

University of Florida Department of Statistics

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Statistics at the University of Florida (UF) evolved from a small Statistical Laboratory in the 1950s to a department formed in 1962 to coordinate statistics teaching, collaborative research, and consulting around campus. It has grown to now encompass a highly rated graduate program with 17 faculty and 65 MS and PhD students. Throughout its history, the department has emphasized excellence in its teaching role, including the development of course textbooks, and about 7,500 students a year now take its courses.

Early Days: A UF Statistical Laboratory

The first course devoted to Statistics at University of Florida (UF) seems to have been given in 1926 in the Mathematics Department—“Introduction to Statistical Theory.” This was followed in 1927 by “Elements of Statistics” in the General Business Department. In 1929 the graduate-level “Mathematical Statistics” was offered in the Mathematics Department and taught regularly from the book of the same name that had been published 2 years earlier by Henry Rietz of the University of Iowa. Also in 1929, “Agricultural Statistics” was introduced in the Agricultural Economics Department and was later sometimes taught by J. Wayne Reitz, who served as President of UF from 1955 to 1967.

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The UF established a Statistical Laboratory in 1951, directed by Herbert A. Mayer of the Mathematics Department, to provide statistical consulting and computing services to students and faculty. Mayer had received his PhD at Iowa under Henry Rietz, and as director he reported directly to the dean of the Graduate School. Consultants at the Laboratory in the mid-1950s included David B. Duncan and Victor Chew, who taught a sequence of courses in experimental design and statistical analysis that had been initiated in 1949 in the Agronomy Department.

The Statistical Laboratory organized a symposium on Monte Carlo methods in March 1954, sponsored by the US Air Force, which was followed by a meeting of the Biometric Society (ENAR). Participants at these meetings included George Snedecor, Gertrude Cox, Maurice Kendall, and John Tukey. At ENAR, David Duncan presented his work on the multiple range test (Duncan 1955). The mid-1950s were productive years for the laboratory, and one might have expected a Department of Statistics to be formed, but this was not to be. Duncan left for the University of North Carolina in 1956 and Chew for North Carolina State in 1957. Their departure left a void in the teaching and consulting facilities, although Willard Ash arrived in 1957 to take up some of the slack, remaining at UF until 1967.

In 1958, President J. Wayne Reitz appointed Dr. Alva Esmond (A. E.) Brandt as “Statistician, Head of Statistical Section, Agricultural Experiment Station.” Brandt had co-directed with George Snedecor, his advisor, the Mathematics Statistical Service at Iowa State when it was founded in 1927, and he was Snedecor’s right-hand man when the Statistical Laboratory was founded there in 1933. Brandt’s assignments included overseeing the formation of a statistics department. He was named head of a newly created Department of Statistics in the College of Agriculture in January, 1962. Brandt, who was due to retire in 1963, spent much of his last official year at UF working out budgetary details and interviewing prospective chairs for the department, hiring William Mendenhall III. By this time, course offerings in Statistics were scattered across at least eight departments on campus. A degree with an emphasis in Statistics could be obtained through the Department of Mathematics.

The Mendenhall Years, 1963–1977

Dr. William Mendenhall, a PhD graduate of the Statistics Department at North Carolina State University, came to UF from Bucknell University in 1963 to head the new Department of Statistics. He later noted that when he arrived for his interview in early 1963, there were no faculty members in the statistics department, no vacant position line items, no budget, no approved degrees, and no courses! On the positive side, three strong forces favored the new department. First, the College of Agriculture and the Agricultural Experiment Station were in desperate need of statisticians to serve as statistical consultants upon Dr. Brandt’s retirement. Second, Leon Grinter, Dean of the Graduate School, had pushed for a

statistics department as part of his goal of making the university a true research institution. Third, Robert Mautz, Vice President for Academic Affairs, was faced with a tight university budget and saw the opportunity of saving money by combining the many introductory statistics courses taught throughout the university into a few courses taught by the new department.

The immediate problem in spring 1963 was solving the staffing problem for the coming September. Mautz had suggested that departmental staff members could be drawn from departments in various colleges, but only one of these persons had a graduate degree in statistics, Willard Ash in Agronomy. Mendenhall recruited Larry Kupper, a chemical engineer by training whom he had met at a short course that he taught for the Bureau of Mines in Colorado in 1962, both to help teach the new introductory courses in statistics and to enter the new graduate program in statistics. In fall 1963, Larry Kupper and John Cornell were the first two graduate students in the department.

