Founding a New College of Engineering at Illinois State University: An Overview of the Department of Electrical Engineering

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Dr. Umar Iqbal is an Associate Professor of Electrical Engineering and a Founding Faculty Member of the College of Engineering at Illinois State University. He specializes in autonomous systems, multi-sensor integration, robotics, control, and intelligent navigation, with over 15 years of interdisciplinary experience. His research contributions include MEMS-based inertial systems, GNSS-challenged navigation, radar, LiDAR, and sensor fusion, resulting in over 50 publications and 1,050+ citations (h-index 17). Dr. Iqbal has secured more than $1.5 million in competitive funding and collaborated with industry leaders and research institutes to advance intelligent sensing technologies.

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worked for University of Maine as Chair of Electrical & Computer Engineering. In 2023, Dr. Devabhaktuni joined the College of Engineering at Illinois State University as the Founding Chair of Electrical Engineering. He secured external funding close to $5M. He co-authored more than 250 peer reviewed papers with high citation indices. His interdisciplinary research interests include applied electromagnetics, biomedical applications, computer aided design, device modeling, image processing, infrastructure monitoring, neural networks, RF/microwave design, unmanned aerial vehicles, and virtual reality. He graduated more than 75 theses students at MS and PhD levels and won teaching excellence awards.

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Abstract

To address the critical shortage of engineering professionals, particularly from minorities and underrepresented groups, Illinois State University (ISU) has established a new College of Engineering with programs in Electrical Engineering (EE), General Engineering, and Mechanical Engineering. This paper provides an overview of the EE program's development, emphasizing its innovative curriculum, strategic industry partnerships, and commitment to hands-on learning. The program distinguishes itself by integrating experiential learning from the outset, incorporating interdisciplinary coursework, fostering collaborations with regional industries, and requiring real-world project applications. This approach aligns with ISU's broader strategic vision of promoting diversity and fostering innovation by creating accessible pathways for students from varied backgrounds. The paper also addresses the key challenges encountered during the program's establishment, including infrastructure development, faculty recruitment and retention, and the ongoing adaptation of pedagogy to meet evolving industry needs. By leveraging strong regional industry partnerships and state-of-the-art facilities, ISU aims to establish a forward-thinking engineering education model that prepares graduates to excel in a rapidly changing technological landscape.

Introduction

Establishing a new College of Engineering at Illinois State University (ISU) directly addresses the critical shortage of engineering professionals in Illinois and nationwide, particularly from diverse backgrounds. As a key component of ISU's strategic plan, "Excellence by Design: 2024-2029," this initiative aims to create a pipeline of highly skilled, industry-ready graduates. This paper serves as a case study for other institutions considering similar programs, focusing on the development of ISU's Electrical Engineering (EE) program, its curriculum, industry collaborations, commitment to diversity, and the challenges encountered.

By strategically leveraging its existing resources and academic expertise, ISU aims to become a regional leader in STEM education. The College of Engineering represents a significant institutional investment in cutting-edge facilities, research opportunities, and practical learning experiences, ensuring graduates are well-prepared for the challenges of the 21st-century engineering workforce. The college's founding underscores ISU’s commitment to innovation, diversity, and excellence, creating pathways for students from varied backgrounds to thrive in this essential field [1], [2].

Background and Strategic Vision

Approved by the Illinois Board of Higher Education in 2022, the creation of the College of Engineering aligns with ISU's strategic vision to expand academic offerings and contribute directly to regional and national workforce development [3]. This initiative addresses a critical need for engineering talent in central Illinois, providing new opportunities for students and fostering partnerships with key industries, including Rivian, Caterpillar, and GE Vernova. The college will be housed in state-of-the-art facilities at 1709 General Electric Road in Bloomington, IL, serving as hubs for research and learning [4], [5], [6].

The College of Engineering's location in Bloomington-Normal facilitates close collaboration with industry partners, creating opportunities for joint research projects, internships, and co-op experiences that benefit students and local businesses directly. This proximity to key industries is a strategic advantage. Figure 1 visually represents the increasing trend of total enrollment at Illinois State University from Fall 2020 to Fall 2024. This upward trajectory, culminating in a projected 21,546 students in Fall 2024, underscores the growing demand for educational opportunities and directly supports the need for the new College of Engineering to meet regional workforce demands [2], [7].

