

William Mark Faucette

Curriculum Vitae

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Education:

May, 1988: Ph.D. in Mathematics, Brown University

May, 1987: Sc.M. in Mathematics, Brown University

June, 1983: M.A. in Mathematics, The University of Georgia

June, 1983: B.S. in Mathematics, The University of Georgia

Area of Specialization: Algebraic Geometry

Thesis Topic: Harmonic volume and the algebraic inequivalence of homologous cycles
in the Jacobian of a Riemann surface.

Thesis Adviser: Bruno Harris

Honors: Graduated from The University of Georgia as First Honor Graduate, With
Highest Honors and With Honors in Mathematics.

First undergraduate mathematics major ever to write an undergraduate honors thesis
at The University of Georgia.

Member of Pi Mu Epsilon and Kappa Mu Epsilon mathematics honor societies.

Member of Phi Alpha Phi honor society.

Elected Phi Beta Kappa, 1982.

Awarded University Fellowship for Graduate Study, Brown University, 1983–1984.

In the 1989–1990 academic year, selected as one of twelve semi-finalists for the Educator of the Year award at Northeast Missouri State University (now Truman State University).

Granted tenure and promoted to the rank of associate professor of mathematics in the fall of 1998.

Recognized as College of Science and Mathematics Faculty Member of the Year in 2013–2014 by the University of West Georgia Student Government Association.

Nominated by the Advanced Academy of Georgia as Faculty Member of the Year in 2016.

Awarded University of West Georgia Faculty Member of the Year by the Advanced Academy of Georgia in 2017.

Voted by the student body as Outstanding Undergraduate Mathematics Instructor in 2023.

Professional Organizations:

American Mathematical Society, 1981–present;

Mathematical Association of America, 1988–present;

Scholarly Articles And Books

“Circling Up the Wagons: Unifying Mathematics for the Calculus Student,” completed 1988, unpublished.

“Higher Dimensional Harmonic Volume Can Be Computed As An Iterated Integral,” *Canadian Mathematical Bulletin*, vol. 35(3), 1992.

“Harmonic Volume, Symmetric Products, and the Abel-Jacobi Map,” *Transactions of the Amer. Math. Soc.*, vol. 335, no. 1, January 1993.

“Geometric Interpretation of the Reduction of the General Quartic by Galois Theory,” *Amer. Math. Monthly*, vol. 103, no. 1, January 1996.

“How Not To Prove Fermat’s Last Theorem,” completed 1996, revised 2001.

The Descendants of William E. Faucett and Elizabeth Wallis, State University of West Georgia Press, 1998.

“An Application of Menelaus’ Theorem,” co-authored with Bryan Crawford, 2002, unpublished.

“The Miracle Substitution: How and Why It Works,” 2002, completed.

“Divisibility Rules for 7 and 13,” completed 2003.

“Trisecting an Angle . . . By Cheating” with Wendy C. Davidson, completed 2003.

“Pascal’s Theorem in Degenerate Cases,” completed 2004.

“Around the Cubic Curve in Fifty Minutes,” completed 2005.

“A Poor Man’s Derivation of the Double Angle Formula for Sine,” completed 2006.

“Generalized Geometric Series, The Ratio Comparison Test and Raabe’s Test,” *The Pentagon*, vol. 67, no. 1, Fall 2007.

“Ceva’s Theorem and Its Applications,” completed 2007.

“An Interesting Application of the Commutativity of Factor Groups,” completed 2013.

“The Nine-Point Circle,” completed 2014, revised 2017.

“Trisecting a Segment,” completed 2014, revised 2018.

“The Euler Line of a Triangle,” completed 2014, revised 2018.

Seminars and Conferences

April, 1989, Presented research results at Missouri regional meeting of the Mathematical Association of America.

June, 1989, Presented research results in three lectures to the geometry seminar at The University of Georgia.

February, 1990, Presented research results in two lectures to the geometry seminar at The University of Missouri—Columbia.

Spring Semester, 1990, Conducted an algebraic geometry seminar intended as an introduction to algebraic geometry. The primary text was *Algebraic Curves*, by W. Fulton, but supplementary material on the relation between very ample line bundles and embeddings in projective space was taken out of *Principles of Algebraic Geometry*, by P. Griffiths and J. Harris.

Spring Semester, 1991, Conducted an algebraic geometry seminar. The primary text was chapter zero of *Principles of Algebraic Geometry*, by P. Griffiths and J. Harris.

March, 1991, Presented research results to the mathematics faculty of California State University – Hayward.

Fall Semester, 1991, Taught an introductory course/seminar in algebraic geometry to students and members of the faculty. The primary text was *Algebraic Curves*, by W. Fulton.

