

**Baylor University
Department of ECE
Faculty Personnel Record**

Full name: William Mack Grady

Title: Professor of Electrical &
Computer Engineering

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Date and Place of Birth:

January 1950, Waco, Texas

Citizenship: USA

Education: The University of Texas at Arlington, BS(EE), 1971
Purdue University, MS(EE), 1973
Purdue University, PhD(EE), 1983

Professional Registration: Texas Professional Engineer #48629

Current and Previous Academic Positions:

Baylor University, Professor of ECE, beginning Fall 2012
The University of Texas at Austin, Professor of ECE, 1992 – 2012. Retired Aug. 31, 2012.
The University of Texas at Austin, Associate Professor of ECE 1986–92
The University of Texas at Austin, Assistant Professor of ECE 1983–86

Other Professional Experience:

Texas Power and Light Company (now Oncor), Dallas. System Planning Engineer, 1974-80.

Recent Consulting:

Electric Power Research Institute, Knoxville, TN, and Palo Alto, CA. 1983-present.
Scientific Applications and Research Associates (SARA) for DOD Defense Threat Reduction Agency, electric grid-related projects, 2008-present
Texas Parks & Wildlife Department, (evaluation of energy performance of PV installations), 2013
GE Wind Energy, Schenectady, NY, 2010-present
Idaho National Laboratory, National & Homeland Security Research Program, 2012-present

Honors and Awards:

IEEE Fellow, 2000, for “Contributions in the Analyses and Control of Power System Harmonics and Power Quality.”
Faculty Appreciation Award, Student Engineering Council, College of Engineering, U.T. Austin, November 2001
Annual Faculty Appreciation Award, “for fostering the well-being and professional development of engineering graduate students,” U.T. Austin Graduate Engineering Council, Fall 2004.
Annual ECE Student Body Teaching Award, U.T. Austin ECE Dept., Fall 2004.
Annual Gordon Lepley Teaching Award, U.T. Austin ECE Dept., Fall 2004.
Annual Texas Exes Teaching Award for the College of Engineering, U.T. Austin, Spring 2005 and Spring 2007.
IEEE Favorite Professor, U.T. Austin Student Chapter, 2005.



Photo taken December 2011 at the Toyah, TX, solar monitor

Student Engineering Council Award, Faculty Appreciation Week, Spring 2006.
U.T. Austin College of Engineering, Women's Advocate Award, Spring 2007.
Selected to work at Idaho National Lab for the month of July 2012 as part of INL's
Faculty Exchange Program, National and Homeland Security Research Area
Member, Board of Directors, Texas Solar Energy Society, 2013

Memberships in Professional and Honorary Societies:

Eta Kappa Nu
Tau Beta Pi
IEEE Power and Energy Society, since 1972
Texas Solar Energy Society
Texas Renewable Energy Industries Association

Departmental Assignments and Contributions:

Recruiting Committee, 2012

IEEE Power and Energy Society:

Transmission and Distribution Committee, Chairman, 2005–2006.
Working Group on Power System Harmonics, Chairman, 1985–1994.
General Systems Subcommittee, Chairman, 1995–1998.
IEEE-PES Transmission and Distribution Conference and Exposition, Dallas,
Technical Program Chair, 2003
IEEE International Conference on Harmonics and Quality of Power (ICHQP):
Steering Committee Member, since 1987.

Continuing Education and Community Activities (year 2000 and later):

U.T. Austin Workshops
Texas Electric Power Workshop Co-Chairman, Spring 2000.
Electric Power Quality and Reliability Workshop Co-Chairman, Fall 2003.
Renewable Energy Workshop Co-Chairman, Fall 2004, 2006, 2007.
The Intelligent Utility Co-Chairman, Spring 2007
U.T. Austin Short Courses (organized through CLEE)
Fundamentals of Electric Power Systems Organizer, June 2005-2007.
Electric Power Quality and Harmonics Organizer, June 2005-2006.
Edison Lecture Series, ECE Dept., "Renewable Energy," Faculty Organizer and Speaker,
January 2007.
Texas Annual Renewable Energy Roundup, Fredericksburg, Guest Speaker on Renewable
Energy Topics, 2007, 2008, 2010

Publications:

Refereed Archival Journal Publications

(with G.T. Heydt), A Matrix Method for Optimal VAR Siting, IEEE Trans. on Power Apparatus and Systems, PAS-94 (4), 1214-1222, July/August 1975.

(with G.T. Heydt), Rapid Methods for Transmission Tower Structural Analysis and Design, IEEE Trans. on Power Apparatus and Systems, PAS-94 (4), 1223-1231, July/August 1975.

(with R.R. Shoults and S. Helmick), An Efficient Method for Computing Loss Formula Coefficients Based Upon the Method of Least Squares, IEEE Trans. on Power Apparatus and Systems, PAS-98 (6), 2144-2151, November/December 1979.

(with R.R. Shoults, S.K. Chang and S. Helmick), A Practical Approach to Unit Commitment, Economic Dispatch and Savings Allocation for Multiple-Area Pool Operation with Import/Export Constraints, IEEE Trans. on Power Apparatus and Systems, PAS-99 (2), 625-635, March/April 1980.

