

# Curriculum Vitae

## Thomas W. Judson

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### Current Academic Rank and Department

Associate Professor, Stephen F. Austin State University

### Education

- University of Illinois, Urbana, IL. B.S., Mathematics, 1975.
- University of Oregon, Eugene, OR. M.A., Mathematics, 1979.
- University of Oregon, Eugene, OR. Ph.D., Mathematics, 1984.

Thesis Title: “Invariants in the Spencer cohomology of certain complete filtered Lie algebras.”  
Thesis Advisor: Richard Koch.

### Academic Appointments

- 2008–Present. Associate Professor, Stephen F. Austin State University
- 2002–2008. Preceptor in Mathematics at Harvard University.
- 2001–2002. Visiting Assistant Professor of Mathematics and Computer Science at the University of Puget Sound.
- 1993–2001. Associate Professor of Mathematics at the University of Portland.
- 1984–1993. Assistant Professor of Mathematics at the University of Portland.
- 1978–1984. Graduate Teaching Fellow at the University of Oregon.
- 1977–1978. Graduate Teaching Assistant at the University of California, Irvine.

## Research Interests

Mathematics education, differential geometry, Lie algebras and Lie pseudogroups.

## Thesis Students Supervised

- John A. Kirk. “An Analysis of the Impact of High-Stakes Tests in Public Education.” Thesis for Mathematics for Teaching, Master of Liberal Arts in Extension Studies, Harvard University. 2015 (Thesis Award for the Math for Teaching program).
- Willard G. Boericke. “Investigating the Influence of the NCTM *Standards* on Eighth Grade Mathematics Teaching Practice.” Thesis for Mathematics for Teaching, Master of Liberal Arts in Extension Studies, Harvard University. 2012 (Thesis Award for the Math for Teaching program).
- Rachel Pettit-Scott. “Impact and Implementation of Discourse in a Diverse Middle School Mathematics Classroom.” Thesis for Mathematics for Teaching, Master of Liberal Arts in Extension Studies, Harvard University. 2009.
- Chan Chuan Hsieh. “The Use of Web Technology to Enhance Traditional Teaching Methods in Geometry.” Thesis for Mathematics for Teaching, Master of Liberal Arts in Extension Studies, Harvard University. 2007.
- Kathleen Tuffy. “A Study of the Use of Web-based Benchmark Assessment by Middle School Mathematics Teachers.” Thesis for Mathematics for Teaching, Master of Liberal Arts in Extension Studies, Harvard University. 2007.

## Publications

- *The Ordinary Differential Equations Project*. Published under the GNU Free Documentation License. Preliminary version available at <http://faculty.sfasu.edu/judsontw/ode/>.
- “The Development of Pedagogical Content Knowledge in First-Year Mathematics Graduate Teaching Assistants.” (with M. Leingang). *Journal of STEM Education*. **17**(2016), 37–43.
- *Abstract Algebra: Theory and Applications*. Revised edition published under the GNU Free Documentation License, 1997 (revised August 2015). Available at <http://abstract.pugetsound.edu/>.
- “What Graduate Students (and the Rest of Us) Can Learn from Japanese Lesson Study.” (with A. Alvine, M. Schein, and T. Yoshida). *College Teaching*. **55**(2007), 109–113.
- “Concepts and skills in high school calculus: An examination of a special case in Japan and the United States” (with Toshiyuki Nishimori). *Journal of Research in Mathematics Education*. **36**(2005), 24–43.
- “Complete Filtered Lie Algebras over a Vector Space of Dimension Two.” *Journal of Lie Theory*. **12**(2002), 423–447.