Roadblocks were still encountered. At first, the Mathematics Department refused to transfer their advanced statistics courses, and other departments refused to eliminate their competing courses until pushed to do so by Vice President Mautz. Receiving official approval for a Master's program in statistics was delayed, partly because of a letter from the President of Florida State University (FSU) to the President of UF noting that FSU had statistics faculty with strong theoretical interests and backgrounds, so the UF Statistics department should be restricted to developing an applied program. For fall 1964, Mendenhall was able to hire Dr. P. V. Rao, an assistant professor at the University of Georgia. Fred Barnett, a new PhD graduate from VPI (Virginia Tech), accepted the second teaching appointment, and Frank Martin was hired as a consultant in the Agricultural Experiment Station. New graduate students in 1964 included Robert Beaver and Richard Scheaffer, who had been students in the Mathematics Department at Bucknell University. For several years after that, the new classes of graduate students included students coming through the pipeline established from Bucknell by Mendenhall.

The research capabilities of the department improved significantly with the hiring from VPI in 1965 of John Saw, who had been a PhD student of F. N. David at University College, London. The Master's degree was approved in 1964, and the PhD program in 1968. The academic home of the department then moved to the College of Arts and Sciences, but strong ties with agriculture remained through a consulting unit, and a separate unit was established for consulting in the Health Sciences Center.

The remaining years of the Mendenhall chairmanship included the hiring of several young faculty who were to have long careers at UF (Fig. 1), including Richard Scheaffer, Ramon Littell, Jim McClave, Jonathan Shuster, Mark Yang, Alan Agresti, Dennis Wackerly, André Khuri, and Randy Carter and Ronald Marks in the Health Science Center consulting unit. Others who served several years in the department included James Boyett, David Hughes, and Lyman Ott. Also hired was Carol Rozear, who served as an administrative assistant in the



Fig. 1 Statistics faculty at the University of Florida in 1976. Row 1: Victor Chew and Frank Dietrich; row 2: Alan Agresti, Frank Martin, and John Saw; row 3: John Cornell, Robert Smidt, and James Boyett; row 4: Mark Yang, Randy Carter, Larry Peele, and William Mendenhall; row 5: Richard Scheaffer, P. V. Rao, Ronald Marks, Andre Khuri; row 6: Dennis Wackerly, Ramon Littell

department from 1970 until 2008 and who helped the program run smoothly for several chairs and for several generations of graduate students (Fig. 2).

In the early days, the department prided itself on being socially congenial. One tradition was an annual springtime “lasagna dinner,” at which faculty would bring Italian food for an end-of-the-academic-year celebration at the chair’s home. Many of the graduate students and young faculty were also good athletes, including a few who won All-American honors as undergraduates in various sports. As a consequence, for many years the department fielded very successful intramural sports teams in softball, basketball, and flag football.

The Scheaffer Years, 1977–1989

Dr. Richard Scheaffer, who had joined the faculty in 1967, noted that he chaired the department during its “teenage years,” with all that is implied by that statement. By 1977, the department had clearly established strengths in teaching and applied research. Scheaffer made it a goal to strengthen the research capabilities. Since the faculty members had nearly all been hired as fresh PhD graduates, one



Fig. 2 Three chairs with the department's administrative assistant: Ron Randles, Carol Rozear, Bill Mendenhall, Dick Scheaffer

goal was to add senior faculty. Among these, two full professors were hired who already had strong international reputations for their research accomplishments—Ronald Randles from the University of Iowa in 1981 and Malay Ghosh from Iowa State University in 1982. Additional junior faculty hired who went on to have long careers at UF included Andrew Rosalsky, James Booth, Myron Chang, Jane Pendergast in the biostatistics consulting unit, and Ken Portier in the Institute of Food and Agricultural Sciences (IFAS) consulting unit. Others hired during this period who spent significant time at UF included Rocco Ballerini, Michael Conlon, James Kepner, Susan McGorray, Ralph O'Brien, and Geoff Vining, as well as Marilyn Saddler on the staff. During the early years of his administration, Scheaffer obtained funds to bring several noted statisticians, including C. R. Rao, William Cochran, and David Blackwell, to the department for extended visits.

By the twenty-fifth anniversary of the department in 1988, the department had 34 positions for statisticians, 28 of which were at the PhD level, and six at the Master's level, to serve in teaching, research, and consulting roles. About 50 graduate students were working on degrees and about 3,000 students were taking courses each semester from the department. Faculty research productivity increased, and seven faculty members were named Fellows of the ASA. But, in the early days the department had developed a reputation around campus for the excellence of its teaching, and faculty continued to pay careful attention to that role and regularly received campus-wide teaching awards. Richard Scheaffer himself had a major impact in the field of statistical education, helping to promote the teaching of statistics in secondary schools and initiate an Advanced Placement

Statistics course. With the growth of the department, having sufficient space was a continual problem, and the department moved twice to other buildings.

The first major research grant to the department came in 1979 when NIH funded the Pediatric Oncology Group Statistics Office. After that, grants to faculty members grew steadily, with awards coming through NIH, NSF, ONR, EPA, USDA, and numerous foundations and industrial groups. In addition, the faculty played a major collaborative role in grants that were awarded to other units of the university.