- (with W.N. Song and G.T. Heydt), The Integration of HVDC Subsystems into the Harmonic Power Flow Algorithm, IEEE Trans. on Power Apparatus and Systems, PAS-103 (8), 1953-1961, August 1984.
- (with G.T. Heydt), Distributed Rectifier Loads in Electric Power Systems, IEEE Trans. on Power Apparatus and Systems, PAS-103 (9), 2452-2459, September 1984.
- (with G.T. Heydt), Prediction of Power System Harmonics Due to Gaseous Discharge Lighting, IEEE Trans. on Power Apparatus and Systems, PAS-104 (3), 554-561, March 1985.
- (with W.L. Taylor), Correction of Phase Voltage Measurements Referenced to an Ungrounded Neutral, IEEE Trans. on Power Apparatus and Systems, PAS-104 (7), 1757-1760, July 1985.
- (with G.T. Heydt), Determination of Harmonics in an AC Power System Caused by HVDC Converters, Electric Machines and Power Systems, 10 (1), 39-52, 1985.
- (with M.S. Hwang and H.W. Sanders), Distribution Transformer Winding Losses Due to Nonsinusoidal Currents, IEEE Trans. on Power Delivery, PWRD-2 (1), 140-146, January 1987.
- (with M.S. Hwang and H.W. Sanders), Calculation of Winding Temperatures in Distribution Transformers Subjected to Harmonic Currents, IEEE Trans. on Power Delivery, 3(3), 1074-1079, July 1988.
- (with Q.C. Lu and M.M. Crawford), An Adaptive Algorithm for Short-Term Multinode Load Forecasting in Power Systems, IEEE Trans. on Circuits and Systems, 35(8), 1004-1010, August 1988.
- (with Q.C. Lu, M.M. Crawford and G.M. Anderson), An Adaptive Nonlinear Predictor with Orthogonal Escalator Structure for Short-Term Load Forecasting, IEEE Trans. on Power Systems, 4(1), 158-164, February 1989.
- (with A.H. Noyola and G.L. Viviani), An Optimized Procedure for Determining Incremental Heat Rate Characteristics, IEEE Trans. on Power Systems, 5(2), 376-383, May 1990.
- (with J. Farach and S.D. Kellogg), A Linearized Procedure for Voltage Control, Electric Power System Research, 18, 11-18, 1990.
- (with M.J. Samotyj, A.H. Noyola), Survey of Active Power Line Conditioning Methodologies, IEEE Trans. on Power Delivery, 5(3), 1536-1542, July 1990.
- (with R.E. Rice, W.G. Lesso, A. H. Noyola, M. E. Connolly), Power Generation Scheduling Through the Use of Generalized Network Flow Programming, IEE Proceedings - C: Generation, Transmission and Distribution, 138(1), 39-46, January 1991.
- (with E. G. Preston), An Efficient Method for Calculating Power System Production Cost and Reliability, IEE Proceedings - C: Generation, Transmission and Distribution, 138(3), 221-227, May 1991.
- (with M.J. Samotyj, A.H. Noyola), Minimizing Network Harmonic Voltage Distortion with an Active Power Line Conditioner, IEEE Trans. on Power Delivery, 6(4), 1690-1697, October 1991.
- (with L. A. Groce, T. M. Huebner, Q. C. Lu, M. M. Crawford), Enhancement, Implementation, and Performance of an Adaptive Short-Term Load Forecasting Algorithm, IEEE Trans. on Power Systems, 6(4), 1404-1410, November 1991.

(with R. Chan, M. J. Samotyj, R. J. Ferraro, J. L. Bierschenk), A PC-Based Computer Program for Teaching the Design and Analysis of Dry-Type Transformers, *IEEE Trans. on Power Systems*, 7(2), 709-717, May 1992.

(with M.J. Samotyj, A.H. Noyola), The Application of Network Objective Functions for Actively Minimizing the Impact of Voltage Harmonics in Power Systems, *IEEE Trans. on Power Delivery*, 7(3), 1379-1386, July 1992.

(with J. E. Farach, A. Arapostathis), An Optimal Procedure for Placing Sensors and Estimating the Locations of Harmonic Sources in Power Systems, *IEEE Trans. on Power Delivery*, 8(3), 1303-1310, July 1993.

(with W. K. Chang, M. J. Samotyj), Meeting IEEE-519 Harmonic Voltage and Voltage Distortion Constraints with an Active Power Line Conditioner, *IEEE Trans. on Power Delivery*, 9(3), 1531-1537, July 1994.

(with A. Mansoor, A. H. Chowdhury, M. J. Samotyj), An Investigation of Harmonics Attenuation and Diversity Among Distributed Single-Phase Power Electronic Loads, *IEEE Trans. on Power Delivery*, 10(1), 467-473, January 1995.

(with A. McEachern, W. A. Moncrief, G. T. Heydt, M. McGranaghan), Revenue and Harmonics: An Evaluation of Some Proposed Rate Structures, *IEEE Trans. on Power Delivery*, 10(1), 474-482, January 1995.

(with A. Mansoor, R. S. Thallam, M. T. Doyle, S. D. Krein, M. J. Samotyj), Effect of Supply Voltage Harmonics on the Input Current of Single-Phase Diode Bridge Rectifier Loads, *IEEE Trans. on Power Delivery*, 10(3), 1416-1422, July 1995.

(with W. K. Chang, M. J. Samotyj), Controlling Harmonic Voltage and Voltage Distortion in a Power System with Multiple Active Power Line Conditioners, *IEEE Trans. on Power Delivery*, 10(3), 1670-1676, July 1995.

(with A. Mansoor, P. T. Staats, R. S. Thallam, M. T. Doyle, M. J. Samotyj), Predicting the Net Harmonic Currents Produced by Large Numbers of Distributed Single-Phase Computer Loads, *IEEE Trans. on Power Delivery*, 10(4), 2001-2006, October 1995.

(with S. Santoso, E. J. Powers, P. Hofmann), Power Quality Assessment Via Wavelet Transform Analysis, *IEEE Trans. on Power Delivery*, 11(2), 924-930, April 1996.

(with D. Lin, T. Batan, E. F. Fuchs), Harmonic Losses of Single-Phase Induction Motors under Nonsinusoidal Voltages, *IEEE Trans. on Energy Conversion*, 11(2), 273-286, June 1996.

(with J. E. Farach, A. Arapostathis), Optimal Harmonic Sensor Placement in Fundamental Network Topologies, *IEE Proceedings: Generation, Transmission and Distribution*, 143(6), 608-612, November 1996.

(with T. Stensland, E. F. Fuchs, M. T. Doyle), Modeling of Magnetizing and Core-Loss Currents in Single-Phase Transformers with Voltage Harmonics for Use in Power Flow, *IEEE Trans. on Power Delivery*, 12(2), 768-774, April 1997.

(with W. K. Chang), Minimizing Harmonic Voltage Distortion with Multiple Current-Constrained Active Power Line Conditioners, *IEEE Trans. on Power Delivery*, 12(2), 837-843, April 1997.

(with S. Santoso, E. J. Powers), Power Quality Disturbance Data Compression using Wavelet Transform Methods, *IEEE Trans. on Power Delivery*, 12(3), 1250-1257, July 1997.

(with P. T. Staats, A. Arapostathis, R. S. Thallam), A Statistical Method for Predicting the Net Harmonic Currents Generated by a Concentration of Electric Vehicle Battery Chargers, *IEEE Trans. on Power Delivery*, 12(3), 1258-1266, July 1997.

(with E. Preston, M. L. Baughman), A New Planning Model for Assessing the Effects of Transmission Capacity Constraints on the Reliability of Generation Supply for Large Nonequivalenced Electric Networks, *IEEE Trans. on Power Systems*, 12(3), 1367-1373, August 1997.

(with P. T. Staats, A. Arapostathis, R. S. Thallam), A Procedure for Derating a Substation Transformer in the Presence of Widespread Electric Vehicle Battery Charging, *IEEE Trans. on Power Delivery*, 12(4), 1562-1568, October 1997.

