

MATHEMATICS - B.S.

College of Arts and Sciences
Department of Mathematical Sciences
www.kent.edu/math

Examples of Possible Careers*

Mathematical science teachers, postsecondary

- 1.3% slower than the average
- 60,100 number of jobs
- \$73,650 potential earnings

Mathematicians

- 3.0% about as fast as the average
- 2,900 number of jobs
- \$110,860 potential earnings

Natural sciences managers

- 4.8% about as fast as the average
- 71,400 number of jobs
- \$137,940 potential earnings

Secondary school teachers, except special and career/technical education

- 3.8% about as fast as the average
- 1,050,800 number of jobs
- \$62,870 potential earnings

Contact Information

- Program Coordinator: **Xiaoyu Zheng** | xzheng3@kent.edu | 330-672-9089
- Speak with an Advisor
 - Kent Campus
 - Stark Campus
- Chat with an Admissions Counselor

Fully Offered

- Kent Campus
- Stark Campus

*Note

Source of occupation titles and labor data is from the U.S. Bureau of Labor Statistics'

Occupational Outlook Handbook. Data comprises projected percent change in employment over the next 10 years; nation-wide employment numbers; and the yearly median wage at which half of the workers in the occupation earned more than that amount and half earned less.

Description

The Bachelor of Science degree in Mathematics comprises core areas in algebra (number systems, equations, discrete structures), analysis (functions, limits, continuous processes), geometry (space, shape, form) and associated generalizations and abstractions.

The B.S. degree program is recommended for students interested in a flexible option of careers or graduate study in mathematics. Coupled with the Education minor, the program can lead to Ohio teacher licensure.

Students may apply early to the M.S. in Pure Mathematics program and double count 9 credit hours of graduate courses toward both degree programs. See the Combined Bachelor's/Master's Degree Program policy in the University Catalog for more information.

Admission Requirements

The university affirmatively strives to provide educational opportunities and access to students with varied backgrounds, those with special talents and adult students who graduated from high school three or more years ago.

Freshman Students on the Kent Campus: The freshman admission policy on the Kent Campus is selective. Admission decisions are based upon the following: cumulative grade point average, ACT and/or SAT scores, strength of high school college preparatory curriculum and grade trends. The Admissions Office at the Kent Campus may defer the admission of students who do not meet admissions criteria but who demonstrate areas of promise for successful college study. Deferred applicants may begin their college coursework at one of seven regional campuses of Kent State University. For more information on admissions, including additional requirements for some academic programs, visit the admissions website for first-year students.

Freshman Students on the Regional Campuses: Kent State campuses at Ashtabula, East Liverpool, Geauga, Salem, Stark, Trumbull and Tuscarawas, as well as the Twinsburg Academic Center, have open enrollment admission for students who hold a high school diploma, GED or equivalent.

English Language Proficiency Requirements for International Students: All international students must provide proof of English language proficiency (unless they meet specific exceptions) by earning a minimum 525 TOEFL score (71 on the Internet-based version), minimum 75 MELAB score, minimum 6.0 IELTS score, minimum 48 PTE score or minimum 100 DET score; or by completing the ESL level 112 Intensive Program. For more information on international admission, visit the Office of Global Education's admission website.

Transfer, Transitioning and Former Students: For more information about admission criteria for transfer, transitioning and former students, please visit the admissions website.

Program Learning Outcomes

Graduates of this program will be able to:

1. Reason in mathematical arguments at a level appropriate to the discipline, including using precise definitions, articulating assumptions and reasoning logically to conclusions.
2. Engage effectively in problem solving, including exploring examples, devising and testing conjectures and assessing the correctness of solutions.
3. Approach mathematical problems creatively, including trying multiple approaches and modifying problems when necessary to make them more tractable.
4. Communicate mathematics clearly both orally and in writing.
5. Understand and appreciate connections among different subdisciplines of mathematics.

- Understand and appreciate connections between mathematics and other disciplines.
- Be aware of and understand a broad range of mathematical subdisciplines.

