5	
	Math 582	Algebra III	3					
	Math 504•	History of Mathematics	5	Math 4504•	History of Mathematics	3	1**, 2**, 3*, 4**, 5	replaces 504
	Math 507•	Advanced Geometry	5	Math 4507•	Geometry	3	1**, 2**, 3*, 4**, 5**	replaces 507
	Math 578•	Discrete Mathematical Models	5	Math 4578•	Discrete Mathematical Models	4	1**, 2, 3**, 4**, 5*	replaces 578

Courses marked with • are needed for the MEd program at OSU.

Major 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 communicate mathematical understanding effectively.
5	Become proficient in chosen tracks within the major.

* Learning outcomes are indicated for each semester course listed. Number of asterisks indicates level: beginning, intermediate, or advanced.

Math Major, Biology Track 56 - 60 quarter hrs become 40 - 41 semester hrs.

Segment of major program	Quarter course #	Quarter course name	Credit hours	Semester course #	Semester course name	Units	Learning outcome	Nature of conversion
Prerequisites (30 quarter credit hours become 23 semester credit hours; some may double-count in GEC)								
	Math 151	Calculus and Analytic Geometry I	5	Math 1151	Calculus 1	5	1, 2, 3	1151-1152 replaces 151-152-153
	Math 152	Calculus and Analytic Geometry II	5	Math 1152	Calculus 2	5	1, 2, 3	
	Math 153	Calculus and Analytic Geometry III	5					
	Bio 113	Biological Sciences: Energy Transfer and Development	5	Bio 1113	Biological Sciences: Energy Transfer and Development	4	5	Bio 1113-11214 Replaces Bio 113-114
	Bio 114	Biological Sciences: Form, Function, Diversity, and Ecology	5	Bio 1114	Biological Sciences: Form, Function, Diversity, and Ecology	4	5	
	Chem 121	General Chemistry	5	Chem 1210	General Chemistry	5	5	Chem 1210 Replaces Chem 121
Core major requirements (23-25 quarter credit hours become 17-18 semester credit hours)								
	Math 254	Calculus and Ananytic Geometry IV	5	Math 2153	Calculus 3	4	1*,2*, 3	expands on 254
	Math 345	Foundations of Higher Math	4	Math 3345	Foundations of Higher Math	3	1**, 2, 3*, 4*	expands on 345
	Math 571-572	Linear Alg for Appl I, II	3, 3	Math 2568	Linear algebra	3	1, 2, 3, 5	expands on 568
	Math 530 or Stat 420	Probability	3 or 5	Math 4530 or Stat 4201	Probability	3 or 4	1**, 2, 3*, 4*, 5*	4530 expands on 530; Stat 4201 replaces Stat 420
	Stat 421	Intro to Mathematical Statistics II	5	Stat 4202	Intro to Mathematical Statistics 2	4	1, 5	Stat 4202 replaces Stat 421
Required courses in track (33 to 35 quarter credit hours become 24 semester credit hours)								
	Math 350	Intro to Mathematical Biology	3	Math 3350	Intro to Mathematical Biology	3	4*, 5	replaces 350
	Math 255	Diff Equations and Appls	5	Math 2255	Differential Equations and Appls	3	1, 2*, 3*, 4	replaces 255
	Bio 401 - 2; or MG 660 - 1	Integrated Biology I, II, Integrated Mol & Call Bio I, II	5, 5	Bio 2401 ?	Integrated Biology	6 ?	5*	Bio ????-???? replaces Bio 401-402
Two of the following three:				Two of the following three:				
	Math 512	Partial Differential Equations	3	Math 4557	Partial Differential Equations	3	1*, 2, 3*, 5**	
	Math 556	Dynamical Systems	3	Math 4556	Dynamical Systems	3	1*, 2, 3*, 5**	
	Math 607	Essentials of Numerical Analysis	5	Math 3607	Beginning Scientific Computing	3	1*, 2, 3*, 5**	
Electives (9 credit hrs) Must include courses within and outside of Math				Electives (6 units)				
	Math 547	Introductory Analysis I	3	Math 4547	Introductory Analysis 1	3	1**, 2**, 3*, 4**	Math 4547-4548 replaces Math 547-548-549
	Math 580	Algebra I	3	Math 4580	Abstract Algebra 1	3	1**, 2**, 3*, 4**	Math 4580-4581 replaces Math 580-581-582
	Math 514	Complex Variables	3	Math 4552	Complex Analysis	3 or 3	1*, 2*, 3*, 4*, 5*	replaces 514 or 552
	Math 540H	Calculus on Manifolds	5	Math 5540H	Honors Differential Geometry	5	1*, 2*, 3*, 4*, 5*	replaces 540H-541H
	Math 513 or 551	Vector Analysis	3 or 5	Math 4551	Vector Analysis	3	1*,3*, 4*, 5*	replaces 513 & 551
	Math 601, 602, or 603.02	Math Principles in Science I, II, III	3, 3, 3	Math 5101-5102	Linear Math in Finite & Infinite Dimensions	3, 3	1, 2*, 3, 5*	5101-5102 replace 601-602- 603.02
	Biochem 511	Intro to Biological Chemistry	5	Biochem ?	Intro to Biological Chemistry		5*	B'chem ???? replaces B'chem 511
	EEOB 400	Evolution	5	EEOB?	Evolution		5*	EEOB ???? replaces EEOB 400
	EEOB 410	Animal form and function	4	EEOB ?	Animal form and function		5*	EEOB ???? replaces EEOB 410
	EEOB 503	Introductory Ecology (Lec + Lab)	6	EEOB ?	Introductory Ecology		5*	EEOB ???? replaces EEOB 503
	Chem 251	Organic chemistry	4	Chem ?	Organic chemistry		5*	Chem ???? replaces Chem 251
	MolGen 500	General genetics	5	MolGen ?	General genetics		5*	MolGen ???? replaces MolGen 509
	MolGen 601	Eukaryotic Mol Gen Lab	5	MolGen ?	Eukaryotic Mol Gen Lab		5*	MolGen ???? replaces MolGen 601

