

Department of Mathematics & Statistics

Bowling Green State University



BGSU Graduate Programs[®]

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BGSU®

Introduction

Mathematics has seen a dramatic increase in its application beyond traditional areas of physical sciences into social, biological and behavioral sciences. Part of the dynamic has been the technological revolution in computing providing new opportunities for mathematical research and, even more significantly, new opportunities for applying mathematical concepts to the problems of business, industry and government. New career opportunities in areas of applicable mathematics have emerged—without diminishing in any way the traditional needs of academe and physical sciences. Indeed, career opportunities in higher education promise to become very attractive as the number of individuals receiving doctoral degrees in mathematical sciences continues to decline and the average age of mathematics faculty continues to increase. If you have an aptitude for the subject, a career in mathematical sciences is worth considering.

The Department of Mathematics and Statistics at Bowling Green State University is well-equipped with 24 full-time faculty and several distinguished visitors, all with Ph.D. degrees, to respond to the needs of mathematics and statistics students. In addition, there are 11 permanent faculty members in the Computer Science Department, 7 in the Department of Applied Statistics and Operations Research, and 2 faculty members with specializations in mathematics education in the Department of Educational Curriculum and Instruction. The Department of Mathematics and Statistics is located in the Mathematical Sciences Building which also houses the Science Library. Most classes in mathematics are held in this same building. The faculty, library, and programs of study make it possible for us to meet the needs of most students pursuing graduate studies in the mathematical sciences. In addition to formal courses, we offer a variety of informal seminars and a weekly colloquium where mathematicians and statisticians of international reputation present talks.

The placement record of our advanced degree recipients has been excellent. Our master's graduates of recent years are split fairly evenly between the teaching profession and business. Our department graduated its first Ph.D. in 1975. Of the Ph.D. graduates since then, a recent survey stating that they have obtained positions at four-year colleges, universities and research institutes or have jobs in financial firms, government, or industry commensurate with their training. Ph.D. dissertations have been written in the areas of algebra, complex analysis, functional analysis, combinatorics, inverse problems, scientific computation, probability, statistics, and biostatistics. Current research interests of the faculty include combinatorics, functional analysis, groups and geometries, inverse problems, mathematics education, operator theory, ordered algebraic structures, probability, statistics, biostatistics, and scientific computation.

Programs

Please access graduate courses online at <http://webapps.bgsu.edu/classes/search.php>. Graduate courses offered by the Department of Mathematics & Statistics use the prefix MATH.

Master of Arts (MA)

The M.A. degree program is quite flexible and is designed to prepare for entry into the job market or for further study in a variety of fields such as mathematics, statistics, computer science, applied mathematics, operations research, economics and/or finance. Formal programs are offered in mathematics, statistics, and scientific computation. Programs of study are based on a required core area supplemented by a combination of elective course work in mathematics, statistics and computer science.

The requirements for the M.A. degree are as follows:

1. Completion of either (a), (b), or (c):
 - (a) **Pure Mathematics Track:** a two semester sequence in algebra (633-634), a two semester sequence in real analysis (665-666)
 - (b) **Statistics Track:** real analysis (565 or 665), a two-semester sequence in mathematical statistics (641-642), two additional courses from among 644, 645, 646, 647, 648, 671, 740, 745, 746, 757, 758, and any approved 682
 - (c) **Applied Mathematics Track:** real analysis (665), four courses in scientific computation (539, 618, 620, 668)
2. Completion of at least 30 semester hours of approved graduate level course work in mathematics and statistics, 18 hours of which must be at the 600-level or higher.
3. Completion of a master's thesis (counting for up to six credit hours) or successful completion of a written comprehensive examination based on the core course work.

Statistics students interested in the **Actuarial Science** may augment their preparation for the SOA/CAS Examinations by taking the following courses: Exam I: 641, 642; Exam II: 525; Exam III: 526, 527, 625, 644, 671; Exam IV: 532, 545, 551, 746, Stat 502, Stat 516.

