

Yasser Gawayed, Ph.D.
Chair and Lau Family Professor
Department of Fiber Science & Apparel Design
College of Human Ecology, Cornell University
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Education

Ph.D. North Carolina State University, Raleigh, NC (1992)

M.Sc. Materials Engineering, The American University in Cairo, Egypt (1989)

B.Sc. Civil Engineering, Ain Shams University, Cairo, Egypt (1980)

Professional Experience

Cornell Univ., Chair and Lau Family Professor, Department of Fiber Science & Apparel Design (2019- present)

Auburn Univ., Emeritus Professor of Mechanical Engineering (2017-present)

Auburn Univ., Professor of Mechanical Engineering (2015-2017)

Auburn Univ., Assistant, Associate and full Professor, Department of Polymer and Fiber Engineering (1992-2015)

North Carolina State Univ., Research Assistant (1989-1992)

Howeedy consultants, Senior Structural Engineer (1980 – 1989)

Teaching

Developed and taught the following courses

Cornell University:

FSAD 6860: Mechanics of Fibrous assemblies and their composites (3 cr.)

Auburn University:

ENGR 1110: Introduction to Polymer and Fiber Engineering (2 cr.)

PFEN 4400: Mechanics of flexible structures (3 cr.)

PFEN 4500: Fiber reinforced materials (3 cr.)

PFEN 4810: Polymer and Fiber engineering design I (3 cr.)

PFEN 4820: Polymer and Fiber engineering design II (3 cr.)

TXEN 3550: Numerical methods in Design (3 cr.)

PFEN 7500: Mechanics of fiber reinforced materials (3cr.)

PFEN 7620: Advanced mechanics of flexible structures (3 cr.)

GLOB 7110&7120: Research Colloquium and Methods (2 cr.)

Activities and committees to enhance teaching activities

- Design of undergraduate and graduate curriculums
- ABET committee review
- Creation of new M.Sc. and Ph.D. degrees
- Academic Program Review Committee
- Selection of teaching management system
- Graduate program officer

Research

Interests

- Mechanics of composite materials with emphasis on deformation mechanisms and structure property relationships
- Use of composite materials in energy storage, turbine engines and nuclear applications
- Time-dependent response of polymer and ceramic matrix composites
- Damage progression and the estimation of life for ceramic matrix composites
- Effect of oxidation kinetics and elevated temperature on the mechanical response of ceramic matrix composites
- Manufacturing and testing of polymer matrix composite structures

Contracts and grants

I have been a PI and co-PI on research contracts from government and industrial sources totaling over \$16M mostly geared to study the behavior of polymer and ceramic matrix composite materials and structures, fabrics and protective materials. Main research efforts can be listed as follows:

Air Force Research Lab, "Linking Coupon to Component Behavior of CMCs in Relevant Service Environment," April 2015 – April 2018, \$960,000 (co-PI in collaboration with SAI and Rolls-Royce)

IGP, "Environmentally friendly procedure to synthesize cellulosic/PHB biocomposites," May 2016 – April 2017, \$10,000 (co-PI with Gisela Buschle-Diller)

EASL2Go, "3D Active-Learning Design Laboratory," 2016, Auburn University, \$40,000 (PI with Jordan Roberts, Pramod Rajan, Anahita Ayasoufi and PK Raju)

Air Force Research Lab, "Physics-Based Non-Linear Behavior Models for Design of Carbon-Fiber Reinforced Composite Components," Sept 2015 – May 2016 \$120,000 (co-PI in collaboration with SAI, Boeing and Pratt & Whitney)

Vision Wheels, "Design, manufacture and certification of an automotive composite rim," October 2014 – April 2016, \$97,100 (PI)

The University of Dayton Research Institute, "Prediction of Performance Properties of Advanced Ceramic Matrix Composites," August 2012 – August 2016, \$85,000 (PI)

NASA Dryden, "Highly Reliable Structural Health Monitoring of Smart Composite Vanes for Jet Engine", August 2011 – November 2014, \$1,020,000 (PI in collaboration with IFOS)

Air Force Research Lab, "Modeling and Simulation of Ceramic Matrix Composite (CMC) manufacture processes," January 2012 - July 2014, \$65,000 (co-PI with RAI and COIC)

Alabama Department of Transportation, "Time dependent response of bridges strengthened using FRP," March 2012 – February 2013, \$175,000 (co-PI with UAB)