Major 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 communicate mathematical understanding effectively.
5	Become proficient in chosen tracks within the major.

* Learning outcomes are indicated for each semester course listed. Number of asterisks indicates level: beginning, intermediate, or advanced.

Math Major, Applied Track (options Physics or Chemistry) 58 - 60 quarter hrs become 41 - 42 semester hrs.

Segment of major program	Quarter course #	Quarter course name	Credit hours	Semester course #	Semester course name	Units	Learning outcome	Nature of conversion
Prerequisites (34 quarter credit hours become 23 semester credit hours; some may double-count in GEC)								
	Math 151	Calculus and Analytic Geometry I	5	Math 1151	Calculus 1	5	1, 2, 3	
	Math 152	Calculus and Analytic Geometry II	5	Math 1152	Calculus 2	5	1, 2, 3	1151-1152 replaces 151-152-153
	Math 153	Calculus and Analytic Geometry III	5					
Prerequisite courses depend on Applied Area, like the following:								
	Phys 131, 132, 133	Calc-based Physics 1, 2, 3	5, 5, 5	Phys 1250, 1251	Calc-based Physics 1, 2	5, 5	3, 5*	Phys 1131 & 1132 replaces Phys 131, 132, 133
	CSE 202	Intro to Programming & Algorithms	4	CSE 1222	Intro to Programming in C++	3	3, 5*	
	Bio 113, 114	Biological Sciences	5, 5	Bio 1113, 1114	Biological Sciences	4, 4	3, 5*	
	Chem 121, 122, 123	General Chemistry	5, 5, 5	Chem 1210, 1220	General Chemistry	5, 5	3, 5*	
Core major requirements (23-25 quarter credit hours become 17-18 semester credit hours)								
	Math 254	Calculus and Ananytic Geometry IV	5	Math 2153	Calculus 3	4	1*, 2*, 3	expands on 254
	Math 345	Fdns of Higher Mathematics	4	Math 3345	Fdns of Higher Mathematics	3	1**, 2, 3*, 4	expands on 345
	Math 571, 572	Linear Algebra I, II	3, 3	Math 2568	Linear Algebra	3	1, 2, 3, 5	replaces 571-572
	Math 530 or Stat 420	Probability, or Intro to Statistics I	3 or 5	Math 4530 or Stat 4201	Probability or Intro to Statistics I	3 or 4	1*, 2, 3*, 4*, 5*	expands on 530; Stat 4201 replaces Stat 420
	Stat 421	Intro to Mathematical Statistics II	5	Stat 4202	Intro to Mathematical Statistics	4	1, 3, 5	Stat 4202 replaces Stat 421
Required & Elective courses in track (34 quarter credit hours become 24 semester credit hours)								
Required:								
	Math 512	Partial Diff Equations	3	Math 4557	Partial Diff Eqs	3	1, 2*, 3*, 4, 5	replaces 557 (expands 512)
	Math 255	Diff Equations and Appls	5	Math 2255	Differential Equations and Appls	3	1, 2*, 3*, 4	replaces 255
	Math 607	Essentials of Numerical Analysis	5	Two of the following three:				