(with P. T. Staats, A. Arapostathis, R. S. Thallam), A Statistical Analysis of the Effect of Electric Vehicle Battery Charging on Distribution System Harmonic Voltages, *IEEE Trans. on Power Delivery*, 13(2), 640-646, April 1998.

(with A. Chowdhury, E. F. Fuchs), An Investigation of the Harmonic Characteristics of Transformer Excitation Current Under Nonsinusoidal Supply Voltage, *IEEE Trans. on Power Delivery*, 14(2), 450-458, April 1999.

(with R. Abu-Hashim, R. Burch, G. Chang, E. Gunther, M. Halpin, C. Harziadonin, Y. Liu, M. Marz, T. Ortmeyer, V. Rajagopalan, S. Ranade, P. Ribeiro, T. Sim, W. Xu), Test Systems for Harmonics Modeling and Simulation, *IEEE Trans. on Power Delivery*, 14(2), 579-587, April 1999.

(with E. G. Preston, M. L. Baughman), A New Model for Outaging Transmission Lines in Large Electric Networks, *IEEE Trans. On Power Systems*, 14(2), 412-418, May 1999.

(with S. Santoso, E. J. Powers, A. C. Parsons), Power Quality Disturbance Waveform Recognition Using Wavelet-based Neural Classifier, Part 1: Theoretical Foundation, *IEEE Trans. on Power Delivery*, 15(1), 222-228, January 2000.

(with S. Santoso, E. J. Powers, A. C. Parsons), Power Quality Disturbance Waveform Recognition Using Wavelet-based Neural Classifier, Part 2: Application, *IEEE Trans. on Power Delivery*, 15(1), 229-235, January 2000.

(with S. Santoso, E. J. Powers, J. Lamoree, S. C. Bhatt), Characterization of Distribution Power Quality Events with Fourier and Wavelet Transforms, *IEEE Trans. on Power Delivery*, 15(1), 247-254, January 2000.

(with E. F. Fuchs, D. Yildirim), Measurement of Eddy-Current Loss Coefficient PEC-R, Derating of Single-Phase Transformers, and Comparison with K-Factor Approach, *IEEE Trans. on Power Delivery*, 15(1), 148-154, January 2000.

(with S. Santoso, J. Lamoree, E. J. Powers, S. C. Bhatt), A Scalable PQ Event Identification System, *IEEE Trans. on Power Delivery*, 15(2), 738-743, April 2000.

(with F. A. Gorgette, J. Lachaume), Statistical Summation of the Harmonic Currents Produced by a Large Number of Single Phase Variable Speed Air Conditioners: A Study of Three Specific Designs, IEEE Trans. on Power Delivery, 15(3), 953-959, July 2000.

(with A. Parsons, E. J. Powers, J. C. Soward), A Direction Finder for Power Quality Disturbances Based Upon Disturbance Power and Energy, IEEE Trans. on Power Delivery, 15(3), 1081-1086, July 2000.

Closure to discussion of (with S. Santoso, E. J. Powers, A. C. Parsons), Power Quality Disturbance Waveform Recognition Using Wavelet-based Neural Classifier, Part 1: Theoretical Foundation, IEEE Trans. on Power Delivery, 15(4), 1347-1348, October 2000.

Closure to discussion of (with E. F. Fuchs, D. Yildirim), Measurement of Eddy-Current Loss Coefficient PEC-R, Derating of Single-Phase Transformers, and Comparison with K-Factor Approach, IEEE Trans. on Power Delivery, 15(4), 1331-1333, October 2000.

Corrections to (with E. F. Fuchs, D. Yildirim), Measurement of Eddy-Current Loss Coefficient PEC-R, Derating of Single-Phase Transformers, and Comparison with K-Factor Approach, IEEE Trans. on Power Delivery, 15(4), 1357, October 2000.

Closure to discussion of (with S. Santoso, E. J. Powers, J. Lamoree, S. C. Bhatt), Characterization of Distribution Power Quality Events with Fourier and Wavelet Transforms, IEEE Trans. on Power Delivery, 15(4), 1343-1344, October 2000.

(with S. Santoso), Understanding Power System Harmonics, IEEE Power Engineering Review, Vol. 21, Issue 11, 8-11, November 2001.

(with Jaehak Chung, Edward J. Powers, Siddharth C. Bhatt), Power Disturbance Classifier Using a Rule-Based Method and Wavelet Packet-Based Hidden Markov Model, IEEE Trans. on Power Delivery, 17(1), 233-241, January 2002.

(with Jiesong Kim, Ari Arapostathis, John Soward, Sid C. Bhatt), A Time-Domain Procedure for Locating Switched Capacitors in Power Distribution Systems, IEEE Trans. on Power Delivery, 17(4), 1044-1049, October 2002.

(with R. Burch, G. Chang, C. Hatziaioniu, Y. Liu, M. Marz, T. Ortmeyer, S. Ranade, P. Ribeiro, W. Xu), Impact of Aggregate Linear Load Modeling on Harmonic Analysis: A Comparison of Common Practice and Analytical Models, IEEE Trans. on Power Delivery, 18(2), 625-630, April 2003.

(with M. A. S. Masoum, A. Jafarian, M. Ladjevardi, E. F. Fuchs), Fuzzy Approach for Optimal Placement and Sizing of Capacitor Banks in the Presence of Harmonics, IEEE Trans. on Power Delivery, 19(2), 822-829, April 2004

(with A. Arapostathis, E. J. Powers), A Hybrid Systems Approach for Dynamic Reconfiguration, IASME Transactions, vol. 1, 294-299, April 2004.

(with J. Billo, J. Carroll, J. Shin, A. Arapostathis, E. J. Powers), Research Progress at the University of Texas: System Reconfiguration and Harmonic Studies, IASME Transactions, vol. 1, 199-204, April 2004.

(with G. Chang, C. Hatziaioniu, W. Xu, P. Ribeiro, R. Burch, R.; M. Halpin, Y. Liu, S. Ranade, D. Ruthman, N. Watson, T. Ortmeyer, J. Wikston, A. Medina, A. Testa, R. Gardinier, V. Dinavahi, F. Acram, P. Lehn), Modeling Devices with Nonlinear Voltage-Current Characteristics for Harmonic Studies," IEEE Trans. on Power Delivery, 19(4), 1802-1811, October 2004.

(with M.A.S. Masoum, M. Ladjevardi, E.F. Fuchs), Application of local variations and maximum sensitivities selection for optimal placement of shunt capacitor banks under nonsinusoidal operating conditions, *International Journal of Electrical Power & Energy Systems*, Elsevier, 6(10), 761-769, December 2004.