Air Force Research Labs, "Micromechanics Analyses of Woven Ceramic Matrix Composites with Defects as it relates to Material Performance," April 2012-June 2014, \$830,000 (co-PI with SAI and Pratt & Whitney)

The Department of Energy, "Fiber-Optic Defect and Damage Locator System for Wind Turbine Blades", Jan 2010 – Jan 2011, \$69,000 (PI with IFOS)

Goodrich Inc., "CMC Airfoil Capability Enhancements for Military Aerospace Gas Turbine Engine Systems", June 2008 – May 2010, \$1,100,000. (PI with SRI)

Department of Commerce, Polymer Center, "Stress mapping around SWNT and MWNT in polymer-matrix nano-composites," July 2008 – June 2010, \$220,000 (PI)

USA Forest Services, "Natural Hydrogels from Low-Value Forest Products", Sept 2007-February 2009, \$176,000 (co-PI with Dr. Buschle-Diller)

The Department of Homeland Security, “Efficient Chemical Protective Materials”, August 2005 - November 2007, \$2,100,000 (PI with Clemson, Philadelphia University and other researchers from Auburn University)

Air Force Research Labs, “PRDA I: CMC Mission and Environmental Demonstration Model Development and Test Validation,” April 2004 – February 2008, \$950,000 (co-PI with Pratt & Whitney, RAI, NASA Glenn)

The Department of Commerce, National Textile Center, “Efficient Bio-Chemical Protective Materials”, May 2005 - April 2008, \$540,600 (PI)

NASA Glenn Research Center, “Design and manufacture of a textile composite flywheel”, Center for Space Power and Advanced Electronics, November 1998 - November 2003, \$1,030,000 (PI)

The Department of Commerce, National Textile Center, “Assessment of continuous, pulsed and aerated pressure-washing”, May 2002 - April 2004, \$218,000 (PI)

The Department of Commerce, National Textile Center, “Development of fundamental measures of knitted fabric torque control”, May 2002 - April 2004, \$57,000 (co-PI with Philadelphia University)

Air Force Research Labs, “PRDA VII: Durability and life predication of ceramic matrix composites,” October 2001 – March 2006, \$1,750,000 (co-PI with Pratt & Whitney, RAI, NASA Glenn)

NASA Glenn Research Center, “Damping of MDC flywheels”, July 2001 - November 2003, \$210,000 (PI)

National Science Foundation, “Computer aided design and manufacture of fiber reinforced composites”, September 1997 - August 1999, \$38,500 (PI)

Pratt & Whitney, “Three-phase modeling of textile composites”, August 1997 – December 1998, \$59,000 (PI)

National Science Foundation/EPSCoR, “An integrated approach to added value reclamation of solid waste”, September 1995 - August 1999, \$3,200,000 (PI with Tuskegee University, University of Southern Alabama and UAH)

NASA Glenn Research Center, "Enabling propulsion materials," February 1995 – January 1998, \$320,000 (PI)

The Department of Commerce, National Textile Center, "On-line testing of textiles", March 1996 - February 1997, \$121,000 (co-PI with Dr. Sabit Adanur)

Pratt & Whitney, "Inelastic behavior and failure analysis of textile composites subjected to tensile loads", January 1996 - Sept. 1996, \$45,000 (PI)

The Department of Commerce, National Textile Center, "Backward projection and finger-printing of textile product quality", March 1995 - February 1996, \$205,000 (co-PI with Dr. Royall Broughton)

Pratt & Whitney, "The effect of voids on the thermo-mechanical behavior of textile reinforced composites", August 1994 - July 1995, \$59,000 (PI)

Pratt & Whitney, "Optimization of weave parameters for thermo-mechanical properties using Graphical Integrated Numerical Analysis (GINA)", July 1994 - December 1994, \$30,000 (PI)

Rolls Royce Inc., "Surface inspection of textile composites using image analysis techniques", April 1994 - August 1994, \$19,000 (PI)

The Department of Commerce, National Textile Center, "Use of continuously monitored data in product improvement", March 1993 - February 1995, \$203,000 (co-PI with Dr. Yehia Elmogahzy)

The Department of Commerce, National Textile Center, "Cotton fiber quality: characterization, selection and optimization", March 1994 - February 1995, \$156,000 (co-PI with Dr. Yehia Elmogahzy)

