DEPARTMENT OF MATHEMATICS AND STATISTICS

Chair: Dr. Paul Jung (phj001@shsu.edu), (936) 294-4859

Contact Information: (936) 294-1564

Website: Department of Mathematics and Statistics (http://www.shsu.edu/academics/mathematics-and-statistics/)

Mission
The Department of Mathematics and Statistics will provide all students with the opportunity to receive an educational experience in mathematics and statistics of the highest quality, both inside and outside the classroom. By actively engaging in research and professional development, the faculty will promote quality scholarship among themselves as well as their students.

Highlights
- Opportunities for research through numerous grants with industry, government and education agencies
- Support for travel and presentations at local and national professional meetings
- Opportunities for discipline-related employment, including classroom teaching, grading and tutoring

Career Opportunities
- Accounting and Finance
- Computer Programming
- Data Science
- Sales and Marketing
- Management and Related Positions
- Actuarial Science
- Computer Systems Analysis
- Engineering
- Statistics
- Mathematics
- Operations Research
- Modeling
- Academic Positions - High School or College
- Master of Arts in Mathematics (http://catalog.shsu.edu/graduate-and-professional/college-departments/science-and-engineering-technology/mathematics-statistics/mathematics-education-ma/)
- Master of Science in Mathematics (http://catalog.shsu.edu/graduate-and-professional/college-departments/science-and-engineering-technology/mathematics-statistics/mathematics-ms/)
- Master of Science in Statistics (http://catalog.shsu.edu/graduate-and-professional/college-departments/science-and-engineering-technology/mathematics-statistics/statistics-ms/)

Student Organizations
- American Mathematical Society (AMS) Student Chapter
- Mathematical Association of America (MAA)
- Pi-Mu-Epsilon Mathematics Honor Society
- Stat Club

Assistantships
The Department of Mathematics and Statistics offers a significant number of graduate teaching assistantships each year. For more information, call (936) 294-1564.

Scholarships
The Department of Mathematics and Statistics offers several scholarships each year and Sam Houston State University offers additional, university-wide scholarships. For information on departmental scholarships, visit the departmental website (https://www.shsu.edu/academics/mathematics-and-statistics/scholarships.html). Information on University scholarships may be obtained from the Financial Aid and Scholarships Office (http://www.shsu.edu/dept/financial-aid/scholarships/).
Mathematics

MATH 5360. Special Topics. 3 Hours.
Topics and courses are selected to suit individual needs of students. Methods of independent study and research are stressed. The course may be repeated for additional credit.
Prerequisite: Consent of program coordinator.

MATH 5361. Theory & App Of Probability. 3 Hours.
Topics include probability axioms and properties, conditional probability, random variables, probability distributions, moment generating functions, laws of large numbers, and the Central Limit Theorem. Also listed as STAT 5361.
Prerequisite: STAT 4372 (or equivalent) or consent of the instructor.

MATH 5365. Introductory Analysis. 3 Hours.
Students engage in a more thorough treatment of the material traditionally considered in elementary calculus. Topics may include sets, functions, properties of the real number system and sequences. NOTE: Students who have taken Math 4361 may not take MATH 5365.
Prerequisite: Graduate Standing.

MATH 5366. Elementary Analysis. 3 Hours.
Students study limits, continuity, differentiation, Riemann integration, infinite series and sequences, and series of functions. NOTE: Students who have taken Math 4366 may not take MATH 5366.
Prerequisite: Graduate Standing and MATH 4365 or MATH 5365.

MATH 5370. Fourier Analysis & Application. 3 Hours.
This course is a study of applied harmonic analysis. Topics include Fourier analysis, wavelet analysis, and applications of these topics.
Prerequisite: MATH 4366 or MATH 5388 or the consent of the instructor.

MATH 5375. Partial Differential Equations. 3 Hours.
Students solve problems involving partial differential equations from the natural sciences. Topics may include derivation of the heat/diffusion and wave equations, the method of separation of variables to solve the heat, wave, and Laplace equations on finite domains, Fourier series, Sturm-Liouville eigenvalue problems, the Fourier transform method to solve equations on infinite domains, the method of characteristics, and d’Alembert’s solution of the wave equation. NOTE: Students who have taken MATH 4375 may not take MATH 5375.
Prerequisite: Graduate Standing.

