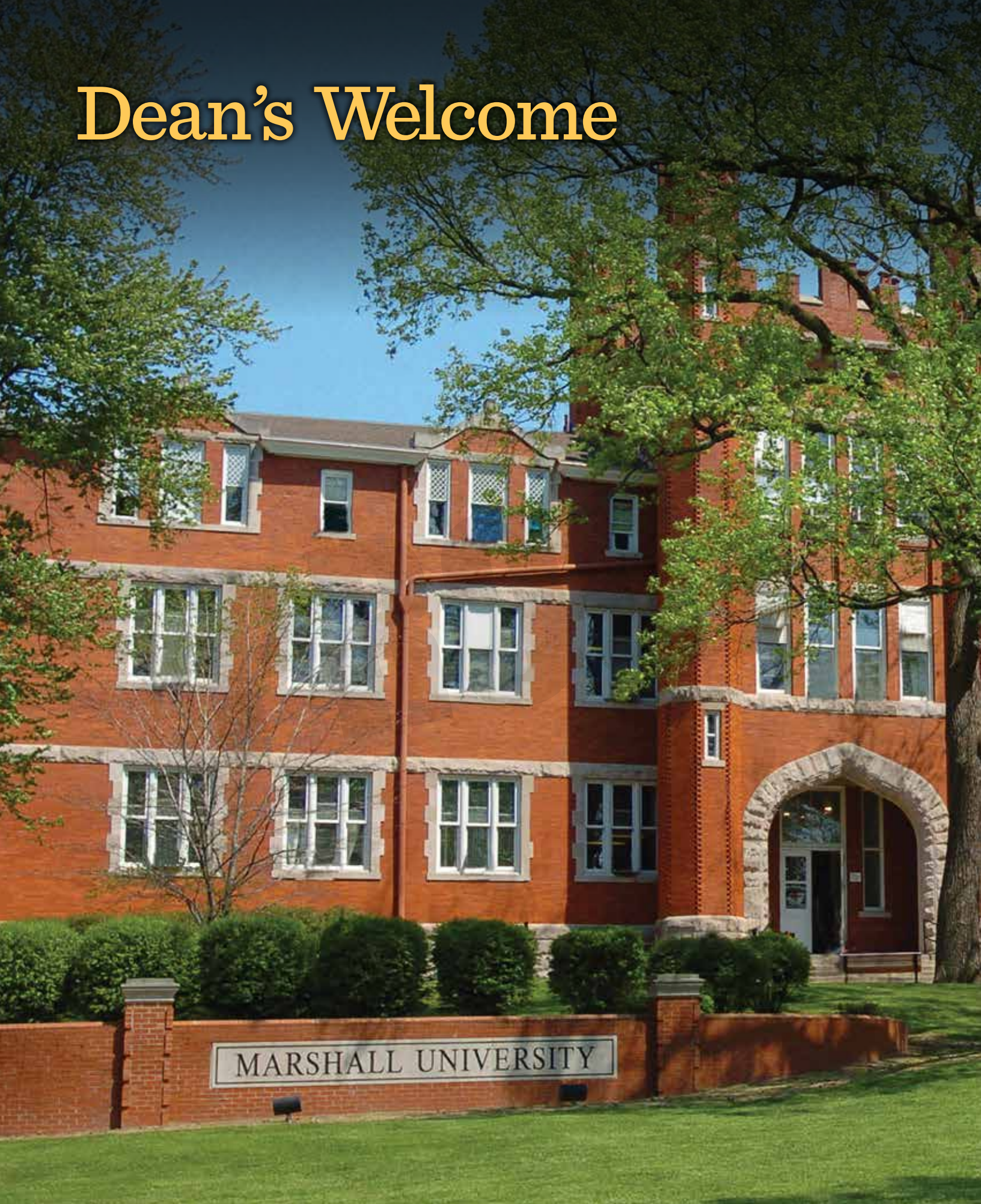




MARSHALL UNIVERSITY
College of Engineering and Computer Sciences

2022 ANNUAL REPORT

Dean's Welcome





Well, here we are at the end of the second year of my tenure as Dean. I continue to be amazed by the good works of our faculty, staff, and students. We have made tremendous strides this year in terms of education, research, and service to the university and community. As we come out of the two-year pandemic limitations, our college has begun to grow again. I expect to see a reasonable growth in our enrollment this fall over last, but it will take a couple of years to completely recover to pre-pandemic numbers. Our leadership has set a goal of 30% growth by Fall 2023, and I believe we will

make it. Helping us achieve those results will be our recent ABET accreditation news. In the Fall 2021 semester, we received a team of ABET evaluators to look at all of our undergraduate engineering programs, as well as our B.S. Occupational Safety and Health program. I am happy to say that after a few minor adjustments, all of our programs have been accredited for a full six years. In 2023, we will have our undergraduate computing programs reviewed, and we expect the same result. We will have to report those results in 2024. In our graduate programs, we have joined a system called eCAS, short for engineering Common Application System. This eCAS helps us to market ourselves to a much larger audience of potential graduate students. Based on applications so far, we expect to see a significant growth in our graduate enrollment as well, helping us to our 30% goal.

Scholarship activity has increased significantly in the last couple of years as well. We completed our first successful year of the Project Work Studio project, where eight students were awarded NSF-funded scholarships to work in a hands-on work environment while pursuing their education. Only one student did not continue into the second year, and we have a new cohort starting in the fall.

In research, our year has been outstanding. We have crossed \$4M in research expenditures for the first time in history, and that looks to grow even more by next year. Additionally, there is a significantly larger number of faculty with research awards, from small awards (\$20,000 or so) to very large awards (nearly \$4M). Significant this year is the subterranean research work sponsored by the Engineering Research and Development Center. This project started as a very small award, but has grown significantly under the leadership of James Bryce, with significant help from Arka Chattopadhyay and Andrew Nichols, and now being shepherded by Greg Michaelson with help from the small army of tenure track and research faculty. Also significant is the work by Sanghoon Lee who was awarded not one NSF grant, but two within several months to support his bioinformatics work on brain cells. Also, we have started to work more closely with the College of Science in a collaborative effort in cyber security. In October 2021, the College of Science and College of Engineering and Computer Sciences came together to form the Institute for Cyber Security, a university level education and research institute responsible for cyber security education and research. Joint efforts in the ICS have resulted in about \$900K in research during this fiscal year.

We have seen some significant losses this year as well. Dr. Tony Szwilski and Dr. Richard Begley both retired this year. They had both been at Marshall for well over 25 years and were part of the core faculty that started this college. They will be missed, but both of them have been awarded Emeritus status, so we will continue to see them from time to time. As you look through this report, I hope you will pick up on all of the good work being done by our faculty for the college and for the university and community. I could not be prouder of what they have accomplished this year and the hope of what they will accomplish in the years to come.

– Dave Dampier

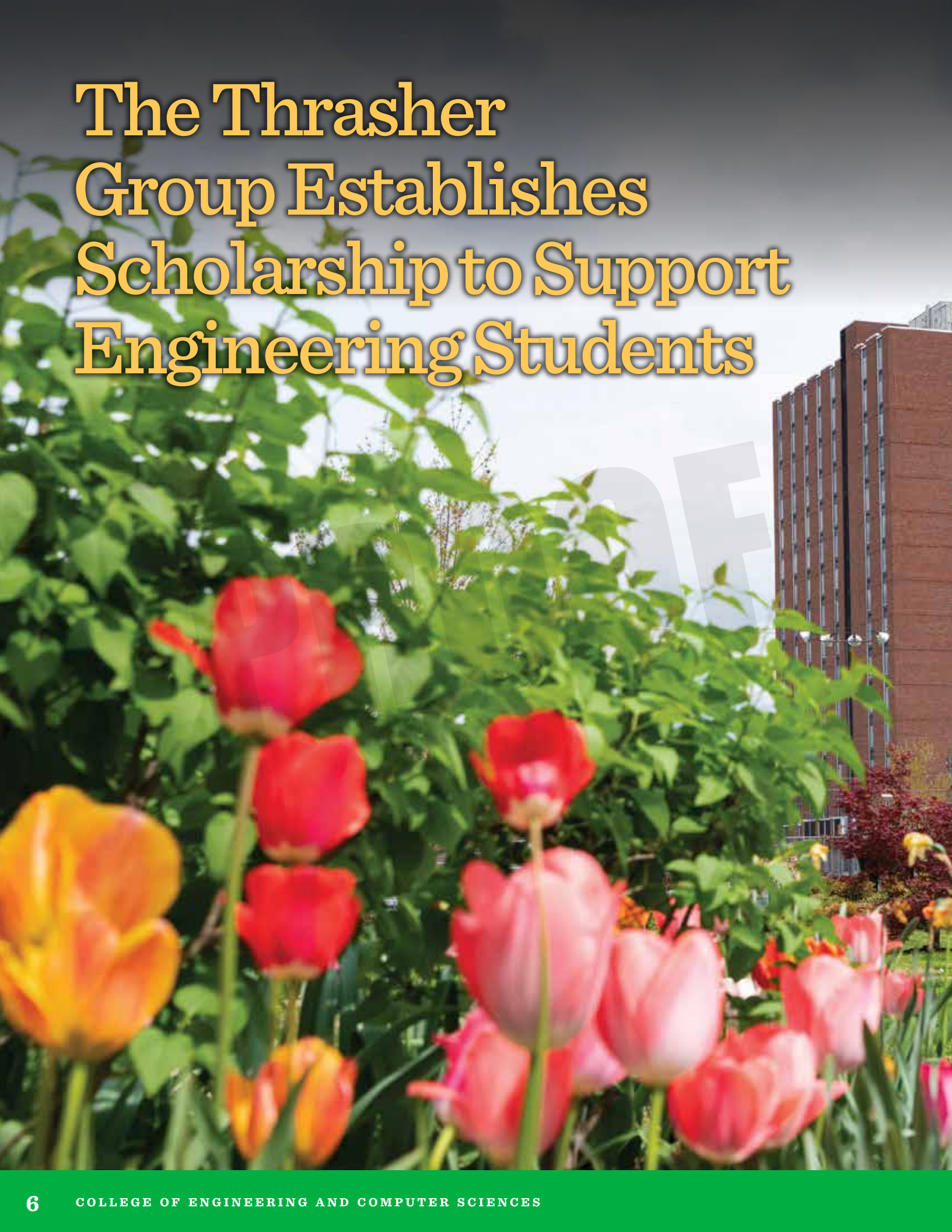
College Advisory Board

- **Dewey Bocook**, Owner, Bocook Engineering
- **Tim Burgess**, VP of Engineering, J.H. Fletcher & Co.
- **Sean Carter**, Chief, Geotechnical and Water Resources, U.S. Army Corps of Engineers
- **Ron Gilkerson**, President, GRW Engineering
- **Doug Hardman**, Former Chairman, J.H. Fletcher & Co.
- **Mike Owens**, President and CEO, Strictly Business
- **Robert Plymale**, COO, Appalachian Transportation Institute
- **Joan Weisberg**, Owner, State Electric Corporation
- **Louis Weisberg**, President and CEO, Service Wire Company
- **Kerry White**, Research and Development Lead, ALCON Huntington

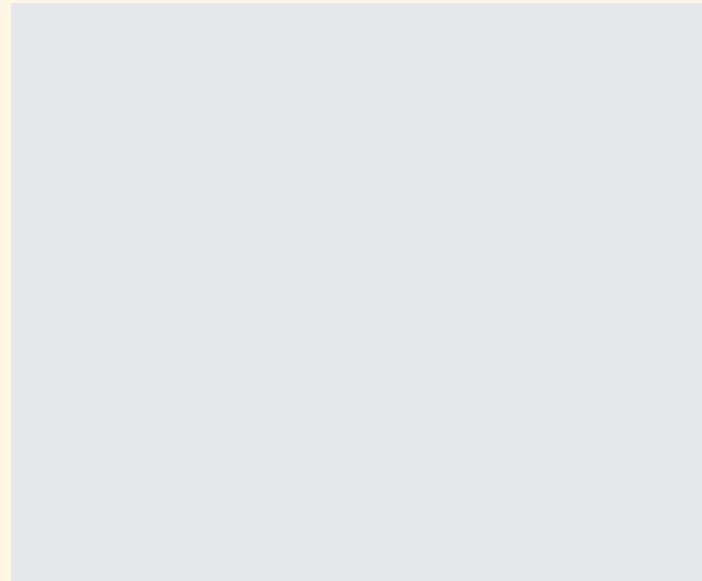
Student Scholarships

- **Hope Bramlett**, Richard Jarrel Hodges Memorial Scholarship
- **Christian Cantrell**, Richard Jarrel Hodges Memorial Scholarship
- **Reid Andrew Collins**, Greg Ferguson Memorial Scholarship
- **Autumn Cook**, Richard Erwin McCoy, Jr., P. E. Scholarship
- **Larry Allen Dangerfield**, The Wellman Family Scholarship
- **Logan Evans**, Professor Thomas Olson Scholarship
- **Logan Shane Griffith**, Greg Ferguson Memorial Scholarship
- **Harry Marcum**, Dr. William and Mrs. Mary Lind Zitter Scholarship
- **Brooklyn Marshall**, Mary H. Hodges Scholarship
- **Ryan Toles**, The Wolfe Family Scholarship Endowment
- **Jacob Trogdon**, The Dewey and Judy Bocook Scholarship for Engineering



A photograph of a garden with tulips in the foreground and a brick building in the background. The tulips are in various colors, including red, pink, and orange. The building is a multi-story brick structure with a modern architectural style. The sky is overcast.

The Thrasher Group Establishes Scholarship to Support Engineering Students



The Thrasher Group recently established The Thrasher Group Scholarship to support Marshall University students in the College of Engineering and Computer Sciences. Students shall be West Virginia residents who are in good academic standing with a 3.0 GPA or higher and have financial need, per standards of the Office of Student Financial Assistance. The award is non-renewable with only one recipient a year.

"So many of our employees are West Virginia educated, and we are really proud of that. This is just another way for us to help feed that talent pipeline here at home," said Jenny Weaver, human resources director at The Thrasher Group.

The Thrasher Group is proud of its collaborative efforts with Marshall. In 2019, The Thrasher Group established the Phillip G. Simmons Scholarship, which was generously funded by Simmons' friends and coworkers at The Thrasher Group. This scholarship benefits incoming freshmen from Braxton County High School in Braxton County, West Virginia, with preference to students who are incoming freshmen and studying within Marshall's College of Engineering and Computer Sciences.

"West Virginia is so special, and anyone who has ever spent time here understands what I mean by that. I don't just mean the natural beauty of our state, I mean the people. West Virginians are bright, they are innovative, and they are perseverant — some of the many reasons I feel so passionate about these scholarships with Marshall University," said Woody Thrasher, president and founder of The Thrasher Group.

The Marshall Foundation maximizes continuous financial support for Marshall University and its students by soliciting, receiving, investing and administering private gift support. The Marshall Foundation is committed to providing professional service to Marshall University, its students and donors.

