

## Department of Mathematical Sciences

The Department of Mathematical Sciences at Bethel College is a community of Christian scholars and educators committed to preparing minds for action within the Kingdom of God (1 Peter 1:13).

### Department Mission

“The truth is that we encounter mathematicians everywhere, every day, but we hardly ever know it... It simply doesn’t occur to us that our bank manager might have a degree in math, or that the people who invent or manufacture DVDs and MP3 players employ large numbers of mathematicians, or that the technology that transmits those stunning pictures of the moons of Jupiter relies heavily on math... Your entire life bobs like a small boat on a vast ocean of mathematics.” (Ian Stewart, *Letters to a Young Mathematician*)

As a reflection of the Author of Creation, our universe is teeming with order. Science is the study of that created order; mathematics is the language humanity uses to facilitate that study. The mission of the Department of Mathematical Sciences is to equip students at every level to use mathematics as a tool for deeper understanding of the natural world as well as their own discipline. To this end, the department provides an essential balance of logical reasoning, conceptual understanding, and computational skills appropriate to students’ diverse needs.

### Department Objectives

In accordance with our mission, as well as the mission and vision of Bethel College, every course and program in our department aims to instill (in a manner appropriate to level of study):

- **Problem solving and logical reasoning** skills – Mathematical study teaches students to construct precise and concise arguments, and analyze the merits of a claim.
- **Experience in mathematical application** – Because of the wide range of mathematical applications, students must learn where and how mathematics can be applied within their discipline.
- **Quantitative literacy** – Applications of mathematics often involve large amounts of numerical data. Students must be proficient at analyzing such data, including any relevant technology.
- **Communication skills** – Mathematics is a very precise language. People that utilize mathematics must communicate it clearly, effectively, and precisely through both oral and written means.
- **Ethics** – Students must learn to grapple with ethical issues presented in such areas as statistical analysis.
- **Research skills** – Mathematics students must learn how to formulate and test mathematical hypotheses, and how to utilize content knowledge and research tools to justify these.

#### Please note:

- Any students considering a major in the mathematical sciences should plan on taking MATH 131 (Calculus 1) during their first semester freshman year. Students who do not have credit for MATH 131 and MATH 132 by the end of their freshman year will have a more difficult time completing a mathematical science major in a total of four years.
- Students who have passed the A.P. Calculus AB exam will receive credit for MATH 131 only, and will need to take MATH 132 during the spring semester of their freshman year. Those students who have taken and passed the A.P. Calculus BC exam will receive credit for both MATH 131 and MATH 132, and should plan on taking MATH 231 during their first semester freshman year.

### Mathematics Major

The Bachelor of Science in Mathematics program is designed to prepare students for either graduate studies in mathematics or applied mathematics in industry, including modeling, simulation, risk analysis (actuarial science), program development, cryptography, and statistical analy-

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sis. Because of the wide variety of opportunities for graduates, the program does not focus on any one specific career, but instead equips the student with fundamental critical thinking, logical reasoning skills, as well as the foundational technological and mathematical tools, necessary for pursuing any of these choices. Internships in specific areas of applied mathematics or summer research experiences are strongly encouraged.

For more information on opportunities for employment, visit the department website at <http://www.bethelcollege.edu/academics/undergrad/mathcomp/>.

### Mathematics Major

			HOURS
<b>General Studies</b>			
COMM	171	Speech Communication	3
ENGL	101	Written Communication II	3
ENGL	102	Written Communication III	3
PSYC	182	General Psychology	3
PHED	100	Lifelong Physical Awareness	0.5
SOC	151	Principles of Sociology	3
BIBL	215	Old Testament Literature	3
BIBL	216	New Testament Literature	3
		Foreign Language (two semesters)	6
		History Elective	3
		Art/Drama/Music	3
		Literature	3
PHIL	150	Logic & Critical Thinking	2
PHIL	250	Introduction to Philosophy	3
THEO	110	Exploring the Christian Faith	3
PHIL	452	Senior Experience	1
PHED	112-136	Physical Education Activities	1.5
			<u>47</u>
<b>Major</b>			
MATH	131	Calculus I	4
MATH	132	Calculus II	4
MATH	210	Discrete Mathematics	3
MATH	231	Calculus III	3
MATH	232	Differential Equations	3
MATH	241	Linear Algebra	3
MATH	252	Probability & Statistics	3
MATH	293	Mathematical Theory & Proof	3
MATH	331	Modern Geometry	3
MATH	341	Abstract Algebra	3
MATH	461	Real Analysis	3
ITSC	120	Introduction to Computing	3
ITSC	121	Computer Programming I	3
PHYS	121	General Physics I	4
PHYS	122	General Physics II	4
			<u>49</u>
		Electives needed to complete the degree	28

### Mathematics Minor

MATH	131	Calculus I	4
MATH	132	Calculus II	4
MATH	210	Discrete Mathematics	3
MATH	241	Linear Algebra	3
MATH	252	Probability & Statistics	3
MATH	293	Mathematical Theory & Proof	3
MATH	231	Calculus III, or	(3)
MATH	232	Differential Equations, or	(3)
MATH	331	Modern Geometry, or	3
MATH	341	Abstract Algebra, or	(3)
MATH	461	Real Analysis	(3)
			<u>23</u>

## Mathematics Education Major

The Bachelor of Arts in Mathematics Education program enables the student to combine the strengths of in-depth preparation in mathematics with the professional teacher education skills necessary for success in the secondary classroom. The program involves practical experience inside and outside the classroom, as well as faculty mentoring throughout class study and student teaching. Students have the option of certification for either grades 9-12 or grades 5-12.

		<b>HOURS</b>	
<b>General Studies</b>			
COMM	171	Speech Communication	3
ENGL	101	Written Communication II	3
ENGL	102	Written Communication III	3
PSYC	182	General Psychology	3
PHED	100	Lifelong Physical Awareness	0.5
SOC	151	Principles of Sociology	3
THEO	110	Exploring the Christian Faith	3
BIBL	215	Old Testament Literature	3
BIBL	216	New Testament Literature	3
		Foreign Language (two semesters)	6
HIST		History Elective	3
LIT		Literature	3
		Art/Drama/Music	3
PHIL	150	Logic & Critical Thinking	2
PHIL	250	Introduction to Philosophy	3
PHIL	452	Senior Experience	1
PHED	112-136	Physical Education Activities	<u>1.5</u>
			<b>47</b>
<b>Major</b>			
MATH	131	Calculus I	4
MATH	132	Calculus II	4
MATH	210	Discrete Mathematics	3
MATH	231	Calculus III	3
MATH	232	Differential Equations	3
MATH	241	Linear Algebra	3
MATH	252	Probability & Statistics	3
MATH	293	Mathematical Theory & Proof	3
MATH	331	Modern Geometry	3
MATH	341	Abstract Algebra	3
ITSC	120	Introduction to Computing	3
PHYS	121	General Physics I	<u>4</u>
			<b>39</b>
<b>Professional Education</b>			
EDUC	102	Foundations of Education	3
EDUC	204	Diversity in the Classroom	3
EDUC	205	Educational Pedagogy I	3
EDUC	305	Educational Pedagogy II	3
PSYC	285	Adolescent Growth & Development	2
SCED	446	Specific Methods in Math	3
SCED	448	Developmental Reading	3
SCED	449	Student Teaching	8
EDUC	441	Professional Education Seminar	<u>0-2</u>
			<b>28-30</b>
Electives needed to complete the degree			8-10

See *TEACHER EDUCATION* (page 144) for program admission and other information.