

Mathematics at St. Olaf College  
A Handbook for Majors  
Preliminary 2008 Edition

For more information, see our Web page, at <http://www.stolaf.edu/depts/math/>

The St. Olaf mathematics department regards mathematics as an interesting, lively, and accessible subject, an appropriate major for *all* students, not just an elite few. If you enjoy mathematics and want to learn more, we invite you to come study with us.

## The contract major

Majors in mathematics are arranged by individual contracts, which you should file no later than sometime in your junior year. Here's how: Pick up an Individualized Mathematics Proposal (IMaP) form from the department office (OMH 202) or print it off from the department website. Discuss your interests with a member of the mathematics faculty, and fill out the IMaP. After the mathematics faculty member signs the form, turn it in to the department secretary in OMH 202 for approval by the department chair. If it is approved, you will be informed shortly thereafter. You always have the option to alter and resubmit your IMaP if you change your mind or your mathematical interests.

An IMaP requires three basic courses unless they have been completed before coming to St. Olaf:

- Calculus I (120 or 121)
- Calculus II(126 or 128)
- Linear Algebra (220)

Seven courses in addition to the basic courses are required. These must include:

- At least two of the three "transition courses":
  - Modern Computational Mathematics (242)
  - Elementary Real Analysis (244)
  - Abstract Algebra (252)
- Two Level III courses, at least one of which must be sequenced with a Level II course.
- One course from each of three of the following perspectives: Axiomatic/Algebraic (A), Continuous/Analytic (C), Discrete/Combinatorial (D), and Modeling/Computation (M)

A total of two approved courses from statistics or computer science can be counted toward the mathematics major. Double majors *may* be able to count a course in another department that makes extensive use of mathematical techniques (e.g., theoretical physics, mathematical economics).

Your IMaP should include, along with mathematics courses, other evidence of mathematical activity outside the classroom. This might include attending the weekly colloquium, paper-grading, tutoring, independent study or being in a problem-solving group.

For more information on the requirements, see [www.stolaf.edu/depts/math](http://www.stolaf.edu/depts/math). NOTE: Some upper level courses are not offered every semester or even every year. Consult the department chair or the department website for confirmation of an offering during a particular term or year.

Here are some planning tips:

### Early Transition Courses (but not too early)

Try to complete at least two of Modern Computational Mathematics (242), Elementary Real Analysis (244) and Abstract Algebra (252) by the end of your junior year. At the same time, we recommend that first-year students take these courses only after careful consultation with an advisor.

**Doubling up** You will probably have to double up on math courses at some point. Talk to a faculty member who knows your abilities when deciding which courses you will take simultaneously. Some common pairs taken immediately after Linear Algebra include 226-262, 226-244, and 230-244. In general, we recommend against doubling up on Math 244 (ERA) and 252 (Abstract).

**Writing** Writing assignments in Math 244 and 252 are designed to fulfill the Writing in the Major component of the College's general education requirements. Satisfactory completion of these assignments is among the requirements for graduation.

### Options

Exactly which courses you take, beyond those required of all majors, depends on your interests and goals. Here are some comments on the intermediate and advanced courses that might appear in contracts meeting different objectives. These are *only* suggestions, not requirements—you should develop a contract that reflects your own interests and goals.

**Actuarial work** Actuaries assess risks, determine rates for insurance companies, and help determine pension and health care plans. The actuarial profession establishes a nationwide series of actuarial examinations; some of these exams

are accessible to undergraduates. The first actuarial exam covers calculus, linear algebra, multivariable calculus (Math 226), probability (Math 262) and statistics (Stat 322). Subsequent exams cover material from Math 266, Stat 266, Econ 385, and Stat 316. Questions should be directed to Julie Legler.

**Mathematics graduate school** The best advice for grad school-bound students is to take as many mathematics courses as possible, especially such “core” courses as Math 340, 344, 348 and 352. See Jill Dietz or Paul Humke for more details.

