



## The History of Mathematics at The University of Findlay

### The first 100 years...

Findlay College was founded in 1882 by the Churches of God, General Conference, and the citizens of the city of Findlay. A freshman student entering the classical academic program in 1886 was expected to bring with him or her a solid background in mathematics (“Arithmetic completed, two terms in Algebra, Elementary Philosophy, and Plane Geometry”). The Board of Trustees set the pay for a mathematics instructor at \$50 a month, while an instructor in lower mathematics and history received \$40 a month. To put these salaries in perspective, note that tuition was only \$8 a term. The first class had 70 students. The campus consisted of an impressive brick building (now known as Old Main), and the use of natural gas heat distinguished it “from any other college in the land”.



Old Main

The first two professors teaching mathematics were Miss Lizzie Grauel and Ed. M. Mills, both of whom are listed in the 1886 catalog. In the lean years around 1900, when only 12 faculty members were employed (and 4 of them in the music conservatory), Dean Charles T. Fox added teaching mathematics to his schedule. The course offerings in 1908-09 included University Algebra for two terms and Trigonometry for the third term of the freshman year for all students. For students in the classical or scientific programs, second and third year courses were in the sciences and logic. The senior year included one term of Analytic Geometry and two terms of Calculus.



MISS CADDIE GRIFFITH, A. M.

Miss Caddie Griffith graduated from Findlay College in 1909. She was a member of the women’s basketball team and active on campus. As with other graduates of this time, she did not have a major, instead receiving a well rounded education. She taught Preparatory Mathematics and Rhetoric at Findlay College in the years 1910-1912 and later, 1914-1917, taught English and History and was head of the English department.

After Miss Griffith’s untimely death in 1923, her parents commissioned the construction of an arch in front of Old Main. The Griffith Memorial Arch is part of the oldest and most honored tradition at The University of Findlay. Students enter through the arch as freshmen and march out through the arch at graduation.



Griffith Memorial Arch -1941

The 1935-36 Findlay College catalog stated that both a Major and a Minor in Mathematics are available. This is the first catalog that gave majors. Findlay College also now offered two semesters a year instead of three. The Department of Mathematics and Physics under Dr. Yale K. Roots, PhD in Physics, offered a collegiate major consisting of a minimum of 24 hours in the major and 8 hours in a related field. For a Mathematics Major, the courses comprising the 24 hours are:

124-125. *Freshman Mathematics*-A year course, fundamental to collegiate courses in science, including algebra, trigonometry, analytic geometry and elementary calculus. This course, or its equivalent, is required as preparatory to all courses in Physics, but may be taken concurrently with Physics 132-133. Credit, four hours. Each semester.

226-227. *Calculus*-A year course in the principles of differentiation and integration with applications. This course is required of all students majoring in Physics. Prerequisite Freshman Mathematics 124-125 or its equivalent. Credit, four hours. Omitted in 1935-1936.

323. *Algebra*-An advanced course in algebra. Prerequisite, Freshman Mathematics 124-125. Credit, four hours. First semester.

324. *Analytic Geometry*-An advanced course in analytic geometry. Prerequisite Freshman Mathematics 124-125. Credit, four hours. Second semester.

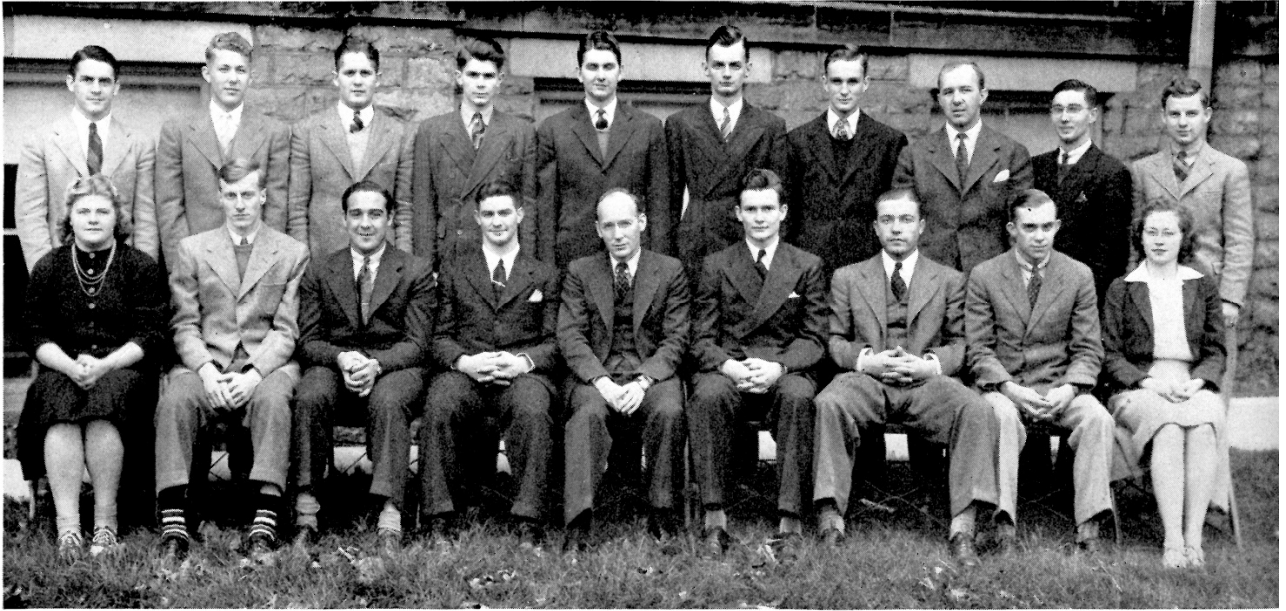
In addition, "Majors and minors in the department are required to attend and occasionally to participate in a physics and mathematics seminar."