The Department of Commerce, National Textile Center, "Design and characterization of geotextiles", March 1994 - February 1996, \$145,000 (PI)

Pratt & Whitney, "Prediction of thermal expansion coefficients for textile reinforced ceramic matrix composites", January 1994 - June 1994, \$29,500 (PI)

Pratt & Whitney, "Thermo-mechanical modeling of textile reinforced materials", June 1993 - December 1993, \$28,000 (PI)

The Department of Commerce, National Textile Center, "Textile structures for composites", March 1993 - February 1995, \$161,000 (PI)

Patent

Ojard, Greg, Eaton, Harry, Nair, Shantikumar and Gowayed, Yasser, "Bond layer for silicon containing substrate," US Patent 7,056,574 (2006)

Refereed Publications

Santhosh, U., Ahmad, J., Ojard, G., Smyth, I., Gowayed, Y., and Jefferson, G., "Effect of porosity on the nonlinear and time-dependent behavior of Ceramic Matrix Composite," Composites Part B 184 (2020) 107658

Gowayed, Y., Pierce, J., Buchanan, D., Zawada, L., John, R. and Davidson, K., "Effect of microstructural features and properties of constituents on the Thermo-Elastic Properties of Ceramic Matrix Composites," Composites Part B, Volume 135, no. 15 (2018) 155-165

Santhosh, U., Ahmed, J., Kalarikkal, S., Ojard G. and Gowayed, Y., "Time-Dependent Deformation and Damage Modeling of a SiC/SiC Composite," Journal of Aerospace Engineering, Volume 31, no. 6 (2018)

Santhosh, U., Gowayed, Y., Ojard, G., Smyth, I., Kalarikkal, S., and Jefferson, G., "Quantification of Porosity in Ceramic Matrix Composites Using Thermography," Journal of Nondestructive Evaluation, Volume 37, no. 2 (2018) 1-14

Mohamed, E., Buschle-Diller, G. and Gowayed, Y., "Solution-Based Synthesis of a 4-Arm Star-Shaped Poly(L-lactide)," Journal of Designed Monomers and Polymers, Volume 19, no. 2 (2016) 180-192

Unni Santhosh, Jalees Ahmad, Greg Ojard, Robert Miller, Yasser Gowayed, "Deformation and damage modeling of ceramic matrix composites under multiaxial stresses," Composites Part B: Engineering, Volume 90, no. 1 (2016) 97–106

Gowayed, Y., Abouzeida, E., Smyth, I, Ojard, G., Ahmad, J., Santhosh, U. and Jefferson, G., "The role of oxidation in time-dependent response of ceramic matrix composites," Composites Part B, Volume 76 (2015) 20–30

Gowayed, Y., Ojard, G., Santhosh, U. and Jefferson, G., "Modeling of Crack density in Ceramic Matrix Composites," *Journal of Composite Materials, Journal of Composite Materials*, Volume 49 no. 18 (2015) 2285-2294

Gowayed, Y., Ojard, G., Prevost, E., Santhosh, U. and Jefferson, G., "Defects in ceramic matrix composites and their impact on elastic properties," *Composites: Part B* 55 (2013) 167–175

Santhosh, U., Ahmad, J., John, R., Ojard, G., Miller, R., and Gowayed, Y., "Modeling of stress concentration in ceramic matrix composites", *Composites: Part B* 45 (2013) 1156-1163

Gowayed, Y., Ojard, G., Miller, Morscher, G., R., Santhosh, U., Ahmad, J., John, R., "Accumulation of time-dependent strain during dwell-fatigue experiments of iBN-Sylramic Melt Infiltrated SiC/SiC composites with and without holes", *Composites Part A* 42 (2011) 2020-2027

Eldessouki, M., Buschle-Diller, G. and Gowayed, Y., "Poly(L-lysine)/microcrystalline cellulose biocomposites for Porous Scaffolds", *Polymer Composites*, Volume 32, 12, (2011) 1937–1944

Shady, E., and Gowayed, Y., "Interlaminar shear stress distribution between nested layers of plain weave composites", *Polymer Composites*, Volume 31, Issue 11, (2010) 1838–1845

Gowayed, Y., Ojard, G., Miller, R., Santhosh, U., Ahmad, J., John, R. "Correlation of elastic properties of melt infiltrated SiC/SiC composites to in situ properties of constituent phases", *Composites Science and Technology* 70 (2010) 435–441