Professional Licensure Disclosure

This program is designed to prepare students to sit for applicable licensure or certification in Ohio. If you plan to pursue licensure or certification in a state other than Ohio, please review state educational requirements for licensure or certification and contact information for state licensing boards at Kent State's website for professional licensure disclosure.

University Requirements

All students in a bachelor's degree program at Kent State University must complete the following university requirements for graduation.

NOTE: University requirements may be fulfilled in this program by specific course requirements. Please see Program Requirements for details.

Destination Kent State: First Year Experience	1
Course is not required for students with 25 transfer credits, excluding College Credit Plus, or age 21+ at time of admission.	
Diversity Domestic/Global (DIVD/DIVG)	2 courses
Students must successfully complete one domestic and one global course, of which one must be from the Kent Core.	
Experiential Learning Requirement (ELR)	varies
Students must successfully complete one course or approved experience.	
Kent Core (see table below)	36-37
Writing-Intensive Course (WIC)	1 course
Students must earn a minimum C grade in the course.	
Upper-Division Requirement	39 (or 42)
Students must successfully complete 39 upper-division (numbered 30000 to 49999) credit hours to graduate. Students in a B.A. and/or B.S. degree in the College of Arts and Sciences must complete 42 upper-division credit hours.	
Total Credit Hour Requirement	120
Some bachelor's degrees require students to complete more than 120 credit hours.	

Kent Core Requirements

Kent Core Composition (KCOMP)	6
Kent Core Mathematics and Critical Reasoning (KMCR)	3
Kent Core Humanities and Fine Arts (KHUM/KFA) (min one course each)	9
Kent Core Social Sciences (KSS) (must be from two disciplines)	6
Kent Core Basic Sciences (KBS/KLAB) (must include one laboratory)	6-7
Kent Core Additional (KADL)	6
Total Credit Hours:	36-37

Program Requirements

Major Requirements

Code	Title	Credit Hours
Major Requirements (courses count in major GPA) ¹		
MATH 12002	ANALYTIC GEOMETRY AND CALCULUS I (KMCR) (min C grade)	5

MATH 12003	ANALYTIC GEOMETRY AND CALCULUS II (min C grade)	5
MATH 20011	DECISION-MAKING UNDER UNCERTAINTY	3
MATH 21001	LINEAR ALGEBRA (min C grade)	3
MATH 22005	ANALYTIC GEOMETRY AND CALCULUS III (min C grade)	4
MATH 31011	PROOFS IN DISCRETE MATHEMATICS (min C grade)	3
MATH 32044	ORDINARY DIFFERENTIAL EQUATIONS	3
MATH 41001	MODERN ALGEBRA I (ELR) (WIC) (min C grade) ²	3
MATH 41002	MODERN ALGEBRA II (ELR) (WIC)	3
MATH 41021	THEORY OF MATRICES	3
MATH 42001	ANALYSIS I (ELR) (WIC) (min C grade) ²	3
MATH 42002	ANALYSIS II (ELR) (WIC)	3
PHY 23101	GENERAL UNIVERSITY PHYSICS I (KBS) (KLAB)	5
Computer Science Elective, choose from the following:		4
CS 10062	PROGRAMMING FOR PROBLEM SOLVING IN SCIENCES	
CS 13001	COMPUTER SCIENCE I: PROGRAMMING AND PROBLEM SOLVING	
CS 13011 & CS 13012	COMPUTER SCIENCE IA: PROCEDURAL PROGRAMMING and COMPUTER SCIENCE IB: OBJECT ORIENTED PROGRAMMING	
Pure Mathematics Electives, choose from the following:		9
MATH 42021	GRAPH THEORY AND COMBINATORICS	
MATH 42048	COMPLEX VARIABLES	
MATH 45011	DIFFERENTIAL GEOMETRY	
MATH 45021	EUCLIDEAN GEOMETRY	
MATH 45022	LINEAR GEOMETRY	
MATH 46001	ELEMENTARY TOPOLOGY	
MATH 47011	THEORY OF NUMBERS	
Applied Mathematics Sequence, choose from the following:		6-8
MATH 40011 & MATH 40012	PROBABILITY THEORY AND APPLICATIONS and THEORY OF STATISTICS	
MATH 40055 & MATH 40056	ACTUARIAL MATHEMATICS I (ELR) (WIC) and ACTUARIAL MATHEMATICS II ²	
MATH 42031 & MATH 42039	MATHEMATICAL MODELS AND DYNAMICAL SYSTEMS and MODELING PROJECTS (ELR) (WIC) ²	
MATH 42041 & MATH 42045	ADVANCED CALCULUS and PARTIAL DIFFERENTIAL EQUATIONS	
MATH 42201 & MATH 42202	NUMERICAL COMPUTING I and NUMERICAL COMPUTING II	
Allied Area Electives, choose from the following: ³		6
BSCI 30050	HUMAN GENETICS	
BSCI 40020	BIOLOGY OF AGING	
CHEM 30050	INTRODUCTION TO MATERIALS CHEMISTRY	
CHEM 30105	ANALYTICAL CHEMISTRY I	
CHEM 30106	ANALYTICAL CHEMISTRY II	
CHEM 30301	INORGANIC CHEMISTRY I	
CHEM 40302	INORGANIC CHEMISTRY II	
CHEM 40303	INORGANIC CHEMISTRY III	
CHEM 40555	PHYSICAL CHEMISTRY I	
CHEM 40556	PHYSICAL CHEMISTRY II	
CHEM 40559	NANOMATERIALS	
CS 33007	INTRODUCTION TO DATABASE SYSTEM DESIGN	

