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Planning Sheet: BACHELOR OF SCIENCE in MATHEMATICS

(This major consists of 13 courses)

Mathematics major core requirements:

Term	Grade	Course #	AugCore	Title
_____	_____	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: Pass CT assessment or GST 100, MAT 146 or MAT 163 & MAT 145. CSC 160 recommended)
_____	_____	MAT 491		Mathematics Colloquium (0.0 credits, in junior and senior years)

Select & complete one of the following:

_____	_____	MAT 201		Communicating Mathematics (0.5 credits) (Prereq: MAT 146)
		COM 111	HUM	Public Speaking
		COM 115	HUM	Scientific and Technical Public Speaking
				Other Approved Speaking Course: _____

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 Requirements: Seven (7) electives or supporting courses chosen from MAT courses numbered above 250 and approved supporting courses. At least four (4) electives must be MAT courses numbers above 250, at least three (3) of which are numbered above 300. Electives must include a *Theoretical structures* course, a *Statistical perspectives* course, and an *Applied project* course. **At least five (5) of the seven electives must be chosen from an approved focus area: Biological sciences; Business, economics or auctorial science; Computational mathematics; Physical sciences; Statistics; Teaching mathematics; Theoretical mathematics; or other approved focus area.**

Mathematics Electives:

Theoretical structures: MAT 314, MAT 324, MAT 304, or other department approved course

_____ MAT _____ Theoretical structures MAT Elective: _____

Statistical perspectives: MAT 163, MAT 164, MAT 373, BUS 379, PSY 215, SOC 362, or other department approved course

_____ MAT _____ Statistical perspectives MAT Elective: _____

Applied project: MAT 355, MAT 369, MAT 374, MAT 377, or other department approved course

_____ MAT _____ Applied project MAT Elective: _____

Notes:

- **Focus Area:** See your faculty advisor to plan out your math electives to fulfill a focus area. At least five (5) of the seven (7) elective must be chosen from a focus area.
- **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; QA = Quantitative Applications; QF = Quantitative Foundations; QFA = Quantitative Foundations & Applications.

Complete Four (4) additional electives & supporting courses corresponding to focus area:

_____	_____	BIO 355	<input type="checkbox"/> Genetics (Prereq: BIO 253)
_____	_____	BIO 473	<input type="checkbox"/> Animal Physiology (Prereq: BIO 253)
_____	_____	BIO 481	<input type="checkbox"/> Ecology (Prereq: BIO 253, MPG 4 or MAT 163 or PSY 215)
_____	_____	BUS 379	<input type="checkbox"/> Genetics (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: CHM 106 or 116, MAT 145 & MAT 146, PHY 121 & PHY 122)
_____	_____	CHM 364	<input type="checkbox"/> Physical Chemistry II (Prereq: CHM 361)
_____	_____	CSC 160 (recommended)	<input type="checkbox"/> Introduction to Computer Science & Communication (Prereq: MPG 3)
_____	_____	CSC 170	<input type="checkbox"/> Structured Programming (Prereq: Pass CT assessment or GST 100, MPG 3 & CSC 160)
_____	_____	CSC 210	<input type="checkbox"/> Data Structures (Prereq: Prereq: Pass CT assessment or GST 100, MPG 4, CSC 170, and either MAT 145 or 171)
_____	_____	CSC 320	<input type="checkbox"/> Algorithms (Prereq: Pass CT assessment or 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, 313, MAT 122)
_____	_____	ECO 490	<input type="checkbox"/> Research Methods in Econometrics (Prereq: ECO 112 and ECO 113, ENL 111 or 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 271	<input type="checkbox"/> Discrete Mathematical Structures (Prereq: MAT 146 or MAT 163 & MAT 145)
_____	_____	MAT 287	<input type="checkbox"/> History of Mathematics (Prereq: MAT 145)
_____	_____	MAT 304	<input type="checkbox"/> Graph Theory (Prereq: MAT 271 & COM 111, 112, 115 or MAT 201 & ENL 111, 112 or HON 111)
_____	_____	MAT 314	<input type="checkbox"/> Abstract Algebra (Prereq: MAT 246 & MAT 271)
_____	_____	MAT 324	<input type="checkbox"/> Analysis (Prereq: MAT 146, MAT 271; 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 of instructor)
_____	_____	MAT 355	<input type="checkbox"/> Numerical Mathematics and Computation (Prereq: MAT 146 & CSC 160)
_____	_____	MAT 363	<input type="checkbox"/> Chaotic Dynamical Systems (Prereq: MAT 146 & MAT 246, 274 or 271)
_____	_____	MAT 369	<input type="checkbox"/> Modeling & Differential Equations in Biology and Natural Sciences (Prereq: MAT 245)
_____	_____	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)
_____	_____	MAT 377	<input type="checkbox"/> Operations Research (Prereq: MAT 246)
_____	_____	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: ENL 111, PHY 121, & MAT 146 or concurrent reg.)
_____	_____	PSY 215	<input type="checkbox"/> Research Methods: Design, Procedure & Analysis (Prereq: PSY 105, MPG 3, Pass CT assessment or 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 support courses

See back for information on graduation skills requirements

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 online at www.augsburg.edu/catalog/ and clicking on "Graduation Skills Catalog Supplement 2008 – 2010" near the bottom of the page.