Shady, E., and Gowayed, Y., "Effect of nanotube geometry on the elastic properties of nanocomposites", *Composites Science and Technology*, Volume 70, Issue 10, (2010) 1476-1481

Turel, T., Shady, E., Farag, R., Eldessouki, M., Gowayed, Y., Burtovvy, O., Luzinov, I., "A probabilistic model for the permeation of gases through microporous membranes", *The Journal of the Textile Institute*, Vol 101, No. 7, (2010) 583-594

Shady, E., Gowayed, Y., "Mapping of stress distribution in woven-fabric composites", *Polymer Composites*, Vol. 29, No. 8, (2008) 861-868

Morscher, G., Ojard, G., Miller, R., Gowayed, Y., Santhosh, U., Ahmed, J., and Reji, J., "Tensile Creep and Fatigue of Sylramic-iBN Melt-Infiltrated SiC Matrix Composites: Retained Properties, Damage Development, and Failure Mechanisms," *Composites Science and Technology*, Vol. 68, (2008) 3305-3313

Buschle-Diller, G., Ahmed, A., Gowayed, Y., Turel, T., Rifki, R. and Bangash, Z., "Assessment of continuous and aerated fabric pressure-washing", *Journal of the Textile Institute*, Vol. 98, No. 4, (2007) 319-326

Lee, D. and Gowayed, Y., "Determination of Mode-I Stress Intensity Factor of Edge Notched Fabric-Reinforced Composites", *Polymer Composites*, Vol. 27, No. 2, (2006) 213-220

Shady, E., Abou-iiana, M., Gowayed, Y., and Pastore, C., "Detection and Classification of Defects in Knitted Fabric Structures", *Textile Research Journal*, Vol. 76, (2006) 295 – 300

Chen, J., Gowayed, Y., Moreira, A., and Flower, G., "Damping of polymer composite materials for flywheel applications", *Polymer Composites*, Vol. 26, No. 4, (2005) 498-508

Abdel-Hady, F., Baaklini, G., Gowayed, Y., Creighton, R., Lee, D., and Trudell, J., "Manufacture and NDE of multi-direction composite flywheel rims," *Journal of Reinforced Plastics & Composites*, Vol. 24, No. 4 (2005)

Hristov, K., Armstrong-Carroll, E., Dunn, M., Pastore, C. and Gowayed, Y., "Mechanical behavior of circular hybrid braids under tensile loads", *Textile Research Journal*, Vol. 74, No. 1 (2004)

Chen, J., Gowayed, Y., and Broughton, R., "Quasi-static behavior of polymer composite flywheel rims", *Polymer Composites*, Vol. 25, No.5 (2004)

Abou-iiana, M., Youssef, S., Pastore, C., and Gowayed, Y., "Assessing structural changes in knits during processing", *Textile Research Journal*, 73 (6), (2003) 535-540

Gowayed, Y. and Barowski, L., "A design procedure for textile composite materials," *Journal of Composites Technology & Research*, Vol. 24, No. 1, (2002) 24-29

Gowayed, Y., Abdel-Hady, F., Flowers, G., and Trudell, J., "Optimal design of multi-direction composite flywheel rotors", *Polymer Composites* Vol. 23, No. 3, (2002) 433-441

Gowayed, Y., and Fan, H., "Fatigue behavior of textile composite materials subject to tension-tension loads", *Polymer Composites* Vol. 22, No. 6, (2001) 762-769

Gowayed Y., Zou, W. and Gross, S., "An analytical approach to evaluate the coefficients of thermal expansion of textile composite materials", *Polymer Composites*, Vol. 21, No. 5, (2000) 814-820

Lin, W., and Gowayed, Y., "The effects of acid dyes on the crystallization and mechanical properties of melt-reprocessed nylon 66", *Journal of Applied Polymer Science*, Vol. 74, (1999) 2386-2396

Vaidyanathan, R., Gowayed, Y. and El-Halwagi, M., "Computer Aided Design of fiber reinforced polymer composite products", *Computers in Chemical Engineering*, Vol. 22, No. 6, (1998) 801-808

Lin, W., Gowayed, Y. and Kotha, S., "The influence of acid dyes on the thermal behavior of nylon 66", *Journal of Applied Polymer Science*, Vol. 67, (1998) 371-382