**Science and engineering** Consider such courses as Math 230, 330, 340 and Computer Science 172.

**Secondary mathematics teaching** Minnesota requirements for secondary school teaching certification include such courses as Geometry (Math 356), Probability (Math 262), Statistics (Stat 272 or 322), Discrete Mathematics (Math 232) and several Education courses. See Martha Wallace for more information.

**Biometrics and biostatistics** These fields involve statistical analysis of problems in biology, medicine, public health, and similar areas. Useful preparations includes Math 262 and Stat 322; Biology 125 and 126; advanced courses in statistics; and knowledge of computers.

**Statistics concentration** A statistics concentration requires Math 262 and Stat 322, plus two additional courses primarily statistical in nature, such as Stat 316, Statistics 266, Economics 385, statistics seminars. See Julie Legler for more information; the College Catalog also has more details.

**Computer science** The College offers a computer science major. See the CS web page at <http://www.stolaf.edu/depts/cs/> or talk to Dick Brown for more details. CS 172 and 272 provide a good foundation for students who are interested in computer science but who prefer not to pursue a major.

## Departmental distinction

Departmental Distinction in Mathematics is a significant honor; it is awarded to graduating seniors who show a genuine interest and enthusiasm for mathematics and who have completed work of high caliber that goes beyond the minimal requirements for a major in mathematics.

Students must apply for Departmental Distinction; the application deadline falls in late February. Application forms are available at the department office, OMH 202. An application includes two letters of recommendation from faculty members, project supervisors, or others who know the candidate’s work. Decisions on distinction are announced at Commencement.

Below are some examples of activities that might support an application for distinction. However, participation in such activities is neither necessary nor sufficient for receiving this honor; the key ingredients are quality work and effort that goes beyond that achieved in a typical class.

- Participating in problem-solving activities, such as the Putnam exam, Carlson exam, etc.
- Participating in a summer mathematics program, such as a Research Experience for Undergraduates (REU) program.
- Presenting a paper at a conference or workshop, or publishing an article in a mathematics journal.
- Participating in the Budapest Semester in Mathematics.
- Doing an internship that involves significant mathematics.
- Independent study or research.
- Taking more than the minimum of advanced mathematics courses.

## Types of mathematics courses

Two especially important courses in a mathematics major are Elementary Real Analysis (244) and Abstract Algebra (252). Both courses have a theoretical flavor, and involve writing proofs. What are these courses about, and why do we require them—even knowing that most mathematics majors will not make careers of “pure” mathematics?

### About real analysis

Real analysis studies real-valued functions of a real variable, like the perennial favorites  $f(x) = x^2$  and  $g(x) = \arctan x$ , objects familiar from elementary calculus. Indeed, real analysis developed historically in response to the theoretical questions that arose as the calculus was developed. For example, what do *continuity* and *differentiability* really mean, and what do

they have to do with limits? What exactly *is* a limit, for that matter? While we're at it, what is a *real number*?

The answers are surprising. Defining these concepts rigorously can lead to highly nonintuitive results. For example, it's quite possible for a function to be continuous *everywhere* but differentiable *nowhere*, or for a function to be continuous at only one point of its domain. Here's another surprise: There are just as many integers as rational numbers, but many more irrationals than rationals. In real analysis you'll carefully revisit such familiar concepts as number, function, and limit, and ponder their sometimes surprising implications.

### About abstract algebra

Algebra is well over 1000 years old. The word itself comes from the Arabic *Hisab al-jabr w'al-muqabala*, a treatise on quadratic equations written in the year 830 by the Arab mathematician Abu Ja'far Muhammad ibn Musa al'Khwarizmi, a native of Baghdad. From this long and illustrious history has evolved a general and unified view of the subject, one that places all algebraic systems (e.g., integers, real numbers, polynomials, matrices) within a single context, by focusing on their essential algebraic properties. By taking this abstract viewpoint, we can streamline and simplify our understanding of the subject.