MATH 5377. Algebraic Structures. 3 Hours.
Students study basic structures of abstract algebra: groups, rings, and fields. Topics may include elementary number theory, equivalence relations, groups, homomorphisms, cosets, Cayley’s Theorem, symmetric groups, rings, polynomial rings, quotient fields, principal ideal domains, and Euclidean domains. Note: Students who have taken Math 4377 may not take MATH 5377.
Prerequisite: Graduate Standing.

MATH 5380. Research Project In Math Edu. 3 Hours.
In this course, the student will develop a project based on one of the core areas (Algebra, Geometry, Analysis, or Probability and Statistics) appropriate for use in teaching. This course is a capstone for candidates pursuing the degree of MA of Mathematics.
Prerequisite: MATH 5386, MATH 5387, MATH 5388, MATH 5389.

MATH 5381. Algebra:Structr & Applications. 3 Hours.
This course includes the study of algebraic structures (such as groups, rings, integral domains, and fields) and their properties, and activities and concepts related to the algebra of real numbers that are applicable to middle school teachers. The course is designed for in-service middle school mathematics teachers.

MATH 5382. Discrete Math for Teachers. 3 Hours.
This course will include a study of graph theory, combinatorics and recursion, social choice and apportionment, algorithms, and iteration, with an emphasis on real-world problem solving applications and mathematical connections to the school curriculum. This course is specifically designed for middle and high school teachers, with a mathematics specialization, obtaining a Master’s Degree in Education with a minor in mathematics.
Prerequisite: Middle or secondary school mathematics certification, or equivalent.

MATH 5383. Seminar in Geometry and Measurement for Teachers. 3 Hours.
This course will include a study of congruency, similarity, transformations, coordinate geometry, and measurement. It is specifically designed for teachers with a mathematics specialization who wish to obtain the master’s degree in education with a minor in mathematics.
Prerequisite: Middle school mathematics certification and MATH 3383 or equivalent.

MATH 5384. Sem in Math Sys for Teachers. 3 Hours.
This course will include a study of the development of the natural number system, the development of the integers, the development of the rational number system, and the development of the real number system. It is specifically designed for teachers with a mathematics specialization who wish to obtain the master’s degree in education with a minor in mathematics.
Prerequisite: Middle school mathematics certification and MATH 3384 or equivalent.

MATH 5385. Sem Num Theory&Prop for Teach. 3 Hours.
This course includes topics from arithmetic, algebra, geometry, number theory and other mathematical areas at a level appropriate for junior high school teachers.
Prerequisite: Consent of instructor.

MATH 5386. Concepts in Modern Algebra. 3 Hours.
This course consists of a survey of several abstract algebraic systems including groups, rings, integral domains, and fields.
Prerequisite: Certification in secondary school mathematics and MATH 3377 or equivalent.
Statistics

STAT 5111. Software For Stat Sciences. 1 Hour.
Topics include MINITAB, SAS, Maple and Scientific Workplace (or equivalents). This one-hour course is available for graduate students in all disciplines.
Prerequisite: STAT 3380 (or equivalent), graduate standing, and consent of instructor.

STAT 5333. Dsgn & Anal Of Experiments. 3 Hours.
Topics include the design, analysis and interpretation of results from standard experimental designs including the completely randomized design, the randomized complete block, the incomplete block, factorial models, Latin squares, Greco-Latin squares, screening designs, fractional factorials, and general fixed, mixed and random effects ANOVA models.
Prerequisite: STAT 4372 (or equivalent).

STAT 5360. Special Topics In Statistics. 3 Hours.
Topics are selected from emerging areas in statistics that are not covered in regular courses. Such topics as data mining, statistical learning, pattern recognition, spatial statistics, statistical methods in finance, functional data analysis, life contingencies may be included. Also listed as MATH 5360.
Prerequisite: Consent of instructor.

STAT 5361. Thry & Appltn Of Probability. 3 Hours.
Topics include probability axioms and properties, conditional probability, random variables, probability distributions, moment generating functions, laws of large numbers and the Central Limit Theorem. Also listed as MATH 5361.
Prerequisite: STAT 4372 (or equivalent) or consent of instructor.

STAT 5362. Thry & Appltn Of Statistics. 3 Hours.
Topics include convergence in probability and distribution, point estimation, hypothesis testing, interval estimation, maximum likelihood methods, properties of estimators such as efficiency, sufficiency and completeness, exponential family of distributions, most powerful tests, uniformly most powerful tests, and likelihood ratio tests.
Prerequisite: STAT 5361 (or equivalent) or consent of instructor.

