

# 3450

## MATHEMATICS

### Bachelor of Science

NOTE TO STUDENT: A student is expected to be familiar with the degree requirements. The following information has official approval of the Department of Theoretical and Applied Mathematics, but is intended only as a guide. Official degree requirements are established at the time of admission to the degree-granting college.

#### FIRST YEAR

##### Fall Semester

	<u>Semester Credit Hours</u>	<u>Prerequisites</u>
3450:221 Analytic Geometry-Calculus I (Note a.)	4	Placement Test or 3450:149
English Composition Requirement (Note c.)	4	Appropriate Placement by Adviser
Language Requirement (Note b.)	3-4	
Social Science Requirement (Note c.)	<u>3-4</u>	
	15-16	

##### Spring Semester

3450:222 Analytic Geometry-Calculus II (Note a.)	4	3450:221
English Composition Requirement	3	
Language Requirement (Note b.)	3-4	Sequential
Speech/Oral Communication (Note c.)	3	
Physical Education/Wellness (Note c.)	<u>1-3</u>	
	14-18	

#### SECOND YEAR

##### Fall Semester

3450:223 Analytic Geometry-Calculus III (Note a.)	4	3450:222
Language Requirement (Note b.)	3	Sequential
Natural Science Requirement (Note c.)	3-4	
3450:307 Fundamentals of Advanced Mathematics	3	3450:222
Elective (Dept. approved 300/400 level)	<u>3</u>	
	16-17	

##### Spring Semester

3450:312 Linear Algebra	3	3450:223
Natural Science Requirement (Note c.)	3-4	
Social Science Requirement (Note c.)	3-4	
Language Requirement (Note b.)	3	Sequential
3460:209 Introduction to Computer Science	<u>4</u>	3450:145 or 149
	16-18	

#### NOTES:

- a. Grade of C- or better is required.
- b. Completion of the second year of a foreign language or sign language is required. See your adviser for placement.
- c. Please see the General Education Guide for options at <http://www.uakron.edu/advising/docs/GEN-EDUC.pdf>

**POLICY ALERT: 1) By the end of your first 48 credit hours attempted, you must have completed your General Education English, Math, and Communications (Speech) requirements; 2) By the end of your first 48 credit hours attempted, you must have declared a major and transferred to (been accepted by) a degree granting college at The University of Akron.**

# 3450

## APPLIED MATHEMATICS

### Bachelor of Science

NOTE TO STUDENT: A student is expected to be familiar with the degree requirements. The following information has official approval of the Department of Theoretical and Applied Mathematics, but is intended only as a guide. Official degree requirements are established at the time of admission to the degree-granting college.

#### FIRST YEAR

<u>Fall Semester</u>	<u>Semester Credit Hours</u>	<u>Prerequisites</u>
3450:221 Analytic Geometry-Calculus I (Note a.)	4	Placement Test or 3450:149
English Composition Requirement (Note c.)	4	Appropriate Placement by Adviser
Beginning Foreign Language I (Note b.)	4	
Social Science Requirement (Note c.)	<u>3-4</u>	
	15-16	
 <u>Spring Semester</u>		
3450:222 Analytic Geometry-Calculus II (Note a.)	4	3450:221
English Composition Requirement	3	
Beginning Foreign Language II	4	Sequential
Speech/Oral Communication (Note c.)	3	
Physical Education/Wellness (Note c.)	<u>1-3</u>	
	15-18	

#### SECOND YEAR

<u>Fall Semester</u>	<u>Semester Credit Hours</u>	<u>Prerequisites</u>
3450:223 Analytic Geometry-Calculus III (Note a.)	4	3450:222
Intermediate Foreign Language I	3	Sequential
Natural Science Requirement (Note c.)	3-4	
3460:209 Introduction to Computer Science	4	3450:145 or 149
Elective	<u>3</u>	
	17-18	
 <u>Spring Semester</u>		
3450:335 Introduction to Ordinary Differential Equations	3	3450:223
3450:312 Linear Algebra	3	3450:222
Social Science Requirement (Note c.)	3-4	
Natural Science Requirement (Note c.)	3-4	
Intermediate Foreign Language II	<u>3</u>	Sequential
	15-17	