The Second Quarter Century

During its second quarter century, the department's objective continued to be to build a research program that balanced theory with applications while maintaining excellence in its service role. The success of the service role was reflected by continually increasing enrollments in basic statistics courses at the undergraduate and graduate levels.

The tradition of the statistics department having long-serving heads continued when Ronald Randles served as chair from 1989 to 2000. During this period, the financial status of the UF followed a roller coaster pattern that continues today, reflecting the state of Florida's often precarious financial situation. This often affected the department's ability to keep faculty and hire new ones. In 1992 the department moved to Griffin-Floyd Hall, one of the oldest buildings on campus, when it was renovated after being empty since 1978. This building had been the original home of the College of Agriculture and the location for its teaching of statistics more than 60 years previously. The department remains there today. After John Saw passed away in 1990, his mother made a donation to fund a departmental library in his name in the building.

During this period, the department offered several 2 1/2- day short courses at an Orlando hotel during the university's spring break each year, on topics in which the faculty had special expertise. These were well attended, largely by statisticians working in industry, and brought in significant discretionary funds for the department. A research initiative, starting in 1999 and continuing to the present day, was a Winter Workshop held in early January each year, focusing on a currently vibrant research area, and inviting worldwide leaders in the area to present talks (Fig. 3).

Several new hires during this period have had long careers in the department, including James Hobert, Brett Presnell, and the instructors Larry Winner and Maria Ripol. An external search for a chair to replace Randles led to the hiring of George Casella from Cornell University in 2000. Casella served as chair from 2000 until 2006, followed by interim chair Ramon Littell and then Mike Daniels, who is the current chair. New hires in these years included the senior hires, Linda Young, Mary Christman, Mike Daniels, and Hani Doss, the junior hires Pamela Ohman, Bhramar Mukherjee, Alex Trindade, Trevor Park, Kshitij Khare, and Xu Han, and the



Fig. 3 Attendees of the UF Winter Workshop in 2001 on Monte Carlo methods



Fig. 4 Statistics faculty and former faculty at the University of Florida in 2010. From left Bhramar Mukherjee, Linda Young, Trevor Park, Maria Ripol, Ramon Littell, George Casella, Mary Christman, Andre Khuri, Richard Scheaffer, John Cornell, Michael Daniels, Alan Agresti, Kshitij Khare, Hani Doss, James Hobert, Jon Shuster, Andy Rosalsky, Mark Yang, Robert Dorazio, Malay Ghosh, Larry Winner, Ron Randles, Jane Pendergast, Sam Wu

instructors Megan Mocko and Yasar Yesilcay who now together with Ripol and Winner handle most of the undergraduate service course teaching (Fig. 4).

A generous donation to the department by the Gill Foundation, created by Jack and Linda Challis Gill, led in 2001 to the annual Challis Distinguished Lecturer series. This has brought to the department visits by distinguished statisticians such as Persi Diaconis, Bradley Efron, Norman Breslow, and Peter Hall. Other donations by William Mendenhall, Myron Katzoff, and Kenneth and Janet Keene have funded fellowships and awards for graduate students.

In the new millennium, disagreements occurred between many members of the Biostatistics unit in the Health Center and the rest of the department about academic goals for the Biostatistics group. That group broke away from the Statistics Department to become a division in the Department of Epidemiology and Health Policy Research in the College of Medicine, with faculty including Mini Devidas, Wendy London, Jon Shuster, Sam Wu, and later Keith Muller. A separate Biostatistics group was established in the College of Public Health and Health Professions, with faculty including Babette Brumback and Mike Daniels. That group has maintained close ties with the Statistics Department, including a joint academic program. Currently, the Biostatistics groups are being merged while remaining in separate colleges.

As of 2012, at its fiftieth anniversary, the Statistics Department has about 65 graduate students in its Masters and PhD programs. The department's undergraduate major has been increasing in size, having about 50 majors and many more co-majors. During the last decade, in addition to its standard MS and PhD-level courses, the department developed several new applied courses that serve both undergraduate Statistics majors, as well as graduate students in other fields who want to take additional courses beyond the basic two-semester sequence in statistical methods that many departments require. In the 2011–2012 academic year, about 7,500 students took courses from the Statistics Department at UF. On the negative side, after many years of budget cuts at the University of Florida, the Statistics Department had shrunk from 25 tenured or tenure-track faculty in three units in 2000 to 12 such faculty in two units in 2011, as the service course teaching was increasingly handled by nontenure-track instructors.