Gowayed, Y., "The effect of voids on the elastic properties of textile composites", *ASTM Journal of Composite Technology & Research*, Vol. 18, No. 2, (1997) 168-173

Gowayed, Y. and Yi, L., "Mechanical behavior of textile composite materials using a hybrid finite element approach", *Polymer composites*, Vol. 18, No. 3, (1997) 313-319

Gowayed, Y., Wu, J., Barowski, L. and Westphall, W., "Mapping of preform architecture for textile reinforced composite products", *Composites Part A - Applied Science and Manufacturing*, Vol. 27A, (1996) 1023-1032

Gowayed, Y., Schreibman, D. and Roberts, M., "Surface inspection of textile composite materials using image analysis techniques", *ASTM Journal of Composite Technology & Research*, Vol. 18, No. 1, (1996) 3-14

Gowayed, Y., Pastore, C. and Howarth, C., "Modification and application of unit cell continuum model to predict the elastic properties of textile composites", *Composites Part A - Applied Science and Manufacturing*, Vol. 27A, (1996) 149-155

Vaidyanathan, R. and Gowayed, Y., "Optimization of elastic properties in the design of textile composites", *Polymer Composites*, Vol. 17, No. 2, (1996) 305-311

Gowayed, Y., Vaidyanathan, R. and El-Halwagi, M., "Synthesis of composite materials from waste fabrics and plastics", *International Journal of Elastomers and Plastics*, Vol. 27, No. 1, (1995) 79-90

Gowayed, Y., Hwang, J. and Chapman, D., "Thermal conductivity of textile composites with arbitrary preform structures", *ASTM Journal of Composite Technology & Research*, Vol. 17, No. 1, (1995) 56-62

Wang, Y., Gowayed, Y., Kong, X., Li, J., and Zhao, D., "Properties and analysis of composites reinforced with E-glass weft knitted fabrics", *ASTM Journal of Composite Technology & Research*, Vol. 17, No. 4, (1995) 283-288

Gowayed, Y. and Hwang, J., "Thermal conductivity of composite materials made from plain weaves and 3-D weaves", *Composites Engineering*, Vol. 5, No. 9, (1995)

El Mogahzy, Y. and Gowayed, Y., "Theory and practice of cotton fiber selection: Part I: fiber selection techniques and bale-picking algorithms", *Textile Research Journal*, Vol. 65, No. 1, (1995) 32-40

El Mogahzy, Y. and Gowayed, Y., "Theory and practice of cotton fiber selection: Part II: sources of cotton mix variability and critical factors affecting it", *Textile Research Journal*, Vol. 65, No. 2, (1995) 75-84

Pastore, C. and Gowayed, Y., "A self-consistent fabric geometry model: modification and application of a fabric geometry model to predict the elastic properties of textile composites", *ASTM Journal of Composite Technology & Research*, Vol. 16, No. 1, (1994) 32-36

El Mogahzy, Y., Gowayed, Y. and Elton, D., "Theory of soil/geotextile interaction", *Textile Research Journal*, Vol. 64, No. 12 (1994) 744-755

Gowayed, Y., El Mogahzy, Y. and Mayo, L., "The frictional behavior of nonwoven geotextiles in granular soils", *INDA International Nonwovens Journal*, Vol. 6, No. 4, (1994) 66-71

Pastore, C., Bogdanovich, A. and Gowayed, Y., "Application of a meso-volume based analysis for textile composite structures", *Composite Engineering*, Vol. 3, No. 2, (1993) 181-194

Masters, J., Foye, R., Pastore, C. and Gowayed, Y., "Mechanical properties of tri-axially braided composites: experimental and analytical results", *ASTM Journal of Composite Technology & Research*, Vol. 15, No. 2, (1993)

Gowayed, Y. and Pastore, C., "Analytical techniques for the prediction of elastic properties of textile reinforced composites", *Mechanics of Composite Materials*, Vol. 5, (1992) 579-596

Gowayed, Y. and Russ, J., "Geometric characterization of textile composite preforms using image analysis techniques", *Journal of Computer Assisted Microscopy*, Vol. 3, No. 4, (1991) 189-199

Books and book chapters

"A Perspective on Ceramic Matrix Composites," DesTech Publications, Gowayed, Y. and Ojard, G., 2020