STAT 5364. Applied Multi Statistical Anal. 3 Hours.
Topics include the multivariate normal distribution, inferences about a mean vector, comparisons of several multivariate means, principal components analysis, clustering, discriminant and classification analysis.
Prerequisite: STAT 4372 (or equivalent) or consent of instructor.

STAT 5365. Linear Statistical Models. 3 Hours.
Topics include the statistical properties of quadratic forms, the full-rank general linear statistical model, the less-than-full-rank model, the linear model structure of regression models, ANOVA models, ANCOVA models, the general characteristics of the fixed, mixed and random effects models and model diagnostics considerations.
Prerequisite: STAT 4372 or STAT 5362 (or equivalents).

STAT 5366. Sampling Methods. 3 Hours.
Topics include the theory and applications of standard methods for performing scientific-based sampling. Among these are simple random sampling, cluster sampling, stratified random sampling, systematic sampling, probability proportional to size (pps) sampling, sampling from finite populations and ratio regression estimation.
Prerequisite: STAT 4372, STAT 5362, or consent of instructor.

STAT 5367. Reliability Anal & Qual Ctrl. 3 Hours.
Topics include measures of failure, reliability functions, failure models, life testing and censoring, system reliability, parameter estimation and testing, control charting, acceptance sampling plans, software reliability and process control.
Prerequisite: STAT 4372, STAT 5362, or consent of instructor.

STAT 5368. Regression Modeling & Analysis. 3 Hours.
Topics include model estimation and testing, simple and multiple regression models, residual analysis, variables selection, polynomial regression, multicollinearity, ridge regression, logistic regression and real data analysis and applications.
Prerequisite: STAT 4372, STAT 5362, or consent of instructor.

STAT 5369. Stat Computing & Consulting. 3 Hours.
This course consists of a detailed study of the SAS package including SAS/BASICS, SAS/STAT, SAS/GRAPH and SAS/IML with emphasis on applying these tools in a consulting environment. Techniques and principles important in working with representatives of user disciplines are included.
Prerequisite: STAT 3380 and graduate standing.

STAT 5370. Nonparametric Statistics. 3 Hours.
Topics include order statistics, contingency analysis, rank tests (Wilcoxon signed-rank test, Mann-Whitney U test and others), distribution-free tests of location and scale, nonparametric regression, Kendall’s tau and related areas.
Prerequisite: STAT 4372 (or equivalent) or consent of instructor.

STAT 5375. Statistical Methods for Agriculture. 3 Hours.
This course explores applications of statistical methods for making interpretations of qualitative and quantitative data in agricultural research. Topics include sampling and randomization, correlation and regression, methods of inference for means and proportions, and design of experiments.

STAT 6060. Independent Study. 1-3 Hours.
Students research a subject in depth under the direct supervision of a faculty member with expertise in the particular area of study. The topic of study will be mutually selected and approved by the student and Statistics faculty member. Variable Credit (1 to 3).
Prerequisite: Consent of instructor.
Director/Chair: **Dustin L Jones**

John G Alford, PHD (jga001@shsu.edu), *Professor of Mathematics, Department of Mathematics & Statistics*, PHD, Univ of Houston-Main; MS, Univ of Houston-Main; BS, Univ of Calif-Los Angeles

Emma Kathleen Price Bullock, PHD (ebx051@shsu.edu), *Assistant Professor of Mathematics, Department of Mathematics & Statistics*, PHD, Utah State University; MMATH, Utah State University; BS, Brigham Young University

Ferry B Butar, PHD (mth_fbb@shsu.edu), *Professor of Statistics, Department of Mathematics & Statistics*, PHD, Univ of Nebraska-Lincoln; MA, Univ of Nebraska-Lincoln; MS, Univ of Nebraska-Lincoln; BS, Academy of Statistics; DRS, University of Indonesia

Scott Thomas Chapman, PHD (stc008@shsu.edu), *Distinguished Professor of Mathematics, Department of Mathematics & Statistics*, PHD, Univ of North Texas; MS, Univ of N Carolina-Chapel Hill; BS, Wake Forest University; BS, Wake Forest University

Beth L Cory, PHD (blc006@shsu.edu), *Associate Professor of Mathematics Education, Department of Mathematics & Statistics*, PHD, University of Virginia - SFS; MS, Florida State University; BS, Liberty University

Brandy Gunet Doleshal, PHD (bdoleshal@shsu.edu), *Associate Professor of Mathematics, Department of Mathematics & Statistics*, PHD, Univ of Texas At Austin; BA, Indiana University; BS, Indiana University