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	Writing Requirements TWO (2) Writing courses		
Embedded in major			
MAT 201, COM 111, COM 115 or other approved speaking course	Speaking One (1) Speaking course		
Designated Major Course	QUANTITATIVE REASONING		Completed
MAT 145 or MAT 146	Quantitative Foundations & Applications One (1) QFA course (Prereq: MPG3)	QFA course	
– OR –			
N/A	Quantitative Foundations and Quantitative Applications One (1) QF course (Prereq: MPG 3) <u>and</u> one (1) QA course		QF course
N/A			QA course

Graduation Tally Checklist

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

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

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

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

Sample Four-Year Plan (B.S.)

This is a possible plan for the Bachelor of Science in Mathematics, though there are many configurations of courses. Students should complete MAT 145 and MAT 146 during the first year. Liberal Arts Foundation (LAF), Modern Language and other Core courses are more flexible. If you are planning a double major, teaching certification, revisions will be needed to this sample plan. Please talk with your Mathematics faculty advisor for more information.

Freshman Year

Fall Term (4)

MAT 145
CSC 160 (recommended)
Focus Area Supporting/MAT Elective
ENL 111
AugSem

Spring (4)

MAT 146
Major/Minor or Elective
LAF Course
REL 100
HPE 001

Sophomore Year

Fall Term (4)

MAT 245
MAT 271
Modern Language
LAF Course
HPE Skill

Spring (4.5)

MAT 246
Modern Language
LAF Course
REL 200
MAT 201(0.5 credit)

Junior Year

Fall Term (4)

MAT Elective (Theoretical Structures)
Focus Area Supporting/MAT Elective
LAF Course
Major/Minor or Elective
MAT 491 (non-credit)

Spring (4)

MAT Elective (Applied Project)
Focus Area Supporting/MAT Elective
LAF Course
Major/Minor or Elective
MAT 491 (non-credit)

Senior Year

Fall Term (4)

MAT Elective (Statistical Perspectives)
Major/Minor or Elective
Major/Minor or Elective
Major/Minor or Elective
MAT 491 (non-credit)

Spring (4)

Focus Area Supporting/MAT Elective
Keystone Course
Major/Minor or Elective
Major/Minor or Elective
MAT 491 (non-credit)

Notes:

- Grade of 2.0 or above is required in each course applicable to the Mathematics major.
- At least two MAT courses number 250 or above must be completed at Augsburg.
- Talk with your faculty advisor about your focus area and experiential requirement.
- Computer Science double majors do not get the B.S. waivers.

What can I do with a Math major?

The following jobs are some of the positions that mathematics majors could pursue. Many require professional or graduate school.

Actuary
Auditor
Consultant
Database Administrator
Developer
Economist
Engineer
Financial Analyst
Lawyer
Loan Officer
Market Researcher

Mathematician
Operations Manager
Professor
Programmer
Researcher
Statistician
Systems Analyst
Teacher
Technical Writer
Underwriter

Mathematics Department

The Mathematics Department is located in Science Hall 137. You may contact the following faculty for more information on the major requirements, and also check out the website at www.augsburg.edu/mathematics.

Matthew J Haines, Associate Professor
Department Chair
Phone: 612-330-1050
E-mail: haines@augsborg.edu

Pavel Bělík, Associate Professor
Phone: 612-330-1091
Email: belik@augsborg.edu

Tracy Bibelnieks, Associate Professor
Phone: 612-330-1335
Email: bibelnie@augsborg.edu

Suzanne Dorée, Associate Professor
Phone: 612-330-1059
Email: doree@augsborg.edu

Kenneth Kamisky, Professor
Phone: 612-330-1066
Email: kamisky@augsborg.edu

Sridevi Pudipeddi, Asst Professor
Phone: 612-330-1391
Email: pudipedd@augsborg.edu

Jody Sorenson, Associate Professor
Phone: 612-330-1064
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John Zobitz, Assistant Professor
Phone: 612-330-1065
Email: zobitz@augsborg.edu

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For more information on possible careers in mathematics, please talk with your faculty advisor, and also the Center for Service, Work and Learning.