### About both courses

Courses in both real analysis and abstract algebra are, among other things, courses in mathematical language. You'll learn a substantial new mathematical vocabulary and use it in writing clearly and reasoning logically. Both courses are also about logic—your proofs must make logical sense—and about writing—it's essential to communicate your thoughts and reasons clearly and effectively. Both courses, in short, are at the heart of a liberal arts education: they require you to think, reason, read and write—all essential skills in post-St. Olaf life.

### Applied mathematics

Applied mathematics is theory applied (or derived) in response to specific, concrete problems. Many abstract concepts, such as groups, vector spaces, eigenvalues, and convergence, began in studying physical problems. This process continues today. For example, such esoteric mathematical concepts as string theory and chaos were developed in response to problems in cosmology (the mathematics and physics of the universe) and turbulence. Applied mathematics is more

than a kit of procedures to solve problems: it's also about why these procedures work and when to use them. Therefore, a solid theoretical background (normally including both 244 and 252) is essential to success in applied mathematics.

### Level III courses

*may* courses represent a culmination of earlier mathematical work. Level III courses offer close-up, in-depth looks at various areas in the mainstream of modern mathematics: analysis, algebra, geometry, logic, topology, and combinatorics. We believe that every mathematics major should encounter, at an advanced level, the ideas, language, and methods of at least one principal area of our discipline.

## Activities beyond the classroom

We encourage all majors to engage in some sort of mathematical activity in addition to their course work. The *MSCS Mess*, the department's weekly newsletter, is a good source of information. Here are some possibilities:

**Colloquia** The MSCS department sponsors a weekly colloquium at which invited speakers talk about mathematical, statistical and computer science ideas and applications that go beyond coursework. Guest speakers range from research mathematicians to industrial statisticians to St. Olaf alumni. Most colloquia occur on Tuesday afternoons; see the *MSCS Mess* for details.

**MAA Student Chapter** This student organization is involved in social and mathematical activities. In recent years, events have included designing a mathematics department T-shirt, a Halloween pumpkin-carving party, a Christmas cookie-decorating party and the annual Pig Roast. Join us for more mathematical fun than you could have dreamed possible.

**Tutoring and Math Clinic work** Many students who enjoy doing mathematics also enjoy tutoring mathematics. If interested in either one-on-one or group tutoring, please contact the Academic Support Center for application forms or more information.

**Paper grading** The mathematics department hires students to help grade homework papers for many of its courses. Contact Donna Brakke in the mathematics office (OMH 202) for more information.

**Independent study and research** Advanced students may wish to study a topic not offered as a regular course. See any faculty member or the department chair for more information.

**Budapest Semester in Mathematics** Spend a semester in Budapest, Hungary, studying mathematics. See Tina Garrett for details.

**Summer research, Internships** Summer research programs in mathematical areas are often available at St. Olaf. In addition, the National Science Foundation sponsors summer REU (Research Experiences for Undergraduates) programs at colleges and universities nationwide; many Ole majors have participated. Internships at corporations or research centers are also often available. Watch the *MSCS Mess* for announcements; see Paul Zorn for more detailed information.

**Contests** Students can participate in various contests and competitions, national and local, that are held each year. The Putnam Exam, for example, is a national problem-solving contest that is held every December. The mathematics department also sponsors a mathematics contest for St. Olaf students every spring; it tests general mathematics problem-solving ability. Watch the *MSCS Mess* for announcements.

## After-math: what good is a mathematics major?

A mathematics major supports almost every career. In an increasingly technological society, quantitative, analytical, and computer skills are more important than ever. More and more, general problem-solving skills and the ability to synthesize information and reason logically are seen as advantages for employment. A mathematics major is not merely *vocational* training. Rather, we aim to equip you with skills, knowledge, attitudes, flexibility, and ability to learn—all necessary in a changing world.