Master of Arts in Teaching (MAT)

The M.A.T. degree in the field of mathematics is designed for those who plan a teaching career in secondary schools, two-year colleges, or liberal arts colleges. Admission to the program requires teacher certification and one year of teaching experience in mathematics, or consent of the program supervisor. Individuals who receive the M.A.T. typically go on to assume leadership roles in secondary schools or small liberal arts colleges. The program requires 35 hours of graduate credit with a minimum of 24 hours in mathematics and a minimum of 8 hours in education courses. Four of the mathematics courses must be selected from among Math 501, 502, 511, 547, 602 and 603.

In addition to the 35 hours of graduate credit, the M.A.T. degree also requires a research paper and a three-hour written comprehensive exam based on two mathematics content

courses from the list above. For further details, please contact the program supervisor (Dr. Barbara Moses).

Master of Science in Applied Statistics (MS)

The M. S. in Applied Statistics degree is offered jointly by the Department of Mathematics and Statistics and the Department of Applied Statistics and Operations Research. This program prepares the student for a career as a statistician in business, industry or government or for further study toward a Ph.D. degree with specialization in statistics.

In addition to the requirements of item 2 of the M.A. program, the requirements for the M.S. in Applied Statistics are as follows:

1. STAT 502, 506, 508, and 675
2. MATH 641, 642
3. At least three courses from among STAT 504, 512, 514, 630, 631, MATH 545, 547, 643, 644, 645, 646, 647, 648, 671, 682, 740, 742, 745, 746, 757, and 758. At least one of these must be at the 600 level or higher. At least one of these must be from the STAT list and at least one must be from the MATH list.
4. At least one 3-hour course at the 500 or 600 level offered by the Department of Mathematics and Statistics in the Fall and Spring Semesters.
5. A six hour cognate in an area of application of statistics such as economics, biology, psychology, operations research or in an area supportive of statistics such as mathematics or computer science.
6. Completion of a master's thesis (counting for up to six credit hours) or successful completion of a comprehensive examination based on the courses listed in (1) and(2).

The prerequisites for the program are undergraduate course work in advanced calculus, linear algebra, probability, and statistical inference, although some of this coursework can be completed on a remedial basis after admission.

Dual Master's Degrees

This is a student/advisor designed program incorporating a mathematical curriculum with another, closely related, graduate curriculum. This program leads to the simultaneous awarding of two master's degrees. Strong programs are possible in combination with areas such as computer science, economics and finance, or one of the other sciences. The minimal requirements for the dual master's degree are:

1. Completion of the basic core curriculum in each department; completion of either track (a), (b), or (c), above, in mathematics/statistics.
2. At least 15 credits in approved mathematics courses numbered 600 or above.
3. **Non-thesis option:** Completion of at least 24 hours of approved course work in each department and successful completion of the comprehensive examination.
Thesis option: Completion of at least 22 hours of approved course work in each department and completion of a thesis with two faculty members from each department on the committee.
4. Satisfaction of all other requirements of the Graduate College and of both departments.

PhD - Mathematics

The Ph.D. is a research degree. Students may enter the Ph.D. program if they have a Master's degree from an accredited university and meet admission requirements at Bowling Green State University. Students who successfully complete the Master's program at BGSU and wish to continue for the Ph.D. must also apply for admission to the Ph.D. program.

The doctoral program requires a minimum of 60 hours of graduate credit beyond the Master's degree. A dissertation (minimum of 16 credit hours, maximum of 30 credit hours) consisting of original research is required and must be judged to be of publishable quality.

In addition to completing the requirements for one of the M.A. tracks above. Students must obtain B or better from least 8 of the following 12 courses:

Algebra: 733, 734	Topology: 651, 752
Analysis: 765, 766	Partial Differential Equations: 712, 713
Complex Analysis: 661, 762	Probability: 741, 742

A student becomes a doctoral candidate upon passing the Ph.D. preliminary examination consisting of the written and oral parts. The written exam is in two areas of the student's choice from among real analysis (765-766), complex analysis (661-762), algebra (733-734), topology (651-752), partial differential equations (712-713), and probability (741-742).