Y.-J. Shin, E.J. Powers, M. Grady, and A. Arapostathis, Power Quality Indices for Transient Disturbances, *IEEE Transactions on Power Delivery*, Vol. 21, Issue 1, pp. 253-261, January 2006.

A. Testa, W. M Grady, et. al., Interharmonics: Theory and Modeling, *IEEE Transactions on Power Delivery*, Volume 22, Issue 4, Oct. 2007 pp. 2335 – 2348.

Yong-June Shin; Powers, E.J.; Grady, W.M.; Arapostathis, A.; , "Signal Processing-Based Direction Finder for Transient Capacitor Switching Disturbances," *Power Delivery, IEEE Transactions on* , vol.23, no.4, pp.2555-2562, Oct. 2008.

Taekhyun Kim; Powers, E.J.; Grady, W.M.; Arapostathis, A.; , "Detection of Flicker Caused by Interharmonics," *Instrumentation and Measurement, IEEE Transactions on* , vol.58, no.1, pp.152-160, Jan. 2009

Rylander, M.; Grady, W.M.; Narendorf, M. "Experimental Apparatus, Testing Results, and Interpretation of the Impact of Voltage Distortion on the Current Distortion of Typical Single-Phase Loads," *Power Delivery, IEEE Transactions on* , vol.24, no.2, pp.844-851, April 2009

Rylander, M.; Grady, W.M.; Arapostathis, A.; Powers, E.J.; "Power Electronic Transient Load Model for Use in Stability Studies of Electric Power Grids," *Power Systems, IEEE Transactions on Power Systems*, vol.25, no.2, pp.914-921, May 2010

C. A. Hill, D. Chen, M. C. Such, D. Chen, J. Gonzalez, W. M. Grady, "Battery Energy Storage for Enabling Integration of Distributed Solar Power Generation," *IEEE Transactions on Smart Grid*, vol. 3, Issue 2, pp. 850-857, June 2012.

Refereed Conference Proceedings

(with G.T. Heydt), A Z-Matrix Method for Fast Three Phase Load Flow Calculations, Proc. of the IEEE Power Industry Computer Application Conference, Minneapolis, Minnesota, June 1973.

(with G.T. Heydt), Experience with the Harmonic Power Flow Algorithm at an Industrial Site with Large Rectified Loads, Proc. of the IEEE International Symposium on Circuits and Systems, Newport Beach, California, May 1983.

(with G.T. Heydt), Voltage and Current Distortion in Power Systems Caused by Six Pulse Line Commutated Converters, Proc. of the IEEE Midwest Power Symposium, Ames, Iowa, October 1983.

(with M.S. Hwang and H.W. Sanders), Assessment of Winding Losses in Transformers Due to Harmonic Currents, Proc. of the First Inter. Conf. on Harmonics in Power Systems, Worcester, Massachusetts, October 1984.

(with G.T. Heydt and M. Etezadi), The Significance of Published Research Papers in the Promotion Process for Electric Power Engineering University Professors, Proc. of the IEEE Midwest Power Symposium, Philadelphia, Pennsylvania, October 1984.

(with M.S. Hwang), Application of a Finite Element Method in Solving Eddy Current Problems, Proc. of the IEEE Midwest Power Symposium, Philadelphia, Pennsylvania, October 1984.

(with M.T. Doyle), Improved Jacobian Matrix Structures for the Harmonic Power Flow Algorithm, Proc. of the Second Inter. Conf. on Harmonics in Power Systems, Winnipeg, Canada, October 1986.

(with A. E. Emanuel, H. A. Khatib, and M. T. Doyle), The Effect of DC Smoothing Inductance on Converter Current Distortion, Proc. of the IEEE Inter. Conf. on Harmonics in Power Systems, Budapest, Hungary, October 1990.

(with A. H. Noyola), Results of Power Quality Surveys in the United States: End User and Electric Utility Perspectives, Proc. of the First International Conference on Power Quality: End-Use Applications and Perspectives, Gif-Sur-Yvette, France, October 1991.

(with M. J. Samotyj and A. H. Noyola), Improving Power Quality with Active Power Line Conditioners, Proc. of the First International Conference on Power Quality: End-Use Applications and Perspectives, Gif-Sur-Yvette, France, October 1991.

(with R. Chan), Harmonics Modeling in the Residential Sector, Proc. of the First International Conference on Power Quality: End-Use Applications and Perspectives, Gif-Sur-Yvette, France, October 1991 (Invited paper).

(with G. Binas), Active Power Line Conditioners for Improving Electric Power Quality, XII International Congress of the International Union for Electroheat, Montreal, Canada, June 1992.

(with R. Thallam and M. Samotyj), Estimating Future Harmonic Distortion Levels in Distribution Systems Due to Single-Phase Adjustable-Speed-Drive Air Conditioners: A Case Study, Proc. of the 5th IEEE International Conference on Harmonics in Power Systems, Atlanta, 65-69, September 1992.

(with M. T. Doyle, B. W. Carroll, and R. E. Barbré), Field Measurements and Preliminary Study of Harmonic Distortion Caused by Distributed Single-Phase ASD Heat Pumps, Proc. of the Second International Conference on Power Quality: End-Use Applications and Perspectives, Atlanta, Georgia, September 1992.

(with R. J. Gilleskie), Harmonics and How They Relate to Power Factor, Proc. of the Power Quality Issues & Opportunities Conference (PQA'93), San Diego, California, November 1993.

(with W. K. Chang, M. J. Samotyj), A Practical Method for Siting and Sizing Multiple Active Power Line Conditioners in a Power System, Proc. of the IEEE-PES Transmission and Distribution Conference, Chicago, 117-120, April 1994.

(with A. Mansoor, A. H. Chowdhury, M. J. Samotyj), An Investigation of Harmonics Attenuation and Diversity Among Distributed Single-Phase Power Electronic Loads, Proc. of the IEEE-PES Transmission and Distribution Conference, Chicago, 110-116, April 1994.

(with A. Mansoor, P. Verde), Harmonic Current Diversity for Distributed Thyristor-Controlled Incandescent Lighting Loads, Proc. of the IEEE International Conference on Harmonics in Power Systems, Bologna, Italy, September 1994.

(with W. K. Chang, P. Verde), Optimal Current Injection and Placement of an Active Power Line Conditioner in a Harmonic Polluted Power System Using Several Network Correction Strategies, Proc. of the IEEE International Conference on Harmonics in Power Systems, Bologna, Italy, September 1994.