In addition to fields that use mathematics directly, such as operations research, teaching, statistical consulting and actuarial work, a B.A. in mathematics provides a good background for entry to jobs in business or admission to MBA programs, law school, public health programs and engineering school. The Career Development Center has extensive resources to help you find careers for which a background in mathematics is beneficial. See the department web page at see our Web page, at <http://www.stolaf.edu/depts/math/> for links to helpful web sites.

Below are some examples of directions some recent St. Olaf mathematics majors have taken:

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### What mathematics grads do: some examples

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Lori B.	'89	Statistician	U.S. Dept. of Labor & Statistics
Neal P.	'90	Lawyer	Myrtha, Cullina, Richter & Pinney
Steve Y.	'80	Systems Engineer	Hughes Aircraft
Jennifer G.	'87	Actuary	Fortis Benefits Insurance
Peder A.	'86	Budget Analyst	Sierra Pacific Power Company
Lori A.	'90	Math Teacher	Minnetonka High School
Rebecca R.	'82	Programmer/Analyst	Shell Oil Company
Peter O.	'80	Physician	Minnesota
Lisa W.	'92	Ph.D. student - Chemistry	Indiana University
Karin H.	'86	Market Research Manager	U.S. West
Steve M.	'87	Assistant Prof. Math.	Univ. of Redlands
Jennifer B.	'91	Auditor/Public Accountant	Ernst & Young
Lynn O.	'85	Biostatistician	Fred Hutchinson Cancer Research Center
Greg L.	'89	Technical Document Writer	West Publishing
Heidi J.	'95	Statistician	Northwest Airlines
Wendy M.	'90	Epidemiologist	Minnesota Department of Health
Kraig L.	'97	Volunteer	Peace Corps
Mark C.	'94	Seminary Student	Luther Seminary
Eric C.	'97	Conservatory Student	Conservatory
Theresa H.	'89	Operations Researcher	Northwest Airlines
Matt E.	'96	Consultant	Anderson Consulting

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## Faculty

**Richard Allen:** A native New Englander, Rich graduated from Boston College and received his Ph.D. from Indiana University. During 1984-86 he worked on an intelligent geometry tutor in the artificial intelligence research group at IRISA in Rennes, France. His professional interests subsequently expanded to include use of computer geometry systems in schools both in this country and in France. During 1991-92 and again during 1998-99, he returned to France, to IMAG in Grenoble, to continue his research collaboration on intelligent systems and to participate in interdisciplinary research on the cognitive effects of the use of such systems. His interests have further evolved to include the geometry of Islamic patterns and bioinformatics. His wife, Wendy, is professor of French at St. Olaf. His son, Joshua, and his daughter, Sarah, both graduated from another Northfield college. Rich and Wendy led the Term in the Middle East in 2001-02 and the Global Semester in 2005-06.

**Peder Bolstad:** Peder has taught various combinations of math, music, education, art, physical education, guidance and social science in elementary, secondary, and college settings in Australia, Canada, and the U.S. He has math (1974) and vocal music (1979) majors from St. Olaf and an M.Sc. in discrete mathematics from Simon Fraser University in British Columbia. (If you're interested in the Oberwolfach Problem, give Peder a shout.) In addition to teaching calculus and "math for poets," Peder is the Analytical Skills Coordinator in the Academic Support Center which affords him the opportunity to talk with students about studying and with student tutors about teaching. He is an avid (sometimes professional) choral singer who has sung with major choirs and orchestras in Sydney, Adelaide, Vancouver, Duluth, St. Paul, and Minneapolis. His few spare moments are filled with photography, S.C.U.B.A. diving, and tennis.

**Dick Brown:** Dick earned a Ph.D. in math (algebraic topology, 1984) at the University of Illinois/Urbana, then taught for a while at another local college, about a mile from St. Olaf, before ascending the hill in 1990. Dick currently directs the Computer Science Concentration and teaches CS courses at all levels. He enjoys playing tennis and (occasionally) his tuba, riding his bike to work, and camping and spending time with his wife Susan, sons Martin and Kevin, and step-daughters Una, Ariel and Schuyler.

