

Benjamin Marshall

ben.marshall@auburn.edu
334.844.8818

Education

The University of Texas at Austin
Doctor of Philosophy, Civil Engineering, August 2024

Master of Science, Sustainable Design, May 2021

Mississippi State University
Bachelor of Architecture, Cum Laude, May 2017

Bachelor of Science, Mechanical Engineering, Cum Laude, May 2013

Research Interests

Building Science, Building Ventilation, Indoor Air Quality, Indoor Lighting, Energy Modeling, Humidity Control, Temporary Structures, Indoor Mold, Thermal Comfort, Air Change Rate

Research Experience

The University of Texas at Austin
Department of Civil, Architectural and Environmental Engineering
Austin, Texas

May 2022 - August 2024

Graduate Research Assistant - Sniffer Lab

- Led collaborative research team (with UC Berkeley and Ohio State) on indoor mold emissions to quantify indoor air quality
- "Sniffed" a variety of building materials using cutting edge mass spectrometry (PTR TOF MS) to determine their effect on indoor air quality

The University of Texas at Austin
School of Architecture
Austin, Texas

May 2020 - May 2021

Research Assistant - Energy Institute - "Fueling a Sustainable Energy Transition"

- Created residential housing models for energy analysis
- Performed energy analysis using climate models A1B, A2, & B1 (IPCC)
- Collaborated with engineers, policy makers, programmers, urban designers, and academics to build predictive models of urban growth in Austin

Mississippi State University
School of Architecture
Starkville, Mississippi

Summer 2015

Research Assistant- Audit Squad

- Performed blower door tests in the Mississippi Delta Region to determine housing air infiltration rate
- Studied average spots for outdoor air infiltration so residents could seal them to save energy and money



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Teaching Experience

Auburn University
McWhorter School of Building Science
Auburn Alabama

Spring 2025 Semester

Assistant Professor -Mechanical Systems in Buildings BSCI 4700

- Teaching students how buildings the basics of plumbing and mechanical systems they will encounter when constructing buildings

Fall 2024 & Spring 2025 Semesters

Assistant Professor -Construction Materials and Methods BSCI 2300

- Teaching students how buildings are constructed and how material choices affect the performance, cost, and durability of buildings

Fall 2024 Semester

Assistant Professor -Construction Documents BSCI 2200

- Teaching students how to read a set of building construction documents and how buildings are constructed
- Teaching students how buildings are constructed

The University of Texas at Austin

Department of Civil, Architectural and Environmental Engineering
Austin, Texas

January 2023 - May 2023

Teaching Assistant - Indoor Air Quality CE 369R

- Graded homework and projects

April 2023

Guest Lecturer - Indoor Air Quality CE 369R

- CO2 and You: Uses, Health, and the Great Debate

The University of Texas at Austin

School of Architecture
Austin, Texas

August 2022 - December 2022

Assistant Instructor - Environmental Controls 1 ARK 334K

- Delivered bi-weekly lectures on light, acoustics, security, power generation, and sustainability
- Developed curriculum for lectures, labs, homework, tests, and projects
- Organized light show for displaying student work

Jan 2021 - May 2021; Jan 2020 - May 2020

Teaching Assistant - Construction IV ARC 435L

- Graded tests, quizzes, and homework assignments
- Supervised lab and taught test review sessions on structural statics, cantilevers, trusses, arches, domes, shear walls,



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Teaching Experience cont.

The University of Texas at Austin
School of Architecture
Austin, Texas

August 2020 - December 2020

Teaching Assistant - Environmental Controls I ARC 334K

- Graded tests, quizzes, and homework assignments
- Supervised lab and taught test review sessions on light, acoustics, power generation, security, and sustainability

May 2020 - July 2020

Teaching Assistant - Environmental Controls II ARC F385T

- Graded test, quizzes, and homework assignments
- Supervised lab and taught test review sessions on solar hot water, basic HVAC, fire code, egress, and thermal envelope

Mississippi State University
School of Architecture
Starkville, Mississippi

October 2017, April 2018, June 2018, October 2018, April 2019

Guest Studio Critic - 5th Year architecture studio

February 2016

Guest Lecturer - Active Building Systems ARC 3723 :

- Electrical Systems for Architecture | single and three phase power, ac vs dc, outlet types, wiring, electrical boxes, power storage, and system design