(with E. F. Fuchs, T. Stensland, M. Doyle), Measurement of Harmonic Losses of Pole Transformers and Single-Phase Induction Motors, Conference Record of the IEEE IAS Society Annual Meeting, Denver, 128-134, October 1994.

(with S. Santoso, E. J. Powers), Electric Power Quality Disturbance Detection Using Wavelet Transform Analysis, Proc. of the IEEE Signal Processing Society International Symposium on Time-Frequency and Time-Scale Analysis, Philadelphia, 166-169, October 1994.

(with A. Mansoor, E. F. Fuchs, R. S. Thallam, M. T. Doyle, M. Narendorf) Net Harmonic Currents Produced by Distributed Single-Phase Power Electronic Loads, Proc. of the Power Quality Issues & Opportunities Conference (PQA'95), New York, New York, May 1995.

(with E. F. Fuchs, M. Narendorf) Impact of Voltage Harmonics on the Performance of High-Efficiency Refrigerators, Proc. of the Power Quality Issues & Opportunities Conference (PQA'95), New York, New York, May 1995.

(with F. D. Martzloff, A. Mansoor, K. O. Phipps) Surging the Upside-Down House: Measurements and Modeling Results, Proc. of the Power Quality Issues & Opportunities Conference (PQA'95), New York, May 1995.

(with M. T. Doyle) Field Measurements and Modeling of Harmonic Distortion Caused by Distributed Single-Phase ASD Heat Pumps, ASHRAE Transactions: Symposia, 101(1), 1995.

(with E. Preston, M. L. Baughman), A New Planning Model for Assessing the Effects of Transmission Capacity Constraints on the Reliability of Generation Supply for Large Nonequivalenced Electric Networks, Proc. of the IEEE PES Transmission and Distribution Conference, 445-451, September 1996.

(with S. Santoso and E. J. Powers), Power Quality Disturbance Identification using Wavelet Transforms and Artificial Neural Networks, Proc. of the IEEE International Conference on Harmonics and Quality of Power, Las Vegas, October 1996.

(with P. T. Staats, A. Arapostathis, R. S. Thallam), Sensitivity Analysis of a Statistical Method for Predicting the Net Harmonic Currents Generated by a Concentration of Electric Vehicle Battery Chargers, Proc. of the IEEE International Conference on Harmonics and Quality of Power, Las Vegas, October 1996.

(with P. Caramia and P. Verde), On the Neutral Current Harmonics of Thyristor Controlled Incandescent Lighting Loads, Proc. of the IEEE International Conference on Harmonics and Quality of Power, Las Vegas, October 1996.

(with A. H. Chowdhury, S. N. Siddiqi, M. L. Baughman), A Generalized Benders Decomposition Algorithm for Optimally Placing and Dispatching Multiple Active Power Line Conditioners to Meet IEEE-519 Harmonic Voltage Distortion Constraints, Proc. of the IEEE International Conference on Harmonics and Quality of Power, Las Vegas, October 1996.

(with F. G. Eisenmann, A. C. Parsons), A Study of Harmonic Current Cancellation in a Semiconductor Fabrication Plant, Proc. of the IEEE International Conference on Harmonics and Quality of Power, Las Vegas, October 1996.

(with F. A. Gorgette, P. Fauquembergue, K. Ahmed), Statistical Summation of the Harmonic Currents Produced by a Large Number of Single Phase Variable Speed Air Conditioners, Proc. of the IEEE International Conference on Harmonics and Quality of Power, Las Vegas, October 1996.

(with F. A. Gorgette, J. Lachaume), Statistical Summation of the Harmonic Currents Produced by a Large Number of Single Phase Variable Speed Air Conditioners: A Study of Three Specific Designs, Proc. of the 8th IEEE International Conference on Harmonics and Quality of Power, Athens, Greece, 1194-1199, October 1998.

(with A. Mansoor), Analysis of Compensation Factors Influencing the Net Harmonic Current Produced by Single-Phase Non-Linear Loads, Proc. of the 8th IEEE International Conference on Harmonics and Quality of Power, Athens, Greece, 883-889, October 1998.

(with A. Parsons, E. J. Powers, J. C. Soward), A Direction Finder for Power Quality Disturbances Based Upon Disturbance Power and Energy, Proc. of the 8th IEEE International Conference on Harmonics and Quality of Power, Athens, Greece, 693-699, October 1998.

(with A. C. Parsons, E. J. Powers), A Wavelet-Based Procedure for Automatically Determining the Beginning and End of Transmission System Voltage Sags, Proc. of the IEEE-PES Winter Meeting, New York, 1310-1315, February 1999.

(with J. Chung, E. J. Powers, S. C. Bhatt), Variable Rate Power Disturbance Signal Compression Using Embedded Zerotree Wavelet Transform Coding, Proc. of the IEEE-PES Winter Meeting, New York, 1305-1309, February 1999.

(with J. Chung, E. J. Powers, S. C. Bhatt), Adaptive Power-Line Disturbance Detection Scheme Using a Prediction Error Filter and a Stop-and-Go CA CFAR Detector, Proc. of the ICASSP'99 IEEE International Conference on Acoustics, Speech, and Signal Processing, Phoenix, 1533-1536, March 1999.

(with A. C. Parsons, E. J. Powers, J.C. Soward), Rules for Locating the Sources of Capacitor Switching Disturbances, Proc. of the IEEE PES Summer Meeting, Edmonton, 794-799, July 1999.

(with J. Chung, E. J. Powers, S. C. Bhatt), New Robust Voltage Sag Disturbance Detector Using an Adaptive Prediction Error Filter, Proc. of the IEEE PES Summer Meeting, Edmonton, 512-517, July 1999.

(with Y. J. Shin, A. C. Parsons, E. J. Powers), Time-Frequency Analysis of Power System Disturbance Signals for Power Quality, Proc. of the IEEE PES Summer Meeting, Edmonton, 402-407, July 1999.

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(with A. Mansoor, E.F. Fuchs, P. Verde, M. Doyle), Estimating the Net Harmonic Currents Produced by Selected Distributed Single-Phase Loads: Computers, Televisions, and Incandescent Light Dimmers, Proc. of the IEEE PES Winter Meeting, 1090-1094, New York, January 2002.

(with M. Masoum, M. Ladjevardi, E. F. Fuchs), Optimal Placement and Sizing of Fixed and Switched Capacitor Banks Under Nonsinusoidal Operating Conditions, Proc. of the IEEE PES Summer Meeting, Chicago, July 2002.