The intent of the oral exam is to prepare and facilitate students for their dissertation research. The doctoral committee decides the content, format, time frame and result of the oral exam. In general, the oral and written parts of the preliminary examination should be taken in the same semester for each student.

PhD - Statistics

The Ph.D. is a research degree. Students may enter the Ph.D. program if they have a Master's degree from an accredited university and meet admission requirements at BGSU. Students who successfully complete the master's program at BGSU and wish to continue for the Ph.D. must also apply for admission to the Ph.D. program.

The doctoral program requires a minimum of 60 hours of graduate credit beyond the Master's degree. A dissertation (minimum of 16 credit hours, maximum of 30 credit hours) consisting of original research is required and must be judged to be of publishable quality.

In addition to completing the requirements for one of the M.A. tracks above, students must obtain B or better from the following courses:

Required Courses	Four(4) Electives From	Two (2) Electives From
Analysis: 665-666	Math 644, 645, 646, 647, 648	Stat 620, 630, 634, 675
Probability: 741	Math 671, 672, 740, 742	
Statistics 745, 746, 757, 758	Any approved 682 topics course	

A student becomes a doctoral candidate upon passing the Ph.D. preliminary examination, which consists of written and oral parts. The written exam is in two areas from among 741/742, 745/746, and 757/758. Students intending to write a dissertation on statistics are suggested to take the Preliminary exam based on 745/746 and 747/758, while probability students are encouraged to take a Preliminary Exam based on 741/745 and either 745/746 or 757/758.

The intent of the oral exam is to prepare and facilitate students for their dissertation research. The doctoral committee decides the content, format, time frame and result of the oral exam. In general, the oral and written parts of the preliminary examination should be taken in the same semester for each student.

Faculty

Albert, James H., Ph.D., Purdue University	Professor; Bayesian inference, statistical education, application of statistical methodology to sports
Bes, Juan, Ph.D., Kent State University	Associate Professor; Operator theory, functional analysis
Blok, Rieuwert, Ph.D., Delft Univ. of Technology	Assistant Professor; Algebra, groups and geometries
Carothers, Neal L., Ph.D., Ohio State University	Professor; Functional analysis, Banach space theory
Chan, Kit, Chair , Ph.D., Univ. of Michigan	Professor; Functional analysis, function theory
Chen, Hanfeng, Ph.D., Univ. of Wisconsin-Madison	Professor; Data analysis, statistical inference, statistical genetics
Chen, John Tuhao, Graduate Coordinator , Ph.D. University of Sydney	Associate Professor; Biostatistics, multivariate analysis
Chou, So-Hsiang, Ph.D., University of Pittsburgh	Professor; Numerical analysis, fluid mechanics
Diesl, Alexander, Ph.D., University of California Berkley	Assistant Professor; Noncommutative rings and modules
Gupta, Arjun K., Ph.D., Purdue University	Distinguished University Professor; Multivariate statistical inference, robust methods, change point detection, non-normal models and their applications
Hoffman, Corneliu, Ph.D., Univ. of So. California	Associate Professor; Algebra
Irmak, Elmas, Ph.D., Michigan State University	Assistant Professor; Topology mapping class groups
Izzo, Alexander, Ph.D., University of California Berkley	Associate Professor; Functional analysis, function algebras, several complex variables
McGovern, Warren Wm, Undergraduate Coordinator , Ph.D., University of Florida	Associate Professor; Ordered groups, commutative rings
Meel, David, Ed.D., University of Pittsburgh	Associate Professor; Mathematics education
Moses, Barbara E., Assistant Chair , Ph.D., Indiana University	Professor; Mathematics education, problem solving
Nguyen, Diem, Ph.D., Texas A & M University	Associate Professor; Mathematics education
Ning, Wei, Ph.D., Syracuse University	Assistant Professor; Mixture models, MANOVA