The Thrasher Group is a full-service consulting firm that has served clients in West Virginia for nearly four decades. With offices in Bridgeport, Charleston, Beckley, Scott Depot, Martinsburg and beyond, Thrasher employs hundreds of professionals throughout West Virginia and the greater Mid-Atlantic Region. For more information, visit their website at www.thethrashergroup.com.

2022 Faculty Awards



Weisberg Research Award

Junior



Dr. Sanghoon Lee is an Assistant Professor of Computer Sciences. He earned his Ph.D. and M.S. in Computer Science from Georgia State University, as well as a M.S. and B.S in Computer Science from the University of Suwon in Korea. He served in a postdoctoral fellowship at Emory University. Originally from Seoul, South Korea, Dr. Lee now resides in Huntington, WV. His research interests include machine learning, deep learning, and artificial intelligence in interdisciplinary domains.

Senior



Dr. Haroon Malik is an Assistant Professor of Computer Sciences. He received his Ph.D. in Computer Science from Queen's University in Canada. Originally from Rawalpindi, Pakistan, he now resides in Huntington, WV. Dr. Malik also serves as Co-Chair of the Marshall University Data Sciences Council. His research interests include wireless sensor networks (WSN), internet of things (IOT), mining social repositories (MSR) and performance testing. His personal interests include gardening and traveling.

Weisberg Service Award and Hedrick Teaching Innovations



Dr. Husnu S. Narman is an Assistant Professor of Computer Science. He received his Ph.D. in Computer Science from the University of Oklahoma. He currently lives in South Point, OH. His research interests include distributed computing, including cloud and edge computing, the internet of things, cyber-physical systems, machine learning applications, social networks, and content delivery networks. He has over 45 peer-reviewed publications and more than seven years of teaching experience in K-12 and higher education. He has extensive experience with teaching computer science-themed summer camps in the past. He organized the Computer Science Adventure Zone K-12 and Teacher Summer Camp to increase Computer Science and Cybersecurity awareness in WV in the last several years. He is the recipient of the 2020-2021 College of Engineering and Computer Sciences Weisberg Academy of Distinguished Teachers Award and the 2020-2021 Marshall University Distinguished Artists and Scholars Junior Category Award.

Marshall University Distinguished Artists and Scholars



Dr. Wael Zatar is a professor of Civil Engineering at Marshall University. He served as the Dean of the College of Engineering and Computer Sciences and the College of Information Technology and Engineering from 2011 to 2020. He served as Director of the Appalachian Transportation Institute and as Associate Director of the University Transportation Center Region 3 Mid-Atlantic Transportation Sustainability Center. Holding a tenured professor academic appointment, he served as the J.H. Fletcher Chair of Engineering at Marshall University. Many factual references support the positive impacts Dr. Zatar has made in the engineering and transportation fields. Dr. Zatar held memberships in six Transportation Research Board (TRB) committees, served as the chair of TRB AFF80 Standing Committee on Structural Fiber Reinforced Polymers for six years. He currently co-chairs TRB AKB10 Standing Committee on Innovative Highway Structures and Appurtenances. He is the Chair of the Student Education Committee of the Precast/Prestressed Concrete Institute. Dr. Zatar attracted and directed many funded projects from numerous governmental and state agencies. He authored/coauthored numerous journal papers and technical publications. He held memberships in professional societies, honor societies and national committees, and received numerous awards for his significant contributions to research and education.

Academy of Distinguished Teachers



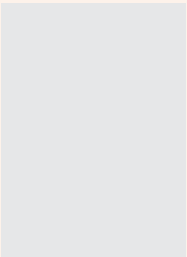
Dr. Arka Chattopadhyay is a Research Assistant Professor in the Department of Civil Engineering at Marshall University. Dr. Chattopadhyay is originally from Hyderabad, India. He earned a Bachelor of Science in Mechanical Engineering from Jawaharlal Nehru Technological University in India. Following this, he came to the United States and joined the Mechanical and Nuclear Engineering Program at Kansas State University to pursue a Master of Science in Mechanical Engineering and Ph.D. in Engineering Mechanics from Virginia Tech. He joined Marshall University in 2018. Prior to his current position at Marshall University, he worked as a Visiting Research Associate and an Adjunct Faculty in the College of Engineering teaching engineering courses and performing collaborative research. His research interests focus on mechanics of materials and systems, mathematical modeling, numerical methods, and computational mechanics using finite element analysis.



Dr. Sungmin Youn was born and raised in Seoul, South Korea, until he moved to Michigan to attend Calvin College where he earned his B.S. in Engineering. Upon graduating, Dr. Youn began the graduate civil engineering program at the University of Texas at Austin. He obtained his master's degree in 2013 and Ph.D. in May 2017. Dr. Youn joined Marshall as an assistant professor in Civil Engineering in August of 2017. His research focuses on water quality and physiochemical water treatment. He enjoys playing, watching, and talking about soccer.



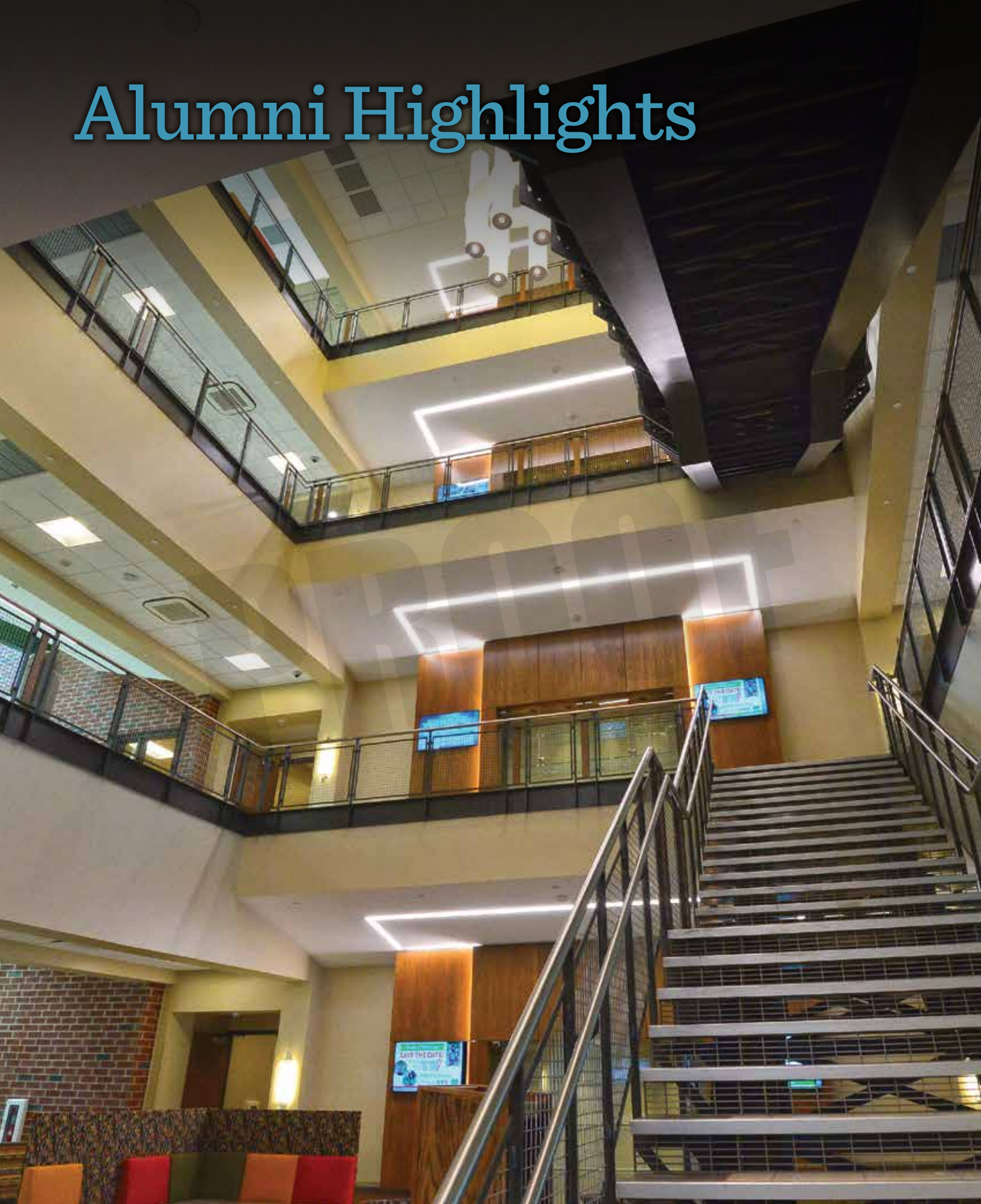
Dr. Yousef Sardahi is an assistant professor in the Weisberg Department of Mechanical Engineering at Marshall University. He earned a Ph.D. in Mechanical Engineering at the University of California, Merced. His research interests include Control System Design and Multi-Objective Optimization. His teaching experience includes Control Systems, Digital Controls, Automation and Control, System Modeling, Advanced Vibrations, Mechatronics, Circuits and Instrumentations, and Mechanical Engineering Computations.



Dr. Bill Pierson, PE, served as the Chair of the Weisberg Division of Engineering and Computer Science from 2000 until his retirement in 2015. Prior to joining Marshall, he served as a faculty member in the Department of Electrical Engineering at WVU Tech in Montgomery for 28 years. Dr. Pierson helped navigate the state and university procedures to re-establish the engineering program at Marshall University and led the effort to obtain the initial ABET accreditation of the Bachelor of Science in Engineering degree. Dr. Pierson was a strong advocate of student learning and professional licensure. He served on the West Virginia Board of Professional Engineers and helped write the Fundamentals of Engineering exams for the National Council of Examiners for Engineering and Surveying. He was very personable with all of his students and had no problem whooping them at foosball or ping pong outside of his office in the basement of Gullickson Hall. Dr. Pierson's emphasis on serving students and prioritizing their needs set the tone within the Division, and that student-centered example reverberates throughout the College to this day. Dr. Pierson was very humble and never allowed others to give him formal recognition for his contributions and achievements, so his posthumous induction to the Academy of Distinguished Teachers is well deserved and long overdue. He passed away in 2019 after a long battle with cancer.



Alumni Highlights



Biomedical Engineering

Regan Raines earned a B.S. in Biomedical Engineering at Marshall in May 2022 and went on to the graduate program of Neuroscience at WVU, aiming to earn an M.S. degree in (cognitive) neuroscience. Regan was a student athlete as a member of the swim team, and plans to embark on a clinical career after graduate study. She has authored a publication focusing on drug-targeted genomes in human chromosomes.

Nathaniel Stansberry, originally from Lewis County, WV, is a 2010 graduate of Marshall's Bachelor of Science in Engineering, Civil Engineering emphasis program. After graduation, he relocated to Springfield, MO, where he worked as an Engineer in Training for the City of Springfield—Stormwater Engineering Division, and worked on a multitude of planning studies and drainage and greenway projects. From there, he relocated to Rutland, Vermont, to accept a position as Assistant City Engineer in their full-service Public Works Department that managed all of the city's utilities plus a 4,000-acre watershed. He became licensed as a Professional Engineer during this period. After a 2 ½-year stint in Majuro, Marshall Islands, working as a technical consultant for the Asian Development Bank in the redevelopment of the Majuro Water and Sewer Company's fresh, salt and wastewater services, Nate returned home to Weston, WV, to accept his long-desired position as City Manager of Weston, WV. In this role, he leads the day-to-day implementation of city services, and has used his engineering, public works planning, and project management background to lead the redevelopment of streets and utilities, abandoned "BAD" buildings and other public assets in an ongoing effort to revitalize one of West Virginia's most historic small cities.

Mechanical and Industrial Engineering

Austin Brislin is currently a Safety Manager with TC Energy in Charleston, WV, where he leads a team of Safety professionals across 10 states. He has held various HSE roles at TC Energy over the last nine years. He is a native of Ashland, Kentucky, and a 2013 graduate of the Marshall Safety program, where he earned his Bachelor's degree in Safety Technology. He has been a Certified Safety Professional and Marshall Safety Advisory Board member since 2019 and took the opportunity to serve as an adjunct instructor for one semester as part of the Marshall Safety program. Austin and his wife, Allie, are proud parents of their daughter, Reaghan.

Alicia Cunningham holds a Bachelor of Science Degree in Biology and a Master of Science Degree in Occupational Safety and Health from Marshall University in Huntington, WV. She began her career as an intern for BrickStreet Insurance. Immediately following graduation from the master's program at Marshall University, she was hired full-time as a Safety and Loss Control Specialist. Alicia is now a Senior Safety and Loss Control Consultant for the West Virginia Large Team at Encova Insurance (formerly BrickStreet Insurance). She is an authorized outreach OSHA trainer in both construction and general industry. She is a certified National Safety Council defensive driving instructor (DDC-4) and a defensive driving professional truck driver instructor (DDC-PTD). She is also a member of the Marshall University Safety Technology Department's Board for Engineering and Technology (ABET) accreditation and has served as the Marshall Safety Conference committee chair since 2015.

John Opperman is a West Virginia native and a proud graduate of the Marshall University Safety Department. John entered into the coal mining industry in West Virginia after graduation as a safety supervisor with Magnum Coal. Within a few years, he began working as the safety director for JMP Coal Holdings, which led to a position as Corporate Health and Safety Director for Blackhawk Mining LLC. Recently, John has started a new career as a Senior Safety and Loss Control Consultant with Encova Insurance. He currently is a member of the Safety Academic Board at Marshall University and occasionally assists as an adjunct professor. He has served on the Certification Board for the International Society of Mine Safety Professionals and holds credentials from the Board of Certified Safety Professionals and Society for Mining, Metallurgy and Exploration. John currently resides with his wife, Brooke, and two children, Ella and Jay, where they have a small farm in Milton, WV.

Patrick Stump After graduating Marshall in 2018, Patrick Stump accepted a Graduate Research Assistantship for Professor Andrea Vacca, head of the Maha Fluid Power Research Center at Purdue University. Maha conducts fundamental research in fluid power components and systems, collaborates with industry to solve real-world problems, and focuses on improving the efficiency and performance of fluid power systems. His research has centered on agricultural hydraulic systems, specifically those found on tractors and planters. His latest project is funded under a \$5 million grant from the U.S. Department of Energy and is a collaboration between academia and industry, with partners like Case New Holland, Bosch Rexroth, and the National Renewable Energy Laboratory. Through simulation on machine experimental tests, and real testing in the field, they have been able to redesign the primary high-pressure hydraulics of a tractor-planter system and have doubled the hydraulic efficiency of the circuit. This directly leads to a fuel rate savings of over 2.5 liters per hour – increasing run time, reducing fuel costs in agriculture, and reducing the emissions from off-road hydraulic systems. Stump completed his Master's in Mechanical Engineering in May of 2022 and expects to defend his thesis by Fall 2023. Coursework at Purdue has focused on advanced control systems and mathematics. His thesis explores the implementation and control of high-efficiency, high-performance, integrated hydraulic systems on agricultural machinery. He is currently in talks with several companies to continue his R&D work after his PhD.