"Immigrant Faculty in the Academy," Book chapter, edited by Maysaa Barakat, Routledge, New York , 2020

"High performance textiles and their applications," Book chapter, edited by C. Lawrence, Woodhead Publishing Co., 2014

"Advanced composites in Civil Engineering Applications," Book chapter, edited by Nasim Uddin, Woodhead Publishing Co., 2013

"Sustainable composites and advanced materials," Book chapter, edited by Chris Pastore and Anil Netravali, DEStech Publications, 2012

G. Ojard, Y. Gowayed, G. Morscher, U. Santhosh, J. Ahmad, R. Miller, R. John, "Creep and Fatigue Behavior of MI SIC/SIC Composites at Temperature," in *Mechanical Properties and Performance of Engineering Ceramics and Composites IV* (eds D. Singh, W. M. Kriven and J. Salem), John Wiley & Sons, Inc., Hoboken, NJ, USA, 2009.

“Fatigue of polymer matrix textile composite materials”, Book chapter, edited by Mohsen Mirafteb, Woodhead Publishing, 2009

“Creep and Fatigue Behavior of MI SIC/SIC Composites at Temperature,” Book Chapter G. Ojard, Y. Gowayed, G. Morscher, U. Santhosh, J. Ahmad, R. Miller, R. John in Mechanical Properties and Performance of Engineering Ceramics and Composites IV (eds D. Singh, W. M. Kriven and J. Salem), John Wiley & Sons, Inc., Hoboken, NJ, 2009.

“Polymeric membranes: surface modification by "grafting to" method and fabrication of multilayered assemblies,” Book chapter, Burtovyy, O., Klep, V., Turel, T., Gowayed, Y., Luzinov, I., in Nanoscience and Nanotechnology for Chemical and Biological Defense, Ramanathan Nagarajan editor, ACS Symposium Series, Washington DC, 2008

“Mechanics of Fibrous Assemblies”, Book chapter, Structure and mechanics of 2D and 3D textile composites, in cooperation with Christopher Pastore, edited by Peter Schwartz, Woodhead Publishing, 2008

“Surface Characteristics of Fibers and Textiles - Part III”, Book chapter, edited by Christopher Pastore, Marcel Decker, 2000

“Proceedings of the International Conference on Advanced Composites (icac98)”, editors: Gowayed, Y. and Abdel-Hady, F., ISBN 977-10-1202-9, 1998

Sabbatical activities

Columbia University, Dept. of Civil & Eng. Mech. (F2012)

Philadelphia University, School of Design and Eng. (F2000 and S2001)

Service and Outreach

Memberships and service to professional organizations

Reviewer for a large number of journal articles and books

Reviewer for proposal for funding agencies including NSF, USDA, NTC, DoE, EPSCoR.

Member of ASEE

Member of the American Institute of Aeronautics and Astronauts (AIAA) Committee on Flywheel Rotor Safe-Life Standards

Editorial Board member of Journal of Composites

Member, SAMPE

Member, Fiber Society

Phi Psi, honorary member

The honor society of Phi Kappa Phi, member

Reviewer for NSF, USDA, NTC, DoE, EPSCoR.
External evaluator for tenure and promotion for faculty from other universities
Session chair for various conferences
Conducted workshops on composites and mechanics for the aerospace and space industries for Rolls-Royce, NASA Glenn, Pratt & Whitney, GE, Sikorsky Helicopters, NASA Marshall, etc.
Conducted international workshops and seminars in Taiwan, Brazil and Egypt
Reviewed and assessed feasibility of a new masters programs for Philadelphia University

University

Administrator Evaluation committee, Chair
University computing committee, Chair
Academic program Review committee, Chair
Member of the faculty senate
Selection committee for a new Learning Management System, member
Campus planning committee, member
Presidential symposium committee, Chair
Advisory board to Multicultural Center, member
Committee on assessment of student learning, member
World food program, member
Committee on selection of a Dean for the libraries, member

College

Faculty council, member
Research Initiative committee, member
Graduate Faculty committee, member
Computing advisory committee, member

Department

Search committees for faculty members and department head, Chair (3 committees)
ABET committee, member
Site Director – National Textile Center
Supervisor of physical testing laboratory
Director of protective materials lab
Graduate Program Officer
Mentor to junior faculty
Curriculum Committee, member
Graduate students' handbook, Chair