

# Curriculum Vitae

**John E. Ehrke**

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Abilene Christian University*

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## Education

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- **Ph.D. Mathematics**, Baylor University, Waco, Texas, 2007.  
DISSERTATION: *A Functional Approach to Positive Solutions of Boundary Value Problems*  
ADVISOR: Johnny Henderson, Ph.D.
- **M.S. Mathematics**, Baylor University, Waco, Texas, 2005.
- **B.A. Mathematics**, Abilene Christian University, Abilene, Texas, 2003.

## Professional Profile

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### Research Interests

*Areas of Scholarly Pursuits*

My research area involves ordinary differential equations, integral equations, and Green's functions. This includes applications of cone theory and fixed point theory for ordinary differential equations and boundary value problems. My work thus far applies functional expansion-compression techniques to obtain positive solutions of various boundary value problems. AMS Classification # 34,35,39.

In addition to my work in the field of differential equations I maintain an interest in applications of mobile learning and their impact on mathematics education. Of specific interest are questions about the efficacy of mobile computing platforms and mathematical typesetting in the mobile environment. My work in this area has revolved around a series of case studies conducted beginning in 2010 that has garnered attention from Texas Instruments, the MAA, and a variety of educators around the nation.

## Academic/Teaching Experience

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1. **Assistant Professor of Mathematics**, Abilene Christian University, Abilene, TX 2007-present.
2. **Graduate Teaching Assistant**, Baylor University, Waco, TX 2004-2007.

## Courses Taught at Abilene Christian University

Semester	Course		Enrollment
Fall 2007	MATH 124-02	PreCalculus II	14
Fall 2007	MATH 120-05	Quantitative Reasoning	24
Fall 2007	MATH 120-06	Quantitative Reasoning	24
Fall 2007	MATH 186-01	Calculus II	17
Spring 2008	MATH 361-01	Ordinary Differential Equations	15
Spring 2008	MATW 120-02	Quantitative Reasoning Workshop	12
Spring 2008	MATW 120-02	Quantitative Reasoning Workshop	15
Maymester 2008	MATH 120-01	Quantitative Reasoning	23
Fall 2008	MATH 120-05	Quantitative Reasoning	25
Fall 2008	MATH 120-06	Quantitative Reasoning	24
Fall 2008	MATH 186-01	Calculus II	19
Fall 2008	MATH 124-02	Pre-Calculus II	14
Spring 2009	MATH 361-01	Ordinary Differential Equations	15
Spring 2009	MATW 120-02	Quantitative Reasoning Workshop	21
Spring 2009	MATW 120-03	Quantitative Reasoning Workshop	13
Fall 2009	MATW 130-01	Finite Mathematics Workshop	22
Fall 2009	MATW 130-02	Finite Mathematics Workshop	26
Fall 2009	MATH 227-01	Discrete Mathematics	19
Spring 2010	MATH 120-01	Quantitative Reasoning	23
Spring 2010	MATH 120-04	Quantitative Reasoning	23
Spring 2010	MATH 361-01	Ordinary Differential Equations	17
Spring 2010	MATH 227-01	Discrete Mathematics	12
Fall 2010	MATH 227-01	Discrete Mathematics	14
Fall 2010	MATW 120-03	Quantitative Reasoning Workshop	20
Fall 2010	MATW 120-04	Quantitative Reasoning Workshop	13
Spring 2011	MATH 124-02	PreCalculus II	15
Spring 2011	MATH 131-01	Calculus for Applications	15
Spring 2011	MATH 361-01	Ordinary Differential Equations	9
Summer 2011	MATH 120-01	Quantitative Reasoning	6
Fall 2011	MATW 120-03	Quantitative Reasoning Workshop	17
Fall 2011	MATW 120-04	Quantitative Reasoning Workshop	26
Fall 2011	MATH 186-01	Calculus II	15
Fall 2011	MATH 361-01	Ordinary Differential Equations	16
Spring 2012	MATH 130-01	Finite Mathematics	26
Spring 2012	MATH 186-01	Calculus II	20
Spring 2012	MATH 440-01	Partial Differential Equations	15