The Mathematics and Physics Department had an active student organization, The Einstein Club, for many years. It was established in 1930 and still active in the 1940s. The 1942 Argus yearbook gave the following description as well as a photo:

#### **U. S. Needs Scientists; Einstein Club Has Them**

Federal authorities on all fronts are searching for trained scientists, vital elements to any nation at war. Findlay College is not without its modern science department and to supplement this classroom - laboratory work is the Einstein club.

Here is the next to the most masculine club on the campus - - the Einstein group was 100 % male until two co-eds the first semester, and three more the second semester, were voted into the club. Prof. Brown Lee Mackin is faculty sponsor. Organized in 1930, the club includes those majoring or minoring in math or physics. Each bi-weekly meeting presents new ideas about the "Tesla Coil," the "Oscillagraph," "Radio and Defense," "Mathematical Oddities" or some other similar scientific dissertation. Always anxious to learn more about the sciences, the Einsteiners tripped to Fostoria to learn about "Infra Red" and visited the local radio station to study its technique.



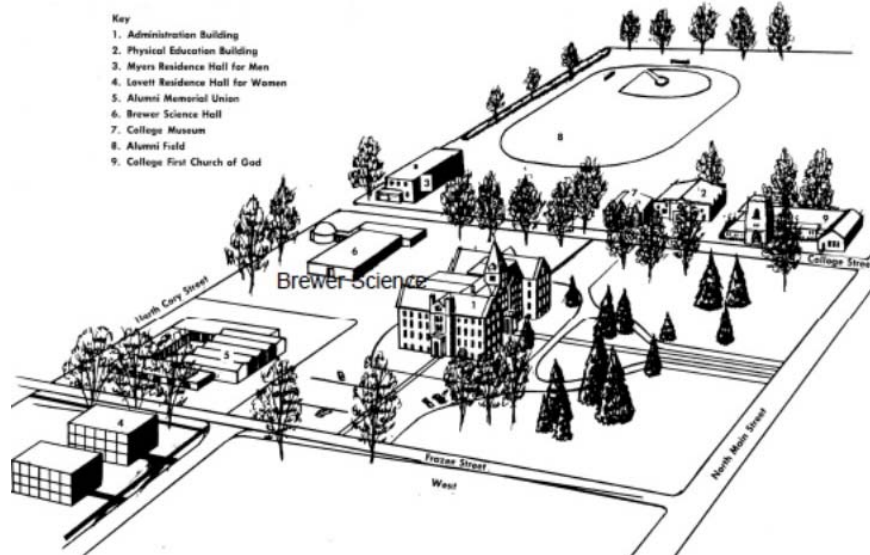
The nation's most valuable men—scientists! This group of students, set on discovering the laws of nature, are headed by Prof. Lee Mackin, the new physics instructor. They are, first row: Elsea, Gaugler, Cancilla, Diemert, Prof. Mackin, Stout, Kanuck, Chapin and Smith; second row: Hummon, Beltz, Lubowicki, Burket, Broske, Ernest, L. Keller, Hodnick, Kint and Pratt. This is also the group that presented "Physical Fantasies."