Rizzo, Maria, Ph.D. Bowling Green State University	Assistant Professor; Statistics, computational statistics
Seubert, Steven M., Ph.D. University of Virginia	Professor; Functional analysis, operator theory
Shang, Junfang, Ph.D., University of Missouri	Assistant Professor; Model selection, multiple comparison, Bayesian analysis
Shpectorov, Sergey, Ph.D., Moscow State Univ.	Professor; Algebra
Sun, Tong, Ph.D., Texas A & M University	Associate Professor; Applied mathematics, numerical analysis
Székely, Gábor, Ph.D., Eötvös Lóránd University	Professor; Statistics
Wade, J. Gordon, Ph.D., Brown University	Associate Professor; Applied mathematics, inverse problems
Zirbel, Craig, Ph.D. Princeton University	Associate Professor; Probability, stochastic processes

Retired Faculty

Al-Amiri, Hassoon	Meronk, Dave
Applebaum, Charles	Neumann, Dean
Blass, Josef	Nguyen, Truc
Glass, Andrew M. W.	Norton, Vic
Graue, L.C.	O'Brien, Thomas
Gresser, John	Rickey, V. Frederick
Hayden, John (Jack)	Rohatgi, Vijay
Hern, Thomas	Steiner, Ray
Holland, Charles	Terwilliger, W. L.
Leetch, J. Frederick	Townsend, Ralph
McCleary, Stephen	Weber, Waldemar

Additional Information

Support

The department provides approximately 60 teaching assistantships (\$10,000 -14,569 for the academic year), and several non-service fellowships (\$17,042 for the calendar year). Instructional, non-resident, general, and parking fees are waived for assistants and fellows, and this waiver extends into the summer semester although no duties are required during this period. Additional summer support (\$1,600—\$3,642) is available to continuing students either through privately funded fellowships or by teaching and other assistantship jobs.

All new and incoming graduate students are invited to participate in the Summer Fellowship Program which runs during the six week period immediately preceding Fall semester. The Fellowship carries a stipend of \$1,800 and includes tuition for 6 - 9 semester credit hours of coursework. The focus of the Program is a teaching seminar aimed at easing the transition to classroom teaching duties in the Fall. Participants will also have the opportunity to take a class in mathematics or statistics for graduate credit. International students may take an English course especially designed for new graduate students.

All classes taught by the Department are small individual sections of 8 - 20 students—we offer no large lecture classes. Teaching assistants are assigned small individual classes in calculus or pre-calculus (Math 130 and below) or Statistics (MATH 115). This involves four to six contact hours per week with undergraduate students.

Statistics students may seek a consultant's position at the University's Statistical Consulting Center. These positions provide valuable experience for those preparing for careers in statistics. The stipends in the Statistical Consulting Center are the same as for teaching assistants.

Computing Facilities

Varied departmental and university computing facilities are available to graduate students. InterNet access is available to the several systems at the Ohio Super Computer Center, for appropriate projects.

Each graduate student office has a desktop computer for word processing, e-mail, small scale computing, and connection to the campus network, including the library catalog and the internet. There is also a graduate student workroom, which are available at all times, that houses a laser printer, Mac and Window machines. The department maintains a large microcomputer lab for teaching mathematics and statistics. This lab and many classrooms are equipped with ceiling mounted projectors. All of these are in the Mathematical Sciences Building.

University facilities include several large computers and open labs with Macintosh and IBM microcomputers, and X terminals. Major software available includes SAS, BMDP, SPSS, Splus, Minitab, MATLAB, Maple, Mathematica, and IMSL.

Location, Cultural and Recreational Activities

Bowling Green, a pleasant university town with a population of 26,000, is located about 20 miles south of Toledo, Ohio on I-75.

The university sponsors a wide variety of cultural events including concerts (many of them free) in the Musical Arts Building, theatre performances, and guest speakers. Toledo has a symphony orchestra and one of the country's finest art museums.