(with M. Masoum, M. Ladjevardi, E.F. Fuchs), Application of Local Variations and Maximum Sensitivities Selection for Optimal Placement of Shunt Capacitor Banks Under Nonsinusoidal Operating Conditions, Proc. of the IEEE-PES 34th North American Power Symposium, Tempe, Arizona, October 2002.

Power Quality Implications of Overcompensated Systems, EPRI Power Quality Applications (PQA) 2003 North American Conference and Exposition, Monterey, California, June 2-4, 2003.

(with Marek Waclawiak), Predicting Voltage Sags at Customer Locations with Substation-Only Measurements, EPRI Power Quality Applications (PQA) 2003 North American Conference and Exposition, Monterey, California, June 2003.

(with Y. Shin, A. Monti, F. Ponci, A. Arapostathis, E. J. Powers, R. Dougal), Virtual Power Quality Analysis for Ship Power System Design, Proc. of the 21st IEEE Instrumentation and Measurement Technology Conference (IMTC 2004), Como, Italy, 1758-1763, May 2004.

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(with M.A.S. Masoum, A. Jafarian, M. Ladjevare, E.F. Fuchs), Fuzzy Approach for Optimal Placement and Sizing of Capacitor Banks in the Presence of Harmonics, Proc. of the IEEE PES General Meeting, Denver, June 2004.

(with S. Santoso), Developing an Upper-Level Undergraduate Course on Renewable Energy and Power Systems, Proc. of the IEEE PES General Meeting, San Francisco, 1239 – 1243, June 2005.

(with J. Carroll; K.C. Nagaraj; A. Arapostathis, E.J. Powers), Dynamic Reconfiguration Preserving Stability, Proc. of the IEEE Electric Ship Technologies Symposium, ESTS 2005, Philadelphia, 105-107, July 2005.

(with T. Kim, E.J. Powers; A. Arapostathis), Real and Reactive Power Analysis for Interharmonics, Proc. of the IEEE Electric Ship Technologies Symposium, ESTS 2005, Philadelphia, 244 - 247, July 2005.

(with G. Tilt, E.J. Powers, A. Arapostathis; J. Lobry), Introduction of the Concept of Friendliness Power to Characterize the Harmonic Emission of Nonlinear Loads, Proc. of the IEEE Electric Ship Technologies Symposium, ESTS 2005, Philadelphia, 306 - 312, July 2005.

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(with Taekhyun Kim, Edward J. Powers, and Ari Arapostathis,) "Robust Interharmonic Detection in Adjustable Speed Drives Using Cross Bicoherence," Proceedings of the 12th IEEE International Conference on Harmonics and Quality of Power (ICHQP'06), Cascais, Portugal, October 2006.

(with Taekhyun Kim, Adam Wang, Edward J. Powers, and Ari Arapostathis), "Detection of Flicker Caused by High-frequency Interharmonics," IEEE Instrumentation and Measurement Technology Conference (IMTC'07), Warsaw, Poland, May 2007.

(with Taeihyun Kim, E. J. Powers, A. Arapostathis), "A Novel QPC Detector for the Health Monitoring of Rotating Machines," IEEE Instrumentation and Measurement Technology Conference (IMTC'07), Warsaw, Poland, May 2007.

(with Keerthi C. Nagaraj, Johnson Carroll, Thomas Rosenwinkel, Ari Arapostathis, and Edward J. Powers), Perspectives on Power System Reconfiguration for Shipboard Applications, Proceedings of the IEEE Electric Ship Technologies Symposium, Arlington, VA, May 2007.

(with Taekhyun Kim, Wonjin Cho, Edward J. Powers, and Ari Arapostathis), ASD System Condition Monitoring Using Cross Bioherence, Proceedings of the IEEE Electric Ship Technologies Symposium, Arlington, VA, May 2007.

(with Matthew Rylander, Ari Arapostathis, and Edward Powers), Enhancement and Application of a Voltage Sag Station to Test Transient Load Response, Proceedings of the IEEE Electric Ship Technologies Symposium, Arlington, VA, May 2007.

(with H. Park, B. Jang; E. J. Powers, A. Arapostathis), "Machine Condition Monitoring Utilizing a Novel Bispectral Change Detection, IEEE Power Engineering Society General Meeting, June 2007

(with Mehrdad Vatani and Ari Arapostathis), "A New Fault Location Method for Electric Power Grids," Summer Simulation Multiconference (SummerSim'07), Society for Modeling and Simulation International (SCS), San Diego, CA, July 2007.

Hyeonsu Park; Powers, E.J.; Grady, W.M.; Arapostathis, A.; Condition Monitoring Based on Estimating Complex Coupling Coefficients," *Instrumentation and Measurement Technology Conference Proceedings, 2008. IMTC 2008. IEEE* , vol., no., pp.781-786, 12-15 May 2008

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Ha Thu Le; Santoso, S.; Grady, W.M.; , "Development and analysis of an ESS-based application for regulating wind farm power output variation," *Power & Energy Society General Meeting, 2009. PES '09. IEEE* , vol., no., pp.1-8, 26-30 July 2009

Kulkarni, S.; Allen, A.; Santoso, S.; Grady, W.M.; , "Phasor measurement unit placement Algorithm," *Power & Energy Society General Meeting, 2009. PES '09. IEEE* , vol., no., pp.1-6, 26-30 July 2009

Grady, W.M.; Costello, D.; , "Implementation and application of an independent Texas synchrophasor network," *Protective Relay Engineers, 2010 63rd Annual Conference for* , vol., no., pp.1-12, March 29 2010-April 1 2010

Rylander, Matthew; Grady, W. Mack; , "Problems in the use of Norton equivalent models for single-phase nonlinear loads," *Power and Energy Society General Meeting, 2010 IEEE* , vol., no., pp.1-7, 25-29 July 2010

A. Allen, S. Santoso, W. M. Grady, "Voltage Phase Angle Variation in Relation to Wind Power," *IEEE PES General Meeting*, July 2010.

(with David Costello), "Implementation and Application of an Independent Texas Synchrophasor Network," *Western Protective Relay Conference*, Spokane, WA, Oct. 20, 2010.

(with Joon Kim), "Synchrophasor Analysis of 221 Generating Unit Trips in ERCOT," *IEEE Power and Energy Society General Meeting*, Detroit, July 2011.

Yazmin Najera, Doug R. Reed, W. Mack Grady, "Image Processing Methods for Predicting the Time of Cloud Shadow Arrivals to Photovoltaic Systems," *37th IEEE Photovoltaic Specialists Conference (PVSC)*, 2011 , pp. 188 - 191

W. M. Grady, Leslie Libby, "A Cloud Shadow Model and Tracker Suitable for Studying the Impact of High-Penetration PV on Power Systems, *IEEE EnergyTech 2012 Conference*, Cleveland, OH, May 2012.