Zachary Hanlon grew up in Logan, West Virginia, and attended Marshall University from 2015- 2019, where he received a bachelor's degree in Safety Technology. For the past two years, he has been working as an Environmental Health and Safety Specialist II at Embraer Executive Aviation in Melbourne, Florida. Hanlon plans to work to acquire the Certified Safety Professional Certification when he gains the necessary years of experience to take the exam. He is very excited to see Marshall and Embraer partner together for the new aviation program at Marshall University.





Graduate Student Highlights

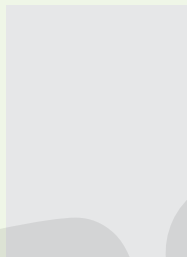


Civil Engineering



Kim Vigneau is a graduate student in the Civil Engineering program at Marshall University. She is a native of Stowe, Vermont, and has been a West Virginia resident since 2017. She spent the past five years as an employee for the state of West Virginia, both at the Department of Environmental Protection and, more recently, at the Department of Highways. In August, she began a new position as a structural engineer with the U.S. Army Corps of Engineers. When she is not at work or in school, she enjoys exploring her new home of West Virginia by camping, backpacking, rock climbing, and many other activities that are thrown her way – usually with her dog and fiancé by her side.

Mechanical and Industrial Engineering



Bertha Onyenachi Akagbue is an international student from Nihi Etche, Nigeria, in the Marshall University Environmental Health and Safety program. She holds a B.Eng. degree in Civil Engineering (Public Health Engineering Option) from the Federal University of Technology Owerri Imo State, Nigeria. Before coming back for graduate studies, she worked for about 15 years as Safety, Health and Environment personnel in some notable international oil and gas companies. She plans to become a professor at a university where she can transfer her industrial and academic knowledge.

Undergraduate Student Highlights



Biomedical Engineering



Tessa Gardner is a senior majoring in biomedical engineering (BME), aiming to earn B.S. BME at Marshall University. Tessa was chosen for the summer research scholarship during 2022, and successfully completed her undergraduate research in the SURE Program. Tessa led the BMES student chapter as a chairperson and actively engaged with the Women in Science here in the college (CECS) at Marshall University.

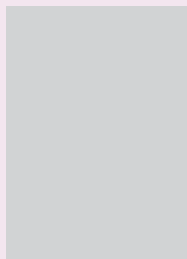
Katie Legg is a senior majoring in biomedical engineering (BME), aiming to earn B.S. BME at Marshall University. Katie was chosen for the summer research scholarship during 2022, and successfully completed her undergraduate research in the SURE Program, where she studied how to create DNA origami and regulate chemokine binding proteins in order to restrain inflammation. Katie made an oral presentation of her poster on hydrocephalus during the University Research Day in the Spring Semester. Katie recently participated in the Wind Tunnel Test at NASA Langley Research Center, as an undergraduate research assistant to test cellular responses to spinning motions at the 20 FT vertical spin tunnel (VST), Hampton, VA. She is the current secretary of the Marshall chapter of the Biomedical Engineering Society (BMES). She is also a member of Society of Women Engineers (SWE), Alpha Xi Delta, and Empower at Marshall University.

Civil Engineering



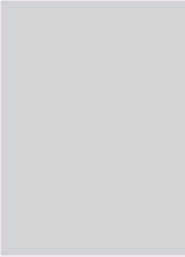
Ben O'Dell from Milton, West Virginia, is a senior in the Civil Engineering program at Marshall University. He chose this program because of his interests and previous work experience in basic construction and because he desires to be on the engineering and management side of construction projects rather than the labor side. Ben currently works at Kanawha Valley Engineering and Home Inspections as a Home Inspector under PE supervision. Outside of school and vocation, Ben and his wife recently welcomed their firstborn son in March 2022. Ben and his wife are also heavily involved in River Valley Church in Huntington, WV.

Computer Sciences and Electrical Engineering



Cameron Nichols is an undergraduate Electrical Engineering student. His favorite part of the Marshall experience is the small class size and that deans and leadership are always open to hearing questions and offering solutions. "I never felt like I was a bother or couldn't go to my professor and ask for extra explanation or help," Cameron said. "This, to me, is the best part of Marshall and a big part of my success in the electrical program and Co-Op."

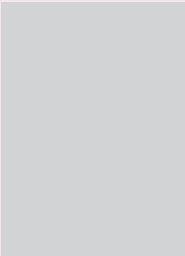
Computer Sciences and Electrical Engineering



Evan Herd is a senior Safety Engineering student at Marshall university. Herd grew up in Philadelphia, but is currently from Columbus, Ohio. He is the current president of the Alpha Tau Omega fraternity, and has completed an internship at Mettler Toledo, a truck scale manufacturing company based out of Worthington, Ohio. Outside of his studies, he enjoys spending time with friends and family.



M. Connor Morrison is a senior at Marshall University pursuing a bachelor's degree in Occupational Safety and Health. This past year, he received an award for academic achievement from the annual Elisabeth Gibson Drinko Honors Convocation. Connor has completed an internship at ENCOVA, working as a safety loss and control intern. He has greatly enjoyed his time as an intern and hopes to continue opening doors to new and great opportunities.



Gabe Sitler is Mechanical Engineering student from Seneca, South Carolina, in his fourth year at Marshall University. He is a member of the Men's Soccer team here at Marshall, where he got to be a part of the National Championship team. Throughout his time playing soccer, he saw and faced many injuries, and as a result, gained an interest in helping people recover from injuries and surgeries through braces and prosthetics. Sitler hopes to pursue a career in this field in the future and have the opportunity to begin his pursuit through research here at Marshall.

PRINTOUT





Cooperative Education

As society innovates and technology advances, the need for professionals who understand how these technologies work and who can propose practical solutions continues to grow, according to Best Colleges (Muniz, November 2021). Furthermore, the U.S. Bureau of Labor Statistics calls STEM (Science, Technology, Engineering, and Mathematics) careers “tomorrow’s jobs,” emphasizing the importance of these unique industries. Marshall University is staying competitive by helping students prepare for these high-demand STEM jobs through the College of Engineering and Computer Sciences (CECS) with a cooperative education program known as Co-Op.

Currently, CECS students experience rigorous academic training through hands-on labs, ample research initiatives, state-of-the-art facilities, and capstone projects during undergraduate studies. In addition, there is a movement within universities to include professional experiences through learning in a real-world setting. In fact, most employers within the STEM fields require a comprehensive work history for graduates being considered for entry-level positions. Thus, the Co-Op program became a necessity for Marshall University’s College of Engineering and Computer Sciences.

Moreover, this Co-Op model has an agreement between the employers/students in which students are provided full-time work employment opportunities with pay during their educational studies. These students receive the benefit of obtaining work experience, income, networking, and many times a permanent job offer with the employer. Thus, through the vigorous academic and the experiential work programs, students are prepared to enter industry with the necessary skills that are required by the STEM workforce. Local industry has been a strong supporter of the Co-Op program by offering employment as well as providing financial support. Many alumni wish to continue to support the students of Marshall University.

One way that the employment industry can link with the Marshall University’s College of Engineering and Computer Sciences students seeking a work experience has been through the Employer Spotlight Series. Through a luncheon and informational session, networking can occur that has led to offers of Co-Op, internships, or even permanent employment. We hope to expand the Employer Spotlight Series as many additional companies have expressed an interest in participating.





Co-Op Program in College of Engineering and Computer Sciences names West Virginia Division of Highways its Co-Op Employer of the Year (August 11, 2022)

Marshall University's College of Engineering and Computer Sciences Co-Op program has named the West Virginia Division of Highways (WVDOH) its 2022 Employer of the Year, after the state agency has provided hands-on learning opportunities for dozens of students in the fields of civil, mechanical and electrical engineering.

"The West Virginia Division of Highways does an incredible job of providing co-op experiences and employment opportunities to CECS students," said Tanner Drown, co-op coordinator for the College of Engineering and Computer Sciences. "The WVDOH was selected based on . . . student feedback as well as the number of opportunities they have provided to our students. This summer, they have hired 20 students and several of those will move on to full-time positions after graduation."

It is beneficial for both the WVDOH and the students to participate in the Marshall co-op program, said Alan Reed, WVDOT state highway engineer.

"It introduces the students to the incredible opportunities DOH offers to develop their skills and give them a real-world feel to how WVDOH operates as an organization and a team," Reed said. "Co-op also opens up future employment opportunities with DOH."

The West Virginia Division of Highways has connected with the co-op program since the program's inception in 2021, and the partnership has provided valuable real-life work experience in which they can apply academic training into industry, Drown said.

"Through this successful initiative, Marshall University can provide a well-rounded program that results in quality, future employees in the science, technology, engineering, and mathematic (STEM) fields. It is a win-win for everyone," Drown said.

"We are exceptionally pleased to be named Marshall University Employer of the Year," said Jimmy Wriston, P.E., West Virginia Secretary of Transportation. "One of the Justice administration's primary goals is to utilize partnerships to build a workforce for the future. . . We appreciate this recognition very much."



2022 Marshall University's CECS Co-Op Student of the Year Cameron Nichols

What are some of the highlights from your experience?

The highlights of my time working as a Co-Op have been the relationships I have created with employers, the projects I have completed in a team setting, and some as an individual. An example of this is the very first project I performed, which was a small installation of level monitoring equipment that, on the surface, seemed straightforward but proved very tricky. The highlight to me was not the project and the associated solution, but the process that taught me the persistence and thought process needed to be a successful engineer.

What are some of the benefits of the Co-Op class and what was the most beneficial assignment?

There are two main benefits to being enrolled as a Co-Op. The first benefit is seeing "real life" or maybe a portion of the field you are studying hard to enter. It teaches you that perhaps the thing you were dead set on is not what you would want (i.e., design, management, etc.). The second benefit is networking with professionals that will not only mentor you but recommend you to further jobs in the future. I have always been a little apprehensive about networking at lunches or school-sponsored networking events. Although, in a work setting where you share a common goal and can show yourself as someone willing to learn, networking will become easier and much more natural. I have had two work assignments, the first with Special Metals and my current position with CDI Engineering Solutions. I can't say one was more beneficial than the other because the roles are different and provide different opportunities. For example, when I was with Special Metals, I was in a production engineer role where I would estimate work and be primary planning and supervision of said work. This differs from my current position with CDI, a detailed design engineering role; a little explanation would be that I use engineering principles to design power systems per NEC to complete whatever task is presented. Both experiences have been influential on my choice of the industry I want to enter when I leave Marshall and who I want to be as a professional.

How will your work experience help with your future career and what skills have you developed from your Co-Op work experience?

The work experiences in the Co-Op program have shaped me in more ways than I can describe. It has helped me learn how to communicate professionally and what will be expected of me once I enter the engineering job market. I have become not only a better communicator, but the program has given me a way to transition the material I learn in class to an application that only further strengthens me as a student. There is a whole list of skills I have learned from my program, but the one that I can say is my most tremendous success is my communication skills have improved because I get put out of my comfort zone and am forced to push myself.

What is your favorite aspect of Marshall University?

My favorite part of Marshall is the small class size and that deans and leadership are always open to hearing your questions and offering solutions. I never felt like I was a bother or couldn't go to my professor and ask for extra explanation or help. This, to me, is the best part of Marshall and a big part of my success in the electrical program and coop.

Grants

- NASA West Virginia EPSCoR Grant \$20,000 “Optimal Multidisciplinary Design of Flexible Wings with Electro-Hydrostatic Actuation Systems.”
- Artificial Intelligence-Based Additive Fabrication of Defect-Free Components with High-Fidelity in Support of NASA’s Manufacturing Infrastructure,” NASA Research Initiation Grant, Role: PI, Fund: \$20,000. (PI: Salary, Ross)
- Michaelson, G. (PI). Technical Program Management for the Bridge Technology Center. American Iron and Steel Institute. (\$98,637 total, \$19,483 to Marshall). January 2022 through December 2022.
- Michaelson, G. (Pi), Chattopadhyay, A. (Co-PI), Esmailpour M. (Co-PI), Na, S. (Co-PI), USACE ERDC - Innovative Technologies to Search, Navigate, and Map Subterranean Unpredictable Environments. (\$999,831.00), September 11, 2019 - June 11, 2022. (closed) (Phase 1)
- Michaelson, G. (PI), Chattopadhyay, A. (Co-PI), Esmailpour, M. (Co-PI), Nichols, A. (Co-PI), FAA 20-0113: Rapid and Efficient Subterranean Mapping in Urban Settings and in Hard Rock Environments, \$1,499,463, USACE ERDC, August 2021 – August 2023. (Phase 2)
- Michaelson, G. (PI), Chattopadhyay, A. (Co-PI), Nichols, A. (Co-PI), BAA 21-0106: Accurate and Rapid Subterranean Mapping: MUSCRAT Park and Affiliated Research, USACE ERDC, \$3,449,295, March 2022 – March 2024.
- Nichols, A. and Youn, S. (Co-PIs), REU Site: Underground Hazard Investigations in the Appalachian Mountains, \$323,910, National Science Foundation, May 2022 – April 2025.
- Acquisition of a CytoViva system for multidisciplinary research and education in nanotechnology, NSF (Co-PI N. Nosoudi), \$266,838.00
- P.I. Michaelson, Greg, Rapid and Efficient Subterranean Mapping in Urban Settings and in Hard Rock Environments, U.S. Army Corps of Engineers Engineer Research and Development Center (Co-PI), \$3,449,295.00. (Phase 3)
- Summer researcher (one month through MURC, PI: Prof Zatar) for USACE project “Dam Gate Anchorage Analysis Using Structural Health Monitoring.”
- “Investigation of the Functional Properties of Ceramic Composite Materials, Fabricated Using Pneumatic Micro-Extrusion Additive Manufacturing Process,” NASA Established Program to Stimulate Competitive Research, Role: PI, Fund: \$100,000.
- “Physics-Driven, Intelligent Biofabrication of Bone Implants for the Treatment of Osseous Fractures,” John Marshall Summer Scholars and Faculty Award, Marshall University Research Corporation (MURC), Role: PI, Fund: \$6,500.
- Dr. Nasim Nosoudi received a \$267,658 National Science Foundation (NSF) MRI grant to acquire a CytoViva enhanced darkfield optical microscope to assist with research in nanotechnology. Last year Dr. Nosoudi applied for two patents and published four journal papers in pioneering journals like Scientific reports and Expert Systems with Applications. She and her students attended three conferences, “BMES and SFB,” which are the largest gathering of biomedical engineers in North America.
- Zatar, W., Principal Investigator, “Implementing Lifecycle Characterization of Embedded Dam Gate Anchorage using Non-Destructive Testing and Structural Health Monitoring,” U.S. Army Corps of Engineers, Engineer Research and Development Center, Agency Award No.: W912HZ2020050, 2020-2023, \$1,299,903.
- Zatar, W., Principal Investigator, “Develop Underwater Inspection Methods to Determine Condition of Pile Foundations Embedded in Soil,” Department of Defense, Department of the Army Engineer Research and Development Center, Agency Award No.: W912HZ1920027, 2019-2022, \$499,879.
- Zatar, W., Principal Investigator, “Corrosion Research to Maintain and Sustain Infrastructure in West Virginia,” West Virginia Department of Transportation - Division of Highways, Agency Award No.: RP328, 2018- 2023, \$599,500.
- 2023 GenCyber Teacher Summer Camp Fund – \$140K (NSA/NSF - Proposal Developer: Husnu S. Narman, Program Director: Wook-Sung Yoo, Lead Instructor: David Dampier, K-12 Pedagogist: Tina Cartwright, Instructors: Bill Gardner, Josh Brunty, and Paulus Wahjudi).
- 09/01/21/- 08/31/2024 Technical Program Management for the Short Span Steel Bridge Alliance. (PI) Michaelson G. \$9,295.14.
- 2022-2023 Summer Faculty Research Grant - 2K (Marshall University - PI: Husnu S. Narman).
- 2022 – 2023 NASA Undergraduate Research Fellowship - \$5K (NASA - Mentor: Husnu S. Narman, Student: Neil Loftus).
- 2022 Summer Creative Discovery and Research Award – \$5K (Marshall University - Mentor: Husnu S. Narman, Student: Neil Loftus).
- 2022 Summer Creative Discovery and Research Award – \$5K (Marshall University - Mentor: Husnu S. Narman, Student: Josh Maddy).
- 2022 Summer Undergraduate Research Experience Fellowship Award – \$4K (Marshall University - Mentor: Husnu S. Narman, Student: Neil Loftus).
- 2022 Summer Undergraduate Research Experience Fellowship Award – \$4K (Marshall University - Mentors: Husnu S. Narman and Paulus Wahjudi, Student: Josh Maddy).
- 2022 Spring Creative Discovery and Research Award – \$1.7K (Mentors: Husnu S. Narman, Student: Eric Dillion).