	Math 514	Complex Variables	3	Math 3607	Beginning Scientific Computing	3	3**, 4, 5*	replaces parts of 607
				Math 4552	Complex Analysis	3 or 3	1*, 2*, 3*, 4*, 5*	replaces 514 or 552
				Math 4556	Dynamical Systems	3	1, 3*, 4, 5	expands on 556
Electives (9 quarter hours in math and 9 in the applied area):				Electives (6 units in math and 6 in the applied area):				
Group I - Math								
	Math 556	Differential Eqs I	3					
	Math 513 or 551	Vector Analysis	3 or 5	Math 4551	Vector Analysis	3	1*,3*, 4*, 5*	replaces 513 & 551
	Math 601, 602, or 603.02	Math Principles in Science I, II, III	3, 3, 3	Math 5101, 5102	Linear Math in Finite & Infinite Dimensions	3, 3	1, 2*, 3, 5*	5101-5102 replace 601-602- 603.02
	Math 547, 548, 549	Intro Analysis I, II, III	3, 3, 3	Math 4547, 4548	Introductory Analysis 1, 2	3, 3	1**, 2**, 3*, 4	4547-4548 replace 547-548-549
	Math 665, 666	Applied Differential Geometry I, II	4, 4	Math 5756, 5757	Methods in Relativity Theory I, II	3, 3	3, 4, 5*	5756-5757 replace 665-666
	Math 701	Calculus of Variation & Tensors	5	Math 5451	Calculus of Variation & Tensors	3	1, 2, 3*, 4, 5**	replaces 701
Group II - Applied Area								
Option 1: Physics								
Electives:	Phys 261-262-263	Dyn of Particles & Waves I, II, III	4, 4, 4	Phys 2300-2301	Dyn of Particles & Waves I, II, III	4, 4, 4	5*	Phys 2300-2301 replace Phys 261-262-263
Recommended courses:	Phys 621-622	Statistical Physics I, II	4, 4	Phys 5600	Statistical Physics	4	5*	Phys 5600 replaces 621-622
	Phys 664	Theoretical Mechanics	4	Phys 5300	Theoretical Mechanics	4	5*	Phys 5300 replaces 664
	Phys 555-656-657	Fields & Waves I, II, III	4, 4, 4	Phys 5400-5401	Fields & Waves I, II	4, 4	5**	Phys 5400-5401 replace Phys 555-656-657
	Phys 631-632-633	Intro Quantum Mech I, II, III	4, 4, 4	Phys 5500, 5501	Intro Quantum Mech I, II	4, 4	5*	Phys 5500 & 5501 replace Phys 631, 632, 633
Option 2: Chemistry								
Electives:	Chem 221	Analytical Chemistry	5	Chem 2210	Analytical Chemistry	5	5*	
	Chem 530-531-531	Physical Chemistry 1, 2, 3	3, 3, 3	Chem 4300-4310	Physical Chemistry 1, 2	3, 3	5*	

Major 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 communicate mathematical understanding effectively.
5	Become proficient in chosen tracks within the major.

* Learning outcomes are indicated for each semester course listed. Number of asterisks indicates level: beginning, intermediate, or advanced.

Math Major, Financial Track 57 - 59 quarter hrs become 41 - 42 semester credit hrs.