Aprajita Sant, W. Mack Grady, Surya Santoso, Jaime Ramos, "A Screening Procedure to Detect Significant Power System Events Recorded by the Texas Synchrophasor Network," *IEEE PES Annual Meeting*, San Diego, July 2012.

A. J. Allen, S. Kulkarni, W. M. Grady, S. Santoso, "Event Detection Method for the PMUs Synchrophasor Data," *Power Electronics and Machines in Wind Applications (PEMWA) Conference*, July 2012.

Moses Kai, W. Mack Grady, David Costello, Daniel Brooks, "Lessons Learned from the Texas Synchrophasor Network," *IEEE-PES Innovative Smart Grid Technologies Conference*, Berlin, October 2012.

Rossen Tzartsev, W. Mack Grady, Jay Patel, "Impact of High-Penetration PV on Distribution Feeders," *IEEE-PES Innovative Smart Grid Technologies Conference*, Berlin, October 2012.

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Alicia Allen, Sang-Wook Sohn, Surya Santoso, W. Mack Grady, "Algorithm for Screening PMU Data for Power System Events," IEEE-PES Innovative Smart Grid Technologies Conference, Berlin, October 2012.

Sahil Shanghavi, W. Mack Grady, Bradley Schwarz, "Evaluating the Impact of Wind Turbine Shadows on an Integrated Wind and Solar Farm," IEEE-PES Innovative Smart Grid Technologies Conference, Berlin, October 2012

John Moseley, W. Mack Grady, Surya Santoso, "A Method for Aggregating and Utilizing Distribution-Level Controllable Loads for Management of Transmission-Level Grid Security," accepted for presentation at the 2013 IEEE Innovative Smart Grid Technologies Conference, February 24-27, 2013.

John Moseley, W. Mack Grady, Surya Santoso, "New Approaches for Smart Device Integration and Maintenance of Power System Models Utilizing a Unified Data Schema," accepted for presentation at the 2013 IEEE Innovative Smart Grid Technologies Conference, February 24-27, 2013.

W. Mack Grady, Holly Thomas, "Predicting the Impact of Panel Orientation and Tracking on PV Daily Energy Harvest," IEEE EnergyTech Conference, May 2013.

W. Mack Grady, Cecilia Klauber, Holly Thomas, "A Monitoring System for Obtaining High-Quality One-Second Spaced PV Maximum Power and Solar Radiation Measurements," IEEE EnergyTech Conference, May 2013.

W. Mack Grady, Ian Gravagne, Leslie Libby, Holly Thomas, "An Electronic Curve Tracing System for Evaluating the Impact of Cloud Shadow Movement on PV Panels and Microinverters," IEEE Photovoltaics Specialists Conference, June 2013.

Other Major Publications (2000 and later)

Notes for Short Course on Fundamentals of Electric Power Systems, U.T. Austin CLEE, Austin, Texas, June 2006 and 2007.

Notes for Short Course on Electric Power Quality and Harmonics, U.T. Austin CLEE, Austin, Texas, June 2006.

(with Surya Santoso), Observations From the Texas Synchrophasor Network, <http://users.ece.utexas.edu/~grady>, timely updates since Feb. 2009.

Oral Presentations (2000 and later, excluding presentations of conference and journal papers):

Professional Society Presentations

(with J. Billo and J. Carroll), Reconfigurable Power Systems, IEEE - PES Central Texas Chapter Meeting, Austin, TX, July 22, 2003

Observations from the Texas Synchrophasor Network, Breaking News Session, IEEE-PES Annual Meeting, July 26, 2010, Minneapolis, MN

Invited Lectures

Considerations in Predicting, Modeling, and Improving Harmonic Levels in Commercial and Industrial Facilities, EPRI Power Quality Interest Group Meeting, April 26, 2000, Kansas City, Missouri.

Power System Harmonics, Reliant Energy HL&P, November 2, 2000 (one full day), Ft. Worth, Texas

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Power System Harmonics, TXU Electric & Gas, November 9th and 21st, 2000 (two full days), Ft. Worth, Texas

Automatic Location of Switched Capacitors in Distribution Systems, EPRI-PEAC Power Quality Interest Group Meeting, October 24-25, 2000, Knoxville, TN.

Future Research Topics in Electric Power Quality, NSF/DOE/EPRI Sponsored Workshop on Future Research Directions for Complex Interactive Electric Networks, November 16-17, 2000, Washington, D.C.

Assessing PQ Levels From a Limited Set of Monitoring Data, EPRI Distribution and Power Quality Product Line Meeting, Phoenix, Arizona, October 2, 2001.

Power System Engineering Topics: Symmetrical Components and Fault Calculations, TXU Electric & Gas, August 6th and August 20th, 2002 (two full days), Ft. Worth, Texas

Voltage Sag Transformation Field Verification Update, EPRI Power Quality Product Line Meeting, Phoenix, Arizona, September 30, 2002.

Power Quality Implications of Overcompensated Distribution Systems, EPRI Power Quality Product Line Meeting, Phoenix, Arizona, September 30, 2002.

A Review of Symmetrical Components and Fault Calculation Formulas, 56th Annual Conference for Protective Relay Engineers, Texas A&M University, College Station, TX, April 8, 2003.

The Energy Systems Area, U.T. Austin, ECE Dept., Eta Kappa Nu Tech Night, Spring 2003.

Modeling Power System Transients Using ATP, PowerGrid, Singapore, December 2003 (three day short course).

Renewable Energy and Grid Issues, 2005 Engineers for a Sustainable World Conference, U.T. Austin, October 6, 2005.

Introduction to Renewable Energy, Edison Lecture Series, ECE Dept., U.T. Austin, January 2007.

Renewable Energy in the U.S, Norway – U.S. Offshore Forum, U.S. Department of Commerce, Houston, April 27, 2007.

A Comprehensive on the Impact of Power Electronic Loads on Power System Transient Response and Stability, 2007 NSF ECCS Grantees' Workshop to Broaden Participation, Reno, NV, May 2007.

EE362L Power Electronics Lab, Faculty Innovation Seminar, College of Engineering, U.T. Austin, Sept. 2007.

Observations from the Texas Synchronphasor Network, Schweitzer Engineering Labs I44 Conference, Branson, MO, August 19, 2010.

Lessons Learned from the Texas Synchronphasor Network, Workshop on Active Power Control from Wind Power, sponsored by NREL and EPRI, Boulder, CO, January 27, 2011.