Nanoclay reinforced recycled HDPE to replace PVC and PE water pipe materials

By Sukjoon Na, Ph.D. and Sungmin Youn, Ph.D.

The U.S. Environmental Protection Agency (EPA) has awarded a grant of \$24,946 to Marshall University through its People, Prosperity and the Planet (P3) program in Dec 2020. Leading the project are Dr. Sukjoon Na, assistant professor of geotechnical engineering, and Dr. Sungmin Youn, an assistant professor of environmental engineering. Drs. Na and Youn aim to promote sustainability by enhancing the properties of recycled high-density polyethylene (HDPE) plastics to reduce plastic waste in landfills. HDPE is one of the most used plastic materials in household products and engineering applications. However, like other plastic wastes, HDPE has low biodegradability. The concerns about the accumulated plastic waste have grown due to its permanence in the environment. Recycled HDPE materials are prone to possessing inferior properties compared to pristine counterparts. For this reason, recycled HDPE is not recommended for engineering applications, particularly in critical civil infrastructures such as water or gas pipes. Improving the inferior properties of recycled HDPE is much needed to promote the use of recycled HDPE in critical civil engineering applications.

To overcome the limitations, Dr. Na and Dr. Youn proposed research that investigates a nanoclay-reinforced recycled HDPE as an alternative to pristine or recycled HDPE pipe materials. Several remarkable improvements in the properties of polymer nanoclay composites have been reported. For example, incorporating a small amount of nanoclay into thermoplastic polymers increases tensile strength and modulus. However, chemical degradation resistance, one of the critical requirements for water or gas pipes, has not been intensively researched yet. Drs. Na and Youn attempt to evaluate the applicability of nanoclay-reinforced recycled HDPE as a potential water and gas pipe material that would be applied in aggressive chemical environments with a team of undergraduate and graduate students.

First, the research team worked on blending nanoclay and recycled HDPE pellets collected from the number "2" stamped products such as milk jugs and water bottles. The recycled HDPE filaments mixed with nanoclay were extruded as filaments for a commercially available 3D printer. Using a 3D printer, the team manufactured double-edge notched tensile (DENT) specimens from the filaments. Each specimen was prepared under different conditions (e.g., varying amounts of nanoclay, ligament lengths, chemical exposures). Fracture tests were performed to ensure failure under the plane-stress condition for the prepared specimens.

Figure 1 shows produced filaments and the fracture test of 3-D printed specimens in the Environmental Engineering Laboratory in WAEC.

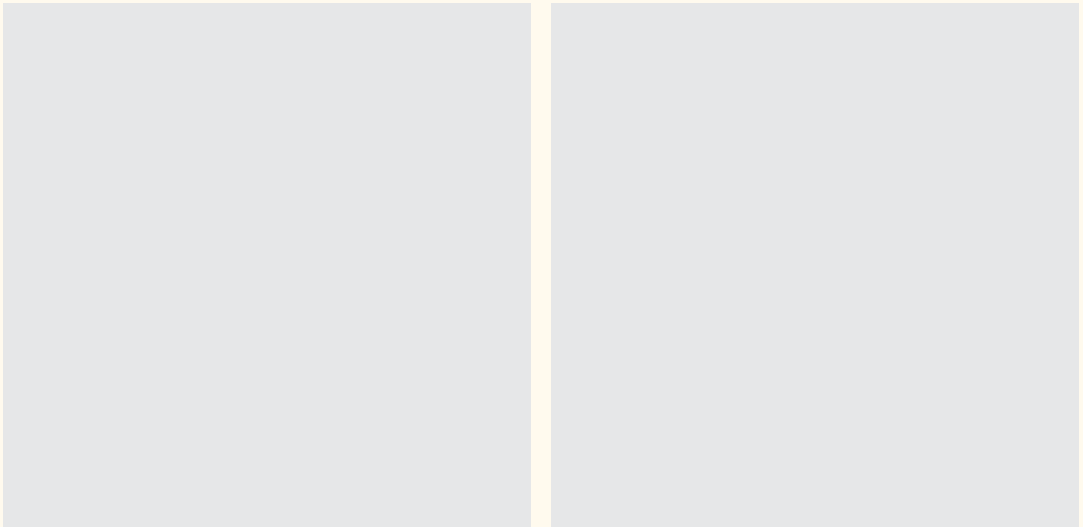


Figure 1: Various filaments made from recycled HDPE, and HDPE/nanoclay blends for 3D printing (left) and manufactured DENT specimens under tensile test (right)

“We are living in an era of plastics, and every year we generate more than a hundred million tons of plastic waste globally,” Dr. Na said. “Reutilizing those used plastics can help to reduce the waste that goes to landfills. However, there are still limitations to the direct use of recycled plastics for engineering applications due to the inferior material properties of recycled ones. This project focuses on improving the material properties, particularly chemical and fracture resistance of recycled plastics by blending an advanced material named nanoclay. We believe that our research helps to reduce waste while promoting sustainability and waste management.”

Four undergraduate students (Travis Adams, Claire Fulks, Mitchell Davis, and Olivia Rogers who is a former student and now pursuing her graduate degree at Cornell University) and one graduate student (Ahmet Bora Oruc) have been involved in the research project.

Currently, the team is analyzing the testing data to understand the roles of nanoclay in the development of fracture on HDPE material. The research findings were presented at the EPA's National Student Design Competition & Expo in May 2021, and the 2022 World Congress on Advances in Civil, Environmental, & Materials Research in Aug 2022. The research team also made a YouTube Video introducing the research work that can be found via the QR code below.

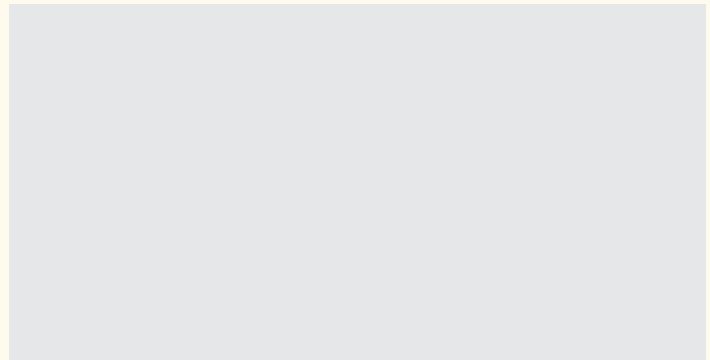


Figure 2: Marshall's EPA P3 Team (From left to right) – Dr. Sukjoon Na, Mitchell Davis, Claire Fulks, Ahmet Bora Oruc, Travis Adams, and Dr. Sungmin Youn).

MU Industrial Systems and Engineering Partners with Mining Industry to prepare new safety training material

The Marshall University Research Corporation (MURC) has received a \$130,000 grant from the U.S. Department of Labor's Mine Safety and Health Administration (MSHA) Brookwood-Sago Mine Safety Grants Program. Marshall will be developing and piloting new safety and emergency preparedness videos that will be available for use throughout the mining industry.

The Brookwood-Sago program is a nationally competitive program established by Congress in the Mine Improvement and New Emergency Response (MINER) Act of 2006 in honor of 25 miners who died in 2001 in Brookwood, Alabama, at the Jim Walter Resources No. 5 mine and in 2006 in Buckhannon, West Virginia, at the Sago Mine.


"We certainly want to remember those that lost their lives in the Brookwood and Sago mine disasters as well as their families at this time," said Dr. Richard Begley, a professor of Civil Engineering at Marshall and Principal Investigator for the grant. "And we are very appreciative that our funding request was approved after a comprehensive grant application evaluation and selection process, and that we were the second highest grant awarded in the country this year."

The video production project will be a joint effort between Marshall's Department of Civil Engineering and the Occupational Safety and Health Program (OSH), both in the College of Engineering and Computer Sciences, as well as Marshall's College of Arts and Media, and Blackhawk Mining, LLC, a Kentucky and West Virginia metallurgical coal production company.

"The training videos will be public domain and are a great example of successful internal collaborations at Marshall, and between industry and academia", said Professor James McIntosh, Co-Principal Investigator for the grant who heads the Occupational Safety and Health (OSH) program.

"John Opperman, director of safety for Blackhawk Mining, OSH advisory board member and Marshall graduate, brought the idea of a partnership on this project to us," McIntosh said. "The idea and project are the perfect example of how an advisory board and the college should work together, and we are pleased to be partnering with Blackhawk Mining."

John Opperman said, "When I saw the Funding Opportunity Announcement (FOA) I knew Marshall would be a good partner for Blackhawk. The Marshall faculty as well as the staff at the Marshall University Research Corporation were very responsive and supportive in helping to get the grant application prepared and submitted. I anticipate that we will be pursuing additional grant applications in the future with Marshall University as our partner."

A large electric shovel is positioned in a rugged, hilly landscape. The shovel is a massive piece of machinery, and its presence in the foreground suggests a mining operation. The background shows rolling hills and a clear sky, indicating an outdoor setting.

The project will be completed with the help of two videographers from the College of Arts and Media: Melissa McCloud, the academic lab manager and safety officer at the Art warehouse for the School of Art & Design, and Karen Fry, a part-time MURC employee and recent graduate of the School of Art & Design.

"I am very appreciative of the opportunity to work alongside my Marshall colleagues and our industry partner to help produce videos on safety and emergency preparedness," McCloud said. "The MSHA agency is also responsible for enforcing safety at sites where clay and other raw materials for ceramics are mined. I will be able to use this experience to help increase the awareness that our current and future ceramics students have about the role that mining plays in the ceramics industry and their careers."

Shows the MU team in front of a large electric shovel used at a local surface mine that helps to efficiently extract high valued metallurgical coal; that is ultimately shipped overseas for producing steel. From left to right: Rusty Keen, Blackhawk Mining (BHM) safety department, Dr. Richard Begley, Heath Wade, Melissa McCloud, Karen Fry, Dawn Rayburn MU – OSH Program staff, Joe McCormick BHM safety department, and Dr. Isaac Wait.



Right to Left: Shows Mr. James Meadows, Vice President for Safety at Blackhawk Mining discussing the safety training requirements for underground miners while conducting a tour in a local underground coal mine to Karen Fry, Melissa McCloud, and Heath Wade – a current Marshall OSH graduate student.

Artificial Intelligence for Cancer Immunotherapy

By Sanghoon Lee

Cancer research is undergoing a massive transformation with significant advances in immunotherapy. Cancer immunotherapy has become a remarkable way of cancer treatment that helps our immune system fight against cancer. Recent studies have reported that the response with immunotherapy is highly dependent on the interactions between cancer cells and their microenvironment called the tumor microenvironment (TME). Understanding the TME is now important and urgent for effective immunotherapy.

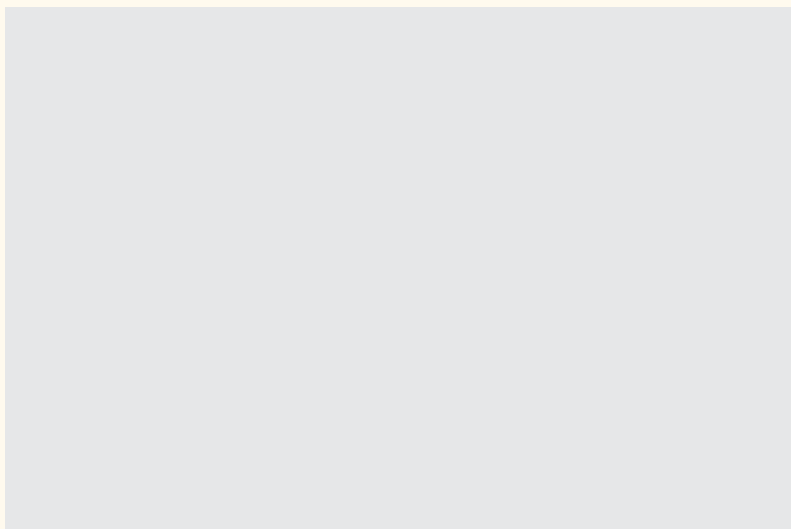
To understand the characteristics of different cells in the TME, many researchers made dedicated efforts to find morphological patterns of tissue cells using computational image processing methods. These efforts have driven impressive advances in computational pathology deciphering features of the TME by using deep learning and artificial intelligence (AI) in recent years.

AI technologies have been used to resolve the inter and intraobserver variability by reducing the workload of pathologists who assign a tissue classification to specimens, which are highly complex and should be iteratively refined over many times. AI now automates the time-consuming process and reduces the workload of pathologists by estimating the quantity of tumor-related cells in whole-slide images (WSIs).

The digitized high-resolution images, WSIs, can very quickly be created by whole slide scanners scanning an entire glass slide and are increasingly common since hardware platforms have been increasingly fast and more scalable, leveraging the development of whole slide images analysis in cancer research.

Dr. Lee and his team have received two NSF grants to conduct an interdisciplinary research study that integrates knowledge from computer science and cancer research, characterizing different cell types in the TME by extracting hand-crafted features from WSIs preserving meaningful histologic characteristics. Dr. Lee and his team have also extracted deep-learned features employed to avoid this heavy computational burden by direct-learning quantitative features from raw data and automatically transformed for use in training a variety of deep learning models.

The efforts of Dr. Lee and his research team will keep contributing to the AI-based biomarker development, multiple types of cancer investigation, a fusion of histopathology and genomic data, and interpretation of spatial variation in other fields of research. Dr. Lee and his research team believe that the accomplished results of the research project will promote cancer research locally, nationally, and globally through synergistic research and educational activities.



Tumor prediction on whole-slide image using AI.



