Emmanuel Rowe | Curriculum Vitae

Middle Tennessee State University, Department of Engineering Technology
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Emmanuel.rowe@mtsu.edu
www.linkedin.com/in/emmanuelrowephd • Google Scholar: www.tinyurl.com/ScholarRowe

Education

Virginia Commonwealth University — **Richmond, VA**
Ph.D. in Electrical Engineering — *May 2014*
Research Area: Gamma Ray Spectroscopy and Scintillator Performance

North Carolina Agricultural and Technical State University — **Greensboro, NC**
B.S. in Electrical Engineering — *December 2004*
Concentration: Semiconductor Devices (Dual Degree Program)

Morehouse College — **Atlanta, GA**
B.S. in Mathematics — *December 2002*
Concentration: Convolution, PreEngineering (Dual Degree Program)

Professional Experience

Government Positions

Air Force Research Laboratory — **Wright-Patterson AFB, OH**
NRC Sr. Fellow — *June 2022 - present*

Academic Positions

Middle Tennessee State University — **Murfreesboro, TN**
Assistant Professor — *August 2019 - present*
Adjunct Professor — *July 2018 - August 2019*

Vanderbilt University — **Nashville, TN**
Adjoint Assistant Professor of Physics and Astronomy — *October 2018-Present*

Fisk University — **Nashville, TN**
Adjunct Professor — *August 2019-present*
Research Assistant Professor — *May 2017 - Aug. 2019*
Fisk Vanderbilt Bridge Post-Doctoral Fellow — *May 2014 - May 2017*
Research Assistant — *Sept 2011- May 2014*

Virginia Commonwealth University — **Richmond, VA**
Graduate Research Assistant — *July 2011-May 2014*
Graduate Teaching Assistant — *Jan 2011-July 2011*
Graduate Research Assistant — *Aug 2007-Dec 2010*

North Carolina A&T State University — **Greensboro, NC**
Undergraduate Summer Researcher — *Summer 2003*

Industry Positions

HC Yu & Associates — **Richmond, VA**
Electrical Engineer — *July 2006-July 2007*

Cree, Inc. — **Durham, NC**
Process Engineer — *Jan 2005-July 2006*

O'Neal, Inc. — **Atlanta, GA**
Electrical Engineer — *Jan 2002-Dec 2002*

Instrumentation Skills

- Growth: PLD, Emcore MOCVD, Riber 32 MBE, KJL RF Sputtering, LPE, Cambridge NanoTech ALD, E-Beam Evaporation, ACRT, Bridgman, Float Zone Method, Czochralski Method
- Metrology: XRD, SEM, AFM, Hall measurement, RHEED, Ellipsometer, Scintillator pulse height spectra, Scintillator decay time, Differential Scanning Calorimetry, FTIR, TG-IR, VSM, SQUID
- Machining: Turnmaster 13" Lathe, Manual Milling, TIG Welder, Acetylene Torch, Oxyhydrogen Torch, Quartz fabrication
- Computational: COMSOL, LabVIEW, Matlab, Python

Publications and Scholarly Work

Peer Reviewed Journal Publications

[1] A. Hunsaker, W. B. Goodwin, **E. Rowe**, C. Wheeler, L. Matei, V. Buliga, A. Burger "Ceramic Cs_2HfCl_6: A Novel Scintillation Material for Use in Gamma Ray Spectroscopy", *Cryst. Res. Technol*., 2021, 2000166

[2] **E. Rowe**, W. B. Goodwin, P. Bhattacharya, G. Cooper, N. Schley, M. Groza, N.J. Cherepy, S.A. Payne and A. Burger, "Preparation, Structure and Scintillation of Cesium Hafnium Chloride Bromide Crystals" J. Crystal Growth, Vol. 509, 1 March 2019, Pages 124-128

[3] E. Brown, Z. Fleischman, L. Merkle, **E. Rowe**, A. Burger, S. Payne, M. Dubinskii, "Optical Spectroscopy of Holmium doped K_2LaCl_5" Journal of Luminescence 196, Page 221-226 (2018)

[4] C. Cardenas, A. Burger, M.L. DiVacri, B. Goodwin, M. Groza, M. Laubenstein, S. Nagorny, S. Nisi, **E. Rowe**, "Internal contamination of the Cs_2HfCl_6 crystal scintillator," *Nuclear Inst. and Methods in Physics Research, A,* Volume 872, 11 November 2017, Pages 23-27 (2017)