- “High school calculus in the U.S. and Japan.” *Mathematics Education Dialogues*. November 2001. Online at <http://www.nctm.org/dialogues/>.
- “Amerika ni okeru suugaku kyōiku ni tuite no ronsō,” (in Japanese). *Journal of Higher Education and Lifelong Learning*. **9**(2001), 10–15.
- “The Controversy over Mathematics Education in the United States,” *Report of Working Group for Undergraduate Mathematics*. The Mathematical Society of Japan. Tokyo, 2000.
- “Majoring in Mathematics at Universities in the United States,” *Report of Working Group for Undergraduate Mathematics*. The Mathematical Society of Japan. Tokyo, 2000.
- “Japan: A Different Model of Mathematics Education,” *1996 Proceedings of the Symposium on the Future of Mathematics Education at Research Universities*. The Mathematical Sciences Research Institute. Cambridge University Press, Cambridge, 1999.
- “Technology, Projects, and Elementary Statistics” *Proceedings of the Third Asian Technology Conference in Mathematics*. Springer, New York, 1998.
- “Calculus Education in the United States” *Proceedings of ICME-EARCOME 1*. 1998.
- “University Mathematics Education in the United States,” *Report of Working Group for Undergraduate Mathematics*. The Mathematical Society of Japan. Tokyo, 1997.
- “Teaching a laboratory based linear algebra course,” 1995 Proceedings of the Asian Technology Conference in Mathematics.
- “Experiences from the ATLAST Project: Implementing a laboratory based linear algebra course,” 1993 Proceedings of the International Conference on Technology in Collegiate Mathematics.
- *Abstract Algebra: Theory and Applications*. PWS Publishing Company, Boston, 1994.
- “Complete Filtered Lie Algebras and their Spencer Cohomology,” *Journal of Algebra* **125**(1989), 66–109.

## Colloquia and Presentations

- “Sage Cells: Making Sage Accessible to Students, Teachers, and Authors.” Presentation at the annual meeting of the American Mathematical Society and Mathematical Association of America, MAA Session on The Advancement of Open Educational Resources, 2017.
- “A Repository of Reviews of Articles Related to the Teaching and Learning of ODEs.” Presentation at the annual meeting of the American Mathematical Society and Mathematical Association of America, MAA Session on the Teaching and Learning of Undergraduate Ordinary Differential Equations, 2017.
- “Graphics in MathBook XML.” Presentation at Open textbooks in MathBook XML Workshop at American Institute of Mathematics, 2016.

- “Integrating Sage into an Ordinary Differential Equations Course using MathBook XML.” Presentation (with T. J. Hitchman) at the annual meeting of the American Mathematical Society and Mathematical Association of America, MAA Session on the Teaching and Learning of Undergraduate Ordinary Differential Equations, 2016.
- “Open Source Mathematics with MathBook XML.” Colloquium at Sam Houston State University, 2015.
- “Systematically Implementing IBL in a Number and Operations Course for Preservice K–6 Teachers.” Presentation (with J. Long and S. Prince) at the 18th Annual Legacy of R.L. Moore—IBL Conference, 2015.
- “Inquiry-Based Learning, Cognitive Dissonance, and Taking K12 Teachers to the Next Level.” Presentation (with L. Beverly, K. Childs, and D. Pace) at the 17th Annual Legacy of R.L. Moore—IBL Conference, 2014.
- “How Graduate Students Develop the Mathematical Knowledge Needed for Teaching.” Colloquium at University of Houston, 2014.
- “Experiences from publishing open source textbooks,” presentation (with R. Beezer) at the annual meeting of the American Mathematical Society and Mathematical Association of America, MAA Session on Open Source Mathematics Textbooks, 2014.
- “The Role of Inquiry-Based Learning in Developing Teacher-Leaders.” Presentation (with L. Beverly, K. Childs, and D. Pace) at the 16th Annual Legacy of R.L. Moore—IBL Conference, 2013.
- “Reporting progress: A minisymposium of projects from the NSF Course, Curriculum, and Laboratory Improvement/Transforming Undergraduate Education in STEM program,” Invited panelist, MAA-NSF Panel Discussion at the annual meeting of the American Mathematical Society and Mathematical Association of America, 2013.
- “Getting your textbook published” Invited panelist, MAA Professional Development Committee Panel Discussion at the annual meeting of the American Mathematical Society and Mathematical Association of America, 2012.
- “The Texas Leadership Initiative and Texas LIMIT Projects: Training the Trainers,” presentation (with L. Beverly and K. Childs) at the annual meeting of the American Mathematical Society and Mathematical Association of America, AMS-MAA Special Session on Centers for Teaching/Education/Outreach in Departments of Mathematics, 2011.
- “What do we know about how to structure the curriculum in a way that supports teachers in developing reasoning and sense-making in their students?” Invited panelist at the Critical Issues in Mathematics Education: Reasoning and Sense-Making in the Math Curriculum Workshop at the Mathematical Sciences Research Institute, 2010.
- “How beginning teachers understand student thinking in calculus.” Presented with Matthew Leingang at the annual meeting of the American Mathematical Society and Mathematical Association of America, Contributed Paper Session, 2010.
- “Inquiry-Based Learning Opportunities for Secondary Teachers and Students,” invited presentation (with M. Leingang) at the annual meeting of the American Mathematical Society and Mathematical Association of America, Special Session on Inquiry Based Learning, 2009.