Dr. Yoo leads collaborative cybersecurity project with the U.S. Army and Civil-Military Innovation Institute

Dr. Wook-Sung Yoo, a professor in the Department of Computer Sciences and Electrical Engineering at Marshall, has led a research project that focuses on engineering and cybersecurity for technology used by the military in the Pathfinder program, the first West Virginia project awarded by U.S. Army Combat Capabilities Development Command (DEVCOM) and the Civil-Military Innovation Institute (CMI2). The Pathfinder program is a Congressional initiative executed by DEVCOM that aims to harness the creativity and technical skills of academic and government researchers to help the Army integrate solutions to real problems into the total force.

"The Pathfinder program represents opportunities to study challenges encountered by our military and develop solutions to those challenges," said Dr. David Dampier, dean of the College of Engineering and Computer Sciences at Marshall University. "This partnership is especially meaningful in that Marshall University's academic community plays a critical role in directly supporting the technological needs of soldiers."

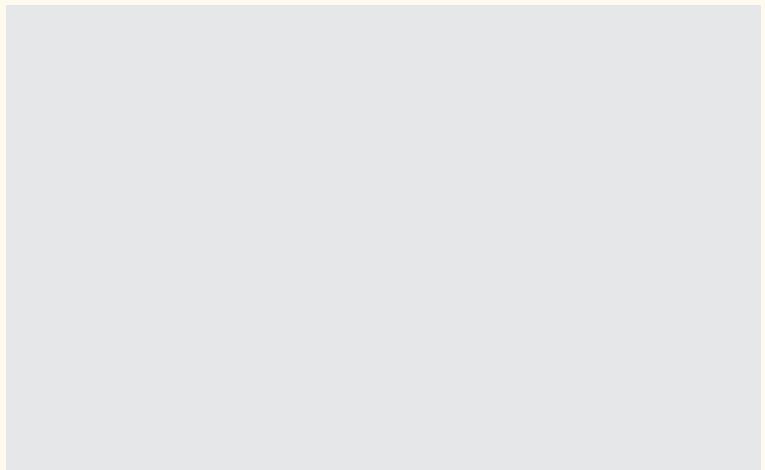
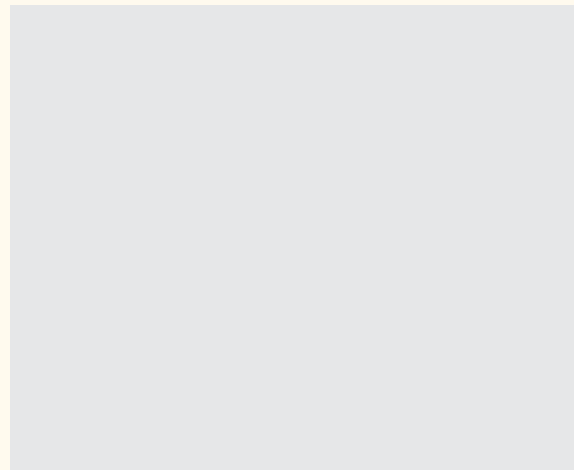
The objectives of this project are to introduce tamper detection techniques. While many electronic devices provide increased functionality, they also introduce new risks, and the risks are increased if the device is connected to the network. Many entities across the globe might be involved in the horizontal integrated circuit (IC) design flow and none are necessarily trusted. This has introduced serious security concerns over electronic devices and the need for a portable capability to inspect the integrity of electronic devices before placement of that device/component into a network is imminent.

Marshall faculty and students partnered with Howard University, the University of Alabama in Huntsville, and Azimuth Co. to develop the Malicious Device Detection system. Based on the extensive research experience of the team in tamper detection in IC before manufacturing, the team has developed scalable solutions through a combination of testing techniques for IC designs and unsupervised machine learning algorithms. The experimental results showed that our system detects all threats with low false positives.

"The collaboration of other universities and companies in Morgantown, WV, demonstrates the critical team approach needed to provide advanced technology to our military," said Dr. Yoo.

Marshall University proposed to extend this research to leverage our experience building a prototype device to be used in the field.

"The relationship between Marshall University, DEVCOM and CMI2 brings innovation to West Virginia, as well as collaborative efforts between academia and the Army," said Cody Clevenger, CMI2 Pathfinder program manager. "This collaboration gets people to the table who can work together to solve these important problems, while strengthening academia and soldier modernization."





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Department of Biomedical Engineering



Faculty Members



Dr. David A. "Dave" Dampier currently serves as Professor, Director for Institute of Cyber Security, Dean of the College of Engineering and Computer Sciences at Marshall, and Interim Chair of Biomedical Engineering, and prior to this, he served as Associate Dean for Research in the college. He has an M.S. and Ph.D. in Computer Science from the U.S. Naval Postgraduate School in Monterey, CA, and a B.S. in Mathematics from the University of Texas at El Paso. He grew up in Florida and now lives "out" Wayne, WV. His research interests are Cyber Security, Digital Forensics, and Software Engineering. His personal interests are family, especially his seven grandchildren, woodworking, and Taekwondo.



Dr. Mohammed Ferdjallah is an Assistant Professor in the Department of Computer Science & Electrical Engineering at Marshall University. Dr. Mohammed Ferdjallah received his PhD degree in Electrical and Computer and MS degree in Biomedical Engineering from The University of Texas Austin. He also received his MD degree from the International University of the Health Sciences. He has a multidisciplinary expertise in image and signal processing, computational modeling, and statistical data analysis. As an electrical and biomedical engineering scientist, he conducted research in computer modeling of the brain, cranial electrical stimulation (CES), electrical impedance tomography, electrode design, and EMG and muscle action potentials and ions channels simulation and modeling. His technical research interests include digital systems, embedded, systems, computer architecture, adaptive and system identification, modeling and simulation, and signal and image processing. His clinical research interests include impacts of chronic diseases in the elderly (such as Alzheimer's disease, cancer, and diabetes), innovative technology for drug addiction treatment and prevention, medical records, comparative outcomes research, and biomedical sciences. He has successfully published several peer-reviewed articles in biomedical sciences, physical medicine and rehabilitation, modeling and simulation of physiological signals, motion analysis, and engineering.



Dr. Nasim Nosoudi is an assistant professor in the Weisberg Division of Biomedical Engineering at Marshall University. She holds a bachelor's degree in Material Engineering. She has completed her master's degree in Biomedical engineering with a focus on bone tissue engineering. She received her Ph.D. in Bio-Engineering with a focus on Nanomedicine from Clemson University. She is interested in developing nanomedicine for cardiovascular diseases and reprogramming cells using electrospinning. Her teaching experience includes Tissue engineering, Nanomedicine, Biomechanics, Biotransport, Advanced biofluid, and Biomaterials.



Dr. Masudur "Masud" Rahman is an Assistant Professor of Biomedical Engineering. He earned a Ph.D. in LifeScience Engineering and M.Eng. in Material Science with a focus on anticancer drug development from the Toyohashi University of Technology, Japan. He did NSF Postdoctoral training at Marshall University. He has several years of industrial background in engineering the DNA for next-generation therapeutics. DNA nanotechnology is his research interest for the development of therapeutic and diagnostics applications. His teaching experience includes Nanomedicine, Medical Imaging, Biomaterial, Nanotechnology, and Nanochemistry He loves to spend time on indoor plants and traveling. Rahman has published a U.S. patent, 23 journals, 48 conferences, and two book chapters.



Dr. Roozbeh "Ross" Salary is an Assistant Professor in both Mechanical Engineering and Biomedical Engineering. He received his Ph.D. in Industrial and Systems Engineering (Advanced Manufacturing) from State University of New York (SUNY) at Binghamton, NY, USA. He now resides in Huntington, WV. His research Interests include Biomedical Fabrication, Tissue Engineering, Regenerative Medicine, and Artificial Intelligence. Dr. Salary is a recipient of the Pickens-Queen Teaching Award and Medal for excellence in teaching at Marshall University.



Joon "Simon" Shim is an assistant professor of biomedical engineering (BME) at Marshall University. Simon has been conducting research with students. His advisees were accepted to the leading Ph.D. programs with full scholarship from the National Science Foundation and others. Dr. Shim teaches both experimental and computational classes centered on biological systems involving brains, arteries, and vascular cells. With the support from the NASA WV Established Program to Stimulate Competitive Research grant, Simon and Katie Legg began testing their hypothesis on human endothelial cells at NASA Langley 20-FT vertical spin tunnel in the fall of 2022. Simon and his team observed the advancement of NASA's own design of a re-entry capsule for Space Missions. Simon has published a review paper and full-length scientific articles with students majoring in BME at Marshall who made significant contributions to the experimental and computational analyses of the human genomes and postmortem brain tissues. Dr. Shim and students assay human postmortem brains obtained from several tissue repositories of the NIH biobank for hydrocephalus and age-related degenerative diseases.

Staff Members



Christy Burton - Administrative Secretary Sr. Christy has earned an Associate's Degree in Applied Science in Administrative Tech-Executive and Administrative Tech-Medical from Mountwest Community and Technical College in Huntington. She lives in Huntington, where she loves taking care of her multiple pets.

Advisory Board Members

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Department of Civil Engineering



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Faculty Members



Dr. Ammar Alzarrad is an Assistant Professor in the Department of Civil Engineering at Marshall. He graduated with dual bachelor's degrees in Civil Engineering and Business Administration from the University of South Alabama. He received his M.Sc. and Ph.D. in Civil Engineering from The University of Alabama. Before assuming his current position, he was an Assistant Professor in the Department of Civil Engineering and Construction at Bradley University. Prior to joining academia, Dr. Alzarrad was a Virtual Design & Construction (VDC) manager at an engineering design firm in Chicago, where he managed multi-million projects (i.e., Wrigley Field restoration and expansion project). Dr. Alzarrad's hometown is Barboursville, WV, and his research interests focus on Building Information Modeling (BIM), Artificial Intelligence, and Unmanned Aerial Systems (UAS) applications in construction.



Dr. Arka Chattopadhyay is a Research Assistant Professor in the Department of Civil Engineering at Marshall University. Dr. Chattopadhyay is originally from Hyderabad, India. He earned a Bachelor of Science in Mechanical Engineering from Jawaharlal Nehru Technological University in India. Following this, he came to the United States and joined the Mechanical and Nuclear Engineering Program at Kansas State University to pursue a Master of Science in Mechanical Engineering and Ph.D. in Engineering Mechanics from Virginia Tech. He joined Marshall University in 2018. Prior to his current position at Marshall University, he worked as a Visiting Research Associate and an Adjunct Faculty in the College of Engineering teaching engineering courses and performing collaborative research. His research interests focus on mechanics of materials and systems, mathematical modeling, numerical methods, and computational mechanics using the finite element analysis.



Dr. Greg Michaelson is the Associate Dean of the College of Engineering and Computer Sciences and an Associate Professor in the Department of Civil Engineering at Marshall University. Originally from Bluefield, West Virginia, Dr. Michaelson earned his Ph.D. degree in Civil Engineering from West Virginia University 2014, and then joined the faculty at Marshall. Dr. Michaelson's research interests are focused in the area of structural engineering and include efficiency and economics of steel bridge design, nonlinear finite element modeling, structural stability, modular/accelerated bridge construction, and experimental investigation of structural systems.



Dr. Sukjoon Na, who was born and raised in Seoul, South Korea, is an assistant professor in geotechnical engineering within the Department of Civil Engineering at Marshall University. He received his Ph.D. in Civil Engineering from Drexel University in 2016, M.S. from the University of Texas at Austin in 2009, and B.E from Chung-Ang University in 2005. His research interests focus on failure analysis of polymer composite materials, 3D printed polymers, geosynthetics, and sustainable construction materials. His interests also include underground detection technologies.



Dr. Andrew Nichols is a Research Professor in the Department of Civil Engineering at Marshall University. Dr. Nichols is from Point Pleasant, WV, obtained his Bachelor of Science in Civil Engineering from West Virginia University, and his Master of Science in Civil Engineering and Ph.D. degrees from Purdue University. He worked as an Assistant Professor in the Department of Civil Engineering at the University of South Carolina, before joining Marshall University in 2007. Dr. Nichols' research interests are in transportation engineering, specifically traffic operations, traffic safety, and traffic sensors. He is responsible for teaching courses in CAD, geomatics, and transportation.



Dr. Isaac Wait is a Professor and Chair of the Department of Civil Engineering at Marshall University. Originally from North Canton, Ohio, Dr. Wait earned a Bachelor of Science in Civil and Environmental Engineering and Master of Science of Civil Engineering from Brigham Young University, and then worked as a design engineer at Horrocks Engineers, in American Fork, Utah. Following that he earned a Ph.D. degree in Civil Engineering from Purdue University, and then worked as an Assistant Professor at the American University of Sharjah, in the United Arab Emirates. Dr. Wait has been at Marshall since 2009, teaching courses in water resources, environmental engineering, and engineering economics. His research interests include watershed modeling, hydraulic scour of rock, and engineering education, with funded projects from the National Science Foundation and West Virginia Division of Highways.



Dr. Sungmin Youn was born and raised in Seoul, South Korea until he moved to Michigan to attend Calvin College where he earned his B.S. in Engineering. Upon graduating, Dr. Youn began the graduate civil engineering program at the University of Texas at Austin. He obtained his Master's degree in 2013 and Ph.D. in May 2017. Dr. Youn joined Marshall as an assistant professor in Civil Engineering in August of 2017. His research focuses on water quality and physiochemical water treatment. He enjoys playing, watching, and talking about soccer.



Dr. Wael Zatar is a professor of Civil Engineering at Marshall University. He served as the Dean of the College of Engineering and Computer Sciences and the College of Information Technology and Engineering from 2011 to 2020. He served as Director of the Appalachian Transportation Institute and as Associate Director of the University Transportation Center Region 3 Mid-Atlantic Transportation Sustainability Center. Holding a tenured professor academic appointment, he served as the J.H. Fletcher Chair of Engineering at Marshall University. Many factual references support the positive impacts Dr. Zatar has made in the engineering and transportation fields. Dr. Zatar held memberships in six Transportation Research Board (TRB) committees, served as the chair of TRB AFF80 Standing Committee on Structural Fiber Reinforced Polymers for six years. He currently co-chairs TRB AKB10 Standing Committee on Innovative Highway Structures and Appurtenances. He is the Chair of the Student Education Committee of the Precast/Prestressed Concrete Institute. Dr. Zatar attracted and directed many funded projects from numerous governmental and state agencies. He authored/coauthored numerous journal papers and technical publications. He held memberships in professional societies, honor societies and national committees, and received numerous awards for his significant contributions to research and education.

Staff Members



Christy Burton - Administrative Secretary Sr. Christy has earned an Associate's Degree in Applied Science in Administrative Tech-Executive and Administrative Tech-Medical from Mountwest Community and Technical College in Huntington. She lives in Huntington, where she loves taking care of her multiple pets.