Segment of major program	Quarter course #	Quarter course name	Credit hours	Semester course #	Semester course name	Units	Learning outcome	Nature of conversion
Prerequisites (35 quarter credit hours become 23 semester credit hours; some may double-count in GEC)								
	Math 151	Calculus and Analytic Geometry I	5	Math 1151	Calculus 1	5	1, 2, 3	1151-1152 replaces 151-152-153
	Math 152	Calculus and Analytic Geometry II	5	Math 1152	Calculus 2	5	1, 2, 3	
	Math 153	Calculus and Analytic Geometry III	5					
	Acct 310	Foundations of Accounting	5	Acct 2000	Foundations of Accounting	3	3, 5*	Acct 2000 replaces Acct 310
	Econ 200	Principles of Microeconomics	5	Econ 2001.01	Principles of Microeconomics ?	3	3, 5*	Econ 2001.01 replaces Econ 200
	Econ 201	Principles of Macroeconomics	5	Econ 2002.01	Principles of Macroeconomics ?	3	3, 5*	Econ 2002.01 replaces Econ 200
	CSE 200	Computer Assisted Problem Solving for Business	5	CSE 1113	Computer Assisted Problem Solving for Business	4	3, 5*	CSE 1113 replaces CSE 200
Core major requirements (17 quarter credit hours become 14 semester credit hours)								
	Math 254	Calculus and Analytic Geometry IV	5	Math 2153	Calculus 3	4	1*, 2*, 3	expands on 254
	Math 345	Foundations of Higher Math	4	Math 3345	Foundations of Higher Math	3	1**, 2, 3*, 4	expands on 345
	Math 568	Linear Algebra	3	Math 2568	Linear Algebra	3	1, 2, 3, 5	expands on 568 or 571
	Stat 421	Introduction to Mathematical Statistics II	5	Stat 4202	Introduction to Mathematical Statistics 2	4	1, 3, 5*	Stat 4202 replaces Stat 421
Required courses in track (39 or 41 quarter credit hours become 27 or 28 semester credit hours)								
	Math 255	Differential Equations and Their Applications	5	Math 2255	Differential Equations and Their Applications	3	1, 2*, 3*, 4	replaces Math 255
	Math 512	Partial Differential Equations & Boundary Value Problems	3	Math 4557	Partial Differential Equations	3	1, 2, 3*,5**	replaces 512 or 557
	Math 530 or Stat 420	Probability (in Math or Stat)	3 or 5	Math 4530 or Stat 4201	Probability	3 or 4	1*, 2, 3*,4*, 5*	expands on 530; Stat 4201 replaces Stat 420
	Math 588	Practicum in Actuarial Science	4					
	Math 589	Introduction to Mathematical Finance	3	Math 3589	Introduction to Financial Mathematics	3	3*, 4*, 5**	replaces 589
	Math 607	Essentials of Numerical Analysis	5	Math 3607	Begin Sci Computing	3	3*, 4*, 5**	replaces parts of 607
	Math 618	Theory of Interest	4	Math 3618	Theory of Interest	3	3*, 4*, 5**	replaces 618
	Math 632	Actuarial Mathematics III	4	Math 5632	Financial Economics	3	3*, 4*, 5**	replaces 632
	Bus 420 or 620	Foundations of Finance, Business Finance	4, 4	Bus Fin 2220 or 3280	Business Finance ?	3, 3	3*, 4*, 5**	replaces BUS 420, 620
	CSE 201 or 202	Elementary Computer Programming, Intro. to Programming & Algorithms	4, 4	CSE 1223, 1222	Intro to Computer Prog. in Java, Intro to Computer Prog. in C++	3, 3	3, 5*	replaces CSE 201, 202
Electives	none			none				
Major 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 communicate mathematical understanding effectively.						
	5	Become proficient in chosen tracks within the major.						

* Learning outcomes are indicated for each course listed. Number of asterisks indicates level: beginning, intermediate, or advanced.

SAMPLE FOUR-YEAR PLANS

Italic indicates prerequisite courses, not counted in the major.

Math Major: **Theoretical Track** **Quarters**

	Au	Wi	Sp	Hours in major
YR 1.	*Math 151 (5)* GEC	*Math 152 (5)* GEC	*Math 153 (5)* GEC	0
YR 2.	Math 254 (5) GEC	Math 255 (5) GEC	Math 345 (4) Math 568 (3) GEC	17
YR 3.	Math 580 (3) Math 530 (3) or Stat 420 (5) GEC	Math 581 (3) Stat 421 (5) GEC	Math 582 (3) GEC	17 or 19
YR 4.	Math 547 (3) Math Elective (5) GEC	Math 548 (3) Math Elective (5) GEC	Math 549 (3) GEC	19

Math Major: **Theoretical Track** **Semesters**

	Au	Sp	Hours in major
YR 1.	*Math 1151 (5)* GE	*Math 1152 (5)* GE	0
YR 2.	Math 2153 (4) GE	Math 3345 (3) Math 2568 (3) GE	10
YR 3.	Math 4580 (3) Math 4530 (3) or Stat 4201 (4) Math 2255 (3) GE	Math 4581 (3) Stat 4202 (4) GE	16 or 17
YR 4.	Math 4547 (3) Math Elective (3) GE	Math 4548 (3) Math Elective (3) GE	12

Math Major: **HONORS Theoretical Track** **Quarters**

	Au	Wi	Sp	Hours in major
YR 1.	Math 190H (5) GEC	Math 191H (5) GEC	Math 264H (5) GEC	15
YR 2.	Math 520H (5) GEC	Math 521H (5) GEC	Math 522H (4) GEC	15
YR 3.	Math 575H (5) Math 531H (5) GEC	Math 540H (5) or Math 576H (5) Stat 421 (5) GEC	Math 541H (5) or Math 577H (5) GEC	25
YR 4.	Math 590H (5) GEC	Math 591H (5) GEC	Math 592H (5) GEC	15