- “Galloping Gertie: The Tacoma Narrows Bridge.” Colloquium at Colby College, 2007.
- “Two non-traditional content courses for in-service high school teachers at the Harvard Extension School.” Presented with Bret Benesh and Matthew Leingang at Critical Issues in Education: Teaching Teachers Mathematics Workshop at the Mathematical Sciences Research Institute, 2007.
- “Biology, Differential Equations, and Learning to Read the Research.” Presented at the annual meeting of the American Mathematical Society and Mathematical Association of America, Contributed Paper Session, 2007.
- “Teaching Graduate Students to Teach Mathematics.” Presented at the Fall Eastern Section Meeting of the American Mathematical Society and Mathematical Association of America, Special Session on Undergraduate Mathematics Education, 2006.
- “A Lesson Study Program for Middle and High School Teachers.” Presented at the annual meeting of the American Mathematical Society and Mathematical Association of America, Contributed Paper Session, 2006.
- Lesson Study Workshop for the Appalachian Math Science Partnership, Lexington, KY (2005).
- “What Graduate Students (and the Rest of Us) Can Learn from Japanese Lesson Study.” Presented with Amanda Alvine, Michael Schein, and Teruyoshi Yoshida at MathFest, Contributed Paper Session, 2004.
- “Japanese Lesson Study and the Teaching of Elementary Statistics.” Presented at the annual meeting of the American Mathematical Society and Mathematical Association of America, Contributed Paper Session, 2003.
- “Problems from Calculus Reform,” invited presentation, Tsukuba University, 2001.
- “Japanese Lesson Study,” invited presentation at the annual meeting of the Teachers of Teachers of Mathematics (TOTOM), Portland, OR, 2001.
- “Conversations on the changing face of the mathematics major,” invited panelist at the 2001 annual meeting of the Pacific Northwest Section of the Mathematical Association of America.
- “Are students learning the necessary concepts of calculus? A comparative study of Japanese and American High School Students,” invited presentation at the annual meeting of the American Mathematical Society and Mathematical Association of America, Special session on Mathematics and Education Reform, 2001.
- “Japanese and American High School Calculus Students,” invited presentation at the Ninth International Congress of Mathematics Education (ICME-9) in Makuhari, Japan, 2000.
- “Amerika ni okeru suugaku kyouiku ni tuite no ronsou,” invited presentation, Hokkaido University, 2000.
- “Amerika de bibunsekibun o benkyou suru koukousei no gainen no kangaekata,” invited presentation at Workshop on Mathematics Education, Nagoya University, 2000.
- “The Controversy over Mathematics Education in the United States,” invited presentation at Workshop on Mathematics Education, Nagoya University, 1999.

- “Undergraduate Mathematics Education in the United States,” invited presentation at Workshop on Mathematics Education, Nagoya University, 1999.
- “An Internet Database for Teaching Statistics.” Presented at the annual meeting of the American Mathematical Society and Mathematical Association of America, Session on Teaching Statistics: Teaching the Reasoning and New Technological Tools, 1999.
- “Ideas for Projects and Other Student Collected Data,” joint paper with John Kurtzke, David Cresap, and William Fuller. Presented at Mathfest98 (Summer National Meeting of the Mathematical Association of America), Session for Contributed Papers on Innovative Ideas for Student-Collected Data, 1998.
- “Transitive Lie Algebras.” Colloquium at Portland State University, 1997.
- “Experiences from the ATLAST Project: Implementing a laboratory based linear algebra course.” International Conference on Technology in Collegiate Mathematics, 1993.
- “Pseudogroups and Lie Algebras.” Colloquium at Portland State University, 1987.
- “Complete Filtered Lie Algebras and the Spencer Cohomology.” Presented at the Summer Meeting of the American Mathematical Society, Session on Topology and Geometry, 1987.
- “Complete Filtered Lie Algebras.” Colloquium at Pacific Lutheran University, 1984.