#### NOTES:

- a. Grade of C – or better is required.
- b. Completion of the second year of a foreign language is required. See your adviser for placement.
- c. Please see the General Education Guide for options at <http://www.uakron.edu/advising/docs/GEN-EDUC.pdf>

**The student in Applied Mathematics should note the requirement of a 6 credit sequence at the 300/400 level in some approved applied area such as chemistry, physics, engineering, computer science, or economics. For this reason, these students are strongly urged to satisfy part of the social science requirement by taking 3250:200, Principles of Microeconomics or 3250:244, Economic Analysis. Students are also urged to satisfy the Natural Science Requirement with 3150:151, Principles of Chemistry I, or 3650:291, Elementary Classical Physics I, and the appropriate sequential course depending on the student's prospective applied area.**

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**IN GENERAL:** The recent rise in the field of automation and computing has been a significant factor in the greatly increased need for mathematicians at the Bachelor's level and especially at the higher degree levels. The physical and engineering sciences have been traditionally dependent upon mathematics, and, due to recent developments, a similar situation exists with the biological, behavioral, and social sciences. The early emphasis in college mathematics is on problem-solving, but this is later subordinated to the more important task of formulation of problems in mathematical language and in dealing with mathematical structures and abstract ideas. Hence, prospective mathematicians should plan to pursue college and graduate training to the highest level of which they are capable; i.e., a student obtaining a B average should plan to study for a Master's degree.

**JOB DESCRIPTION:** **I. Teaching** - Job openings in teaching exist in junior high and high schools, in community or junior colleges, and in colleges and universities. These three have different requirements as to degree levels and subject matter taken as electives.

- II. Industry** - Industrial mathematicians are in demand, and it is estimated that many of them need training beyond a Bachelor's degree. Many courses of a theoretical nature are needed, but the primary concern of a mathematician in industry is the actual solution of problems. Particular types of jobs include consulting, research, operations research (for management decisions), and computing; and it is very desirable to have additional background in such fields as engineering, physics, chemistry, or economics.
- III. Government** - Government service (or service at a university working on a government contract as a mathematician immediately after undergraduate school) usually has some computational aspect, i.e., finding numerical solutions to routine problems. The level of work becomes more difficult, and the responsibility increases with experience and positions. In general, jobs are similar to those in industry. Some government jobs demand a working knowledge of languages.
- IV. Actuarial profession** - This profession requires a competent mathematical and statistical ability, adequate economic and financial knowledge and wide social information. Most actuaries are hired by life insurance companies, and their primary concern is with calculating premium rates and preparing tables of death rates. However, there are casualty and fire actuaries and consulting actuaries/ the latter is often involved with pension plans, retirement, and welfare. A Bachelor's degree is very useful, and a broad business background is helpful.
- V. Salary Level** - The starting salary range for various degree levels depends on the job category, the employer, and the job locale. It appears to fluctuate with the cost of living; there is no particular starting salary. The starting salary for mathematicians with the B.S. degree is approximately \$45,000 per year.

**TRANSFER TO COLLEGE OF ARTS AND SCIENCES:** A student should apply for transfer to the college upon completion of 30 credits and a 2.0 or better overall GPA (including transfer work). In addition, the student must have achieved a 2.0 in all coursework in the major field (including transfer work). The 30 credits must include the completion of both required English Composition courses and 3 credits of mathematics or statistics which meets the General Education requirement. This transfer process is completed through an appointment with an academic adviser, the Academic Advisement Center, Simmons Hall 205, (330) 972-7430, or Summit College, Polsky 301, (330) 972-7220, depending upon the college in which you reside.

**PLACEMENT:** A student is encouraged to check with his/her major department and with the Center for Career Management, Simmons Hall 301, (330) 972-7747, regarding employment opportunities in the field.

**COLLEGE OF ARTS & SCIENCES:** Degree requirements include the first and second year of a foreign language or sign language, 47 credits of 300/400 level courses, not including workshops or any of the Humanities in the Western Tradition or Area Studies and Cultural Diversity (World Civ) requirements. Consult the department if you have any questions.