Math Major: **HONORS Theoretical Track** **Semesters**

	Au	Sp	Hours in major
YR 1.	Math 4190H (5) GE	Math 4191H (5) GE	10
YR 2.	Math 5520H (5) GE	Math 5522H (5) GE	10
YR 3.	Math 5530H (5) Math 5529H (5) or Math 5576H (5) GE	Stat 4202 (4) Math 5440H (5) GE	19
YR 4.	Math 5590H (5) GE	Math 5591H (5) GE	10

Math Major: **Education Track** **Quarters**

	Au	Wi	Sp	Hours in major
YR 1.	*Math 151 (5)* GEC	*Math 152 (5)* *CSE 201, 202, or 221 (4)*	*Math 153 (5)* GEC	0
YR 2.	Math 254 (5) GEC	Math 568 (3) GEC	Math 345 (4) GEC	12
YR 3.	Math 580 (3) Stat 420 (5) GEC	Math 581 (3) Stat 421 (5) GEC	Math 582 (3) Math 578 (5) GEC	24
YR 4.	Math 547 (3) Math 507 (5) GEC	Math 548 (3) GEC	Math 549 (3) Math 504 (5) GEC	19

Math Major: **Educational Track** **Semesters**

	Au	Sp	Hours in major
YR 1.	*Math 1151 (5)* GE	*Math 1152 (5)* *CSE 1223 (3), 1222(3), or 2221 (4)*	0
YR 2.	Math 2153 (4) GE	Math 3345 (3) Math 2568 (3) GE	10
YR 3.	Math 4580 (3) Stat 4201 (4) GE	Math 4581 (3) Stat 4202 (4) GE	14
YR 4.	Math 4547 (3) Math 4504 (3) Math 4507 (3) GE	Math 4548 (3) Math 4578 (4) GE	16

Math Major: **Bio-Math Track** **Quarters**

	Au	Wi	Sp	Hours in major
YR 1.	*Math 151 (5)* *Chem 121 (5)* GEC	*Math 152 (5)* *Bio 113 (5)* GEC	*Math 153 (5)* *Bio 114 (5)* GEC	0
YR 2.	Math 254 (5) GEC	Math 255 (5) Stat 420 (5) GEC	Math 345 (4) Math 512 (3) Stat 421 (5)	27
YR 3.	Math 571 (3) MolGen 660 (5) GEC	Math 572 (3) MolGen 661 (5) GEC	Math 350 (3) GEC	19
YR 4.	Math or Bio (3) GEC	Math 607 (5) Math or Bio (3) GEC	Math or Bio (3) GEC	14

Math Major: **Bio-Math Track** **Semesters**

	Au	Sp	Hours in major
YR 1.	*Math 1151 (5)* *Chem 1210 (5)* GE	*Math 1152 (5)* *Bio 1113 (4)* GE	0
YR 2.	Math 2153 (4) Stat 4201 (4) *Bio 1114 (4)*	Math 3345 (3) Stat 4202 (4) GE	15
YR 3.	Math 2568 (3) Math 2255 (3) GE	Math 4557 (3) Math 3350 (3) GE	12
YR 4.	Bio 2401 (4 or 6 ?) Math or Bio (3) GE	Math 3607 (3) Math or Bio (3) GE	13

Math Major: **Applied Track** **Quarters**

	Au	Wi	Sp	Hours in major
YR 1.	*Math 151 (5)* GEC	*Math 152 (5)* *Physics 131 (5)* GEC	*Math 153 (5)* *Physics 132 (5)* GEC	0
YR 2.	Math 254 (5) *Physics 133 (5)* GEC	Math 255 (5) GEC	Math 345 (4) Math 512 (3) GEC	17
YR 3.	Math 571 (3) Stat 420 (5) GEC	Math 572 (3) Math 607 (5) GEC	Math 514 (3) Stat 421 (5) GEC	24
YR 4.	Math elective (3) Applied elective (3) GEC	Math elective (3) Applied elective (3) GEC	Math 549 (3) Applied elective (3) GEC	18