There are abundant recreational facilities at the University. The highlight is the Student Recreation Center which has two swimming pools (one Olympic - sized), racquetball courts, tennis courts, a track, sauna, and many other facilities. The University also has an 18-hole golf course and a modern ice arena.

Contact:

For additional information on our degree programs, funding opportunities, faculty research strengths, course descriptions, recent employers of our graduates, graduate student directory and more, please visit our website at: <http://www.bgsu.edu/departments/math> or contact

John T. Chen, Ph.D.
Graduate Coordinator
419-372-7461 / 419-372-6092 (Fax)
email: jchen@bgnet.bgsu.edu

Marcia Seubert, Graduate Secretary
419-372-2637 / 419-372-6092 (Fax)
e-mail: msproul@bgsu.edu

Application Instructions

The application process will be simplified if you adhere to the instructions below and send transcripts, application form, and other correspondence **directly to the Department of Mathematics and Statistics at the address provided under (h) below**. In order to complete your application you must:

(a) Complete the application enclosed or complete the electronic application form which can be found on our web site address:

<http://www.bgsu.edu/colleges/gradcol>

(b) No application fee payment is required in advance.

If you submit the application in paper form, do **NOT send the \$30 application fee at this time. We will defer the application fee until after we have made a decision on admission and funding.*

If you complete the on-line application, and you have a financial hardship, feel free to select the **“Apply for a Fee Deferral” button at the bottom of the Payment Options page to request deferring the \$30 application fee. We will defer the application fee in cases of financial hardship until after we have made a decision on admission and funding.*

(c) Arrange for **two (2) official transcripts** to be sent from **each** institution attended. Transcripts are to be sent directly from the institution(s) in a sealed envelope to the Department of Mathematics and Statistics. In those cases where temporary transcripts are submitted initially (when applying for assistantships), formal admission to the Graduate College is granted upon receipt of official transcripts showing the degree earned and the date it was completed.

(d) Submit test scores for the **Graduate Record Examination** Aptitude Test (GRE). For registration form and detailed information about test dates, test centers, fees, and score reporting, applicants should write to:

Graduate Record Examination
Educational Testing Service
P.O. Box 6000
Princeton, NJ 08541-6000
1-800-537-3160
<http://www.ets.org/store.html>

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(e) If your native language is not English, you must submit test scores from the **Test of English as a Foreign Language (T.O.E.F.L.)**

TOEFL Services
Educational Testing Service
P.O. Box 6151
Princeton, NJ 08541-0001
<http://www.toefl.org>

Bowling Green State University
Institution Code: 1069
Department Code: 72

The GRE Aptitude and the T.O.E.F.L. test scores are required for admission consideration and formal admission to the Graduate College. These requirements cannot be waived.

(f) Indicate on the application for admission whether or not you wish to be considered for an **assistantship**.

(g) You must submit on a separate sheet of paper your “**Statement of Purpose**.” This is a brief essay outlining your reasons for attending graduate school at Bowling Green State University together with a few details about your mathematical interests and your professional goals.

(h) Arrange for **three (3) letters of recommendation to be sent directly to our department**. At least one of the letters should be from a member of the mathematics department at your undergraduate/graduate college or someone familiar with your mathematical abilities and your potential for completing a graduate program in mathematics and statistics.

(i) U.S. Immigration and Naturalization Service (INS) requires all international students submit a **Financial Statement** prior to issuing of the I-20 or IAP-66.

Please send your completed application forms to:

**Graduate Secretary
Bowling Green State University
Department of Mathematics and Statistics
450 Math Science Building
Bowling Green, OH 43403-0221
USA**

It is your responsibility to make sure that your application is complete when mailing the materials.

A completed application consists of:

- application for admission
- statement of purpose
- two (2) official transcripts from each institution attended
- three (3) letters of recommendation
- GRE score
- TOEFL score (international students only)
- financial statement (international students only)

You will be notified of an admission decision within approximately one month from the date of the completion of your application. Assistantship decisions are made by **March/April**.

June 08