[5] C. Cardenas, A. Burger, B. Goodwin, M. Groza, M. Laubenstein, S. Nagorny, **E. Rowe**, "Pulse-Shape Discrimination with Cs_2HfCl_6 crystal scintillator," *Nuclear Inst. and Methods in Physics Research, A,* Volume 872, 11 October 2017, Pages 63-67 (2017)

[6] D. Caudel, M. McCurdy, D.M. Fleetwood, R.A. Reed, R.A. Weller, B. Goodwin, **E. Rowe**, V. Buliga, M. Groza, K. Stassun, A. Burger, "Radiation damage of strontium iodide crystals due to irradiation by ^{137}Cs gamma rays: a novel approach to altering nonproportionality*", Nuclear Instruments and Methods in Physics Research Section A* Issue 835, page 117-181 (2016)

[7] A. Burger, **E. Rowe**, M. Groza, K.M. Figueroa, N.J. Cherepy, P.R. Beck, S. Hunter, S. A. Payne, "Cesium hafnium chloride: A high light yield, non-hygroscopic cubic crystal scintillator for gamma spectroscopy," *Applied Physics Letters*, Vol. 107, Issue 14, Pages 143505 (2015)

[8] **E. Rowe**, E. Tupitsyn, P. Bhattacharya, Y. Cui, M. Groza, V. Buliga, G. Atkinson, A. Burger, "Growth of KPb_2Cl_5 and K_2CeCl_5 for Gamma Ray Detection Using Vertical Bridgman method" *Journal of Crystal Growth*, Volume 393, Pages 156–158 (2014)

[9] **E. Rowe**, E. Tupitsyn, B. Wiggins, P. Bhattacharya, L. Matei, M. Groza, V. Buliga, A. Burger, P. Beck, N.J. Cherepy and S.A. Payne, "Double Salts Iodide Scintillators: Cesium Barium Iodide, Cesium Calcium Iodide, and Barium Bromine Iodide", *Cryst. Res. Technol*., **48,** No. 4, 227–235 (2013)

[10] **E. Rowe**, P. Bhattacharya, E. Tupitsyn, M. Groza, A. Burger, N. J. Cherepy, S. A. Payne, B. Sturm, and C. Pédrini, "A New Lanthanide Activator for Iodide based Scintillators: Yb^{2+}" *IEEE Transactions on Nuclear Science*, Vol. 60, No. 2, (2013)

[11] AC Stowe, J Woodward, E Tupitsyn, **E Rowe**, B Wiggins, L Matei, P Bhattacharya, A Burger "Crystal growth in $LiGaSe_2$ for semiconductor radiation detection applications" *Journal of Crystal Growth*, Volume 379, Pages 111-114, (2013)

[12] Y. Cui, P. Bhattacharya, V. Buliga, E. Tupitsyn, **E. Rowe**, B. Wiggins, D. Johnstone, A. Stowe, and A. Burger, "Defects in $^6LiInSe_2$ neutron detector investigated by photo-transient spectroscopy and photoluminescence" *Applied Physics Letters,* 103, 092104 (2013).

[13] A.C. Stowe, J. Woodward, E. Tupitsyn, **E. Rowe**, B. Wiggins, L. Matei, P. Bhattacharya and A. Burger, "Crystal growth in $LiGaSe_2$ for semiconductor radiation detection applications," *Journal of Crystal Growth*, 379, 111 (2013).

[14] Q. Grim, K.B. Ucer, A. Burger, P. Bhattacharya, E. Tupitsyn, **E. Rowe**, V. Buliga, L. Trefilova, A. Gektin, G.A. Bizarri, W.W. Moses, and R.T. Williams, "Nonlinear quenching of densely excited states in wide-gap solids" *Phys. Rev. B* 87, 125117 (2013).