Math Major: **Applied Track** **Semesters**

	Au	Sp	Hours in major
YR 1.	*Math 1151 (5)* GE	*Math 1152 (5)* *Physics 1250 (5)* GE	0
YR 2.	Math 2153 (4) Math 2568 (3) *Physics 1251 (5)*	Math 3345 (3) Math 2255 (3) Math 4551 (3) GE	16
YR 3.	Stat 4201 (4) Math 3607 (3) GE	Stat 4202 (4) Math 4552 (3) GE	14
YR 4.	Math 4547 (3) Math Elective (3) GE	Math 4548 (3) Math Elective (3) GE	12

Math Major: **Financial Track** **Quarters**

	Au	Wi	Sp	Hours in major
YR 1.	*Math 151 (5)* *CSE 200 (5)* GEC	*Math 152 (5)* *Econ 200 (5)* GEC	*Math 153 (5)* *Econ 201 (5)* GEC	0
YR 2.	Math 254 (5) *Acct 310 (5)* GEC	Math 255 (5) CSE 201 (4) GEC	Math 345 (4) Math 568 (3) GEC	21
YR 3.	Stat 420 (5) GEC	Stat 421 (5) Math 512 (3) GEC	Bus Fin 620 (4) GEC	17
YR 4.	Math 618 (4) GEC	Math 589 (3) Math 607 (5) GEC	Math 588 (4) Math 632 (4) GEC	20

Math Major: **Financial Track** **Semesters**

	Au	Sp	Hours in major
YR 1.	*Math 1151 (5)* *CSE 1113 (4)* GE	*Math 1152 (5)* *Econ 2001.01 (3)* GE	0
YR 2.	Math 2153 (4) *Econ 2002.01 (3)* *Acct 2000 (3)*	Math 3345 (3) Math 2568 (3) GE	10
YR 3.	Stat 4201 (4) Math 2255 (3) CSE 1222 (3) GE	Stat 4202 (4) Math 4557 (3) Math 3589 (3) GE	20
YR 4.	Math 3618 (3) Math 3607 (3) GE	Math 5632 (3) Bus Fin 3280 (3) GE	12

Transition Policies and Plans

Requirements for a B.S. in Mathematics will undergo minimal changes in the conversion to semesters. Every math course or course sequence (prerequisite, required, or elective) under quarters will have a corresponding course or course sequence under semesters. In some cases this transition involves an increase in credit hours, typically motivated by the expectation that upper division semester math courses will be 3 credits. In most cases, these increases are balanced by small rearrangements of required and elective courses.

Transition policies for freshman-level courses are more difficult to work out because those courses are usually in a long sequence that can be entered at different points. The only one of those transitions that is relevant for math majors is the mainstream calculus sequence, Math 151-152-153-254. Those plans are outlined on a separate page below.

There is only one difficult transition in the upper division courses taken by math majors:

Students might be part way through a 500-level math course sequence at the end of Spring 2012.

This arises for Math **547-548-549** and **580-581-582**, corresponding to Math **4547-4548** and Math **4580-4581**. Those course sequences in quarters begin in both Autumn and Winter. Each of the four corresponding semester courses will be offered in both Autumn and Spring Semesters.

Since Math 547 and 580 are not offered in Spring, few students will have credit for just one course in the sequence when semesters arrive in Au12. Those students will be guided by advisers on a case by case basis.

Students who complete Math 547-548 in Winter and Spring of 2012 will enter Math 4548 in Au12. To avoid undue overlaps, that 4548 will be a special version, tailored for the transition audience. It will cover material usually done in Math 549, but with further explanations, and a slower pace. That slower treatment will benefit most of the students. This arrangement will not cause delays in graduation, even though students will take a semester 3-credit course rather than a quarter 3-credit course.

Similarly students who complete Math 580-581 in Winter and Spring of 2012 will enroll in a special version of Math 4581 in Au12.

Math 4548 and 4581 will begin their standard semester syllabi in Winter 2013.

ADVISING.
Three full-time counselors are currently available in the *Math Advising Office* for walk-in appointments to help students determine their best paths through the many options for math at OSU. General information about that office is posted at `http://www.math.ohio-state.edu/counseling`. Those counselors devote most of their effort assisting students from other departments. They evaluate math transfer credit, deal with issues involved with the Math Placement Exam, work with many activities to recruit new freshmen, etc. In addition, the math counselors help Math and Actuarial Science students complete major and minor program forms, and the facilitate the process of connecting majors with faculty advisers.

From Winter 2011 through Spring 2012 the math advisers will send messages to all undergraduate majors in the Math Department, highlighting the various math course options available with semesters. We expect that the Department's staff members, faculty advisers, and departmental administrators will be able to deal with the expected numbers of math and actuarial science majors who encounter difficulties in the process of conversion to semesters.