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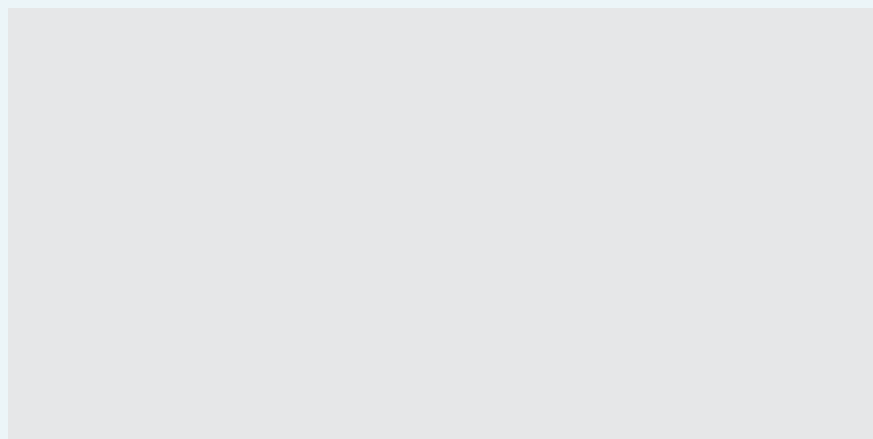
MU SAME-ASCE Chapter Update

2021-2022 was a big rebuilding year for joint student chapter of the Society of American Military Engineers (SAME) and the American Society of Civil Engineers (ASCE). The pandemic brought new challenges to the student chapter that they were able to overcome to maintain a healthy chapter that serves and helps the local engineering community as well as staying active in their professional organization.

In January of 2022, the SAME-ASCE Student chapter hosted the 14th annual Richard F. McCormick Technical Conference. This was the chapter's second fully virtual conference. The conference went exceptionally well for being organized by almost all new members. Every January, the SAME-ASCE student chapter hosts a technical conference to provide continuing education for practicing engineers in the surrounding area, including consultants, West Virginia Division of Highways, and USACE (Huntington district) personnel. The 2022 conference was attended by almost 200 people, making it one of the chapter's biggest technical conferences yet. Presentation topics included:

- Review of Experiments Conducted to Assist in Reducing Ground Penetrating Radar Post Processing and Interpretation Time for Assessing the Substructure Conditions of Rail Lines
- Effective controlling or Gas Emission and Volatile Organic Compounds Leachate through Innovative Geomembranes in Municipal Solid Waste Landfills
- Practical Applications of Hydrologic Analysis and Modeling as a Solution to Construction and Regulatory Concerns in Newark Ohio
- Condition Assessment of Pavement Foundation Based on GPR Data Interpretation
- The Ethics of Engineering and Related Legal Cases and
- 90 Years of Change: The Lower Guard Wall at Charleroi Locks and Dam.

In late April 2022 the SAME-ASCE student chapter traveled to Lexington, Virginia, to The ASCE Virginias Conference, where they competed in the AISC steel bridge competition. The competition included a timed construction portion, as well as both lateral and vertical load tests. Throughout the year, the chapter had been preparing for this. The bridge was completely designed and constructed by students in the chapter.



Pictured is the steel bridge team with their constructed bridge after the competition at Virginia Military Institute.



Department of Computer Sciences and Electrical Engineering



Faculty Members



Dr. Jamil Chaudri is a Professor of Computer Sciences. He earned his Ph.D. in Management from the University of Durham in the U.K., his M.Sc. in Computer Science from the University of Nottingham in the U.K., and the B.Sc. with Honours in Mathematics from University of Salford, in the U.K. Originally from Ludihana, India, he made his way through Pakistan, United Kingdom, and Switzerland to the U.S. He now resides Huntington, West Virginia. His research interests are in Information Systems for Decision Making, Data Classification, Big Data, and Artificial Intelligence. His personal interests are in gardening, traveling, especially by train and to national parks.



Dr. Tanvir Chowdhury is an Assistant Professor in the Department of Computer Sciences and Electrical Engineering at Marshall University. Dr. Chowdhury received his bachelor's degree from Bangladesh University of Engineering and Technology (BUET) and a master's degree and a doctoral degree from the University of Texas at San Antonio (UTSA). Dr. Chowdhury is originally from Chattogram, Bangladesh. His research interests include Human-Computer Interaction (HCI), Virtual / Augmented / Mixed Reality Applications, Computer Graphics, 2D/3D User Interface, Serious Games, and Rehabilitation.



Dr. David A. "Dave" Dampier currently serves as Professor, Director for Institute of Cyber Security, Dean of the College of Engineering and Computer Sciences at Marshall, and Interim Chair of Biomedical Engineering, and prior to this, he served as Associate Dean for Research in the college. He has an M.S. and Ph.D. in Computer Science from the U.S. Naval Postgraduate School in Monterey, CA, and a B.S. in Mathematics from the University of Texas at El Paso. He grew up in Florida and now lives "out" Wayne, WV. His research interests are Cyber Security, Digital Forensics, and Software Engineering. His personal interests are family, especially his seven grandchildren, woodworking, and Taekwondo.



Dr. Jayanta Debnath joined the Computer Science and Electrical Engineering department at Marshall University in August, 2021 as an Assistant Professor. He is a senior member of Institute of Electrical and Electronic Engineers (IEEE) since 2019. He is a member in Training with the Association of Professional Engineering and Geoscientists of Manitoba (APEGM), Canada, since 2015. He has several years of working experience in teaching, research, and industry. He worked as a Mitacs Elevate post-doctoral research fellow for two years with the University of Manitoba, Canada. His research interests include integration of renewable generations to the grid, Micro-grid technologies, Power Systems (including Power Electronics converters) analysis, modeling, simulation, High performance computing for power systems applications, etc. He obtained his PhD in Electrical and Computer Engineering from the University of Manitoba in Winnipeg, Canada; MSc in Electrical Engineering in 2007 from Bangladesh University of Engineering and Technology in Dhaka, Bangladesh; and BSc in Electrical and Electronic Engineering in 2003 with distinction from the Bangladesh University of Engineering and Technology in Dhaka, Bangladesh.



Dr. Mohammed Ferdjallah is an Assistant Professor in the Department of Computer Science & Electrical Engineering at Marshall University. Dr. Mohammed Ferdjallah received his PhD degree in Electrical and Computer and MS degree in Biomedical Engineering from The University of Texas Austin. He also received his MD degree from the International University of the Health Sciences. He has a multidisciplinary expertise in image & signal processing, computational modeling, and statistical data analysis. As an electrical and biomedical engineering scientist, he conducted research in computer modeling of the brain, cranial electrical stimulation (CES), electrical impedance tomography, electrode design, and EMG and muscle action potentials and ions channels simulation & modeling. His technical research interests include digital systems, embedded, systems, computer architecture, adaptive and system identification, modeling and simulation, and signal and image processing. His clinical research interests include impacts of chronic diseases in elderly (such as Alzheimer's disease, cancer, and diabetes), innovative technology for drug addiction treatment and prevention, medical records, comparative outcomes research, and biomedical sciences. He has successfully published several peer-reviewed articles in biomedical sciences, physical medicine and rehabilitation, modeling and simulation of physiological signals, motion analysis, and engineering.



Dr. Taher Ghomian is an Assistant Professor of Electrical and Computer Engineering. He earned his Ph.D. in Electronics Engineering from Louisiana State University in Baton Rouge, LA, and performed a postdoctoral fellowship at the University of California at Davis. He is originally from Tabriz, Iran, and now resides in Huntington, WV. His research interests include energy conversion, nanomaterials, photonics, and electronics. His personal interests include swimming, biking, and hiking.



Dr. Sanghoon Lee is an Assistant Professor of Computer Sciences. He earned his Ph.D. and M.S. in Computer Science from Georgia State University, as well as a M.S. and B.S. in Computer Science from the University of Suwon in Korea. He served in a postdoctoral fellowship at Emory University. Originally from Seoul, South Korea, Dr. Lee now resides in Huntington, WV. His research interests include machine learning, deep learning, and artificial intelligence in interdisciplinary domains.



Dr. Haroon Malik is an Assistant Professor of Computer Sciences. He received his Ph.D. in Computer Science from Queen's University in Canada. Originally from Rawalpindi, Pakistan, he now resides in Huntington, WV. Dr. Malik also serves as Co-Chair of the Marshall University Data Sciences Council. His research interests include wireless sensor networks (WSN), internet of things (IOT), mining social repositories (MSR) and performance testing. His personal interests include gardening and traveling.



Dr. Husnu S. Narman is an Assistant Professor at the Division of Computer Science, Marshall University. Prior to joining Marshall University, Dr. Narman was a post-doctorate fellow at Clemson University. His research interest focuses on Distributed computing, including cloud and edge computing, the Internet of things, Cyber-physical systems, Machine learning applications, Social networks, and Content delivery networks. He has over 45 peer-reviewed publications and more than seven years of teaching experience in K-12 and higher education. He has extensive experience with teaching computer science-themed summer camps in the past. He organized the Computer Science Adventure Zone K-12 and Teacher Summer Camp to increase Computer Science and Cybersecurity awareness in West Virginia in the last several years. He is the recipient of the 2020-2021 College of Engineering and Computer Sciences Weisberg Academy of Distinguished Teachers Award and 2020-2021 Marshall University Distinguished Artists and Scholars Junior Category Award.



Dr. Cong Pu is an Assistant Professor in the Department of Computer Sciences and Electrical Engineering. He received his M.S. and Ph.D. in Computer Sciences from Texas Tech University and his B.S. in Computer Science and Technology from Zhengzhou University in China. His research interests include cryptography, network security, wireless networks, mobile computing, and information-centric networking.



Dr. Paulus Wahjudi currently serves as Chair of the Department of Computer Sciences and Electrical Engineering. He earned his B.S., M.S. and Ph.D. degrees in Computer Science from the University of Southern Mississippi in 2001, 2003 and 2007, respectively and joined Marshall University in 2009. His research interests include intrusion detection and threat intelligence in cyber infrastructure, where he has secured funding from the industry, federal, state and local organizations. During his career, Dr. Wahjudi has received over \$1 million in funding for various research in computing, cybersecurity, and educational activities. Originally from Jakarta, Indonesia, Dr. Wahjudi now resides in Proctorville, OH. There are several rumors roaming around about Dr. Wahjudi, some say that he once took over 19 hours in the summer and that he completed his Bachelor's degree in just two years because he is too lazy. All we know is, Dr. Wahjudi is an avid supporter of his students and dedicated to ensuring they become successful upon graduation.



Dr. Wook-Sung Yoo currently serves as the Director of Research and Professor of Computer Science. He earned his Ph.D. and M.S. in Computer Science from the Florida Institute of Technology. He also earned a D.D.S. from Seoul National University. Originally from South Korea, he now resides in Huntington, WV. His research interests include artificial intelligence, software engineering, cybersecurity, data science, and informatics applying computing technology in interdisciplinary fields.



Dr. Pingping Zhu is an Assistant Professor of Electrical Engineering. He received his Ph.D. from the University of Florida in Gainesville, FL. He did postdoctoral fellowships at both Duke University and Cornell University. Originally from Wuhan, China, he now lives in Huntington, WV. His research interests include signal processing, machine learning, reinforcement learning and approximate dynamic programming, intelligent control, information theoretical learning, neural networks, and artificial intelligence. His personal interests include family and reading.

Staff Members



Hallie R. Evans - Administrative Associate. Hallie attended Mountwest Community and Technical College and Marshall University. She lives in Lavalette, WV, and is a dog-lover (Yorkie) who enjoys True Crime TV shows, collecting vintage vinyl records and taking hikes.

Advisory Board Members

- **Lee Farabaugh**, Co-Owner, Core 10
- **Jeffery Legge**, CIO, City National Bank of West Virginia
- **Clarence Martin**, CEO, State Electric
- **Mike Owens**, President and CEO, Strictly Business
- **Steven Paine**, State Superintendent, West Virginia Department of Education
- **Robert Plymale**, COO, Appalachian Transportation Institute
- **Brian Pratt**, Director IS & C, West Virginia Office of Technology
- **Tammy Shingleton**, Director of Operations, Frontier Communications
- **Joshua Spence**, CIO, West Virginia Office of Technology
- **Debra Stinson**, Engineer III, Core 10

Weisberg Department of Mechanical and Industrial Engineering

A photograph of a computer lab with several students sitting at long wooden desks. They are using desktop computers with large monitors, keyboards, and mice. The students are focused on their work. The lighting is bright, and the overall atmosphere is one of a busy, modern educational environment.

Faculty Members



Dr. Ronald Bieniek is a Professor of Mechanical Engineering. He was born in South Gate, California, and now resides in Huntington, West Virginia. He received a Bachelor of Science in Physics from the University of California-Riverside. After spending his first year of graduate school at M.I.T., Bieniek earned a Master of Arts degree in History of Science and a Ph.D. in Physics from Harvard University. Over his career, he has been a professor of physics science, astronomy, humanities, physics, and engineering. He has also been a resident scholar at Technische Universität Kaiserslautern, Oxford University, Max Planck Institut für Quantenoptik, Observatoire de Paris, Università di Firenze, University of the Western Cape, and Stanford University. Most of his research career centered on atomic and molecular interactions, but later evolved into issues related to student learning. The institutional programs Bieniek established were designed to nurture and enhance student, faculty, and university success. He has contributed to the education of over 12,000 students, from science and engineering majors to English and sociology students, through the engineering, physics, astronomy, and honors courses he has taught. Professor Bieniek has won several teaching awards, and chaired the development committee for the SAT Subject Test in Physics for several years. His non-academic interests include foreign travel, book collecting, and leather bookbinding.



Dr. Gang Chen is a Professor of Mechanical Engineering. He has a Ph.D. in Mechanical Engineering from Nanyang Technical University in Singapore. Hometown: Huntington, WV. Research Interests: Dynamical systems-mechanical systems, vehicle systems, sustainable energy systems and microsystem.



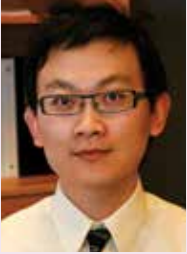
Sudipta Chowdhury joined Marshall University in Fall 2022 as an Assistant Professor at the Department of Mechanical and Industrial Engineering. Sudipta Chowdhury's primary area of research is on enhancing the resilience of critical infrastructures under varying degrees of natural and man-made disasters. He has developed complex planning frameworks, mathematical models, and solution techniques for analyzing different systems and system of systems (SoS) involving transportation asset management and planning, supply chain and logistics, vehicle routing, and power utility asset restoration. His works were funded by various agencies such as the U.S. Department of Transportation, Pacific Northwest National Lab, the U.S. Army, Construction Industry Institute, Eversource Energy, and FedEx. He has published over 20 peer-reviewed journal articles and multiple conference proceedings. He serves as a reviewer of multiple journals such as OR spectrum, Computers and Operations Research, International Journal of Disaster Risk Reduction, Sustainable Cities and Society, Applied Soft Computing, Mathematics, and IEEE systems.



Dr. Mehdi Esmaeilpour is an assistant professor in the Weisberg Department of Mechanical and Industrial Engineering at Marshall University. Prior to joining Marshall University, he held a Research Assistant professor position at IIHR (Hydroscience-Engineering Laboratory), the University of Iowa. He received his Ph.D. from the University of Iowa in 2017 and completed his dissertation research in Ship Hydrodynamics Group at the University of Iowa. Dr. Esmaeilpour teaches both undergraduate and graduate courses in mechanical engineering. His research interests are in the area of Computational Fluid Dynamics (CFD), Experimental Fluid Dynamics (EFD) multiphase flow and energy.