[15] V. Pankratov, A.I. Popov, L. Shirmane, A. Kotlov, G.A. Bizarri, A. Burger, P. Bhattacharya, E. Tupitsyn, **E. Rowe**, V. Buliga, R.T. Williams, "Luminescence of SrI_2 and SrI_2:Eu^{2+}" *Radiation Measurements*, Vol. 56, Pages 13–17 (2013)

[16] Pankratov, A.I. Popov, L. Shirmane, A. Kotlov, G.A. Bizarri, A. Burger, P. Bhattacharya, E. Tupitsyn, E. Rowe, V. Buliga, R.T. Williams, "Nonlinear quenching of densely excited states in wide-gap solids", *Phys. Rev. B*, 87, 125117 (2013)

[17] L.A. Boatner, J.O. Ramey, J.A. Kolopus, R. Hawrami, W.M. Higgins, E. van Loef, J. Glodo, K.S. Shah, **E. Rowe**, P. Bhattacharya, E. Tupitsyn, M. Groza, A. Burger, N.J. Cherepy, S.A. Payne, "Bridgman Growth of Large SrI_2:Eu^{2+} Single Crystals: A High-performance Scintillator for Radiation Detection Applications" *Journal of Crystal Growth*, Volume 379, Pages 63–68 (2013)

[18] E. Tupitsyn, P. Bhattacharya, **E. Rowe**, L. Matei, M. Groza, B. Wiggins, A. Burger, and A. Stowe, "Single crystal of $LiInSe_2$ semiconductor for neutron detector," *Applied Physics Letters,* 101, 202101 (2012)

[19] J.H. Leach, H. Liu, V. Avrutin, **E. Rowe**, Ü. Özgür, H. Morkoç, Y.-Y. Song, and M. Wu, "Electrically and Magnetically Tunable Phase Shifters Based on a BST-YIG layered structure," *Journal of Applied Physics* 108 064106 (2010)

[20] H. Liu, V. Avrutin, B. Xiao, **E. Rowe**, H.R. Liu, Ü. Özgür, and H. Morkoç, Epitaxial relationship of MBE grown BaM (0001) films on sapphire (0001), *Journal of Crystal Growth*, Volume 312, Issue 5, 671, (2010)

[21] B. Xiao, H.R. Liu, V. Avrutin, J.H. Leach, **E. Rowe**, H. Liu, Ü. Özgür, H. Morkoç W. Chang, L. M. B. Alldredge, S. W. Kirchoefer, and J. M. Pond, Epitaxial growth of (001)-oriented Ba0.5Sr0.5TiO3 thin films on a-plane sapphire with an MgO/ZnO bridge layer, *Applied Physics Letters* 95 (21), 212901 (2009)

[22] B. Xiao, V. Avrutin, H.R. Liu, **E. Rowe**, J. Leach, X. Gu, Ü. Özgür, H Morkoç, W. Chang, L.M.B. Alldredge, S.W. Kirchoefer, and J.M. Pond, Effect of large strain on dielectric and ferroelectric properties of $Ba_{0.5}Sr_{0.5}TiO_3$ thin films, *Applied Physics Letters*, 95 (1), 012907 (2009)

Invited Talks

[1] "What makes a great advisor" Center for Astrophysics | Harvard & Smithsonian Panel, July 27, 2021

[2] "Radiation Detectors for space applications: detector design, fabrication and characterization" NASA HBCU/MSI Technology Infusion Road Tour, Tallahassee, FL, September 29, 2016

[3] "Fisk-Vanderbilt Bridge Program" National Astronomy Consortium, Washington, DC, September 10, 2016

[4] "How to Increase The Number of African American Males in Engineering Track in Graduate School" 4th Annual Arkansas ASSET Initiative Project Meeting, Little Rock, AR, September 5, 2014

[5] "Time Traveling Through the PhD Process" Fisk-Vanderbilt Bridge Program Research Celebration Day, Nashville, TN, August 15, 2014 (Keynote Address)

Conference Presentations with Proceedings

[1] T.H. Prettyman, A. Burger, N. Yamashita, **E. Rowe**, J. Butler, M. Groza, K. Stassun, J.L. Lambert, J. C. Castillo-Rogez, C. A. Raymond, S. M. Feldman, P. R. Beck, N. J. Cherepy, S. A. Payne, "Planetary Gamma Ray Spectroscopy with Strontium Iodide" 3rd International Workshop on Instrumentation for Planetary Missions, Page 4105, (2016)

[2] T.H. Prettyman, **E. Rowe**, J. Butler, M. Groza, A.Burger, N. Yamashita, J.L. Lambert, K.G. Stassun, P.R. Beck, N.J. Cherepy, S.A. Payne, J.C. Castillo-Rogez, S.M. Feldman, C.A. Raymond, "Strontium iodide

gamma ray spectrometers for planetary science", Proc. SPIE 9968, Hard X-Ray, Gamma-Ray, and Neutron Detector Physics XVIII, 99680H (2016)

