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**Planning Sheet: BACHELOR OF SCIENCE in MATHEMATICS**

(This major consists of 13 courses)

**Mathematics major core requirements:**

<u>Term</u>	<u>Grade</u>	<u>Course #</u>	<u>AugCore</u>	<u>Title</u>
_____	_____	MAT 145	NSM	Calculus 1 (Prereq: MPG 4)
_____	_____	MAT 146	NSM	Calculus 2 (Prereq: MAT 145)
_____	_____	MAT 245		Calculus 3 (Prereq: MAT 146)
_____	_____	MAT 246		Linear Algebra (Prereq: MAT 245 or 271)
_____	_____	MAT 271		Discrete Mathematical Structures (Prereq: Waived from or passed GST 100, MAT 145 or MAT 146 & one of MAT 163, MAT 164, MAT 252 or MAT 287)
_____	_____	MAT 491		Mathematics Colloquium (0.0 credits, 4 semesters in junior and senior years)

**Mathematics B.S. Degree Requirements:**

An approved experiential component in the focus area is also required, such as an internship, volunteer/paid work experience, or undergraduate research project.

\_\_\_\_\_ Experiential component (0.0 cr): \_\_\_\_\_

**Mathematics Elective Courses:** Select and complete seven (7) electives from those listed on side two.

Four (4) electives chosen from MAT courses numbered above 250, at least three of which are numbered above 300. Three (3) additional electives chosen from MAT courses above 250, or the list of supporting courses (or substitutes with departmental approval). These seven electives must include a "Theoretical Structures" course: MAT 304, MAT 314, MAT 324 or other courses approved by the department; an "Applied Project" course: MAT 355, MAT 369, MAT 374, MAT 377, or other courses approved by the department; and a "Statistical Perspectives" course: MAT 373, MAT 163, MAT 164, BUS 379, PSY 215, SOC 362 or other courses approved by the department. At least five (5) of the seven (7) elective must be chosen from a focus area approved by the department. See your faculty advisor to plan out your math electives to fulfill a focus area

<u>Term</u>	<u>Grade</u>	<u>Course #</u>	<u>Lib. Arts</u>	<u>Title</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

**Sample Focus Areas:**

- Biological Sciences: one of MAT 163, MAT 164, PSY 215; two of BIO 355, BIO 473, BIO 481; two of MAT 363, MAT 369, MAT 373.
- Business, Economics, or Actuarial Science: ECO 112 or ECO 113; two of CSC 160, BUS 379, ECO 318, ECO 416, ECO 490, FIN 331, MAT 163, MAT 164, MAT 173, MKT 352; MAT 373; MAT 374 or MAT 377. (Only one of BUS 379, MAT 163 and MAT 164 may count).
- Computational Mathematics: CSC 170; CSC 210; one of CSC 320, CSC 385, CSC 457; two of MAT 304, MAT 355, MAT 363, MAT 377.
- Physical Sciences: Two of PHY 121, PHY 122, CHM 353, CHM 361, CHM 364; two of MAT 324, MAT 327, MAT 355, MAT 369; a fifth course from this list.
- Statistics: One of MAT 164, BUS 379, PSY 215, SOC 362; MAT 324; MAT 373; MAT 374; one of ECO 490, MKT 352, PSY 315, SOC 363, or another applied statistics course approved by the department.
- Teaching Mathematics: ESE 330; MAT 252; MAT 287; MAT 314; MAT 324
- Theoretical mathematics: MAT 314; MAT 324; at least three of MAT 252, MAT 287, MAT 304, MAT 363, MAT 373, or regularly offered courses at other ACTC colleges in Complex Variables, Topology, Measure Theory/Real Analysis II, Abstract Algebra II, Combinatorics.