# Scholarly Activities

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## Publications

### *Papers in Journals*

1. "Positive Solutions of a Left Focal Second Order Boundary Value Problem," *Communications on Applied Non-Linear Analysis*, 14 (2007), 57-65.
2. "Boundary Data Smoothness for Solutions of Nonlocal Boundary Value Problems for Second Order Differential Equations", (with Henderson, Kunkel, and Sheng), *Journal of Mathematical Analysis and Applications*, 333 (2007), 191-203.
3. "Five-point boundary value problems for n-th order differential equations by solution matching," *Involve: A Journal of Mathematics*, Johnny Henderson, John Ehrke and Curtis Kunkel, 1 (2008), 1-7.
4. "What I Learned from...Catching iPhone Fever," Ehrke, John, *Mathematical Association of America Focus*, August/September 2009, 28-29.
5. "Encouraging the Integration of Complex Numbers in Undergraduate Ordinary Differential Equations", Ehrke, John, *Texas College Journal of Mathematics*, 6 (2009), 18-24.
6. "Positive Solutions of a Second Order, Three Point Boundary Value Problem via Functional Compression-Expansion," Ehrke, John, *Electronic Journal of Qualitative Theory of Differential Equations*, 55 (2009), 1-8.
7. "Course Blogs and the iPhone: Applications at all Levels of Undergraduate Mathematics," Ehrke, John, *Electronic Proceedings of the International Conference of Technology in College Mathematics*, March 2010.

## Conference and Colloquium Presentations

### *Presentations*

1. University of North Carolina at Greensboro, 26<sup>th</sup> Annual Southeastern Atlantic Regional Conference on Differential Equations (SEARCDE). October 2006. *Positive Solutions of a Third Order Focal Boundary Value Problem Family*. Twenty Minute Presentation.
2. Abilene Christian University, *A Million Dollar Math Problem: From Euler's Identity to the Riemann Hypothesis*. Five presentations over the Fall 2007-Spring 2008 semesters.
3. University of North Texas, 89th Texas Section of the Mathematical Association of America (MAA), April 2009. *Making Mathematics Portable*. Fifteen Minute Presentation.
4. Chicago, Illinois, 22nd International Conference of Technology in College Mathematics (ICTCM), March 2010. *One Year Later... Embracing the iPhone in College Mathematics*. Forty-Five Minute invited Presentation.
5. Abilene Christian University, *The Set Partition Problem*, Presentation made to MATH 397 students, March 2010.

6. Abilene Christian University, *Adapting the Core Model to General Education Mathematics*, Summer stipend report to ACU faculty, January 2011.
7. Abilene Christian University, ACU Connected Summit, *Mobile Learning: The Teachers Perspective*, March 2011, Faculty panel presentation.
8. University of Texas Tyler, 91st Texas Section of the Mathematical Association of America (MAA), April 2011. *Mobile Computing*. Fifteen Minute Presentation.
9. Orlando, Florida, 24th International Conference of Technology in College Mathematics (ICTCM), March 2012. *Mobile Learning Experiences: Unwrapping a Campus Wide Initiative*, Conference pre-session workshop.
10. Orlando, Florida, 24th International Conference of Technology in College Mathematics (ICTCM), March 2012. *Moving the Graphing Calculator to the Mobile Platform: Results of a Two Year Study*, Forty-Five Minute Invited Presentation.
11. Abilene Christian University, ACU Connected Open House, *Mobile Learning Strategies for STEM*, April 2012, Faculty panel presentation.

## Refereed Articles

### *Journal Article Reviews*

1. "Multiple Positive Solutions for Second Order m-Point Boundary Value Problems." *Journal of Mathematical Analysis and Applications*, Manuscript No. = JMAA-05-2540.
2. "Positive Solutions for Second Order Three Point Boundary Value Problems." *Journal of Abstract and Applied Analysis*, Manuscript No. = AAA/236826.v2.
3. Positive solutions for nth order nonlinear impulsive singular integro-differential equations on infinite intervals in Banach spaces. *Journal of Nonlinear Analysis*, Manuscript No. = NA-D-07-01235.

## Awards, Grants, Stipends, Fellowships

### *Monetized Awards*

1. *Adapting the Core Model to General Education Mathematics*, ACU Faculty Enrichment Summer Stipend, Summer 2010, \$5,000.
2. *A Case Study on the Efficacy of Mobile Computing Platforms*, ACU Mobile Learning Fellowship Recipient, 2010-2011, \$4,000 with \$1,000 spending budget.

## Professional Societies

### *Memberships*

1. Member of the MAA (Mathematical Association of America) 2005-present
2. Member of the NCTM (National Council of Teachers of Mathematics) 2001-2003
3. Member of the AMS (American Mathematical Society) 2003-2007

## **Service Appointments**

### *Positions Held*

1. Faculty Advisor for Mu Sigma (mathematics club), 2007-present.
2. Library Liaison for the Mathematics Department, 2009-present.
3. Executive Program Committee for the ICTCM, 2012-present.

## **Service to the University**

### *Committees Served On*

1. Undergraduate General Education Council, 3 year appointment, 2009-2012.
2. Abundant Life Committee, 2008-2011.
3. LINK Team, 2011-present.
4. Research Council, 2011-present.
5. Engineering Advisory Group 2011-present.
6. Faculty Senate 2012-present.