CS 33101	STRUCTURE OF PROGRAMMING LANGUAGES	MATH 30055	MATHEMATICAL THEORY OF INTEREST
CS 33211	OPERATING SYSTEMS	MATH 38001	HANDS-ON MATHEMATICS
CS 33901	SOFTWARE ENGINEERING	MATH 40011	PROBABILITY THEORY AND APPLICATIONS
CS 35101	COMPUTER ORGANIZATION	MATH 40012	THEORY OF STATISTICS
CS 35201	COMPUTER COMMUNICATION NETWORKS	MATH 40015	APPLIED STATISTICS
CS 38101	INTRODUCTION TO GAME PROGRAMMING	MATH 40024	COMPUTATIONAL STATISTICS
CS 43006	THEORY OF OBJECT-ORIENTED PROGRAMMING	MATH 40028	STATISTICAL LEARNING
CS 43111	STRUCTURE OF COMPILERS	MATH 40051	TOPICS IN PROBABILITY THEORY AND STOCHASTIC PROCESSES
CS 43202	SYSTEMS ADMINISTRATION	MATH 40055	ACTUARIAL MATHEMATICS I (ELR) (WIC) ²
CS 43203	SYSTEMS PROGRAMMING	MATH 40056	ACTUARIAL MATHEMATICS II
CS 43301	SOFTWARE DEVELOPMENT FOR ROBOTICS	MATH 40059	STOCHASTIC ACTUARIAL MODELS
CS 43305	ADVANCED DIGITAL DESIGN	MATH 42011	MATHEMATICAL OPTIMIZATION
CS 43401	SECURE PROGRAMMING	MATH 42021	GRAPH THEORY AND COMBINATORICS
CS 44001	COMPUTER SCIENCE III-PROGRAMMING PATTERNS	MATH 42024	NUMBERS AND GAMES
CS 44003	MOBILE APPS IN IOS PROGRAMMING	MATH 42031	MATHEMATICAL MODELS AND DYNAMICAL SYSTEMS
CS 44105	WEB PROGRAMMING I	MATH 42039	MODELING PROJECTS (ELR) (WIC) ²
CS 44106	WEB PROGRAMMING II	MATH 42041	ADVANCED CALCULUS
CS 44201	ARTIFICIAL INTELLIGENCE	MATH 42045	PARTIAL DIFFERENTIAL EQUATIONS
CS 45203	COMPUTER NETWORK SECURITY	MATH 42048	COMPLEX VARIABLES
CS 45231	INTERNET ENGINEERING	MATH 42201	NUMERICAL COMPUTING I
CS 46101	DESIGN AND ANALYSIS OF ALGORITHMS	MATH 42202	NUMERICAL COMPUTING II
CS 47101	COMPUTER GRAPHICS	MATH 45011	DIFFERENTIAL GEOMETRY
CS 47205	INFORMATION SECURITY	MATH 45021	EUCLIDEAN GEOMETRY
CS 47206	DATA SECURITY AND PRIVACY	MATH 45022	LINEAR GEOMETRY
CS 47207	DIGITAL FORENSICS	MATH 46001	ELEMENTARY TOPOLOGY
CS 47221	INTRODUCTION TO CRYPTOLOGY	MATH 47011	THEORY OF NUMBERS
CS 48101	GAME ENGINE CONCEPTS	MATH 47021	HISTORY OF MATHEMATICS