In the 1950s, the academic areas were organized into four divisions. Division II contained Mathematics and Physics, Biology, Chemistry and Geology, and Physical Sciences. In 1955, the Mathematics and Physics faculty were Professor Newhard and Professor Karg. A major in Mathematics has additional course offerings that were not available 20 years ago. These new classes included a lower level course - 50. Plane Geometry, for those who did not have the work in high school, and no college credit is given toward graduation; and a large number of upper level courses - 330. Advanced Calculus, 331. Differential Equations, 430. Analytical Mechanics, 431. Theory of Errors, 432. Vector Analyses, and 433. Mathematics-Seminar. Also seven new courses in Mathematics that covered engineering topics were offered by Professor Karg who had an Engineering degree. These included:

- 103. Basic Descriptive Geometry - 4-quadrant space geometry of points, lines and planes, use of Q and R planes, analytical methods, practical applications. Two 2-hour lab. periods. Two credit hours. Second semester.
- 200. Engineering Problems - Basic slide rule instruction, basic mathematic review, survey of engineering, dimensional problems, problems in applied physics, lectures by resident engineers. Two 1-hour recitations 2 credit hours. First semester.

Findlay College has continued to offer applied courses, but has not offered this many courses in engineering since the 1950s.

Findlay College expanded its campus in the 1960s. The William B. Brewer Science Hall was opened in 1961. It housed faculty offices for mathematics and the sciences, as well as classrooms, laboratories and



a planetarium. The planetarium was later named the Newhard Planetarium in honor of Prof. Harold Newhard, professor of mathematics and physics 1944-1967. The campus grew to 7 buildings and covered about two blocks. The other buildings were Old Main (Administration Building), Physical Education Building, two new dorms and the new Alumni Memorial Union, as well as the College Museum. At this time the mathematics faculty had only one or two full time faculty members.

*Campus Map 1962*

In the 1970s, Findlay College hired their first mathematics faculty member with a PhD in Mathematics. Dr. Thomas E. Elsner completed his dissertation titled “Inverse Limits of Finite-Spaces” in 1972 and was on the faculty at Findlay College from 1972-1974. Current faculty member Gale Weisman also finished his PhD in 1972 in Education. His dissertation was “Mathematics Activity Learning Material for Prospective Elementary Teachers and a Comparative Study of Its Application”.

Also in the 1970s, computer science first became part of the mathematics curriculum. This new course was MATHEMATICS 188 Computer Use. Another new lower level course was MATHEMATICS 199 Current Topics in Mathematics. At this time, Findlay College’s academic year was divided into three terms and the calculus sequence was spread over four terms, including more upper level topics. More upper level courses in mathematics are available, including:

**MATHEMATICS 318 MATHEMATICS FOR ELEMENTARY TEACHERS I**

A basic course in functional mathematics, with a detailed study of the structure of the number system. Enrollment is limited to students of elementary education. Second term.

**MATHEMATICS 319 MATHEMATICS FOR ELEMENTARY TEACHERS II**

Continuation of Math 318. Enrollment is limited to students of Elementary Education. Third term.

**MATHEMATICS 342 LINEAR ALGEBRA**

A study of vectors and vector spaces, matrices and matrix algebra, linear transformations, determinants, quadratic forms, and related topics. *Prerequisite:* Math 142 or consent of instructor. First term.

**MATHEMATICS 343 ABSTRACT ALGEBRA**

A study of algebraic structures, functions, sets, and other related topics. *Prerequisite:* Math 254 or consent of instructor. Second term.

**MATHEMATICS 364 DIFFERENTIAL EQUATIONS**

A study of the methods of solving differential equations. *Prerequisite:* Math 251. Third term.

**MATHEMATICS 440 PROBABILITY AND STATISTICS**

A course in mathematical statistics for science students. *Prerequisite:* Math 251. Third term.

**MATHEMATICS 441 REAL ANALYSIS I**

A study of the theory of continuity, differentiation, and integration and an introduction to point set topology. *Prerequisite:* Math 251. First term.

**MATHEMATICS 442 REAL ANALYSIS II**

Continuation of Math 441. Second term.

**MATHEMATICS 500 SEMINAR**

Offered upon demand.

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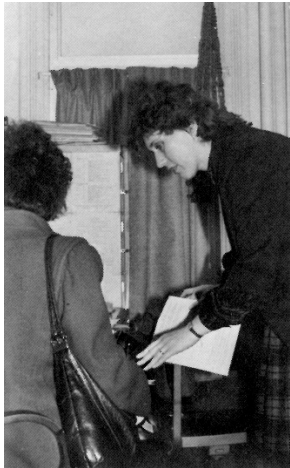
### The second 100 years...