## Memberships in Professional Societies

- American Mathematical Society (since 1980).
- Mathematical Association of America (since 1986).
- National Council of Teachers of Mathematics (since 1993).

## Professional Development and Service

- Advisory Board. Master of Liberal Arts in Mathematics for Teaching Program. Harvard University Extension School (2008 to present).
- Abstract Algebra Subcommittee for Committee on the Undergraduate Program in Mathematics for MAA (2012).
- Advisory Board. NSF Funded Resources for Supporting Lesson Study in Mathematics. Educational Development Center, Inc. (2006 to 2008).
- AP Calculus Reader (2002 to 2006).
- Advisory Board. NSF Funded Lesson Studies Communities Project in Secondary Mathematics. Educational Development Center, Inc. (2003 to 2005).
- CUPM Curriculum Foundations Conference, West Point, NY (2001).
- Undergraduate Faculty Program at the IAS/Park City Mathematics Institute. (2001).

- Mathematical Sciences Research Institute, “Preparation for the Math Major in the First Two Years: A curriculum policy workshop in the CUPM Curriculum Foundations series,” Berkeley, CA (2001).
- Summer Course in Japanese Language at International Christian University in Mitaka, Japan (1994–1996, 1998).
- National Science Foundation Workshop, “STATS Workshop,” Framingham, MA (1997).
- American Mathematical Society Short Course, “Mathematical Finance,” San Diego, CA (1997).
- Mathematical Sciences Research Institute, “Symposium: The Future of Mathematics Education at Research Universities,” Berkeley, CA (1996).
- National Science Foundation Workshop, “Reform of Business Calculus,” Reno, NV (1996).
- Summer Session at Sophia University in Tokyo, Japan (1993).
- National Science Foundation ATLAST Workshop at Michigan State University, East Lansing, MI (1993).
- National Science Foundation Regional Geometry Institute, Park City, UT (1992).
- American Mathematical Society Short Course, “Cryptography and Computational Number Theory,” Boulder, CO (1988).

## Grants and Awards Received

- Principal investigator for National Science Foundation IUSE grant “Collaborative Research: UTMOST: Undergraduate Teaching in Mathematics with Open Software and Textbooks.” \$54,000. (Part of a \$700,000 collaborative grant with American Institute of Mathematics, University of Colorado, and University of Michigan). Project period 2016–2018.
- Stephen F. Austin State University Academic Assistance and Resource Centers Bravo Award. The AARC presents the award to one faculty or staff member for their outstanding support of the center’s efforts (2013, 2014).
- Principal investigator for National Science Foundation CCLI-Type 2 (Expansion) grant “Collaborative Research: UTMOST: Undergraduate Teaching in Mathematics with Open Software and Textbooks.” \$46,000. (Part of a \$525,000 collaborative grant with American Institute of Mathematics, Drake University, University of Colorado, and University of Washington). Project period 2010–2014.
- Nominee, Harvard University Levenson Award for Teaching Excellence (2005).
- Certificate of Distinction in Teaching from the Derek Bok Center for Teaching and Learning in cooperation with the Office of the Dean for Undergraduate Education, Harvard University (Fall 2004, Spring 2005).
- Japan Studies Grant to investigate high school calculus education in the United States and Japan (2000).

- Arthur Butine Fund Grant to investigate high school calculus education in the United States and Japan (2000).
- NSF Grant to attend the Ninth International Congress of Mathematics Education (ICME-9) in Makuhari, Japan (2000).
- Northwest Academic Computing Consortium (NWACC) Grant to continue developing a web-based data bank for teaching elementary statistics and establish tools so that others may add their own datasets (1999).
- Arthur Butine Fund Grant for travel funds to present a paper, “An Internet Database for Teaching Statistics.” Presented at the 1999 annual meeting of the American Mathematical Society and Mathematical Association of America, Session on Teaching Statistics: Teaching the Reasoning and New Technological Tool (1999).
- Arthur Butine Fund Grant to establish an Internet database for teaching elementary statistics (1998).
- Kaneko Foundation grant to study Japanese at International Christian University in Tokyo, Japan (1996, 1994).
- Arthur Butine Fund grant to study Japanese at International Christian University in Tokyo, Japan (1995).
- Meyer Memorial Faculty Award for study at Sophia University in Tokyo, Japan (1993).
- University of Portland Faculty Research Award for the study of the Spencer cohomology and connections in differential geometry (1991).