Research Accomplishments and Textbooks

Areas in which UF Statistics faculty have made significant research contributions include Bayesian statistics (M. Ghosh), biostatistics (H. Doss, M. Daniels, J. Shuster), categorical data analysis (A. Agresti), decision theory (G. Casella, M. Ghosh), experimental design (J. Cornell), missing data (M. Daniels), mixed models (A. Khuri, R. Littell), multivariate statistics (R. Carter, J. Saw), non-parametric statistics (B. Presnell, R. Randles, P. V. Rao), Monte Carlo and computationally intensive methods (J. Booth, G. Casella, H. Doss, J. Hobert, K. Khare, B. Presnell), probability limit theory (A. Rosalsky), spatial statistics (M. Christman, L. Young), and statistical education (R. Scheaffer). The reference list at the end of this chapter shows some research articles written by UF Statistics faculty (while at UF) that have achieved more than 200 citations according to Google Scholar.

As the research achievements of the faculty increased over the years, the department received increasing recognition worldwide. In 2008, the department was ranked by the *U. S. News and World Report* as number nine in the Top Ten Statistics Departments. Special awards to the faculty include the ASA Founder's

Award to Linda Young, elected President of ASA and the ASA Founder’s Award to Dick Scheaffer, Vice President of ASA and the Paul Minton Award by the Southern Regional Council on Statistics to Ron Randles, the Distinguished Achievement Medal from the ASA Section on Statistics and the Environment to Ramon Littell, long time editorship of *Sequential Analysis* by Malay Ghosh, the Youden Prize, Brumbaugh Award, and Shewhart Medal to John Cornell, elected Foreign Member of the Spanish Royal Academy of Sciences and editorship of *JASA*, *Statistical Science*, and *Journal of Royal Statistical Society Series B* for George Casella, and an honorary doctorate from De Montfort University (UK) and “Statistician of the Year” award from the Chicago chapter of ASA for Alan Agresti.

Several highly regarded textbooks evolved from the department’s mission of teaching most of UF’s introductory statistics courses. Bill Mendenhall’s *Introduction to Probability and Statistics* was one of the first introductory statistics textbooks to achieve major sales, and several spin-off versions focused on various disciplines. *Mathematical Statistics with Applications*, which Mendenhall co-wrote with Dick Scheaffer and was later revised by Dennis Wackerly, continues to be one of the most popular undergraduate texts on this topic. Later textbooks achieved prominence for graduate level courses, such as Alan Agresti’s *Categorical Data Analysis* and George Casella’s *Statistical Inference* (with Roger Berger). The reference section at the end of this chapter lists several books written by members of the department.

MS and PhD Graduates

The department has through the summer of 2010 graduated 165 PhDs and 392 MS degrees. The growth in the program is reflected in this table:

Decade	MS Degrees	PhD degrees
1960–1970	28	3
1971–1980	81	24
1981–1990	81	32
1991–2000	94	49
2001–2010	108	57

The list of graduates and their date of degree can be found on the departmental web page, www.stat.ufl.edu/personnel/alumni.html. Over the years, many UF Statistics alumni have had distinguished careers in academia, industry, and government. The first graduate student, Larry Kupper, is Alumni Distinguished Professor of Biostatistics at the University of North Carolina, while his fellow student John Cornell had a long career in the IFAS statistics consulting unit at the University of

Florida. Of the early doctorates, James McClave followed a brief academic career by founding a highly successful consulting company (Info Tech) that now has more than 150 employees, Ken Stanley worked in Geneva for the World Health Organization as well as for the Departments of Biostatistics and Statistics at Harvard, Darryl Downing became Vice President of Statistical and Quantitative Sciences at GlaxoSmithKline, Ronald Marks served as head of the department's Biostatistics Unit for several years, William Louv was Senior Vice President at GlaxoSmithKline, Walter Offen served as Senior Research Fellow at Eli Lilly, Jim Schott at the University of Central Florida wrote the highly regarded book *Matrix Analysis for Statistics* and David Nickerson serves as chair of that department, and Samy Suissa was Director of Clinical Epidemiology at McGill University. Of the later graduates, among those having highly productive academic research careers were Parthasarasi Lahiri (University of Maryland), Dawn Peters (Oregon State University), Gauri Datta (University of Georgia), André Adler (Illinois Inst. Tech.), Joseph Lang (University of Iowa), I-Ming Liu (Victoria University of Wellington), Brent Coull (Harvard University), Ralitza Gueorguieva (Yale University), Galin Jones (University of Minnesota), Brian Caffo (Johns Hopkins University), Wolfgang Jank (University of Maryland), Bernhard Klingenberg (Williams College), and Samiran Sinha (Texas A&M University). MS graduates who went on to receive PhDs elsewhere and then have productive academic careers include Marcello Pagano (Harvard), David Stoffer (Pittsburgh), and Ruey Tsay (Chicago).

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Some Frequently-Cited Articles Written by UF Statistics Faculty

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