_____	_____	BIO 355	<input type="checkbox"/> Genetics (Prereq: BIO 253 and MAT 114, 145, 163, 164 or PSY 215)
_____	_____	BIO 473	<input type="checkbox"/> Animal Physiology (Prereq: BIO 253 and MAT 114, 145, 163, 164 or PSY 215)
_____	_____	BIO 481	<input type="checkbox"/> Ecology (Prereq: BIO 253 and MAT 114, 145, 163, 164 or PSY 215)
_____	_____	BUS 379	<input type="checkbox"/> Quantitative Methods for Business & Economics (Prereq: MIS 260 & MPG 3)
_____	_____	CHM 353	<input type="checkbox"/> Quantitative Analytical Chemistry (Prereq: MPG 3 & CHM 106 or 116)
_____	_____	CHM 361	<input type="checkbox"/> Physical Chemistry I (Prereq: Waived from or passed GST 100, CHM 106 or 116, MAT 145 & 146, PHY 121 & 122)
_____	_____	CHM 364	<input type="checkbox"/> Physical Chemistry II (Prereq: CHM 361)
_____	_____	CSC 160	<input type="checkbox"/> Introduction to Computer Science & Communication (Prereq: MPG 3)
_____	_____	CSC 170	<input type="checkbox"/> Structured Programming (Prereq: Waived from or passed GST 100, MPG 3 & CSC 160)
_____	_____	CSC 210	<input type="checkbox"/> Data Structures (Prereq: Prereq: Waived from or passed GST 100, MPG 4, CSC 170, and either MAT 145 or 171)
_____	_____	CSC 320	<input type="checkbox"/> Algorithms (Prereq: Waived from or passed GST 100, CSC 210, MPG 4 & MAT 145 or 171)
_____	_____	CSC 385	<input type="checkbox"/> Formal Logic and Computation Theory (Prereq: CSC 210 and MAT 145 or MAT 171)
_____	_____	CSC 457	<input type="checkbox"/> Computer Graphics (Prereq: CSC 210 & MPG 4)
_____	_____	ECO 112 SBS	<input type="checkbox"/> Principles of Macroeconomics (Prereq: MPG 3)
_____	_____	or ECO 113 SBS	<input type="checkbox"/> Principles of Microeconomics (Prereq: MPG 3)
_____	_____	ECO 318	<input type="checkbox"/> Management Science (Prereq: MPG 3 and ECO 113)
_____	_____	ECO 416	<input type="checkbox"/> Mathematical Economics (Prereq: ECO 312 or 313, MAT 145)
_____	_____	ECO 490	<input type="checkbox"/> Research Methods in Econometrics (Prereq: ECO 112 & ECO 113, ENL 111,112 or HON 111)
_____	_____	ESE 330	<input type="checkbox"/> 5-12 Methods: Mathematics (Prereq: PPST and admission to Education dept.)
_____	_____	FIN 331	<input type="checkbox"/> Financial Management (Prereq: MPG 3, ACC 221, and ECO 112 or 113)
_____	_____	MAT 163 NSM	<input type="checkbox"/> Introduction to Statistics (Prereq: MPG 3)
_____	_____	MAT 164 NSM	<input type="checkbox"/> Introduction to Biostatistics (Prereq: MPG 4)
_____	_____	MAT 173 NSM	<input type="checkbox"/> Introduction to Mathematical Finance (Prereq: MPG 3)
_____	_____	MAT 252	<input type="checkbox"/> Exploring Geometry (Prereq: MAT 145)
_____	_____	MAT 287	<input type="checkbox"/> History of Mathematics (Prereq: MAT 145)
_____	_____	MAT 304	<input type="checkbox"/> Graph Theory (Prereq: MAT 271, ENL 111, 112 or HON 111 & COM 111, 112, 115 or MAT 201. Also recommended MAT 246)
_____	_____	MAT 314	<input type="checkbox"/> Abstract Algebra (Prereq: MAT 246, MAT 271, ENL 111, 112 or HON 111 & COM 111, 112, 115 or MAT 201)
_____	_____	MAT 324	<input type="checkbox"/> Analysis (Prereq: MAT 146, MAT 271, ENL 111, 112 or HON 111 & COM 111, 112, 115 or MAT 201. Also recommended: additional MAT course numbered 200 or higher)
_____	_____	MAT/PHY 327	<input type="checkbox"/> Special Functions of Mathematical Physics (Prereq: MAT 245 & PHY 122 or consent)
_____	_____	MAT 355	<input type="checkbox"/> Numerical Mathematics and Computation (Prereq: MAT 146, CSC 160, ENL 111, 112 or HON 111 & COM 111, 112, 115 or MAT 201.)
_____	_____	MAT 363	<input type="checkbox"/> Chaotic Dynamical Systems (Prereq: MAT 146 & MAT 246, 269 or 271)
_____	_____	MAT 369	<input type="checkbox"/> Modeling & Differential Equations in Biology and Natural Sciences (Prereq: MAT 245, ENL 111, 112 or HON 111 & COM 111, 112, 115 or MAT 201)
_____	_____	MAT 373	<input type="checkbox"/> Probability and Statistics I (Prereq: MAT 245; Also recommended MAT 271)
_____	_____	MAT 374	<input type="checkbox"/> Probability and Statistics II (Prereq: MAT 373, ENL 111, 112 or HON 111 & COM 111, 112, 115 or MAT 201.)
_____	_____	MAT 377	<input type="checkbox"/> Operations Research (Prereq: MAT 246, ENL 111, 112 or HON 111 & COM 111, 112, 115 or MAT 201.)
_____	_____	MAT 395/495	<input type="checkbox"/> Topics/Advanced Topics in Mathematics (Prereq: at least two MAT courses above 200 & consent of instructor. For 495, an additional upper division MAT course)
_____	_____	MKT 352	<input type="checkbox"/> Marketing Research (Prereq: MKT 252)
_____	_____	PHY 121 NSM – lab	<input type="checkbox"/> General Physics I (Prereq: MAT 145 or concurrent registration)
_____	_____	PHY 122 NSM – lab	<input type="checkbox"/> General Physics II (Prereq: PHY 121, ENL 111, 112 or HON 111, & MAT 146 or concurrent registration)
_____	_____	PSY 215	<input type="checkbox"/> Research Methods: Design, Procedure & Analysis (Prereq: PSY 105, MPG 3, Waived from or passed GST 100 and sophomore status)
_____	_____	PSY 315	<input type="checkbox"/> Research Methods: Design, Procedure & Analysis II (Prereq: PSY 215 with a grade of 2.0 or higher; ENL 111 or 112 or HON 111)
_____	_____	SOC 362	<input type="checkbox"/> Statistical Analysis (Prereq: MPG 3)
_____	_____	SOC 363	<input type="checkbox"/> Management Science (Prereq: SOC 362, ENL 111 or 112 or HON 111 or consent)