Dr. Iyad Hijazi is an Associate Professor of Mechanical Engineering. He has a Ph.D. in Mechanical Engineering from New Mexico State University and Postdoctoral Fellowship at Georgia Institute of Technology. Prior to academia, he had 10 years of industrial experience. His research interests include employees empirical atomistic modeling and first principle calculations to probe for nanomaterials with unique properties. His recent research focused on metal hydrides for hydrogen separation, purification and storage, and piezoelectric materials for sensors and electric power generation.



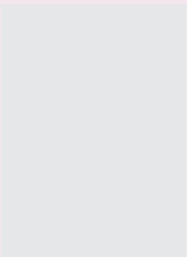
Dr. Jack Liu is an Associate Professor of Mechanical and Industrial Engineering. He received his Ph.D. in Industrial Engineering (Ergonomics) from Virginia Tech, his M.S. in Industrial Engineering from Virginia Tech, and his B.S. in Industrial Engineering from ShangHai Jiao Tong University. Born in YanTai City, China, Dr. Liu now resides in Huntington, WV. His research interests include physical ergonomics; musculoskeletal biomechanics; and fall prevention. His personal interests include traveling, classical music, and reading.



James McIntosh currently serves as Chair of the Department of Mechanical and Industrial Engineering. He received his M.S.E. in Industrial Engineering (Occupational Safety & Health) from West Virginia University; Born in Fairmont, WV, he now lives in Charleston, WV. His research interests include respiratory protection and behavioral safety programs. His personal interests include family, hunting, fishing and tennis.



Dr. Haroon Malik is an Assistant Professor of Computer Sciences. He received his Ph.D. in Computer Science from Queen's University in Canada. Originally from Rawalpindi, Pakistan, he now resides in Huntington, WV. Dr. Malik also serves as Co-Chair of the Marshall University Data Sciences Council. His research interests include wireless sensor networks (WSN), internet of things (IOT), mining social repositories (MSR) and performance testing. His personal interests include gardening and traveling.



Tyler M. Perry, MS, CSP is an Assistant Professor in the Department of Mechanical and Industrial Engineering. Originally from Proctorville, Ohio, Professor Perry earned a Bachelor of Science in Safety Technology from Marshall University and a Master of Science in Occupational Safety, Health, and Environmental Management from Columbia Southern University. Professor Perry is also a Certified Safety Professional (CSP) through the BCSP. After working 10 years in the Steel Manufacturing Industry with experience in safety, environmental, and management, Professor Perry transitioned to faculty at Marshall University in 2022. Professor Perry's research interest include behavioral safety and improving safety training methods. Additional areas of interest include workforce preparation and advising for students.



Dr. Roozbeh "Ross" Salary is an Assistant Professor in both Mechanical Engineering and Biomedical Engineering. He received his Ph.D. in Industrial and Systems Engineering (Advanced Manufacturing) from State University of New York (SUNY) at Binghamton, NY, USA. He now resides in Huntington, WV. His research Interests include Biomedical Fabrication, Tissue Engineering, Regenerative Medicine, and Artificial Intelligence. Dr. Salary is a recipient of the Pickens-Queen Teaching Award and Medal for excellence in teaching at Marshall University.

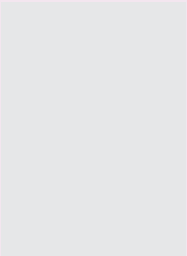


Dr. Asad Salem is the J.H. Fletcher Professor of Mechanical Engineering at the Weisberg Department of Mechanical and Industrial Engineering. He has a Ph.D. in Mechanical Engineering from the University of Akron in Akron, OH, and a B.S. in Mechanical Engineering from the University of Mississippi in Oxford, MS. Dr. Salem is an Ideal ABET Scholar and has extensive experience in ABET Accreditation. His research interests include: Thermal Science, Computational Fluid Dynamics (CFD), Finite Elements, Renewable and Sustainable Energy Sources such as Wind and Solar, Co-generation, Cryogenic Thermodynamics Cycles, LNG Production and Emissions, Energy Storage, Plasma Cutting and Welding, Non-Newtonian Fluids and Drag Reduction and their Biomedical Applications and Polymers Processing and Manufacturing. His teaching interests include Thermodynamics, Heat Transfer, Fluids Mechanics, Renewable Energy, Sustainability, Thermal Management, Fuel cells, and Water Desalination.



Dr. Yousef Sardahi is an assistant professor in the Weisberg Department of Mechanical Engineering at Marshall University. He earned a Ph.D. in Mechanical Engineering at the University of California, Merced. His research interests include Control System Design and Multi-Objective Optimization. His teaching experience includes Control Systems, Digital Controls, Automation and Control, System Modeling, Advanced Vibrations, Mechatronics, Circuits and Instrumentations, and Mechanical Engineering Computations.

DRAFT



Dr. Ruiqing "Ryan" Shen is an Assistant Professor in the Department of Mechanical and Industrial Engineering at Marshall University. He earned his Ph.D. degree in Chemical Engineering from Texas A&M University. With the vision to protect people, the community, and the environment through developing more eco-friendly fire-safe materials and designing cost-effective engineering safety and health strategies, his current areas of research include: advanced manufacturing of polymeric materials, integration of new technologies into chemical process safety, fire protection, and occupational health and safety.



Dr. Scott Simonton is a Professor of Environmental Science. He has a Ph.D. in Engineering, from the University of New Mexico, an M.S. Environmental Engineering from Marshall University, and a B.S. in Civil Engineering from the West Virginia Institute of Technology. He is from Huntington, WV, but now resides in Charleston, WV. His research interests include forensic analysis of environmental impacts, human health risk, and environmental impacts related to mining. His personal interests include being an experienced private pilot and volunteer for Southwings, avid outdoorsman who includes backpacking, fly-fishing, flying as well as travelling throughout the American west with his family.

Staff Members



James Kuzma - Mechanical Engineering Lab Technician. Mr. Kuzma is from Binghamton, NY, and has an undergraduate degree in Physics from Syracuse University. His interests include electronics design, machining, renewable energy and organic gardening.



Tina Sullivan - Administrative Secretary Senior. Tina graduated from Marshall University in 2015 with a degree in Business Management and has been a staff member of the university since 2007. She is an advanced scuba diver and enjoys photography as a hobby.

Advisory Board Members

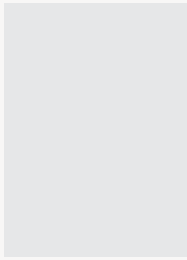
- **April Bailey**, Engineer, JH Fletcher
- **Katherine Burgess**, Powertrain Engineer, Toyota
- **Tim Burgess**, VP of Engineering, JH Fletcher
- **Samuel Butzer**, Project Engineer, ZMM Architects
- **Anthony Ferguson**, Project Manager, Marathon Oil
- **Corey O'Connell**, Director of Process Development, Special Metals
- **Mark Holderby**, Director Quality & Engineering, Special Metals
- **James Hook**, Engineer, Braskem
- **Thomas Kay**, Department Manager – Project & Mechanical, Jacobs
- **Curtis Martin**, Engineering Manager, Toyota
- **Roger Painter**, Associate R&D Director-Pilot Plant Operations, Dow Chemical
- **John Skaff**, Director of Business Development, CDI Engineering Solutions
- **Austin Brislin**, Manager-USGO Safety, TC Energy
- **Prentice Cline Jr.**, Area Director, OSHA Charleston Area Office





College Staff





Husein Al Qawasmi - Instructional Technologist. Mr. Al Qawasmi earned his M.S. in Information Systems from Marshall University in 2005. He resides in Huntington and his personal interests include reading, traveling, community/volunteer work, puzzles, and PC games.



Penny Basenback - Administrative Secretary, Senior. From Proctorville, Ohio, Penny has a Regents Bachelor of Arts degree with a minor in History from Marshall University. Her personal interests include travel and reading crime novels.



Tanner G. Drown - Serves as the Co-Op Coordinator for the College of Engineering and Computer Sciences at Marshall University. In March of 2020, he began this role to create and implement a formalized Co-Op program that supports young professionals in gaining work experience. He earned his B.A. and M.A. degree in Leadership Studies from Marshall University. Originally from Wayne County, West Virginia, Tanner is an avid supporter of students and is dedicated to ensuring they become successful upon graduation.



Hallie R. Evans - Administrative Associate. Hallie attended Mountwest Community and Technical College and Marshall University. She lives in Lavalette, WV, and is a dog-lover (Yorkie) who enjoys True Crime TV shows, collecting vintage vinyl records and taking hikes.



Camella "Cammy" Holley - Business Manager I. Cammy earned an Associate Degree of Applied Science in Secretarial Administration from Ashland Community and Technical College in Ashland, KY. She lives in Catlettsburg, KY, and her interests include camping, gardening and spending time with her grandkids.



Patrick Quinlan, Jr., E.I. - Engineering Technician Laboratory Supervisor. He earned a BSCE (Minor in Mathematics) from West Virginia Institute of Technology in Montgomery, WV. From Salem, OR, his professional interests include research, roadway design, lab testing, and materials testing. His personal interests include spending time with family, fishing, writing, playing/writing/listening to music, biking, hiking, and camping.

Dr. Anthony “Tony” Szwilski Retires

Dr. Anthony “Tony” Szwilski wore many hats during his tenure at Marshall University’s College of Engineering and Computer Science. Dr. Szwilski held countless positions, including Chairperson of Applied Science and Technology; Interim Chairperson of Mechanical Engineering; Director of the Center for Environmental, Geotechnical, and Applied Science; Interim Chairperson of the Division of Computer Science; Interim Dean of the College of Information Technology and Engineering; and Professor of Engineering.

Over the years, Dr. Szwilski’s work impacted not only the students, but the staff, university and community in which he served. Moreover, Dr. Szwilski received his PhD in Geomechanics (Mining) and BSc (Honors) in Mining Engineering from the University of Nottingham, UK, obtained an Executive MBA from Xavier University in Cincinnati in 1986, and was a graduate of the Mine Safety and Health program at the MSHA Academy at Marshall University. He was a professionally registered mining engineer in the U.S. (PE), European Engineer (Eur Ing), and Chartered Engineer (CEng) in the United Kingdom. He also has mine management certification: Surface Mine Manager and Underground Mine Manager (Alberta, Canada 1979).

In addition, he has held academic and consulting positions in the U.S. and internationally, including the Department of Mining Engineering at the University of Kentucky; the Department of Mineral Engineering at the University of Alberta in Canada; the Chief Technical Advisor for Mine Safety & Health in China; the United Nations-International Labor Office in China; Technical Advisor to the Mining Industry of Peru for the British Ministry of Overseas Development and in Zambia, the Nchanga Copper mine with Anglo-American Mining Corporation. He served as mine management apprentice with the National Coal Board in the United Kingdom. Dr. Szwilski has shared his knowledge with others as he has written over 100 journals, conference papers and books (which he helped edit). Furthermore, he was awarded a patent as co-inventor of a Railroad Surveying and Monitoring System (2012) – U.S. (Award # 818059-0 B2), and holds the Canadian patent. Although we hope that Dr. Tony Szwilski enjoys his retirement, we do hope to still see him at the College of Engineering and Computer Sciences from time to time as he will be greatly missed by all.



Society of Women Engineers (SWE)

The Society of Women Engineers seeks to empower women to achieve their full potential in careers as engineers and leaders, to expand the image of the engineering and technology professions as a positive force in improving the quality of life, and to demonstrate the value of diversity and inclusion.

Goal 1: Professional excellence – SWE will develop women engineers at all stages of their personal and professional lives.

Goal 2: Globalization – SWE will be recognized as a global, inclusive organization that promotes diversity and inclusion and serves women engineers wherever they are.

Goal 3: Advocacy – SWE will advocate for the inclusion and success of women, both present and prospective, in engineering and technology.

Goal 4: SWE will champion diversity in the engineering and technology professions and promote an inclusive environment.