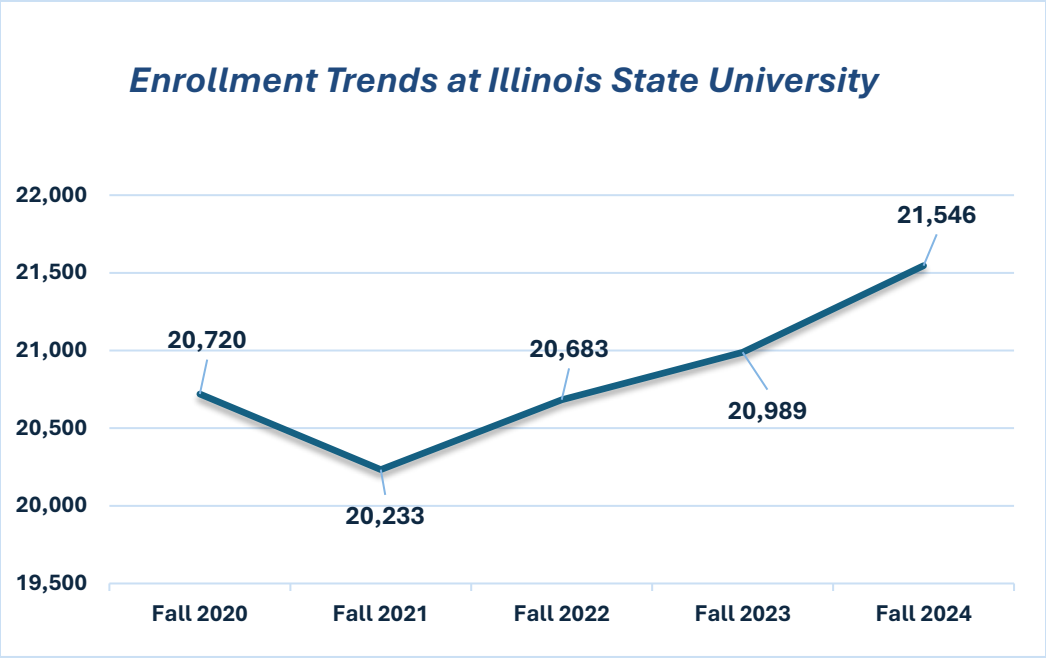

Figure 1: Enrollment Trends at Illinois State University (2020–2024)[7]

ISU's strategic vision encompasses sustainability and innovation, aiming to meet enrollment demands while fostering forward-thinking initiatives. The new engineering facilities are designed with environmentally friendly principles, incorporating renewable energy sources and advanced building management systems. This reflects the university's commitment to creating a sustainable, future-ready campus and demonstrates leadership in green campus initiatives. Furthermore, ISU's

long-term strategy includes establishing articulation agreements and transfer pathways with regional community colleges. This ensures that students from diverse educational backgrounds have equitable access to engineering education.

To ensure the long-term success and sustainability of the College of Engineering, Illinois State University has implemented a comprehensive faculty recruitment and retention strategy. The hiring plan prioritizes attracting diverse faculty with strong industry and research backgrounds and professional development opportunities. Additionally, ISU is committed to faculty mentorship programs, industry collaborations, and ongoing participation in professional organizations such as ASEE to foster continuous growth and innovation within the engineering faculty [8].

Curriculum Structure and the Electrical Engineering Program:

The College of Engineering offers programs in General, Electrical, and Mechanical Engineering, all distinguished by a curriculum that prioritizes hands-on learning, interdisciplinary projects, and industry-relevant coursework. ISU's approach departs from traditional engineering programs that often emphasize theory in the early years. Instead, practical, experiential learning is integrated from the outset [9].

Foundational courses, such as "Engineering Explorations" and "Introduction to Engineering Design," are designed to immediately engage students in hands-on projects and problem-solving activities [1], [10]. These are not simply introductory surveys; they involve active design and building experiences. This early and consistent exposure to design and prototyping continues throughout the program. Laboratory courses, integrated with lectures, reinforce theoretical concepts in subsequent years. The curriculum culminates in team-based senior capstone projects. These capstone projects frequently address authentic engineering challenges, often in collaboration with industry partners, providing students with invaluable real-world experience. This approach, embedding industry partnerships, internships, and co-op experiences throughout the student journey, ensures graduates possess both technical knowledge and practical problem-solving abilities, making them highly competitive in the job market.