[3] D.R. Onken, S. Gridin, K.B. Ucer, J.L. Drewery, R.T. Williams, **E. Rowe**, E. Tupitsyn, M. Groza, P. Bhattacharya, A. Burger, "Observing dislocation motion induced by laser shock peening in KI," IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC), pages 1-3, (2015)

[4] L. A. Boatner, J. O. Ramey, J. A. Kolopus, J. S. Neal, N. J. Cherepy, S. A. Payne, A. Burger, **E. Rowe**, P. Bhattacharya "Advances in the growth of alkaline-Earth halide single crystals for scintillator detectors" Part of SPIE Optical Engineering + Applications (2014)

[5] R. T. Williams, J. Q. Grim, Qi Li, K. B. Ucer, G. A. Bizarri, S. Kerisit, Fei Gao, P. Bhattacharya, E. Tupitsyn, **E. Rowe**, V. M. Buliga, A. Burger, "Experimental and computational results on exciton/free-carrier ratio, hot/thermalized carrier diffusion, and linear/nonlinear rate constants affecting scintillator proportionality" Proc. SPIE Vol. 8852, 88520J-1 (2013).

[6] B. Wiggins, E. Tupitsyn, P. Bhattacharya, **E. Rowe**, E. Lukosi, O. Chvala, A. Burger, A. C. Stowe, "Investigation of non-uniformity and inclusions in $^{6}LiInSe_2$ utilizing laser induced breakdown spectroscopy (LIBS)", in Hard X-Ray, Gamma-Ray, and Neutron Detector Physics XV, Michael Fiederle; Arnold Burger; Larry Franks; Ralph B. James, Editors, Proceedings of SPIE Vol. 8852, 88520M (2013)

[7] M. Zhuravleva, L. Stand, H. Wei, C. Hobbs, L.A. Boatner, J.O. Ramey, K. Shah, A. Burger, **E. Rowe**, P. Bhattacharya, E. Tupitsyn, C.L. Melcher, "Hygroscopicity evaluation of halide scintillators" IEEE Nuclear Science Symposium and Medical Imaging Conference, Pages 1-5, (2013)

[8] H. Liu, V. Avrutin, C. Zhu, J.H. Leach, **E. Rowe**, L. Zhou, D. Smith, Ü. Özgür and H. Morkoç, "Three-Step Deposition Method for Improvement of the Dielectric Properties of BST Thin Films," MRS Proceedings, Volume 1397, (2012)

Conference Presentations without Proceedings

[1] **E. Rowe**, P. Bhattacharya, E. Tupitsyn, Y. Cui, L. Matei, M. Groza, N. J. Cherepy, S.A. Payne, and Arnold Burger "Co-doping of $SrI_2:Eu^{2+}$ Crystal With Different group I & II Elements Using Multi-Growth Vertical Bridgman" IEEE 2014 Symposium on Radiation Measurements and Applications, Ann Arbor, MI June 9-12, 2014. (poster presentation)

[2] Y. Cui, P. Bhattacharya, M. Groza, E. Tupitsyn, **E. Rowe**, V. Buliga, L. Matei, B. Wiggins, D. Johnstone, A. Stowe, and A. Burger "Crystal growth and characterization of $^{6}LiInSe_2$ neutron detector" APS March Meeting 2014, Denver, Colorado, March 3–7, 2014 (poster presentation)

[3] P. Bhattacharya, E. Tupitsyn, **E. Rowe**, M. Groza, Y. Cui, V. Buliga, A. Burger, Qi Li, Koushik Biswas, and Richard T. Williams, "ZnSe:Te crystals grown by chemical vapor transport for scintillation application" SPIE: Hard X-Ray, Gamma-Ray, and Neutron Detector Physics XVI, San Diego, CA, August 17-21, 2014 (oral presentation)

[4] **E. Rowe**, E. Tupitsyn, P. Bhattacharya, Y. Cui, M. Groza, V. Buliga, A. Burger, "The Growth of Eu-doped KPb_2Cl_5 for Gamma Ray Detection" The 19th American Conference on Crystal Growth and Epitaxy held jointly with The 16th U.S. Biennial Workshop on Organometallic Vapor Phase Epitaxy, Keystone, CO, July 26, 2013 (oral presentation)