Fall 2011

Teaching Assistant - Structures 1 ARC 3904

- Graded tests, quizzes, and homework assignments
- Supervised lab and taught test review sessions on static structures, beams, columns, trusses

Service

Auburn University

October 2024 - Present

Committee Member - Univesity Library Committee

The University of Texas at Austin

September 2023 - December 2023

Graduate Mentor

- Coordinated monthly meetings with three mentees
- Discussed topics on graduate school, advising, and developing research

January 2023 - March 2023

Teaching Assistant and Judge -Sustainable Doghouse Challenge

- Hosted information sessions
- Guided students with their design and construction of doghouses
- Tested doghouses for structural integrity, watertightness, and air quality
- Judged for the structural category of the competition



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The University of Texas at Austin

Feb 2023, Feb 2022

Volunteer - UT Girl Day

- Introduced elementary and middle school girls to STEM through interactive hands-on learning
- radiation and conduction popsicle melting experiment booth (2023)
- aerodynamics "bunny copter" experiment booth (2022)

2021 - 2023

Co-President - ASHRAE Student Chapter (TexASHRAE)

- Planned and led monthly meetings
- Organized members to perform service
- Met with local ASHRAE chapter

Mississippi State University

2016 Fall, 2015 Fall

Site Leader - Service Dawg Days

- Organized a group of students to complete service projects around the Starkville, MS area

2010

Dean's council - College of Architecture, Art, and Design

- Met with the Dean and gave updates on student life, events, and building concerns

Industry

March 2023

Guest Speaker - Austin American Institute of Architects (AIA)

- CO2 and You: Uses, Health, and the Great Debate

Grants

2024-2025

Primary Investigator - College of Architecture Design and Construction (CADC)
SEED Grant

2024-2025

Primary Investigator - College of Architecture Design and Construction (CADC)
McWhorter Grant

2024-2025

Primary Investigator - Center for Construction Innovation and Collaboration Grant

2022 - 2024

Graduate Researcher - A.P. Sloan Foundation
Chemistry of Indoor Environments Grant

2022 Fall

Research Volunteer - The University of Texas at Austin
Greenfund Grant

2020 Summer

Graduate Researcher - The University of Texas at Austin
Energy Intsitude - Fueling a Sustainable Energy Transition Grant



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Peer Reviewed Publications

2024 "Asphalt Roof Shingle Emissions and their implications for homeowners and installers" (in progress) Marshall, B., Deveraux, E. Lin, C.H., and Misztal, P.K.,

2024 "Light controls emissions of fungal volatile organic compounds" (In Progress) Marshall, B., Maestre, J.P., Novoselac, A., Kinney, K., Stickney, A., Dannemiller, K., Bope, A., Goldstein, A.H. and Misztal, P.K.

2024 "Condensation events in household ductwork causing mold growth" (in progress) Marshall, B., Guinn, J., Misztal, P.K., and Novoselac, A.

2022 Nagy, Zoltan, et al. "IMPACT: Integrated Multi-Domain Emission Pathways For Cities Under Land-Use Policy, Technology Adoption, Climate Change And Grid Decarbonization." arXiv preprint arXiv:2202.07458 (2022).

Computer Programs Proficiency

AutoCAD, Sketchup, Adobe (Photoshop, Illustrator, Indesign), Solidworks, Excel, Word, Revit, Rhino, Grasshopper, Trace 700, Visual, Matlab, Python, EQuest, EnergyPlus, LabView, THERM, and MathCad

Consulting Experience

2020 - 2021 Positive Energy - Therm/ResCheck - Valentine Residence

2020 - 2021 Positive Energy - Therm/ResCheck - Abbnik Residence

2019 Kit Johnson Architect -Design Development Drafting -Madrid House

2019 Kit Johnson Architect- Design Development Drafting- Flagstaff House

2019 Kit Johnson Architect Christ Church Austin Sustainability Presentation

2018 Redeemer Church - Benning Street Residence- Drafting

Presentations

2022 American Geophysical Union, Chicago, IL | Poster

2022 International Society of Indoor Air Quality, Kuopio Finland | Poster

2021 Fueling a Sustainable Building Transition, The University of Texas at Austin | Poster

2021 Building Science 2021 Conference, Remote Austria | Oral

Professional Affiliations

2022 American Geophysical Union Student Member

2022 ASHRAE Student Member

2022 International Society of Indoor Air Quality Student Member

2016 Tau Sigma Delta Architecture Honor Society Member

2005 Boy Scouts Amer. Eagle Scout, Order of the Arrow, Lodge Chief, Vigil Member

Certifications

2019 Registered Architect | Mississippi #5510

2013 Engineer in Training (Fundamentals of Engineering Exam Pass)



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Papers, Features, and Publications