The EE curriculum prepares students for real-world applications, with a strong emphasis on core electrical engineering principles. To promote interdisciplinary learning, EE students are actively encouraged to take elective courses from related departments, including Mechanical Engineering, General Engineering, and the School of Information Technology [10]. This fosters cross-disciplinary collaboration and allows students to broaden their technical expertise. Senior design projects are often structured to require students to work in diverse, interdisciplinary teams, applying their collective knowledge to solve complex, real-world problems. This approach cultivates not only technical expertise but also crucial communication, teamwork, and project management skills, all essential for success in the modern engineering landscape [11], [12]. The inclusion of elective courses in emerging and high-demand areas like artificial intelligence (AI) and Robotics ensures that graduates are well-versed in the latest technologies and prepared for roles in cutting-edge industries.

Moreover, the program's structure allows for flexible learning pathways, ensuring students can specialize in areas aligned with their career aspirations. Whether focusing on renewable energy, advanced robotics, or embedded systems, the curriculum fosters depth and breadth of knowledge [12], [13]. To complement formal coursework, the program integrates co-curricular activities such as hackathons, design competitions, and student chapters of professional organizations (e.g., IEEE). These activities further enrich the learning experience, allowing students to apply their skills in practical, competitive settings and build valuable professional networks.

The program also includes a mentorship model where students are paired with faculty and industry mentors [14]. These mentorship opportunities provide guidance on academic and career decisions and expose students to professional networks that enhance their post-graduate opportunities. By fostering such connections, the EE program ensures its graduates are well-prepared to contribute to the global engineering community.

The College of Engineering is committed to rigorous and comprehensive assessment of both student learning and overall program effectiveness. A structured framework is in place, utilizing multiple assessment methods:

- Coursework Performance: Regular assessment of student understanding and mastery of concepts through homework assignments, quizzes, and examinations.
- Senior Design Projects: Thorough evaluation of capstone projects, many of which are directly sponsored by industry partners, providing a realistic assessment of students' ability to apply their knowledge to solve real-world problems.
- Internship Evaluations: Formal feedback from industry supervisors on student performance during internships and co-op experiences, providing valuable insights into students' practical skills and professional readiness.

The EE program is designed to fully align with ABET accreditation criteria, ensuring that graduates meet the standards of engineering education. Continuous program improvement is driven by the regular and systematic collection of feedback from multiple stakeholders, including employers, alumni, and industry partners. This feedback is actively used to refine curriculum offerings, update laboratory resources, and align strongly with evolving workforce demands and technological advancements.

Hands-On Learning and Facilities

As part of ISU's long-term vision, the College of Engineering is committed to expanding laboratory facilities, research spaces, and interdisciplinary collaboration hubs. Plans include the development of state-of-the-art smart classrooms, advanced simulation labs, and specialized research centers [15]. Experiential learning is a core principle across all ISU engineering programs. Laboratories will have industry-standard equipment, including Tektronix oscilloscopes, Keysight multimeters, programmable logic controllers (PLCs), hardware-in-the-loop (HIL) systems, and advanced

robotics platforms. From MATLAB programming courses to practical labs in circuits, digital design, embedded systems, data-driven controls, machine learning, power electronics, and robotics, students gain direct experience in applying theoretical concepts [16], [17]. Currently, all lab sessions will be conducted in person, and students will have access to cutting-edge simulation software through the facilities, enabling them to model and test complex systems before building physical prototypes.

The facilities include over 100,000 square feet of learning and research space. These spaces support interdisciplinary collaboration and innovation, aligning with recommendations from the *Engineering Mindset Report* for flexible and inclusive learning environments [2], [10]. Adding collaborative workspaces and maker labs encourages creativity and teamwork, fostering a culture of innovation among students.