Faculty Publications



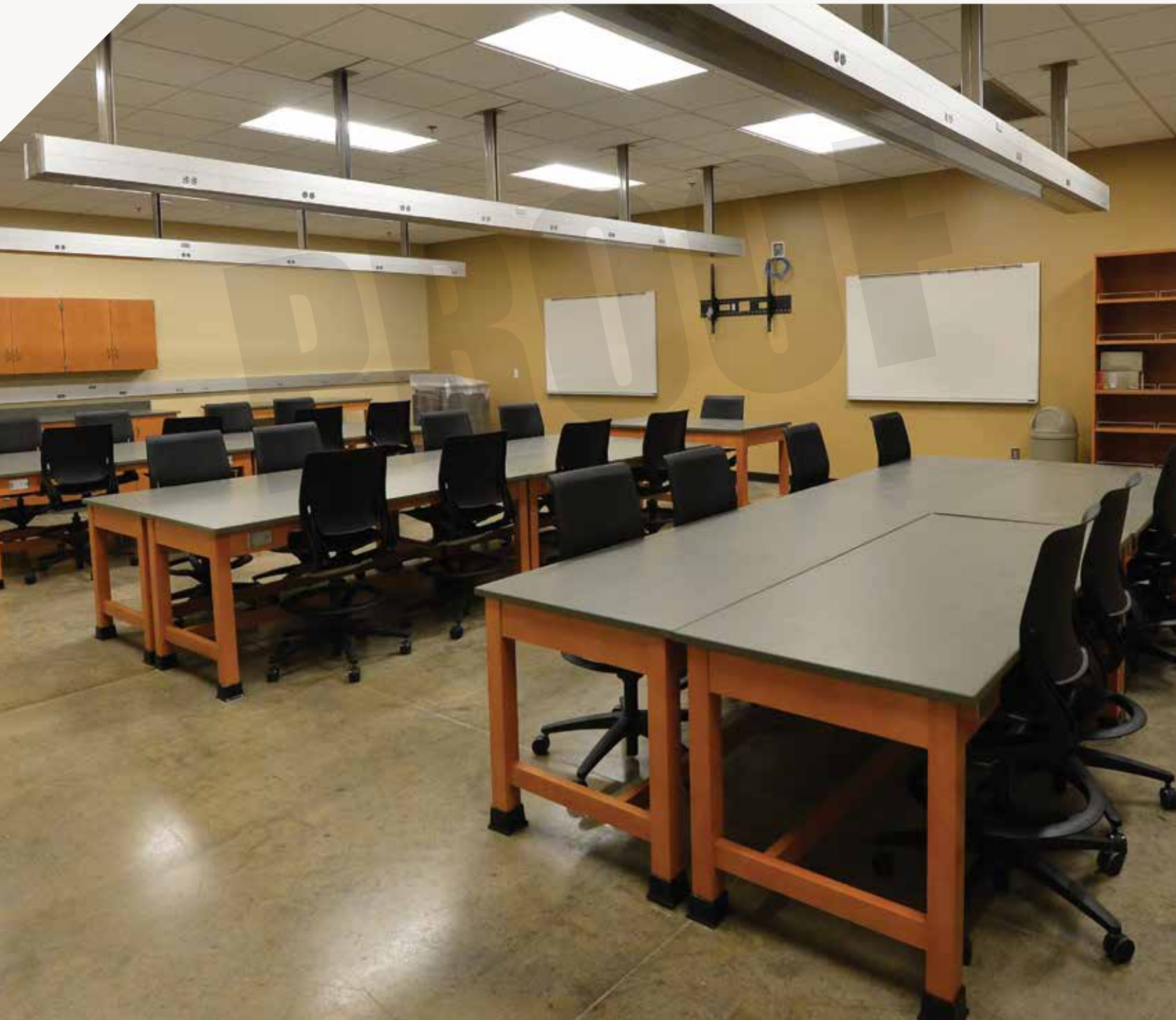
1. Awolusi, I., Marks, E., Hainen, A., & Alzarrad, A. (2022). Incident Analysis and Prediction of Safety Performance on Construction Sites. *CivilEng*, 3(3), 669-686.
2. Alzarrad, A., Emanuels, C., Imtiaz, M., & Akbar, H. (2021). Automatic Assessment of Buildings Location Fitness for Solar Panels Installation Using Drones and Neural Network. *CivilEng*, 2(4), 1052-1064.
3. Hatamleh, M.T., Moynihan, G.P., Batson, R.G., Alzarrad, A., & Ogunrinde, O. (2021). Risk Assessment and Ranking in the Developing Countries' Construction Industry: The Case of Jordan. *Engineering, Construction and Architectural Management*, Vol. (ahead-of-print) No. (ahead-of-print), 9969-9988.
4. Alzarrad, A., Akbar, H., Awolusi, I., & Song, S. (2022, April 20-23). The Effects of COVID-19 on the Safety Procedures of Construction Workers: A Survey. The proceeding of the 58th Annual Associated Schools of Construction International Conference. Georgia Tech, Atlanta, Georgia.
5. Alzarrad, A., Akbar, H., Awolusi, I., & Song, S. (2022, April 20-23). E-procurement Practices in The U.S. Construction Industry. The proceeding of the 58th Annual Associated Schools of Construction International Conference. Georgia Tech, Atlanta, Georgia.
6. O'Leary, J., Awolusi, I., Alzarrad, A., & Nnaji, C. (2022, April 20-23). Eco-efficient Construction: The Utilization of Nanotechnology and 3D Printing in the Sustainable Building Practices of the AEC Industry. The proceeding of the 58th Annual Associated Schools of Construction International Conference. Georgia Tech, Atlanta, Georgia.
7. Waugaman, H., Alzarrad, M.A., Bryce, J. (2022, Mar 9-17). Cost Estimate Risk Factors in US Army Corps of Engineers' Emergency Streambank Protection Projects. Proceedings of the ASCE Construction Research Congress 2022 Conference, Arlington, Virginia.
8. Song, S., Alzarrad, M.A., Kim, S. (2022, Mar 9-17). Improving BIM Integration and Implementation in Construction Education. Proceedings of the ASCE Construction Research Congress 2022 Conference, Arlington, Virginia.
9. Zatar, W., Alzarrad, M.A., Nguyen, T.T., & Nguyen, H.D. (2021, Nov 1-5). Artificial Neural Network Utilization for Nondestructive Testing and Evaluation of Concrete Structures. ACI 2021 Virtual Concrete Convention: The Concrete Industry in the Era of Artificial Intelligence. Virtual Conference.
10. Hossain, M., Miah, S., Alzarrad, M.A., Wolfe, K., Dial, A., Keys, C., Spaunhorst, M., & Merrill, N. (2021, June 8-10). On the Adoption of 5G Cellular Network Using Small Cells in Transportation Infrastructure. Proceedings of the International Conference on Transportation and Development, Virtual Conference.
11. Cockerham, C., Caruthers, A., McCloud, J., Fortner, L.M., Youn, S., and McBride, S.P., Azo-Dye-Functionalized Polycarbonate Membranes for Textile Dye and Nitrate Ion Removal. *Micromachines*, 13(4), p.577. 2022.
12. Oruc, A., Fulks, C., Adams, T., Kim, D.H., Youn, S., and Na S., "New energy partitioning method in essential work of fracture (EWF) concept for 3-D printed high density polyethylene blends." Virtual Presentation, The 2022 World Congress on Advances in Civil, Environmental, & Materials Research (ACEM22), Seoul, South Korea, Aug, 2022.
13. Ball, A., Youn, S., and Na, S., "Effects of activated carbon on the compressive strength and air content of Portland cement concrete." Virtual Presentation, The 2022 World Congress on Advances in Civil, Environmental, & Materials Research (ACEM22), Seoul, South Korea, Aug, 2022.
14. Youn, S., Song, H., and Lee, S., "SEM Image Analysis for Activated Carbon to Correlate Adsorption Kinetics of Methylene Blue." Virtual Presentation, ACS Fall 2021 National Meeting & Expo, Atlanta, GA., Aug, 2021.
15. Oruc, A., Fulks, C., Adams, T., Kim, D.H., Youn, S., and Na S., "New energy partitioning method in essential work of fracture (EWF) concept for 3-D printed high density polyethylene blends." Virtual Presentation, The 2022 World Congress on Advances in Civil, Environmental, & Materials Research (ACEM22), Seoul, South Korea, Aug, 2022.
16. Ball, A., Youn, S., and Na, S., "Effects of activated carbon on the compressive strength and air content of Portland cement concrete." Virtual Presentation, The 2022 World Congress on Advances in Civil, Environmental, & Materials Research (ACEM22), Seoul, South Korea, Aug, 2022.
17. Bryce, J., Ilnat, Z. (2022). Improved models of solar radiation and convective heat transfer for pavement temperature prediction. *International Journal of Pavement Engineering*, Vol. 23, No. 7, pp. 2123-2134.
18. Jarrell, A., Bryce, J. (2022). Effect of climate change on asphalt pavement strains. Presentation at the 101st Annual Meeting of the Transportation Research Board of the National Academies of Science, Engineering and Medicine, January 9 through 13, Washington, DC.
19. Bryce, J. (2022). Using optimization to calculate the effects of deferred maintenance. Presentation at the 11th International Conference on Managing Pavement Assets, June 7 through 10, Chicago, IL.
20. Rada, G., Bryce, J. (2022). Timing of preservation treatments on asphalt concrete pavements. Presentation at the 11th International Conference on Managing Pavement Assets, June 7 through 10, Chicago, IL.
21. Shoemaker, E., Randolph, H., Bryce, J. and Narman, H. (2021). Designing crowdsourcing software to inform municipalities about infrastructure condition. Proceedings of the 18th International Conference on Smart Communities: Improving Quality of Life Using ICT, IoT and AI (HONET), Institute of Electrical and Electronics Engineers (IEEE), pp. 38-43.
22. Cornett, T., Chattopadhyay, A. P., & Esmaeilpour, M. (2021, November). A Parametric Study of Piezoelectric Energy Harvesting by Vortex Induced Vibration of a Pair of Cylinders. In ASME International Mechanical Engineering Congress and Exposition (Vol. 85543, p. V001T01A019). American Society of Mechanical Engineers.
23. Hebert, T. R., Bryce, J. M., & Chattopadhyay, A. P. (2022, August). On the absorbing boundaries to replicate semi-infinite half-space in numerical seismic analyses using the finite element method. In Second International Meeting for Applied Geoscience & Energy (pp. 2576-2580). Society of Exploration Geophysicists and American Association of Petroleum Geologists.

24. Michaelson, G. K., Barth, K. E., Tennant, R. M., Woldegabriel, B. T. (2022). Field Investigations and Behavioral Assessments of Press-Brake-Formed Tub Girders. 11th International Conference on Short and Medium Span Bridges.
25. Barth, K. E., Michaelson, G. K., Tennant, R. M., Woldegabriel, B. T. (2022). Assessment of Live Load Distribution Factors in Press-Brake-Formed Tub Girder Bridges. 11th International Conference on Short and Medium Span Bridges.
26. B Ma, Y Wang, G Chen, Event-triggered type-2 fuzzy-based sliding mode control for steer-by-wire systems, *Mechatronics*, Volume 82, April 2022, 102704 (impact factor 3.6)
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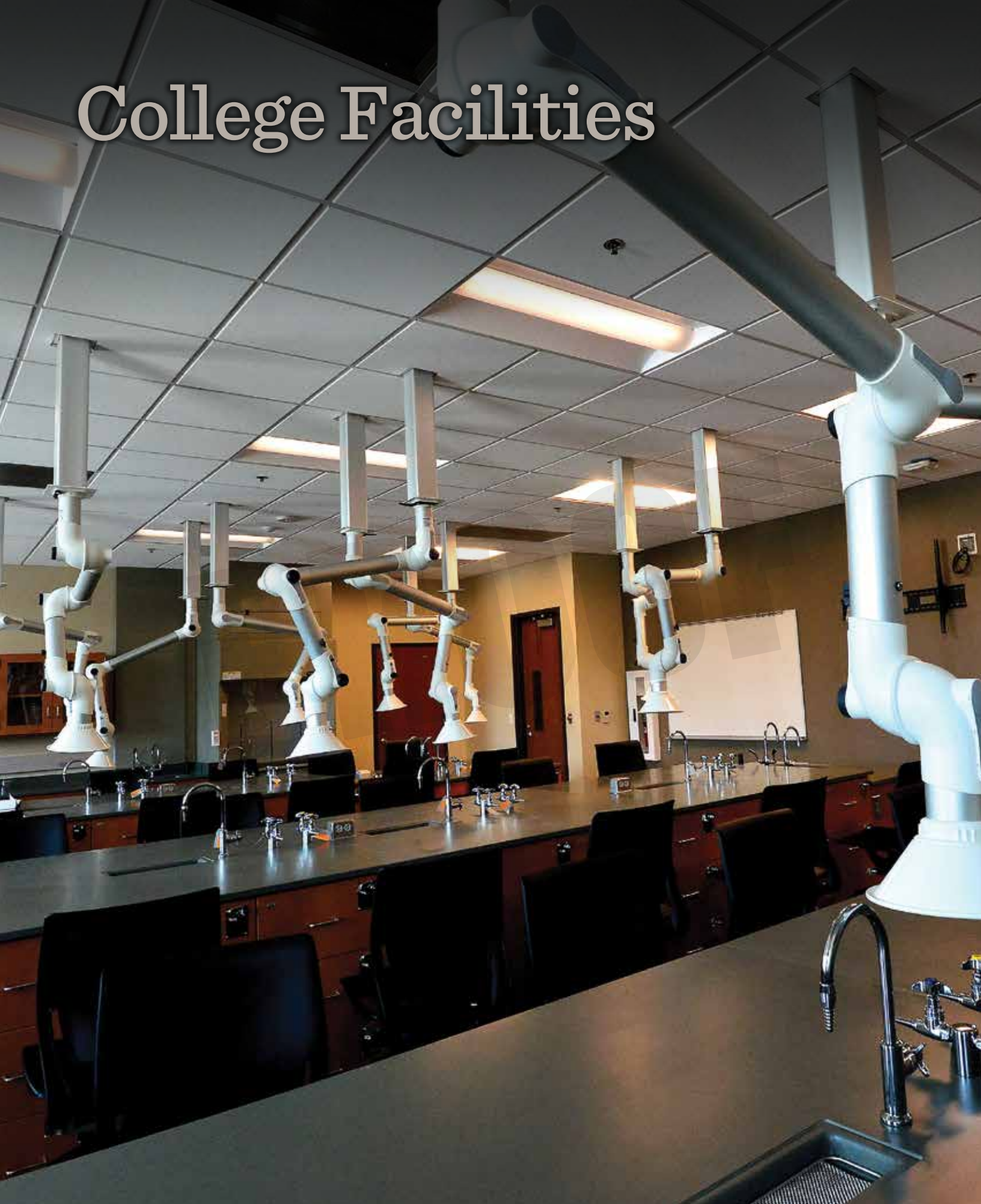
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College Facilities





The College of Engineering and Computer Sciences (CECS), including the departments of Biomedical Engineering, Civil Engineering, Mechanical and Industrial Engineering, and Computer Sciences and Electrical Engineering have been housed in the Weisberg Applied Engineering Complex (WAEC) since 2015. The WAEC is a state-of-the-art multi-story facility organized to promote collaboration between the university's colleges and research corporations. It houses six different academic and research programs that include the College of Engineering and Computer Sciences, Mathematics & Computational Sciences, Computer Modeling & Digital Imaging, and the Marshall University Research Corporation (MURC). It also houses faculty offices, classrooms, and many science, engineering, and computer laboratories. Laboratory functions include traditional wet bench biological sciences, dry technology development laboratories and applied engineering laboratories. CECS occupies over 21,000 square-feet of laboratory, office and support space. The WAEC provides space for offices to accommodate all CECS academic and administrative functions. In addition to the WAEC, the college has continued to occupy the Weisberg Engineering lab (WEL), a 13,000-square-foot structure completed in 2008 to meet the critical need for engineering labs space on campus and two labs for electrical engineering in the Gullickson Hall (GH05 and 206A). The WEL was the first building on the Marshall Campus constructed specifically for engineering. It is a space designed for flexible use so that it can accommodate a large lab, or several small labs. At the current time, about half of this large space is used as a manufacturing/machine-shop/capstone lab for the civil and mechanical engineering students. It also houses the Robotic and Autonomous Control lab, and an Electrical Engineering Capstone lab in support of the Electrical Engineering program. The other half is used as a soils and civil engineering materials lab.

Classrooms

CECS currently has a total of six dedicated classrooms and four computer labs in the WAEC and WEL.

The classrooms are designed to accommodate 32-96 students. Two computer labs are used primarily for engineering courses. They have a capacity of 36 students each. Classrooms each have an instructor station and projection capabilities.

The WAEC and WEL include spacious, well-lit collaboration areas for students including 17 computer-huddle stations. Tables and comfortable chairs are provided in the large lobby area for students to gather and work on homework. The collaboration space is heavily used, and the tables are rarely empty.

Laboratories

The WAEC has designated spaces for the following engineering labs: Advanced Materials Testing lab, Environmental lab, Thermal Engineering lab, Hydraulics and Pneumatics lab, Fluids and Hydraulics lab, Controls and Instrumentation lab, Industrial Controls lab, Circuits and PLC lab, and a Machine-shop. The WEL has civil engineering materials and soil, 3-D printing, manufacturing machine-shop/capstone labs, Robotic and Autonomous Control lab, the Electrical Engineering Capstone Lab, and a Visualization Lab. The Gullickson Hall (GH) houses two Electrical Engineering labs. The first lab is designated for the electric power and energy conversion GH 05). While the second lab (GH 206A) is designated for the communications, electronics, microprocessors and microcontrollers.

An assessment is conducted each year to ensure that the appropriate equipment is available for the upcoming academic offerings in engineering. An annual evaluation of equipment is conducted each summer. Should replacement equipment be needed for the upcoming academic year, it is ordered through the standard purchasing system. There are funds designated for future maintenance in the operating budget. See Appendix C - Equipment for a list of major instructional and laboratory equipment.



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