April, 1992, Presented paper “Geometric Interpretation of the Reduction of the General Quartic by Galois Theory” at the regional meeting of the Mathematical Association of America.

Fall Semester, 1992, Participated in a computer science programming seminar on the C programming language.

Spring Semester, 1993, Presented a lecture on the definition and basic properties of schemes.

Spring, 1994, Presented paper *Geometric Interpretation of the Reduction of the General Quartic by Galois Theory*, at the Southeastern regional meeting of the Mathematical Association of America at Carson-Newman University, Knoxville, Tennessee.

Spring, 1995, Presented paper *How Not To Prove Fermat’s Last Theorem*, at the Southeastern regional meeting of the Mathematical Association of America at The University of North Carolina at Asheville, in Asheville, North Carolina.

Spring, 1996, Attended the Southeastern regional meeting of the Mathematical Association of America at The University of Alabama at Huntsville, Huntsville, Alabama.

Spring, 1998, Attended the Southeastern regional meeting of the Mathematical Association of America at The College of Charleston in Charleston, South Carolina.

Spring, 1999, Attended the Southeastern regional meeting of the Mathematical Association of America at The University of North Carolina at Charlotte, in Charlotte, North Carolina.

Spring, 2000, Attended the Southeastern regional meeting of the Mathematical Association of America at Huntingdon College in Montgomery, Alabama.

Fall, 2001, Presented a seminar in commutative algebra. The text was *Commutative Algebra*, by M. F. Atiyah and I. G. MacDonalld.

Spring, 2002, Presented a lecture for Math Day at the State University of West Georgia. The subject was algebraic coding theory and the title was *The FBI, the CIA, the NSA and You: The Trish Gibbs Memorial Lecture*.

March, 2005, Presented my paper “Pascal’s Theorem in Degenerate Cases” at the Southeastern Regional Meeting of the Mathematics Association of American in Raleigh, North Carolina.

March, 2005, I sponsored a student, Khrysti Cash, in doing a research project in coding theory. She presented her research at the Southeastern Regional Meeting of the Mathematics Association of American in Raleigh, North Carolina.

Spring, 2005, I presented a research talk at the State University of New York at Potsdam titled “Around the Cubic Curve in Fifty Minutes”

Other Presentations

Spring 1995: Presented a lecture at Math Day, West Georgia College.

Spring 2004: PowerPoint Presentation *How Many Ways Can 945 Be Written as the Difference of Squares?* given at Math Day 2004, University of West Georgia

Spring 2004: PowerPoint Presentation *Public vs. Private Cryptosystems* was presented in the UWG mathematics department and was attended by members of the computer science department.

Spring 2004: PowerPoint Presentation *The RSA Algorithm* was presented in the UWG mathematics department and was attended by members of the computer science department.

Spring 2004: I have written three PowerPoint slide shows on Hodge Theory based on lectures given by Mark Andrea A. de Cataldo

- Calculus on Smooth Manifolds
- Hermitian Linear Algebra
- Hermitian Metrics on Complex Manifolds

Spring 2004: I have written three PowerPoint slide shows on topics in Advanced Calculus.

- Multivariable Differentiation
- The Inverse Function Theorem
- The Implicit Function Theorem

2013 & 2014: I presented my paper “An Interesting Application of the Commutativity of Factor Groups” in a student-centered seminar at the University of West Georgia.

2015: Gave an invited presentation on the mathematical way of thinking at Newnan High School.

Spring 2015: I gave presentation *How Many Ways Can 945 Be Written as the Difference of Squares? An introduction to the mathematical way of thinking* to prospective students.

2016: I participated on a panel discussion as a panel member on the topic of education for gifted students during a conference in the Campus Center at the University of West Georgia.

Summer 2021: I wrote a lecture titled “An Exploration of the Chinese Remainder Theorem”, which presented the generalization of the Chinese Remainder Theorem to comaximal ideals in a commutative ring.

Summer 2021: I wrote a lecture titled “Exploring $x^n + y^n = z^n$ ”, which presented from an historical perspective the attempts to solve Fermat’s Last Theorem. The lectures touches on the origins and purposes of ideals, prime ideals, integral elements, and Dedekind domains.

Summer 2021: I wrote a lecture titled “Factorization of Ideals”, which follows on the last presentation. This lecture covers the factorization of ideals in a Dedekind domain into a product of prime ideals and, more generally, the factorization of ideals in a Noetherian domain into an intersection of primary ideals.

Summer 2021: I wrote a lecture titled “Birational Maps and the Weierstrass Substitution”, which investigate the birational map between the projective line and a nonsingular conic and shows how that map can be used to reduce integrals of trigonometric functions to integrals of rational functions.

Fall 2022: I gave presentation *An Application of Quotient Rings to Number Theory* relating the writing of an odd prime p as the sum of two squares and the existence of the square root of -1 in the integers modulo p .