Additionally, ISU's investment in robotics and automation technologies allows students to engage in cutting-edge projects. Integrating advanced laboratory equipment ensures that students remain at the forefront of technological advancements, equipping them with skills that directly translate to industry demands [16], [17]. The robotics lab, for instance, includes programmable robots, drones, and autonomous vehicles, providing hands-on experience in automation and control systems.

One notable feature is the emphasis on project-based learning. Students collaborate on interdisciplinary projects, utilizing MATLAB and Multisim to prototype solutions. This approach enhances technical skills and cultivates creativity and problem-solving abilities [16], [17]. Capstone projects often involve collaboration with local industries, allowing students to work on real-world challenges while building professional networks. Table 1 provides an example breakdown of core and elective courses in the Electrical Engineering program.

Table 1: Sample Electrical Engineering Curriculum Structure

Year	Core Courses	Electives	Hands-On Projects
1	Introduction to Engineering Design	Internship in EE	Arduino and obotics projects.
2	Analog and Digital Circuits	Independent Study	Circuit Simulation, Embedded Systems/Microcontroller Lab
3	Electronics, Power, Control Systems	Machine Learning for Engineers	Electronics labs, Smart Grid Simulations
4	Capstone Project	Robotics and AI	Industry-Sponsored Projects

Moreover, the College of Engineering has introduced a lab system designed to enhance specialization, allowing students to select projects based on their interests. These projects cover advanced topics like applications in embedded systems, real-time control of robotic platforms, and

renewable energy grid simulations. This flexibility ensures students can tailor their education to match industry demands and personal career goals.

Broadening Access and Supporting Student Success

Illinois State University's College of Engineering is committed to fostering an inclusive academic environment that supports student success across all backgrounds. In alignment with national best practices in engineering education, the program emphasizes flexibility, access, and opportunity through its curriculum design, outreach efforts, and support systems [2].

Access-enhancing strategies include merit-based scholarships, collaboration with student organizations such as the Society of Women Engineers (SWE) and the National Society of Black Engineers (NSBE), and targeted advising to promote academic progression and timely degree completion. These measures contribute to an inclusive learning environment and support ISU's broader goal of cultivating a STEM workforce that reflects the diversity of the surrounding community [18], [19]. These initiatives also build on research demonstrating that structured onboarding and early academic support for transfer and first-generation students can significantly improve retention and success in engineering pathways [20].