**Jill Dietz:** Jill earned her B.A. in mathematics from Brandeis University in 1986, and her Ph.D. from Northwestern University in 1991. After graduating, she spent four years at the University of Washington in Seattle cultivating the fine arts of espresso drinking and vegetarian dining (oh, and of being a mathematician too). Jill spent one year at Gettysburg College, then finally returned to her Minnesota roots. Her main mathematical interests are in algebra (finite groups, group cohomology, representation theory), topology (knots, topological graph theory),

homotopy theory), and convincing undergraduates to do research in these and other areas. Jill also enjoys camping and hiking, throwing pots in her Dad's studio, and crossword puzzles. Jill is on leave 2008-2009.

**Kristina Garrett:** After earning her S.B. in mathematics from M.I.T. in 1994, Tina spent two years playing amateur rugby and building a non-profit Minneapolis youth center from the ground up. Returning to graduate school at the University of Minnesota, she studied combinatorics and group theory, earning her PhD in 2001. Tina spent four years teaching at Carleton College before coming to St. Olaf. Her main mathematical interests are in enumerative combinatorics (partition theory, basic hypergeometric series and special functions), computational combinatorics, and in encouraging students to participate in undergraduate research. Tina is also an avid racquetball player and rarely misses a Vikings game on television.

**Rose Gundacker:** Rose earned her BA in mathematics from the College of St. Teresa (no longer functioning) and her masters in mathematics from Arizona State University. She has spent the past 35 + years as a high school teacher, most recently at Rosemount High School, retiring last June. She has been actively involved in the AP Calculus program as a teacher of both AB and BC Calculus, and as a reader and consultant for Summer Institutes for new AP teachers. She is active in state educational organizations and is presently working with the state department of education on an initiative to provide subject-matter training for Minnesota mathematics teachers. She and her husband have four grown children living in various places around the world. Rose enjoys reading, walking, biking, and cross-country skiing.

**Bruce Hanson:** Bruce grew up in Duluth, Minnesota, graduated from St. Olaf (a small Norwegian liberal arts institution in southern Minnesota) in 1975, and finished his Ph.D. at the University of Wisconsin in Madison in complex analysis. Besides mathematics, Bruce is interested in playing guitar and singing, language, and almost all sports. His life goal is to beat Dick Kleber in tennis.

**Olaf Hall-Holt:** Olaf earned his Ph. D. in CS at Stanford University in 2002, then served as a Postdoctoral Research Associate at SUNY Stony Brook before arriving at St. Olaf in Fall 2004. His research interests include computational geometry, graphics, computer vision, and elements of human cognition. Olaf has worked with students on research projects since his days as a staff researcher at the Geometry Center in Minnesota, between college (at Swarthmore) and graduate school. He grew up in West Africa, studied mathematics in Budapest, and has worked in CS from coast to coast. Olaf co-founded the Twin Cities Free-Net, and enjoys playing soccer and ultimate frisbee, learning about first century history, camping in the winter, and spending time with his wife Christy and their daughters Viveka and Annelise.

**Paul Humke:** Paul came to St. Olaf n years ago as a Visiting Associate Professor, and found he couldn't leave. His 1972 Ph.D. is from the University of Wisconsin and he continues an active research career in real analysis. He also serves as the North American Director of the Budapest Semesters in Mathematics program, and is a managing editor for the research journal, *Real Analysis Exchange*. He, his wife, Bonnie, and three children, Kristi, Eric, and Peter, enjoy classical music and are active outdoor people. Kristi has two children and is a pastor. Eric is in the M.D.–Ph.D. program at the University of Michigan, and Peter attends Vanderbilt University. (2003)

**Julie Legler:** Julie was recently promoted to Full Professor and continues as Director of the Statistics Program and Director of the Center for Interdisciplinary Research. She will be on sabbatical leave for the 2008-09 academic year.