2024 ASHRAE Winter Conference Abstract Accepted

2021 CISBAT Abstract submitted

2019 "Artificial trichome copper mesh for dehumidification purposes in architecture" -
Masters Thesis

2017 Mississippi State University School of Architecture- BARNWORKS Featured

2016 Mississippi State University School of Architecture - BARNWORKS Featured

2015 Mississippi State University School of Architecture - BARNWORKS Featured

Awards and Scholarships

2021 -2024 The University of Texas at Austin Provosts Graduate Excellence Fellowship

2021 Sustainable Design - Outstanding Master's Thesis Award UTSOA

2021 Department of Energy (DOE) IBUILD Fellowship Honorable Mention

2020 - 2021 Arumi-Noe Memorial Fellowship in Sustainable Design UTSOA

2020 Materials Lab Grant Recipient UTSOA

2019 Fred Winfield Day, Jr. Endowed Scholarship in Architecture UTSOA

2017 ACSA Diversity Award: Boys and Girls Club - Learn and Grow Garden Member

2011 Brassfield&Gorrie Competition 1st Place Team Member

2011 Fred and Sara Jean Burke Study Abroad Scholarship

2010 Shackoul's Honors College Phase I & II Honors Awarded

Professional Experience

Auburn University - Auburn, Alabama

Aug 2024 - Present

Assistant Professor

- Taught and developed course materials for building science courses
- Researching building science, materials science, energy efficiency, and health in buildings
- Serving the university and community on committees and through events

Positive Energy - Austin, Texas

May 2021 - Aug 2021

Visiting Scholar

- Researched window and enclosure design for custom homes
- Built energy models for custom homes
- Designed and assembled presentation materials
- Drafted client deliverable reports

Eley Guild Hardy Architects- Jackson, Mississippi

May 2017 - August 2019

Intern Architect upon hiring - Assoc. AIA |

Registered Architect, Mississippi August 2019

- Prepared schematic design, design development, and construction documents
- Managed projects under the supervision of licensed architects
- Performed construction administration of various projects
- Designed and assembled presentation materials
- Coordinated drawings and designs with consultants



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Professional Experience cont.

PryorMorrow Architects and Engineers- Columbus, Mississippi

June 2013 - July 2016

Mechanical & Electrical Engineer in Training (EIT)

- Responsible for design of Plumbing, HVAC, Lighting, Communications, Fire Sprinkler, and Building Power Systems
- Built Revit standards for the engineering department
- Assisted in architecture drafting and design
- Performed construction administration on ongoing projects
- Completed engineering estimates

Semisouth Laboratories- Starkville, Mississippi

Spring & Summer 2012

Mechanical Engineering CO-OP - Facilities Engineer

- Planned and performed preventative maintenance
- Created AutoCad drawings for facilities renovation projects
- Installed and removed machinery (routed utilities to new machinery, moved new and old machinery into and out of place, and connected/disconnected machinery to and from utilities)

Sam Marshall Architects- Pensacola, Florida

Summer 2010

Architectural Intern

- Drafted plans, sections, elevations, and details of ongoing projects
- Developed and participated in architectural presentations

Cranbrook Academy of Art, Bloomfield Hills, Michigan

Summer 2009

Architectural Intern - Bill Massie, Architect in Residence

- Worked on facilities/shop maintenance and upgrades
- Fabricated, delivered, and installed architectural structures
- Constructed presentation models
- Recontoured grounds for architecture intervention and grass tennis courts

Goetter and Sons Roofing - McDavid, Florida

Fall 2004

Roofing Installer

- Installed asphalt shingle roofs in the Florida Gulf Coast area following the landfall of hurricane Ivan

Acousti Engineering Company of Florida- Pensacola, Florida

Summer 2003

Acoustical Ceiling Installer

- Installed acoustical ceilings in the Florida Gulf Coast area