[5] **E. Rowe**, E. Tupitsyn, P. Bhattacharya, Y. Cui, M. Groza, V. Buliga, A. Burger, S. Payne, N. Cherepy R. Williams "New Scintillator Activator Candidate" Scintillator Nonproportionality Workshop, Oakland, CA, May 18, 2012 (oral presentation)

[6] A. Burger, **E. Rowe**, P. Bhattacharya, E. Tupitsyn, M. Groza, N. J. Cherepy, S. A. Payne, B. Sturm, and C. Pédrini, "Yb^{2+}: A New Lanthanide Scintillator Activator, : IEEE 2012 Symposium on Radiation Measurements and Applications, Oakland, CA, May 14-17, 2012. SORMA West 2012 (poster presentation)

[7] **E. Rowe**, B. Xiao, Ü. Özgür, V. Avrutin, and H. Morkoç, Magnetoelectric Effect in LSMO on Stripe Patterned PZT Grown by RF Sputtering, VCU-LSAMP I-GEEAR Research Symposium, March 27, 2010 (oral presentation)

[8] **E. Rowe**, B. Xiao, Ü. Özgür, V. Avrutin, and H. Morkoç, Magnetoelectric effect in patterned PZT/LSMO bilayers grown by RF sputtering, MRS Fall Meeting 2008, Symposium C: Theory and Applications of Ferroelectric and Multiferroic Materials. Boston, November 30 - December 1, 2008 (poster presentation)

[9] V. Pankratov, A.I. Popov, L. Shirmane, A. Kotlov, G.A. Bizarri, A. Burger, P. Bhattacharya, E. Tupitsyn, **E. Rowe**, V. Buliga, R.T. Williams, "Luminescence of SrI_2, $SrI_2:Eu^{2+}$, BaI_2, and $BaI_2:Eu^{2+}$ Under

Synchrotron Radiation and X-Ray Excitation" 10th International Conference on Excitonic Processes in Condensed Matter, Nanostructured and Molecular Materials, Groningen, the Netherlands, July 2-6 2012. (oral presentation)

[10] J. Grim, Q. Li, B. Ucer, R. Williams, A. Burger, P. Bhattacharya, E. Tupitsyn, **E. Rowe**, V. Buliga, G. Bizarri, B. Moses, "Z-Scan Measurements of Rate Constants and Kinetic Orders of Nonlinear Quenching in SrI_2, $SrI_2:Eu^{2+}$, $NaI:Tl^+$, $CsI:Tl^+$, BGO, ZnO, ZnSe:Te, CZT, and CdTe" SORMA West, May 16, 2012. (oral presentation)

[11] R. Williams, J. Grim, Q. Li, B. Ucer, A. Burger, P. Bhattacharya, E. Tupitsyn, **E. Rowe**, V. Buliga, G. Bizarri, B. Moses, "Why does SrI_2:Eu Have Higher Light Yield and Flatter Electron Response Than NaI:Tl? Why Do Halide Scintillators Generally Have Higher Light Yield Than Oxides? ...etc." International Conference on Optical and Optoelectronic Properties of Materials and Applications, Nara, Japan June 3-7, 2012. (oral presentation)

[12] K.B. Ucer, A. Burger, P. Bhattacharya, E. Tupitsyn, **E. Rowe**, V. Buliga, L. Trefilova, R. Williams, "Early Evolution of Excitation in SrI_2:Eu and CsI:Tl Scintillators Studied by Picosecond Absorption Spectroscopy" ICDIM 2012, Santa Fe, NM, June 24-29, 2012. (oral presentation)

[13] V. Pankratov, A.I. Popov, I. Shirmane, A. Kotlov, G.A. Bizarri, A. Burger, P. Bhattacharya, E. Tupitsyn, **E. Rowe**, V. Buliga, R.T. Williams, "Luminescence of Pure and Europium Doped SrI_2 and BaI_2 under VUV and X-Ray Excitation" LUMDETR 2012 Halle, Germany, Sept. 10-14 2012 (oral presentation)

[14] R. Charity, **E. Rowe**, K. Wyatt, H. Abdus-Salaam, and N. Allen, The Pulsed Laser Deposition of Yttrium Barium Copper Oxide, Florida Georgia LSAMP Expo 2004, Engineering Section, January 29 - February 1, 2004 2001 (oral presentation)