**Urmila Malvadkar:** Growing up in Oklahoma, Urmila Malvadkar was always interested in both mathematics and environmental issues. She was fortunate to be able to combine her interests both in college at Vanderbilt (BS, mathematics and environmental science) and in graduate school at Princeton (PhD, applied and computational mathematics, emphasis: mathematical biology). She studied zooplankton behavior and taught both undergraduates and elementary school student. The latter took significantly more energy. Recently she has been working on an NSF biocomplexity project involving optimal marine reserve placement in the Bahamas.

**Steven McKelvey:** Steve is a Phi Beta Kappa graduate of Grinnell College. He completed his Ph.D. at Brown University in operations research—more specifically, in the field of network equilibria. In addition to work in large-scale network equilibria, Steve is involved with the mathematical modeling of biological systems, primarily population levels of endangered species. Before coming to St. Olaf in 1985, he held summer positions with the Washington, D.C. headquarters of NASA and the Internal Revenue Service. He has also spent three summers working as an actuarial trainee. Between college and graduate school, Steve spent a year working with the Illinois Bureau of the Budget as a systems analyst. Steve was recently elected to the position of President Elect of the Resource Modeling Association (RMA), an interdisciplinary, international professional organization using quantitative tools to better manage natural resources of all types. He will become President at the RMA's world meeting in Warsaw, Poland in June, 2008. Steve's leisure time is spent canoeing, hiking, skiing, folk dancing, and supporting progressive politics.

**Matt Richey:** Matt is originally from Kentucky and received his B.A. from Kenyon College and his Ph.D. from Dartmouth. He came to St. Olaf in 1986 and has been here ever since. His areas of research are Applied Mathematics, Mathematical Computing, and Bayesian Computational Statistics. In addition, Matt has been designed and implemented software for industry and is a consultant

to the college's efforts to redesign the student information system. In his spare time (the little that remains) Matt enjoys running, listening to music, and cooking. He is also involved in a life-long effort to correct the commonly held belief that the sacrifice bunt in baseball is an effective strategic ploy. So far, he has failed. Matt is currently the Associate Dean for the Faculty of Natural Science and Mathematics.

**Paul Roback:** Paul is an applied statistician, having attacked problems ranging from clinical trials in panic disorder to population models for bowhead whales to indicators of welfare recidivism to the effects of forest fragmentation on birds. He returns to The Hill after a long hiatus; after graduating from St. Olaf in 1989 with majors in mathematics and economics, Paul earned an M.S. in statistics from Iowa State, worked as a clinical statistician for Eli Lilly, earned a Ph.D. in statistics from Colorado State, and taught for several years at both Bucknell and Connecticut College. In addition to applied statistical consulting, Paul's research interests include Bayesian statistics, non-parametric methods, and statistical education. Paul and his wife Karen have three young children—Samantha, Timothy, and Sophie—who keep his office decorated with fine artwork. Outside of his office, Paul can often be found on some athletic court or field, playing basketball, tennis, soccer, and maybe even broomball. Or, he can be found putting his statistical knowledge to good use—attempting to win the coveted Joe Boe Trophy in the Boe Fantasy Football League.

**Jim Scott:** Jim is a native of southern Minnesota who, after graduating from Macalester College with a mathematics degree in 1996, hung a right turn on I-80 and didn't stop until he hit the west coast. After arriving in California, he worked as a computer programmer in San Francisco on the Y2K switch. Really. (Insert "Office Space" joke here). Jim finally got his act together and did something constructive when he went to the University of California, Berkeley to get his Master's degree in Public Health. After a brief stint as a tuberculosis outbreak epidemiologist, he returned to Berkeley and received an M.A. in biostatistics and a Ph.D. in epidemiology (ask him about it!). His research interests include causal inference, computational statistics, simulating the spread of infectious diseases, and statistical modeling. In his spare time he goes backpacking, hiking, and spends quality time with his wife, Kate, and his 1 y.o. daughter, Julia.