In 1985, Mathematics and Computer Science became a separate academic area, no longer under the Division of Natural Sciences. The formation of the Division of Mathematics and Computer Science allowed the disciplines to more efficiently address curricular, student, and faculty issues in the two disciplines. The faculty offices were now in Old Main, the signature original building of Findlay College. Dr. Janet Roll was the first division chairman of the newly formed area and served 1985-1989. She taught mathematics, computer science, and technology management courses. Dr. Roll was also a leader regionally, serving as President of the Ohio Section of the Mathematical Association of America in 1990-1991.



*Dr. Janet Roll*

In 1985, nineteen students were majoring in Mathematics. There were 3 members of the mathematics faculty, and 4 that were mathematics/computer science. The Mathematics Faculty were: Prof. Anne Albert, Prof. Judith McCrory, and Prof. David Wallach; and the Mathematics/Computer Science Faculty: Prof. Dick Corner, Prof. Mary Jo Geise, Dr. Janet Roll, and Dr. Gale Weisman.



*Geise, Albert, McCrory, Wallach, Corner – 1986-87 Argus Yearbook*

In the 1980s, Findlay College was back on a two semester schedule. Among the unique Mathematics offerings in the 1980s were a number of college mathematics classes being taught by full time and part time faculty at the Lima Correctional Facility in Lima, Ohio. These classes were offered for college credit. Faculty also were involved on campus in the freshman seminar program. In this program, faculty team taught an interdisciplinary course with a faculty member from another discipline. Another unique feature of mathematics course offerings was offering courses through the weekend college program. Statistics, Intermediate Algebra, and a two course business precalculus/calculus sequence were offered. In addition, full time UF faculty taught Technical Mathematics courses on campus through a cooperative program for the adjacent Owens Technical College South (Findlay Campus). This was a beneficial arrangement between private and public institutions.

In 1986, Math Encounter, a mathematics organization for students, was formed. Prof. David Wallach was its first advisor. Also in 1986, the first Mathematics Day was held. The first speaker was well-known educator Dr. Kenneth Cummins, who spoke on mathematics education. The tradition has continued with both UF faculty and outside speakers. Most recently, the annual Math Day is held in March and includes two presentations by an outside speaker. The talks are enjoyed by approximately 250 students per year, both math majors and other students enrolled in mathematics classes. Dr. Cummins returned to campus to speak, as well as other area faculty: 2014 Dr. James Albert “Looking for Streakiness”, “Big Data and The Boston Marathon” – Statistics and 2013 Dr. John Stadler – “The Mathematics of Juggling”, “Deconstructing the Towers of Hanoi” – Modeling. The 25<sup>th</sup> Mathematics day in 2012 featured Dr. Ensley “Invariants under Group Actions to Amaze Your Friends”, “Permutations in Graph Puzzles” – Permutations, and a retrospective powerpoint presentation by Prof. Anne Albert.



*Math Day 2013*

In the summer of 1989, Findlay College became The University of Findlay, in recognition of the growth of its programs, including graduate programs. Also in the summer of 1989, the mathematics department hosted the Summer Short Course of the Mathematics Association of America Ohio section. The topic was Topics in Additive Number Theory taught by Dr. George Andrews. Attendees came from a wide geographic area. Prof. Donald Mathews became the second Chairman of the Division of Mathematics and Computer Science in fall 1989.

The mathematics faculty have continued to be involved professionally in the Mathematics Association of America. A number of faculty have spoken at national meetings held in January and August. Faculty members have served on committees and chaired committees of the Ohio Section of the MAA such as Prof. David Wallach, Ohio Council of Teachers of Mathematics Liaison, Prof. Anne Albert, Chair of Committee on Curriculum, Mrs. Diane Groth, Department Liaison, Dr. Pamela Warton, Ohio Section Secretary, and Dr. Chandra Dinahavi, Chair of Committee on Curriculum. The University of Findlay has also hosted two meetings of the Ohio Section of the MAA. The first was fall 1994 and the second was fall 2011. Prof. Judith McCrory was in charge of local arrangements in 2011.

In 1993, the mathematics faculty offices were moved to 1104 N. Cory Street. Seven faculty offices, a foyer/reception area for the secretary, and a work area/storage area/kitchen were features of this former private residence. Known as the Math House, the new office arrangement served well to unite the faculty and make it convenient for students to stop by and see one or several faculty members. Prof. David Wallach served as chair of the Division of Mathematics and Computer Science and then became head of the Mathematics Department when the two disciplines split. Prof. Anne Albert and Prof. Judith McCrory became Co-directors of Mathematics in 1997. In 2006 with a growing faculty, a new, larger Math House was created at 1110 N. Cory, just next door.