Other Presentations

[1] L. Matei, **E. Rowe**, E. Tupitsyn, M. Groza, P. Bhattacharya, A. Burger, "Crystal Growth and Fabrication of Radiation Sensors and Imagers for Portable and Mobile Application, 16th Annual Fisk Research Symposium, Nashville, April 9, 2014

[2] R. Williams, J. Grim, Q. Li, B. Ucer, A. Burger, P. Bhattacharya, E. Tupitsyn, **E. Rowe**, V. Buliga, G. Bizarri, B. Moses, "Why does SrI_2:Eu Have Higher Light Yield and Flatter Electron Response Than NaI:Tl? Why Do Halide Scintillators Generally Have Higher Light Yield Than Oxides? ...etc." National Nuclear Security Administration NA-22 Workshop, Oakland, CA, May 18, 2012.

[3] R. Williams, B. Ucer, J. Grim, Q. Li, A. Burger, P. Bhattacharya, E. Tupitsyn, **E. Rowe**, V. Buliga, G. Bizarri, B. Moses, S. Payne, B. Sadigh, D. Aberg, F. Gao, "Z-Scan and τ Measurement of K_2, K_3, C_2, D_{eh}/C_2 D_{exe}; Track Radius From Experiment; e^- Yield $(E_i) = \int PY(n, E_i)LLY(n)dn$; Synchrotron excitation of $SrI_2:Eu^{2+}$ and BaI_2; 'Halide Rule'; K_1, $(dE/dx)_{Birks}$, η_{eh}"" NA-22 Workshop, PNNL, March 9, 2012.

[4] H. Morkoç and colleagues, "Preparation of complex FE and FM oxides and investigation of their structural and magnetoelectrical properties for device applications", Office of Naval Research Progress Report Symposium, Nov. 5, 2008.

[5] **E. Rowe**, Crystal Plasticity; Life Estimation of metals, General Electric Research Summit, Morehouse College, July 2001 (oral presentation)

Honors and Awards

NSF Minority Faculty Development Workshop	*2018*
NextProf: Science	*2017*
Carl Storm Underrepresented Minority Fellowship	*2016*
R&D 100 Award: LISe™: A High-Efficiency Thermal Neutron Detector	*2013*
VCU School of Engineering Thesis and Dissertation Award	*2011*

Teaching Experience

ENGR 4520 - Electrical Power and Machinery

Single and three phase power circuit calculations with phasor diagrams and electromagnetic laws. Magnetic field and circuit analysis. Variable frequency drives. Electromechanical energy conversion and rotating machinery modeling and analysis. Construction, equivalent circuit, and performance analysis of three-phase transformers and DC, induction, and synchronous motors. Lectures and laboratory.

Spring 2021 Enrollment: 33 undergraduate students
Fall 2020 Enrollment: 31 undergraduate students
Spring 2020 Enrollment: 26 undergraduate students
Fall 2019 Enrollment: 27 undergraduate students
Spring 2019 Enrollment: 22 undergraduate students
Fall 2018 Enrollment: 64 undergraduate students

ENGR 3510 – Electrical Circuit Analysis II

Use of Laplace Transform techniques to analyze linear circuits with and without initial conditions. Characterization of circuits based upon impedance, admittance, and transfer function parameters. Determination of frequency response via analysis of poles and zeros in the complex plane. Relationship between the transfer function and the impulse response of a circuit. The Fourier transform. Two-port circuit calculations. Balanced three-phase circuits. Lecture and Laboratory.

Summer 2020 Enrollment: 9 undergraduate students

ET 3602 - Electrical Circuit Analysis II

Addresses basic circuit components and quantities of AC circuits. Introduces three-phase circuits and transformers. Emphasis on AC circuit calculations and theorems. Uses lab equipment to build and test AC circuits. Lectures and laboratory.

Spring 2021 Enrollment: 28 undergraduate students
Spring 2020 Enrollment: 28 undergraduate students
Spring 2019 Enrollment: 30 undergraduate students
Fall 2018 Enrollment: 21 undergraduate students

ET 3601 - Electrical Analysis I

Addresses basic circuit components and quantities of DC circuits. Introduces circuit analysis . Emphasis on DC circuit calculations and theorems. Uses lab equipment to build and test DC circuits. Lectures and laboratory.