**Kay Smith:** Kay received her B.S. from Bucknell University and her Ph.D. from Yale University. Before coming to Saint Olaf in 1980, she taught at Davidson College. Her primary mathematical interests are logic and the mathematics of games. She is married to Arnold Ostebee, another member of the department who is currently Assistant Provost of the College. She has two grown children, Kristin and Paul. She also enjoys classical music and baking, particularly anything with chocolate in it.

**Eric Ufferman:** Eric received his B.S. in Mathematics from the University of Illinois in 2000, and his PhD at

The George Washington University in Washington, DC in 2006. His dissertation, completed under the supervision of Dr. Valentina Harizanov, was titled "Structures and Partial Computable Automorphisms." Since completing his PhD, he has been Visiting Assistant Professor of Mathematics at GWU. When not doing mathematics he enjoys reading, traveling, and playing Scrabble.

**Martha Wallace:** A 1975 Phi Beta Kappa graduate of St. Olaf, Martha earned her M.A. and Ph.D. degrees in mathematics education from the University of Minnesota. She spent several years teaching secondary school mathematics before she returned to her alma mater. Now she is in charge of the mathematics education program at St. Olaf, and in the summers teaches mathematics to school mathematics teachers. She is active in state and national mathematics education leadership programs. She and her husband, LuVerne, spend their spare time running a crop farm, doing volunteer work for their church, and watching their grown children and their grandchildren play in orchestra and jazz concerts.

**Mike Weimerskirch:** Mike is a native of Minnetonka, and earned a B.A. in Mathematics from Northwestern University (Evanston IL) in 1985. From 1986-1995, Mike taught at Simley H.S., and later taught at Park Center H.S. and Brooklyn Center H.S. He returned to the University of Minnesota in 2000, and recently earned his PhD.

for his research in Combinatorial Game Theory. Mike's mathematical interests include combinatorics, probability, statistics and K-12 mathematics education. Mike served as the Director of the United States Croquet Association from 1995-1998, and is still a competitive player, ranked in the top 50 in the U.S. He also has been a Nordic Skiing coach for 19 years, most recently at Minneapolis South H.S.

**Katie Ziegler-Graham:** When not doing statistics, Katie spends most of her time with her husband Tom and their two very young children.

**Paul Zorn:** Paul's life began in southern India, near the confluence of the Bay of Bengal, the Arabian Sea, and the Indian Ocean. He was educated through high school at Kodaikanal International School, high in the Palni Hills of Tamil Nadu. He was an undergraduate at Washington University in St. Louis, majoring in mathematics and English literature. He did his Ph.D., in several complex variables, at the University of Washington, Seattle, and came to St. Olaf in 1981. His professional interests include complex analysis, mathematical exposition, and textbook writing. During 1995-2000 he was editor of Mathematics Magazine. Paul and his wife, Janet, a pediatric occupational therapist, have two daughters. Both are named for Austen heroines, and both were formerly students at (other) liberal arts colleges.

## References

Questions about...?		Phone	E-mail
Actuarial Information	Paul Roback	3936	roback
Budapest Semester	Kristina Garrett	3419	garrettk
Computer Science	Dick Brown	3860	rab
Department Chair	Paul Zorn	3414	zorn
Graduate School	Paul Humke	3410	humke
IMaP Contracts	Donna Brakke	3113	brakke
Internships/REU's	--	--	--
MAA Student Chapter	--	--	--
Math Clinics & Tutoring	Peder Bolstad	3288	bolstad
Math Education	Martha Wallace	3408	wallace
<i>MSCS Mess</i> - subscription	Donna Brakke	3113	brakke
<i>MSCS Mess</i> - editor	--	--	--
Paper Grading	Donna Brakke	3113	brakke
Placement	Kay Smith	3784	smithk
Putnam Exam/Problem-solving	--	--	--
Statistics Concentration	Paul Roback	3936	roback
Student Work (clinic, tutors)	Peder Bolstad	3288	bolstad

*Handbook revised June 2008 -mlw*