However, throughout 2012 we expect floods of students to visit the Math Advising Office with questions about transition processes, especially concerning semester transitions of the many lower-division math courses. We hope that the Department will be able to find funds to hire another full-time math adviser during the transition year, and to hire several student helpers as needed.

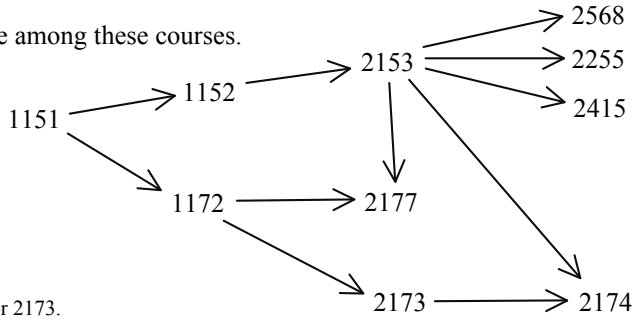
Calculus transition plans.

Mainstream calculus is taught in a sequence of 5-credit courses: Math 151 – 152 – 153 – 254. Many students go on to take differential equations (255 or 415) and linear algebra (568 or 571-572).

Because of demands from various departments in the College of Engineering, that sequence of courses will be split into different strands. We conjecture that the Engineering Calculus strand will involve most of the students.
Note: 1151, 1152, 2153, 2568, and 2255 satisfy the *Transfer Assurance Guidelines* provided by Ohio's Board of Regents.

- Standard Calculus: 1151 – 1152 – 2153 – {2568, 2255, 2415}.
- Engineering Calculus: 1151 – 1172 – 2173 – 2174.
- Engineering Calculus Lite: 1151 – 1172 – 2177.

Here is a picture illustrating how students can move among these courses.



Note: A student with credit for 1151-1152 may not enter 2177 or 2173.

Here are short descriptions of these courses. Credit hours are indicated in parentheses.

1151 Calculus 1 (5) limits, derivatives, max-min, definite integrals, Fundamental Theorem.

1152 Calculus 2 (5) integration techniques, sequences and series, convergence, Taylor series, parametric and polar curves, (optional: vectors).

2153 Calculus 3 (4) vectors, several variables, partial derivatives, max-min, multiple integrals, line integrals and vector fields, divergence, curl, integration theorems.

2568 Linear Algebra (3) systems of equations, matrices, vector spaces, dimension, linear transformations, determinants, eigenvalues, diagonalization,

2255 ODEs (3) first and second order ODEs, independence, undetermined coefficients, series solutions, Laplace transform.

2415 ODEs and PDEs (3) first and second order ODEs, Fourier series, constant coefficient PDEs, boundary value problems, systems of ODEs.

1172 Engineering Math A (5) integration, Taylor polynomials, vectors and parametric curves, several variables, partial derivatives, max-min.

2173 Engineering Math B (3) multiple integrals, line integrals, vector fields, second order constant coefficient ODEs.

2174 Linear Algebra and Differential Equations (3) vectors, matrices, diagonalization, systems of linear ODEs, Fourier series, PDEs.

2177 Mathematical Topics for Engineers (4) multiple integrals, line integrals, matrices and linear systems, constant coefficient ODEs, Fourier series, PDEs.

Abbeviations: ODE = ordinary differential equation, PDE = partial differential equation.

TRANSITION PLANS for Freshman Calculus.

Here are different scenarios for students coming to semesters at the end of Spring 2012.

Completed 151-152-153: may take 2153, (not 2173 or 2177).

Completed 151-152: may take 1152 or 1172. There will be some repetition of

Completed 151:
Most of these students began college taking algebra, and have relatively weak math backgrounds. They will be advised to *not* take Math 151 in Spring 2012, postponing calculus until Math 1151 in Autumn. This delay does not make excellent academic sense, but it avoids the problem of repeating the whole of Math 151 as part of 1151.

Students with credit for Math 151 will be offered a bridge course for 4 or 5 weeks in Su12, covering the integral calculus topics appearing at the end of Math 1151. That bridge course will be offered in two formats.
(1) with a live teacher at the Columbus campus,
(2) as an on-line, self-study module run through the Learning Center.
Students who pass a proctored exam at the end of that bridge course, and earn C- or better, may enter Math 1152.

Students with credit for Math 151 but without credit for that bridge course, will be allowed to enroll in Math 1151 in Au12, even though that involves a repetition of material discussed in Math 151.

Possibly the Department will continue to make such an on-line bridge course available to students who transfer to OSU from a quarter-based college and have only one quarter of calculus credit.