Fall 2022–Fall 2023: I gave a presentation on the fundamental structures of Banach Spaces and Hilbert Spaces.

Fall 2022–Spring 2023: I wrote a series of two lectures on algebraic number theory based on the text *Number Fields* by Daniel A. Marcus.

Fall 2022–Spring 2023: I gave a series of two lectures to students on the use of the L^AT_EX typesetting system.

Fall 2022–Spring 2023: I wrote a series of two lectures on algebraic geometry at the undergraduate level using the text *Undergraduate Algebraic Geometry* by Miles Reid.

Fall 2022–Spring 2023: I am in the process of constructing a series of twelve lectures on the number theory of the nonsingular cubic curve following the text *Rational Points on Elliptic Curves* by Joseph H. Silverman and John R. Tate.

Spring 2022–Fall 2023: I am in the process of constructing a series of lectures on the text *Commutative Algebra in Algebraic Geometry*, by David Eisenbud. I have completed three slide shows.

Spring 2022–Fall 2023: I am in the process of constructing a series of lectures on the text *Algebraic Curves*, by William Fulton. I have fifteen slide shows in various stages of completion.

Professional Service

December, 2006: I was invited to review a chapter in a book for Oxford University Press. However, the review itself was published in January/February 2007.

2009: I reviewed a paper, “Root Insertion Methods for Solving a Cubic,” by Raghavendra G. Kulkarni, for publication.

2010: I reviewed a chapter on number theory for a book.

2013–2014: I was invited to participate in a pilot project for teaching abstract algebra using the book by Thomas W. Judson at Stephen F. Austin State University. (I taught Abstract Algebra II from this text in Spring semester 2014 during which I offered editing suggestions on the text.)

Grant Writing

2013: I applied for and received a Technology Fee Grant for \$1000.00 to upgrade *Geometer's Sketchpad* on the computers across campus.

Teaching Experience

- 2005–present: Associate Professor of Mathematics at the University of West Georgia.
- 1998–2005: Associate Professor of Mathematics at the State University of West Georgia.
- 1996–1998: Assistant Professor of Mathematics at the State University of West Georgia. From Fall 1996 to Spring 1998, taught College Algebra; Plane Trigonometry; Calculus I, II, III, and IV; Discrete Structures and College Geometry.
- Summer 1996: Taught in the Governor’s Honors Program, a statewide program for gifted high school students, for the State of Georgia.
- 1993–1996: Assistant Professor of Mathematics at West Georgia College. From Fall 1993 to Spring 1996, taught College Algebra; Plane Trigonometry; Calculus I, II, III, and IV; Real Analysis; and College Geometry.
- 1988–1993: Assistant Professor of Mathematics at Northeast Missouri State University (now Truman State University). From Fall 1988 to Spring 1993, taught Calculus I, II, and III; Plane Trigonometry; College Algebra; Advanced Calculus II; Topology; a year-long sequence in abstract algebra at the undergraduate level; and graduate courses in real analysis, complex analysis, point-set topology, differential topology, and algebra.
- Summer 1988: Taught in the Governor’s Honors Program, a statewide program for gifted high school students, for the State of Georgia.
- 1984–1988: Teaching Assistant at Brown University.
- Fall 1987: Duties included teaching Advanced Placement Calculus with special emphasis on applications to physics and engineering.
- Summer 1987: Duties included teaching differential calculus to minority premedical students through the Brown University Medical School.
- Fall 1986: Duties included teaching Advanced Placement Calculus.
- Fall 1985 to Spring 1986: Duties included teaching a sequence of two courses in calculus designed for slower students.
- Fall 1984 to Spring 1985: Duties included conducting recitation sessions for a freshman calculus course and grading exams.
- 1983–1988: Tutor at Brown University.
- 1980–1983: Math Lab instructor at The University of Georgia. Duties included helping calculus and pre-calculus students with their homework.

University Service

2022–2023: Served on the Faculty Advisory Committee of the College of Arts, Culture, and Scientific Inquiry.

2018–2021: Chair of the University Faculty Development Committee

2018–2021: Represented the College of Science and Mathematics on the Faculty Senate.

2014–2016: Chair of the University Honors Committee

2013–2016: Represented the College of Science and Mathematics on the Faculty Senate.

2013: Department Liaison to the Honors College.