Di Gao, PHD (dxg085@shsu.edu), *Assistant Professor of Statistics, Department of Mathematics & Statistics*, PHD, North Dakota State University; MA, Univ of Missouri-Columbia; BEC, Tianjin University; BBA, Tianjinj University

Rebecca E Garcia, PHD (mth_reg@shsu.edu), *Professor of Mathematics, Department of Mathematics & Statistics*, PHD, New Mexico State University; MA, Univ of Calif-Berkeley; BS, Loyola Marymount University

Damon Martin Hay, PHD (dhay@shsu.edu), *Associate Professor of Mathematics, Department of Mathematics & Statistics*, PHD, Univ of Houston-Main; MS, Univ of Houston-Main; BS, Univ of Texas At Austin

Melinda Ann Holt, PHD (mmx014@shsu.edu), *Professor of Statistics and Associate Dean, COSET, Department of Mathematics & Statistics*, PHD, Baylor University; MA, Baylor University; BA, Baylor University

William A. Jasper, PHD (mth_waj@shsu.edu), *Professor of Mathematics Education, Department of Mathematics & Statistics*, PHD, Texas A&M University; MS, Univ of Southern California; BS, Lafayette College

Dustin L Jones, PHD (dljones@shsu.edu), *Professor of Mathematics Education and Chair, Mathematics and Statistics, Department of Mathematics & Statistics*, PHD, Univ of Missouri-Columbia; MS, Texas A&M University; BS, Southwest Baptist University

Ram Chandra Kafle, PHD (ckafle@shsu.edu), *Associate Professor of Statistics, Department of Mathematics & Statistics*, PHD, Univ of South Florida; MS, Univ of Akron; MS, Tribhuvan University; BS, Tribhuvan University

Doo Young Kim, PHD (dkim@shsu.edu), *Assistant Professor of Statistics, Department of Mathematics & Statistics*, PHD, Univ of South Florida; MA, Ball State University; BS, Gachon University

Naomi Lynne Krawzik, PHD (stdnlv11@shsu.edu), *Assistant Professor of Mathematics, Department of Mathematics & Statistics*, PHD, Univ of North Texas; MS, Sam Houston State University; BS, Alma College

Brian M Loft, PHD (mth_bml@shsu.edu), *Associate Professor of Mathematics, Assistant Provost of Sponsored Programs, Department of Mathematics & Statistics*, PHD, Univ of Oregon; MS, Texas State Univ-San Marcos; BS, Louisiana Tech University

Martin E Malandro, PHD (mem037@shsu.edu), *Associate Professor of Mathematics, Department of Mathematics & Statistics*, PHD, Dartmouth College; AM, Dartmouth College; BS, Texas Tech University

Ananda Bandulasiri Manage, PHD (wxb001@shsu.edu), *Professor of Statistics, Department of Mathematics & Statistics*, PHD, Texas Tech University; MS, Texas Tech University; MS, Sam Houston State University; BS, University of Kelaniya

Taylor Elizabeth Martin, PHD (taylor.martin@shsu.edu), *Associate Professor of Mathematics, Department of Mathematics & Statistics*, PHD, Rice University; MA, Rice University; BA, Univ of Rochester; BS, Univ of Rochester

Amy E Ray, PHD (aer066@shsu.edu), *Assistant Professor of Mathematics, Department of Mathematics & Statistics*, PHD, Michigan State University; MS, Michigan State University; MED, Texas Christian University; BS, Texas Christian University

Stephen Mark Scariano, PHD (sms049@shsu.edu), *Professor of Statistics, Department of Mathematics & Statistics*, PHD, Texas Tech University; MS, Texas Tech University; BS, Loyola Univ-New Orleans
Mary B Swarthout, PHD (mbs001@shsu.edu), Associate Professor of Mathematics Education, Department of Mathematics & Statistics, PHD, Ohio State Univ; MA, Miami University; BA, Berea College

Edward W. Swim, PHD (ews007@shsu.edu), Associate Professor of Mathematics, Department of Mathematics & Statistics, PHD, Texas Tech University; MS, Colorado School of Mines; BS, Angelo State University

Timothy O Trujillo, PHD (txt031@shsu.edu), Assistant Professor of Mathematics, Department of Mathematics & Statistics, PHD, Univ of Denver; MS, New Mexico Inst/Mining/Tech; BS, New Mexico Inst/Mining/Tech

Linda Reichwein Zientek, PHD (lrz002@shsu.edu), Professor of Mathematics, Department of Mathematics & Statistics, PHD, Texas A&M University; MS, Sam Houston State University; BS, Sam Houston State University