GEOG 31062	FUNDAMENTALS OF METEOROLOGY	MATH 49992	INTERNSHIP IN MATHEMATICS (ELR)
GEOG 31064	PRINCIPLES OF CLIMATOLOGY	PHIL 41035	PHILOSOPHY OF SCIENCE
GEOG 35065	GEOGRAPHY OF TRANSPORTATION AND SPATIAL INTERACTION	PHIL 41038	INTERMEDIATE LOGIC
GEOG 39002	STATISTICAL METHODS IN GEOGRAPHY	PHIL 41045	METALOGIC
GEOG 41065	APPLIED CLIMATOLOGY	PHY 34000	COSMOLOGY
GEOG 44070	SPATIAL ANALYSIS AND LOCATION THEORY	PHY 35101	CLASSICAL MECHANICS
GEOG 49070	GEOGRAPHIC INFORMATION SCIENCE	PHY 36001	INTRODUCTORY MODERN PHYSICS
GEOG 49080	ADVANCED GEOGRAPHIC INFORMATION SCIENCE	PHY 36002	APPLICATIONS OF MODERN PHYSICS
GEOG 49085	WEB AND MOBILE GEOGRAPHIC INFORMATION SCIENCE	PHY 44802	ASTROPHYSICS
GEOG 49162	CARTOGRAPHY	PHY 45201	ELECTROMAGNETIC THEORY
GEOG 49230	REMOTE SENSING	PHY 45301	THERMAL PHYSICS
GEOL 31080	STRUCTURAL GEOLOGY	PHY 45401	MATHEMATICAL METHODS IN PHYSICS
GEOL 32066	GEOMORPHOLOGY	PHY 45403	DATA ANALYSIS AND COMPUTATIONAL PHYSICS TECHNIQUES
GEOL 41025	GENERAL GEOPHYSICS	PHY 45501	ELECTROMAGNETIC WAVES AND MODERN OPTICS
GEOL 41080	TECTONICS AND OROGENY	PHY 46101	QUANTUM MECHANICS
GEOL 42030	REMOTE SENSING	PHY 46301	INTRODUCTION TO NUCLEAR AND PARTICLE PHYSICS
GEOL 42035	SCIENTIFIC METHODS IN GEOLOGY	PHY 46401	INTRODUCTION TO SOLID STATE PHYSICS
ECON 32040	INTERMEDIATE MICROECONOMIC THEORY AND APPLICATIONS	Additional Requirements (courses do not count in major GPA)	
ECON 32041	INTERMEDIATE MACROECONOMIC THEORY AND POLICY	UC 10097	DESTINATION KENT STATE: FIRST YEAR EXPERIENCE 1
ECON 32050	APPLIED ECONOMETRICS I (ELR)	Foreign Language (see Foreign Language College Requirement below) 8	
ECON 32051	APPLIED ECONOMETRICS II	Kent Core Composition 6	
ECON 42050	DATA ACQUISITION, PREPARATION AND VISUALIZATION	Kent Core Humanities and Fine Arts (minimum one course from each) 9	
ECON 42070	GAME THEORY	Kent Core Social Sciences (must be from two disciplines) 6	
		Kent Core Basic Sciences 1	
		Kent Core Additional 6	