AP-Calculus credit:
Students to wook AP calculus exams in high school will get OSU credit for calculus courses.

Score	Credit for:	Recommended Courses
AB-1, AB-2, BC-1, BC-2	no credit	Use OSU Math Placement Exam
AB-3	1150, 1131	1151
AB-4	1150, 1151	1152
AB-5	1150, 1151	1161.01, 1181H, (or 4190H, with adviser approval)
BC-3	1150, 1151	1161.01, 1181H
BC-4, 5	1150, 1151, 11523	4190H, 1181H, 2153

Generic transition schedules.
The next page provides generic course schedules for math majors (theoretical track) who will experience the transition to semesters at different points in their undergraduate careers. Credit hours are indicated to the right of each course in the major program. Similar schedules can be generated for the other tracks. Nearly all math majors will have little difficulty passing to the new system. We expect a few individual difficulties to arise, often for unanticipated reasons. Those difficulties might lead to larger numbers of individual studies courses run by appropriate faculty members.

We can produce a similar generic schedule for the other tracks (sub-plans) within the major, if there is a request to do so.

Math Major – Theoretical Track

Sample curricula for students at different stages of the semester transition

Graduating ≤ Sp12		Graduating Sp13		Graduating Sp14		Graduating Sp15		Graduating ≥ Sp16	
(Au08)		(Au09)		(Au10)		(Au11)		(Au12)	
Math 151 (Calc I)	5	Math 151 (Calc I)	5	Math 151 (Calc I)	5	Math 151 (Calc I)	5	Math 1151 (Calc 1)	5
Math 152 (Calc II)	5	Math 152 (Calc II)	5	Math 152 (Calc II)	5	Math 152 (Calc II)	5	Math 1152 (Calc 2)	5
Math 153 (Calc III)	5	Math 153 (Calc III)	5	Math 153 (Calc III)	5	Math 153 (Calc III)	5	GEs	
GECs		GECs		GECs		GECs			
Math 254 (Cal IV)	5	Math 254 (Calc IV)	5	Math 254 (Calc IV)	5	Math 2153 (Calc 3)	4	Math 2153 (Calc 3)	4
Math 255 (ODE)	5	Math 255 (ODE)	5	Math 255 (ODE)	4	Math 2255 (ODE)	3	Math 2255 (ODE)	3
Math 345 (Hi Math)	4	Math 345 (Hi Math)	4	Math 345 (Hi Math)	4	Math 3345 (Hi Math)	3	Math 3345 (Hi Math)	3
Math 568 (Lin Alg)	3	Math 568 (Lin Alg)	3	Math 568 (Lin Alg)	3	Math 2568 (Lin Alg)	3	Math 2568 (Lin Alg)	3
GECs		GECs		GECs		GEs		GEs	
Math 580 (Ab Alg I)	3	Math 580 (Ab Alg I)	3	Math 4580 (Ab Alg 1)	3	Math 4580 (Ab Alg 1)	3	Math 4580 (Ab Alg 1)	3
Math 581 (Ab Alg I)	3	Math 581 (Ab Alg I)	3	Math 4581 (Ab Alg 2)	3	Math 4581 (Ab Alg 2)	3	Math 4581 (Ab Alg 2)	3
Math 582 (Ab Alg I)	3	Math 582 (Ab Alg I)	3	Math 4530 (Prob)	3	Math 4530 (Prob)	3	Math 4530 (Prob)	3
Math 530 (Prob)	3	Math 530 (Prob)	3	Stat 4201 (Stat)	4	Stat 4201 (Stat)	4	Stat 4201 (Stat)	4
Stat 421 (Stat)	5	Stat 421 (Stat)	5	GEs		GEs		GEs	
GECs		GECs							
Math 547 (An I)	3	Math 4547 (An 1)	3	Math 4547 (An 1)	3	Math 4547 (An 1)	3	Math 4547 (An 1)	3
Math 548 (An II)	3	Math 4548 (An 2)	3	Math 4548 (An 2)	3	Math 4548 (An 2)	3	Math 4548 (An 2)	3
Math 549 (An III)	3	Math 4507 (Geom)	3	Math 4507 (Geom)	3	Math 4507 (Geom)	3	Math 4507 (Geom)	3
Math 507 (Geom)	5	Math 4552 (Cx An)	3	Math 4552 (Cx An)	3	Math 4552 (Cx An)	3	Math 4552 (Cx An)	3
Math 552 (Cx Vbl)	5	GEs		GEs		GEs		GEs	
GECs									