*Math House with Related Rates ladder*

While the turn of the century 1900 was a low point for the university and its faculty, in the year 2000 the Mathematics Department was thriving. The faculty was capable and stable with the 5 faculty full

time in mathematics and the 3 in mathematics/computer science having taught a combined total of 138 years at the University of Findlay! In spite of their average of 17 years of service, math faculty continued to innovate, be involved campus-wide, and serve our students well. Prof. Judith McCrory offered statistics online. She also was the first faculty member to be involved in dual enrollment – leading area high school teachers to teach UF Calculus at their high schools. This program grew to 30 high schools offering Calculus and a smaller number offering Statistics. Prof. Anne Albert started our first online mathematics placement exam. This allowed students to take the exam from home before coming for freshman orientation. Prof. Mary Jo Geise was the Director of Computer Science and then became Dean of the College of Sciences. These faculty members and others served on university wide committees. The faculty served an increasing number of students as our overall enrollment grew.

The new requirement of a general education statistics course for all students, which went into effect in the mid-1990s, insured the need for a large number of statistics sections. Our majors were being successful, with a total of 33 mathematics majors. As an example of our successful class of 2000 graduates: Jonathan Hauenstein - completed a PhD in mathematics and has a faculty position, Eric Smith - hired by the national headquarters of Cooper Tire in Findlay, OH, and Benjamin Neff - middle school mathematics teacher.

Changes to the mathematics curriculum were made in 2007, led by newly hired faculty Dr. Pamela Warton and Dr. Mahmoud Rawashdeh. New classes were added and the mathematics major now had five versions. Two were similar to previous majors: Mathematics - Pure Mathematics Emphasis (based on mathematics major) and Mathematics - Applied Emphasis for Engineering Science (based on mathematics –preengineering). Three new majors gave distinctive curriculums that had previously been offered by combining a mathematics major with various minors. They allowed students to be better prepared for a variety of careers. These majors are Mathematics – Applied Emphasis for Actuary Preparation, Mathematics – Applied Emphasis for Computer Science, and Mathematics – Applied Emphasis for Operations Research. Double majors are also popular, including Mathematics – Pure Mathematics Emphasis and Adolescent/Young Adult Integrated Mathematics for students planning to teach 7<sup>th</sup>-12<sup>th</sup> grade mathematics.

The re-establishment of a Math Club in 2006, the increase of UF mathematics faculty with PhD degrees, and the work of Dr. Pamela Warton, led to the establishment of a local chapter of the Mathematics honorary Pi Mu Epsilon. The chapter was chartered in 2009 with faculty members Dr. Pamela Warton and Prof. Anne Albert. Nine students were initiated the first year: *1<sup>st</sup> row: (Albert), Justin Shannon, Heather Maltsbarger, Lauren Williams, and Danielle Rohal, (Warton); 2<sup>nd</sup> row: Ryan McDannell, Jeraco Speelman, Kendra Bruns, and Erica Keene.* Current members are involved in the initiation ceremony held during Math Day each year. A review of the year's activities of the Math Club also is given. Family members are welcome to attend.



*Charter Class of Pi Mu Epsilon*



Mathematics students of The University of Findlay are active in undergraduate research, presenting both on campus and in area conferences. A tradition of attending the spring meeting of the Ohio Section of the MAA has been solidified in recent years. Students have presented at the spring meeting every year starting in 2008. Teams of students have also participated in the annual mathematics contest at the meeting.

After the year 2000, The University of Findlay began to increase its emphasis on research by faculty, and to provide sufficient salaries to attract candidates with PhDs. In addition, our long-tenured faculty members began to retire. Dr. Pamela Warton, PhD, became the Mathematics Department Chair in 2009. By 2012, the mathematics faculty had grown to five members with a PhD degree, for 63% of the full time mathematics faculty. In keeping with this new dynamic, a new colloquium series was started by Dr. Daniel Baczkowski in 2012. Faculty members speak before an audience of faculty and math majors on their current research and interests. The colloquium is held on the last Wednesday of each month. Two of the early presentations were “Applications of Modular Arithmetic and Coverings to Problems in Number Theory” by Dr. Daniel Baczkowski and “Graph Decompositions” by Dr. Chandra Dinavahi. In 2014, Prof. Anne Albert gave a colloquium with a historical bent that included a review of UF mathematics faculty who have taught since 2000.



*Dr. Dan Baczkowski*