Fall 2020 Enrollment: 31 undergraduate students

ENGR 3540 – Introduction to Feedback Control

Introduces classical feedback control in electrical, mechanical, mechatronics, and other continuous-time dynamic systems. Discusses how to model, evaluate, and design SISO and linear control systems using differential equations, transfer function, root locus, and frequency response methods. Hands-on experiments involving Matlab, Labview, transducers (sensors), and actuators (motors) used to complement the theoretical aspects of the course. Embedded control also introduced. Lectures and laboratory.

Spring 2019 Enrollment: 24 undergraduate students

ENGR 3520 – Digital Circuits Fundamentals

Introduces logic design with emphasis on practical design techniques and circuit implementation. Topics include Boolean algebra; theory of logic functions; mapping techniques and function minimization; logic equivalent circuits and symbol transformations; transistor-transistor-logic (TTL)/metal oxide semi-conductor (MOS) logic into gate implementations; electrical characteristics; propagation delays; signed number notations and arithmetic. Digital design using random logic and programmable logic devices (FPGAs and CPLDs). Lectures and laboratory.

Spring 2019 Enrollment: 12 undergraduate students

Professional Service and Activities

Project Peer Reviewer

Department of Energy Small Business Innovation Research (SBIR) FY21 Phase I Release 2	2020
National Science Foundation	2020
Office of Nuclear Energy Competitively Funded Projects	2017, 2018

Journal Peer Reviewer

Journal of Crystal Growth	2014, 2015, 2019
Nanoscale	2018
Journal of Optics and Laser Materials	2017
Journal of Physical Chemistry	2016

University Service

Middle Tennessee State University

Chair, Engineering Technology Awards Committee	Jan. 2021 - present
Member, Mechatronic Engineering Tenure Track Faculty Search Committee	Nov. 2020 – Jan. 2021
Member, Academic Appeals for College of Basic and Applied Sciences	Aug. 2020 - present
Member, Curriculum Committee	Oct. 2019 - present
Chair, Awards Planning Committee	Nov. 2020 – Jan. 2021
Member, Engineering Technology Department Chair Search Committee	Sept. 2019 – Jan. 2021
Member, Engineering Technology Faculty Search Committee	Sept. 2019 – Dec. 2020

Fisk University

Member, President Kevin Rome Inauguration Committee	Sept. 2017 - May 2018

Professional Affiliations

American Ceramic Society (ACerS)

Member — *2019 – present*

Society of Photographic Instrumentation Engineers (SPIE)

Early Career Professional — *2017 – present*

Academic and Research Leadership Network

Member — *2014 – present*

The International Society for Optics and Photonics (SPIE)

Member — *2013-present*

Institute of Electrical and Electronic Engineers (IEEE)

Member — *2013–present*

Student Member — *2003-2013*

American Physical Society

Member — *2013–present*

American Association for Crystal Growth

Member — *2013–present*

National Society of Black Physicists
Member *2011–present*

National Society of Black Engineers
Member *2000–present*

Entrepreneurship

Vanderbilt Tech Venture Challenge
Astrohound – CEO *2017*

Erudite Research Engineering & Technology, LLC
Founder *2014-present*

Morehouse Football Alumni Corporation
Co-Founder *2008-present*

Public Service

TN Department of Education
STEM Advisory Council Committee Member *2020-present*

Fisk-Vanderbilt Master-PhD Bridge Program
Steering Committee Member *2018-present*

Phi Beta Sigma Fraternity, Inc.
Western TN State Director *2022-present*
Southwestern Region Director of Education *2018 – 2022*
Southwestern Region Parliamentarian *2016 – 2017*

Eta Beta Sigma Graduate Chapter of Phi Beta Sigma Fraternity, Inc.
President *2016 – 2020*
1st Vice President *2014 – 2016*

NC-VA LSAMP
Assistant Director *2009 –2011*

VCU Chapter of Toastmasters, Int.
President *FY - 2011*
VP of Education *FY - 2010*

Diversity and Outreach Efforts

Community ACT Preparation Program	2016-2019
Adopt-A-School Program – Haynes Middle School	2015-present
TCAP Testing Proctor	2015-2019
March of Dimes Fundraising	2014-present
TLSAMP	2014-present
4th Annual Arkansas ASSET Initiative Project Meeting Diversity Panelist	2014
Fisk University Research Symposium Judge	2013
Eakin Elementary School Super Science Presentation	*2012*