Lessons Learned from the Texas Synchronphasor Network, Conference for Protective Relay Engineers, College Station, TX, April 2011.

Lessons Learned from the Texas Synchrophasor Network, Utility Wind Integration Group (UWIG), Kansas City, MO, April 2011.

Lessons Learned from the Texas Synchrophasor Network, IEEE Fort Worth Section, Fort Worth, TX, May 2011.

Lessons Learned from the Texas Synchrophasor Network, North American Synchrophasor Initiative (NASPI), Toronto, June 2011.

The Power Grid, DOD Nuclear Weapon Effects Users Group Meeting, Fort Belvoir, VA, April 24, 2012.

Guest speaker on three topics at the Schweitzer Engineering Labs, Modern Solutions Power Systems Conference, Chicago, IL, June 6-8, 2012. Topics were

- Power System Safety
- Synchrophasors and Control - Wide-Area Tools for Today's Power System
- Business Applications for Synchrophasors

Power Measurements and Transformer Behavior During DTRA MHD-E3/GIC Tests, Idaho National Laboratory Geomagnetic Disturbance Workshop, Idaho Falls, ID, August 27, 2013

Experience with Synchrophasor Analysis and Application in Electric Power Systems, SEL Golden Horseshoe Relay Conference, Niagara Falls, Ontario, Sept. 19, 2013.

Patents:

(with Alexander McEachern), Harmonic-Adjusted Power Factor Meter, U.S. Patent Numbers 5,212,441 (May 18, 1993), 5,298,855 and 5,298,856 (March 29, 1994), 5,302,890 (April 12, 1994).

(with R. Chan, G. C-Y Chung, D. Gerez, W. B. Leuschner, G. P. Olson), Voltage Sag/Swell Testing Station, 5,886,429, March 23, 1999.

(with Antony Parsons, Edward Powers, Surya Santoso, John Soward), "System and Method for Locating a Disturbance in a Power System Based Upon Disturbance Power and Energy," 6,360,178 (March 19, 2002), 6,772,075 (August 3, 2004), and 6,996,483 (February 7, 2006).

Software (available on <http://users.ece.utexas.edu/~grady/>)

PCFLO: loadflow, short circuit, and harmonics analysis.

ABC012: phase sequence calculator with phasor diagrams.

Grants and Contracts (not shown in this version)

Courses Taught (2000 and later):

UT Austin

Spring 2000, Power Electronics, EE362L (14753) and EE394 (15023) combined

Fall 2000, Power System Engineering II, EE394J (15580) and EE369 (15345), combined

Fall 2000, Introduction to ECE, EE302, (14625 and 14630, combined)

Spring 2001, Power Electronics, EE362L (14740) and EE394 (15065) combined

Spring 2001, Circuit Theory, EE411 (14135 and 14140, combined)

Fall 2001, Introduction to ECE, EE302, (14675 and 14680, combined)

Fall 2001, Power Quality and Harmonics, EE394, Topic 9 (15710) and EE379K (15515), combined
Spring 2002, Power Electronics and Laboratory, EE362L (14870) and EE394 (15215), combined. Note – the course was expanded to include a lab.
Fall 2002, Introduction to ECE, EE302, (14930 and 14935, combined)
Fall 2002, Electrical Transients in Power Systems, EE394J, 16025.
Spring 2003, Electric Power Transmission and Distribution, EE368 (14905) and EE394J (15095), combined
Spring 2003, Power Electronics and Laboratory, EE362L (14815) and EE394 (15085), combined.
Fall 2003, Circuit Theory, EE411 (14638 and 14639, combined)
Spring 2004, Electric Power Transmission and Distribution, EE368 (14835) and EE394J (15080), combined
Spring 2004, Power Electronics and Laboratory, EE362L (14745) and EE394 (15070), combined.
Summer 2004, Power Electronics and Laboratory, EE362L (76930) and EE394 (76935), combined.
Fall 2004, Circuit Theory, EE411 (15285 and 15290, combined)
Fall 2004, Power System Engineering, EE369 (15975) and Power System Engineering II, EE394J-2, (16240), combined
Spring 2005, Power Electronics and Laboratory, EE362L (15300 and 15302) and EE394 (15655), combined
Summer 2005, Power Electronics and Laboratory, EE362L (77235 and 77240) and EE394 (77290), combined
Fall 2005, Power Electronics and Laboratory, EE362L (16126, 16127, 16128) and EE394 (16442 and 16443), combined
Spring 2006, Power Electronics and Laboratory, EE362L (16126, 16127, 16128) and EE394 (16442 and 16443), combined
Spring 2006, Electric Power Transmission and Distribution ,EE368, (15770) and EE394J (16030), combined
Fall 2006, Power Electronics and Laboratory, EE362L (16625, 16630, 16640) and EE394 (17015 and 17020), combined
Spring 2007, Power Electronics and Laboratory, EE362L (16175, 16180, 16185, 16190) and EE394 (16515, 16520, 16525, 16530), combined
Summer 2007, EE411, Circuit Theory (77255)
Fall 2007, EE362L and EE394, Power Electronics and Laboratory (16940, 17385, 16945, 17390, 16950, 17395, 16955, 17400)
Fall 2007, EE411, Circuit Theory (16385 and 16390)
Spring 2008, EE394, Topic 14, Electrical Transients in Power Systems (16765)
Fall 2008, EE362L and EE394, Power Electronics and Laboratory (16920, 17345, 16925, 17350, 16930, 17355, 16935, 17360)
Fall 2008, EE379K, Renewable Energy and Power Systems (17115)
Spring 2009, EE394J-2 Power System Engineering II (16845)
Fall 2009, EE362L and EE394, Power Electronics and Laboratory (16885, 16890, 16895, 17310, 16900, 17315)
Fall 2009, EE411, Circuit Theory (16345, 16350)
Spring 2010, EE394J-2 Power System Engineering II (16930)
Fall 2010, EE462L and EE394, Power Electronics and Laboratory (16705, 17050, 16710, 17055, 16715, 17060)
Fall 2010, EE362R, Renewable Energy and Power Systems (17115)
Spring 2011, EE394J-2, Power System Engineering II (17155)

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Fall 2011, EE462L and EE394, Power Electronics and Laboratory
Fall 2011, EE411, Circuit Theory
Spring 2012, EE394J-2, Power System Engineering II

Baylor

Fall 2012, EGR 1301, Introduction to Engineering
Spring 2013, ELC 4340, Power Systems
Fall 2013, EGR 1301, Introduction to Engineering
Fall 2013, ELC 4345, Power Electronics and Laboratory

Ph.D. and MS Supervisions Completed (not shown in this version):