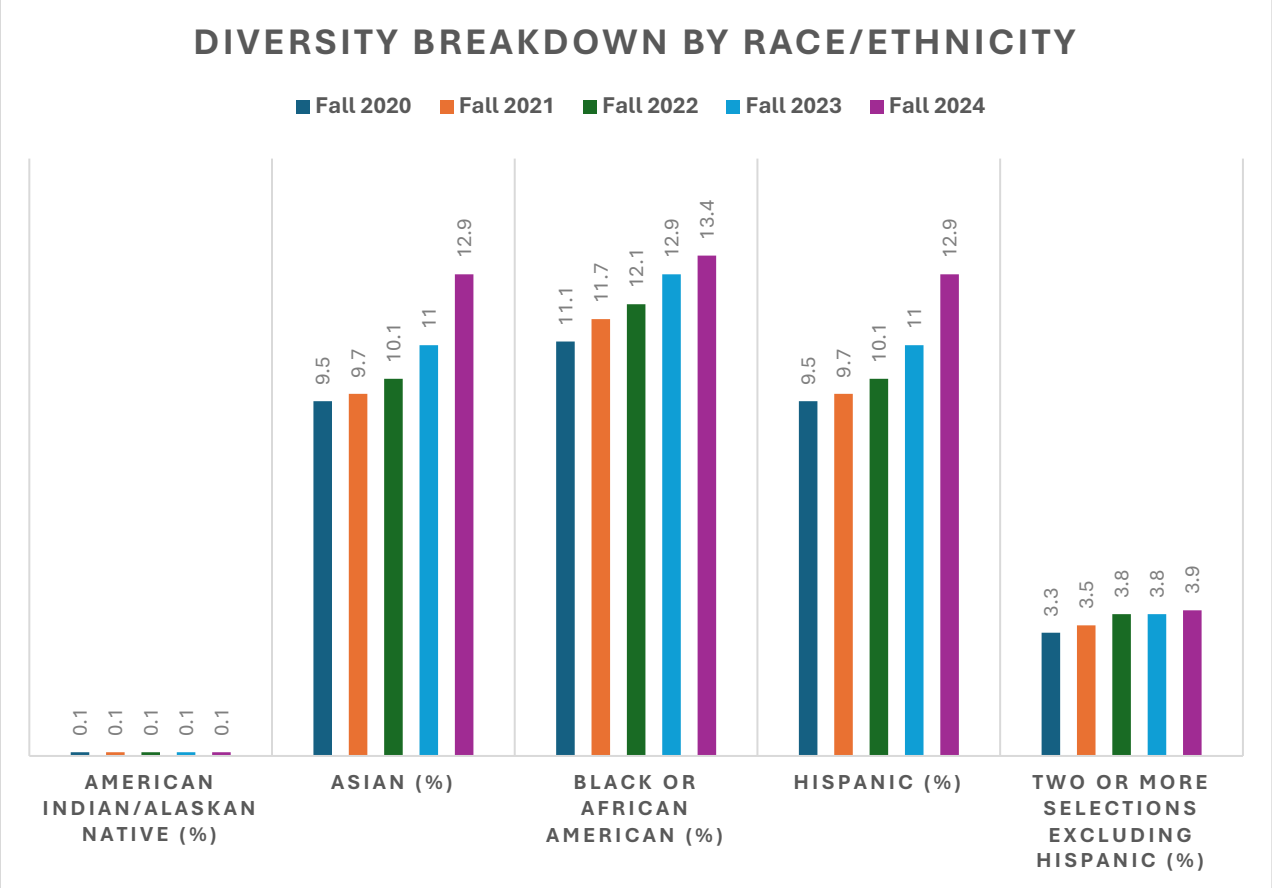

Figure 2: Diversity Trends at Programs [18]

The College actively partners with regional high schools and community colleges to expand awareness of engineering careers. Outreach activities, including hands-on demonstrations and mentoring, have proven effective in encouraging broader participation in STEM [18]–[21]. Additionally, the curriculum design draws on prior experience with vertically integrated course sequences, which reinforce skill development from foundational to advanced levels [22].

Courses that address global and ethical engineering dimensions help students understand their work's societal impacts and the diverse communities they may serve [10]. Beyond the classroom, student-led organizations enrich the academic experience by offering peer mentoring, technical enrichment, and leadership opportunities.

As shown in Figure 2, ISU has experienced steady growth in enrollment among students identifying as Asian, Black or African American, and Hispanic. This trend reflects the university's ongoing efforts to expand access and opportunity within STEM fields. The College of Engineering continues to welcome students from a broad spectrum of experiences, supporting Illinois State University's larger mission of educational opportunity and regional workforce development.

Industry Alignment and Economic Contributions

The College of Engineering significantly strengthens ISU's connections with industry, particularly within central Illinois. ISU's strategic location provides students access to major engineering firms, including ADM, Caterpillar, GE Vernova, and Rivian. This proximity facilitates robust co-op and internship programs, preparing students for careers in high-demand sectors. ISU's approach, embedding real-world projects from the freshman year, contrasts with traditional engineering programs and ensures graduates possess practical, industry-ready skills. This pedagogical model aligns with the American Society for Engineering Education's (ASEE) emphasis on experiential learning as a cornerstone of modern engineering education. Industrial internships are integrated into the curriculum for course credit, reinforcing the practical application of engineering principles and preparing students for technically demanding careers. The program's focus on renewable energy and smart grid technologies also aligns with state and national priorities for sustainability [4], [5].

The College of Engineering's economic impact extends beyond individual student success to the broader community. ISU directly contributes to regional economic growth and innovation by producing a highly skilled workforce. Furthermore, the college's partnerships with local industries foster collaborative research and development (R&D), driving advancements that benefit both academia and the business sector [2], [5].

These collaborations often result in tangible benefits, such as innovative product development and improved industrial processes. For instance, partnerships with electric vehicle manufacturers like Rivian have led to co-creating projects focused on sustainable transportation solutions [4], [5]. Furthermore, ISU's focus on industry-relevant certifications ensures that graduates are immediately employable, with skills that meet current market demands.