General Electives (total credit hours depends on earning 120 credit hours, including 42 upper-division credit hours)	12
Minimum Total Credit Hours:	120

- ¹ MATH 30011, MATH 34001 and MATH 34002 may not be applied to the major requirements.
- ² A minimum C grade must be earned to fulfill the writing-intensive course requirement.
- ³ A course may count toward only one requirement even though it may appear in more than one course list.

Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
2.000	2.000

Foreign Language College Requirement, B.S.

- Students pursuing the Bachelor of Science degree in the College of Arts and Sciences must complete 8 credit hours of foreign language.¹
- Minimum Elementary I and II of the same language

- ¹ All students with prior foreign language experience should take the foreign language placement test to determine the appropriate level at which to start. Some students may start beyond the Elementary I level and will complete the requirement with fewer credit hours and fewer courses. This may be accomplished by (1) passing a course beyond Elementary I through Intermediate II level; (2) receiving credit through one of the alternative credit programs offered by Kent State University; or (3) demonstrating language proficiency comparable to Elementary II of a foreign language. When students complete the requirement with fewer than 8 credit hours and two courses, they will complete remaining credit hours with general electives.

Roadmap

This roadmap is a recommended semester-by-semester plan of study for this major. However, courses designated as critical (!) must be completed in the semester listed to ensure a timely graduation.

Semester One			Credits
!	MATH 12002	ANALYTIC GEOMETRY AND CALCULUS I (KMCR)	5
	UC 10097	DESTINATION KENT STATE: FIRST YEAR EXPERIENCE	1
!	Computer Science Elective		4
	Foreign Language		4
	Kent Core Requirement		3
	Credit Hours		17
Semester Two			Credits
!	MATH 12003	ANALYTIC GEOMETRY AND CALCULUS II	5
	MATH 20011	DECISION-MAKING UNDER UNCERTAINTY	3
!	PHY 23101	GENERAL UNIVERSITY PHYSICS I (KBS) (KLAB)	5
	Foreign Language		4
	Credit Hours		17
Semester Three			Credits
!	MATH 21001	LINEAR ALGEBRA	3
!	MATH 22005	ANALYTIC GEOMETRY AND CALCULUS III	4
	MATH 31011	PROOFS IN DISCRETE MATHEMATICS	3
	Kent Core Requirement		3
	Kent Core Requirement		3
	Credit Hours		16
Semester Four			Credits
	MATH 32044	ORDINARY DIFFERENTIAL EQUATIONS	3
!	MATH 41021	THEORY OF MATRICES	3
	Kent Core Requirement		3
	Kent Core Requirement		3
	Kent Core Requirement		3
	Credit Hours		15
Semester Five			Credits
!	MATH 41001	MODERN ALGEBRA I (ELR) (WIC)	3
	Allied Area Elective		3
	Pure Mathematics Elective		3
	Kent Core Requirements		3
	Kent Core Requirements		3
	Credit Hours		15
Semester Six			Credits
!	MATH 41002	MODERN ALGEBRA II (ELR) (WIC)	3
	Pure Mathematics Elective		3
	Kent Core Requirement		3
	Kent Core Requirement		1
	General Electives		3
	Credit Hours		13
Semester Seven			Credits
!	MATH 42001	ANALYSIS I (ELR) (WIC)	3
	Allied Area Elective		3
	Applied Mathematics Sequence		3
	General Electives		6
	Credit Hours		15
Semester Eight			Credits
!	MATH 42002	ANALYSIS II (ELR) (WIC)	3
	Applied Mathematic Sequence		3

Pure Mathematics Elective	3
General Electives	3
Credit Hours	12
Minimum Total Credit Hours:	120