\*\*No more than one of MAT 163, MAT 164, PSY 215, or SOC 362 may count toward the supporting courses

**Notes:**

- **GPA:** Grade of 2.0 or above is required in each course applicable to the Mathematics major.
- **B.S. Waiver:** Student completing the B.S. in Mathematics may waive two Liberal Arts Foundation courses (in two different areas), or waive the two-course Modern Language requirement.
- **Keystone:** Complete KEY 490 or a Keystone through a different department as part of a second major or minor.
- **Abbreviation Key:** ML = Modern Language; SC = Signature Curriculum; EM = Engaging Minneapolis; AE = Augsburg Experience; KC = Senior Keystone Course; NSM = Natural Science & Mathematics - no lab; NSM-L = Natural Science & Mathematics-with lab; SBS = Social & Behavioral Science; FA = Fine Arts; HUM = Humanities;

## Planning Sheet: GRADUATION SKILLS REQUIREMENTS

These requirements were implemented for Fall 2008. Please talk with your faculty advisor for information.

**Graduation skills, including the Quantitative Reasoning requirements, are completed as follows.** Graduation skills in Critical Thinking, Writing, Speaking, and Quantitative Reasoning are required for graduation. Critical Thinking is embedded in all majors. Plans for completion of other graduation skills are determined by the major department. Consult your department chair or faculty advisor to select appropriate courses to meet the Quantitative Reasoning (QR) graduation skill. QR is satisfied by completing one (1) Quantitative Foundational course (QF) and one (1) Quantitative Application course (QA), or one (1) combined QFA course. The most current information on Graduation Skills can be found in the Augsburg College catalog at [www.augsburg.edu/catalog/](http://www.augsburg.edu/catalog/).

**Transfer students must consult an advisor about potential adjustments to their course requirements to fulfill each graduation skill.**

Designated Major Course	GRADUATION SKILLS – Mathematics		Completed
Embedded in major	<b>Writing Requirements</b> TWO (2) Writing courses		
Embedded in major			
MAT 201, COM 111, COM 115 or other approved speaking course	<b>Speaking</b> One (1) Speaking course		
Designated Major Course	QUANTITATIVE REASONING		Completed
Embedded in major	<b>Quantitative Foundations &amp; Applications</b> One (1) QFA course (Prereq: MPG3)	QFA course	
<b>– OR –</b>			
Embedded in major	<b>Quantitative Foundations and Quantitative Applications</b> One (1) QF course (Prereq: MPG 3) <b>and</b> one (1) QA course		QF course
Embedded in major			QA course

## Graduation Tally Checklist

These requirements were implemented in April 2003 and remain in effect until further notice.

Requirement	Progress Towards Completion	
<b>Cumulative Course Credits</b> <ul style="list-style-type: none"> <li>▪ Minimum number of course credits needed for graduation = 32</li> <li>▪ At least 8 credits completed at Augsburg.</li> <li>▪ 6 of last 8 credits completed in residence.</li> <li>▪ Second degree – minimum of 8 credits completed in residence.</li> </ul>	Transfer Credits Earned	
	+ Aug. Credits Earned	
	= Total Credits Earned	
	# Credits Needed	

<b>Grade Point Average (GPA)</b> <ul style="list-style-type: none"> <li>▪ Minimum 2.0 GPA required in major, minor, &amp; overall.</li> <li>▪ Some majors require higher GPA.</li> <li>▪ Latin Honors GPA requirements:                             <ul style="list-style-type: none"> <li>○ Summa cum laude: 3.9-4.0</li> <li>○ Magna cum laude: 3.80-3.89</li> <li>○ Cum laude: 3.60-3.79</li> </ul> </li> </ul>	Cumulative GPA	
	Major 1 GPA	
	Major 2 GPA	
	Minor GPA	

Other Limits	Minimum/Maximum	Your Total
<b>Overall maximum courses graded Pass/No Pass (P/N)</b> <ul style="list-style-type: none"> <li>▪ Grade of 2.0 or above required to Pass and earn credit for course.</li> <li>▪ Maximum of 2 of 6 credits P/N may be in major.</li> </ul>	Maximum of 6	
<b>Major Courses graded Pass/No Pass (P/N)</b>	Maximum of 2	
<b>Latin Honors courses graded Pass/No Pass (P/N)</b>	Maximum of 2	
<b>Latin Honors traditionally graded courses</b>	Minimum of 14	
<b>Internships</b>	Maximum of 4	
<b>Independent/Directed Studies</b>	Maximum of 2	