ISU has developed an Industry Advisory Board composed of leaders from diverse sectors, including energy, healthcare, and advanced manufacturing. This board plays a crucial role in shaping the curriculum, ensuring alignment with industry standards and emerging trends. Regular feedback helps the College of Engineering stay ahead in offering relevant and impactful education.

Challenges and Opportunities

The establishment of the College of Engineering at Illinois State University (ISU) has encountered both anticipated and unforeseen challenges. These challenges, however, have also spurred innovation and strategic adaptation across various facets of the college's development.

One primary hurdle involved facility acquisition and adaptation. Initial plans centered on renovating existing campus buildings to house the new college. However, escalating construction costs and evolving site requirements necessitated a strategic shift. The university acquired a new property on General Electric Road in Bloomington, approximately 3 miles from the main ISU campus. While this move presented logistical complexities, it ultimately addressed critical space needs. Furthermore, it contributes to revitalizing the area, transforming a potential vacancy into a vibrant educational hub with classrooms, labs, and collaborative workspaces [23].

Significant financial constraints have presented ongoing challenges to the college's development. In response to a projected structural deficit, ISU implemented a university-wide budget cut for the current fiscal year and a pay freeze. These necessary measures, while impacting all departments, have had implications for resource allocation within the new College of Engineering, affecting faculty recruitment and infrastructure development. The university actively pursues external funding sources, including grants and industry partnerships, to mitigate these financial impacts. A notable example of this effort is the $1 million commitment from Archer-Daniels-Midland Company (ADM). These funds are specifically designated for scholarships to recruit undergraduates from central and eastern Illinois and faculty fellowships to attract and retain high-caliber faculty, ensuring the college can build a strong academic foundation [24].

Attracting and retaining a diverse and highly qualified faculty is essential for the success of any new engineering program and is particularly challenging in the current competitive environment. ISU is addressing this through a multi-pronged approach. This approach includes targeted recruitment efforts, focusing on individuals with strong academic credentials and relevant industry experience. Competitive compensation and benefits packages are being offered, alongside robust faculty development programs, including mentorship and support for attending professional development opportunities. Also, fostering an inclusive work environment is a priority.

Adapting Pedagogy to modern educational needs is another challenge. The college is exploring innovative teaching methods and integrating virtual and augmented reality technologies to enhance learning experiences and attract a broader student base [2], [12].

Conclusion

The establishment of the College of Engineering at Illinois State University represents a significant advancement in engineering education. It addresses critical workforce demands, especially for diverse talent, and drives regional economic growth. ISU is creating a pipeline of highly skilled, industry-ready graduates by offering robust Electrical, Mechanical, and General Engineering programs, investing in state-of-the-art facilities, and cultivating strong industry partnerships. The college's commitment to diversity, inclusion, and hands-on, project-based learning ensures graduates are technically proficient and prepared to contribute meaningfully to society.

As ISU welcomes its inaugural engineering cohort in Fall 2025, the College of Engineering embodies its dedication to academic excellence, technological innovation, and inclusivity. The curriculum, facilities, and partnerships carefully align with industrial and societal needs. The journey to establish the College has presented challenges, including facility acquisition, financial constraints, faculty recruitment, and pedagogical innovation. These have been met with strategic planning, community engagement, and a commitment to finding innovative solutions. The College of Engineering aspires to become a leader in engineering education, striving to provide exceptional learning experiences and contribute significantly to regional and national progress.

References

[1] Illinois State University, "Excellence by Design: 2024-2029 Strategic Plan," 2024. Available: https://strategicplan.illinoisstate.edu. Accessed on: Jan. 14, 2025.

[2] National Academy of Engineering, *Educating the Engineer of 2020: Adapting Engineering Education to the New Century*. Washington, DC: The National Academies Press, 2005. Available: https://doi.org/10.17226/11338.

[3] Illinois Board of Higher Education, "Approval of Proposal for Illinois State University College of Engineering," *Meeting Minutes*, Mar. 2022.

[4] Rivian Automotive. Available: https://www.rivian.com. Accessed on: Jan. 14, 2025.

[5] Caterpillar Inc. Available: https://www.caterpillar.com. Accessed on: Jan. 14, 2025.