2004–2005: I was elected by the general faculty to serve on the Post Tenure Review Appeals Committee

2004: I served on the Post Tenure Review Committee for Professor Bobby Powell

2004: I served on the Post Tenure Review Committee for Professor Karen Smith

2002–: Served on the Department of Mathematics Promotion and Tenure Committee

2002–: Served on the Undergraduate Curriculum Committee in the Department of Mathematics

2002–2020: Served on the Freshman Mathematics Committee in the Department of Mathematics

2002: Elected to the Faculty Senate at the University of West Georgia

2001–?: Chair of the Library Committee in the Department of Mathematics

2001–2002: Chair of the Undergraduate Curriculum Committee in the Department of Mathematics

2001–2002: Member of the Faculty Evaluation and Teaching Load Committee in the Department of Mathematics

2001–2002: Member of the Applied Mathematics Hiring Committee in the Department of Mathematics

2000–2001: Served as a member of the University Post-Tenure Review Appeal Committee

2000–2001: Member of the Department of Mathematics Hiring Committee

- 1999–2001: Member of the College of Arts and Science Promotion and Tenure Advisory Committee
- 1999–2001: Chair of the Department of Mathematics Promotion and Tenure Committee
- 1999–2001: Member of the Department of Mathematics Advisory Committee
- 1999–2000: Served on hiring committee to fill three assistant professorships and several instructorships.
- 1998–present: Member of the Department of Mathematics Promotion and Tenure Committee
- 1997–1998: Member of the Teacher Education Advisory Committee.
- 1997–1999: Member of the College of Arts and Science Executive Committee.
- 1997–1999: Adviser of the Gay, Bisexual, Straight Alliance at the State University of West Georgia.
- 1998–1999: Served on hiring committee to fill three assistant professorships and several instructorships.
- 1994–1999: Served on the Executive Committee in the Department of Mathematics. Chaired a subcommittee that designed an applied mathematics option for the Bachelor of Science Degree in Mathematics and constituted a subcommittee that designed a mathematical modeling course as part of this option.
- 1993–present: Coadviser to Kappa Mu Epsilon mathematics honor society.
- 1997–1998: Served on hiring committee to fill one assistant professorship and several instructorships.
- 1996–1997: Served on hiring committee to fill two assistant professorships.
- 1995–1997: Member of the Advisory Committee to the Dean of the School of Arts and Sciences. Served on subcommittee that selected slate of candidates for school-wide elections.
- 1995–1996: Served on hiring committee to fill two assistant professorships.
- 1994–1995: Served on hiring committee to fill three instructorships. Recommended hiring of Kae Harrison, Leslie Redwine, and Paul Lupica.

1991–1993: Served on the Undergraduate Committee in the Division of Mathematics and Computer Science overseeing the degree programs in mathematics. During the year 1991–1992, served as chair of the committee. Under my leadership the committee added an undergraduate course in topology, a second semester of advanced calculus, and a second semester of abstract algebra to the undergraduate curriculum. Further, the curriculum was changed to require completion of one sequence of two courses.

Fall, 1991: Served as faculty representative on the Coeducational Housing Committee. As a member of this committee, I chaired a subcommittee that was responsible for devising plans for expanding coeducational housing opportunities on campus. One of these plans was implemented in the 1992–1993 academic year.

1988–1991: Served on the Graduate Committee in the Division of Mathematics and Computer Science overseeing the Master of Arts program in mathematics at Northeast Missouri State University (now Truman State University). I am the primary author of a Five-Year Planning Document for the Master of Arts Program in Mathematics and the designer of an integrated five-year, bachelor/master program in mathematics, allowing exceptional undergraduates to complete both degrees in five years.

1990–1992: Elected to represent the Division of Mathematics and Computer Science on the Faculty Senate and the Graduate Council, a university-wide committee overseeing the graduate program. As a member of the Faculty Senate, I represented the faculty on the university-wide Coeducational Housing Committee during Fall Semester, 1991. As a member of the Graduate Council, I was the primary author of the Graduate Student Grievance Policy, which was adopted by the University.

1988–1991: Faculty Associate in Missouri North Residential College. This program is designed to integrate the classroom experience with the residential experience for a complete learning environment.

Community Service

1994–present: Member of the St. Margaret’s Episcopal Church.

1990–1993: Member of the vestry and junior warden of Trinity Episcopal Church. Elected to serve as a representative to the conventions of the Episcopal Diocese of Missouri. Participated in the Special Convention of the Diocese of Missouri for the election of a Bishop Coadjutor in October, 1990.

1989–1991: Member of the Board of Directors of Planned Parenthood of Northeast Missouri.

References

These references are all former students of mine who have gone onto very successful careers.

- Natalie Young Barnhart, Coweta County Schools
- Dean Andrew Beckett, University College, University of Iowa
- Dr. Michael Berglund, Department of Mathematics, University of Georgia
- Dr. Andrea Chaney, Department of Physics, University of Michigan
- Daniel Hartman, Department of Mathematics, University of Georgia
- Li Keith, Northrop Grumman Corporation
- Dr. Chad Mullikin, Department of Defense
- Dr. Matthew Schuette, University of Missouri Kansas City