[6] R. M. Lima, M. Soledad, C. L. Anderson, I. Villanueva, and J. A. Mejia, "Breaking Down the Silos: Innovations for Multidisciplinary Programs," in *Proc. of the 2023 ASEE Annual Conference & Exposition*, Baltimore, MD, 2023. Available: https://peer.asee.org/breaking-down-the-silos-innovations-for-multidisciplinary-programs.

[7] Illinois State University, "Illinois State sees total enrollment climb with largest entering class in the University's history," *News*, Sep. 2024. Available: https://news.illinoisstate.edu/2024/09/illinois-state-sees-total-enrollment-climb-with-largest-entering-class-in-the-universitys-history/. Accessed on: Jan. 14, 2025.

[8] B. G. Attinsi, A. R. Alpha, and S. K. Ofori, "Changing the Landscape of the Digital Workforce and DEI: A Call to Action for Engineering Education," in *Proc. of the 2023 ASEE Annual Conference & Exposition*, Baltimore, MD, 2023. Available: https://peer.asee.org/42697.

[9] P. K. Baidoo, I. K. Sam, E. E. K. Kwarteng, and V. K. Agyemang, "Challenge-based learning for competency development in engineering education," in *Proc. of the 2023 CIEC - 18th*

LACCEI International Multi-Conference for Engineering, Education, and Technology, Buenos Aires, Argentina, 2023, pp. 1–7, doi: 10.18687/LACCEI2023.1.1.95.

[10] Illinois State University Department of Electrical Engineering, "Electrical Engineering Program Overview." Available: https://engineering.illinoisstate.edu/electrical/. Accessed on: Jan. 14, 2025.

[11] Y. Wu, M. Nassar, and S. S. Hosseini, "Improving Multidisciplinary Understanding Through Interdisciplinary Education," in *Proc. of the 2020 IEEE Frontiers in Education Conference (FIE)*, Uppsala, Sweden, 2020, pp. 1–5, doi: 10.1109/FIE44824.2020.9274096.

[12] Illinois State University News, "University News Briefs: Implementation of New Strategic Plan Begins," Nov. 2024. Available: https://strategicplan.illinoisstate.edu/. Accessed on: Jan. 14, 2025.

[13] Illinois State University Department of Electrical Engineering, "Hands-On Learning Opportunities in Electrical Engineering." Available: https://engineering.illinoisstate.edu. Accessed on: Jan. 14, 2025.

[14] A. Walia, "What early-career researchers have to say," *IEEE Women in Engineering Magazine*, vol. 18, no. 1, pp. 10–13, Mar. 2024, doi: 10.1109/MWIE.2024.3362752.

[15] J. Ma, J. Jordan, H. Hu, and A.-V. Ledoan, "Project-Based Learning within a Large-Scale Interdisciplinary Research Effort," *arXiv preprint*, arXiv:1410.6935, 2014.

[16] Illinois State University Facilities Planning and Management. Available: https://www.wglt.org/local-news/2024-06-04/isus-plans-for-new-stem-science-lab-building-could-attract-federal-funding. Accessed on: Jan. 14, 2025.

[17] Illinois State University, "Hands-On Learning Opportunities." Available: https://illinoisstate.edu/academics/electrical-engineering/. Accessed on: Jan. 14, 2025.

[18] Illinois State University Multicultural Center, "Diversity and Inclusion in STEM Education Initiatives." Available: https://app.powerbi.com/view?r=eyJrIjoiYzU1YWNlNTAtMjQyOC00ZTliLTg3NTEtMGVkODI1ODc0Y2JlIiwidCI6IjA4NWY5ODNhLTBiNjktNDI3MC1iNzFkLTEwNjk1MDc2YmFmZSIsImMiOjN9. Accessed on: Jan. 14, 2025.

[19] A. M. K. Memon, S. A. Shaikh, H. U. Rehman, F. Shaikh, and A. A. Chandio, "Practicing equity, diversity, and inclusion (EDI) in software development teams," in *Proc. of the 2022 International Conference on Emerging Trends in Electrical, Control, and Telecommunication Engineering (ETECTE)*, Karachi, Pakistan, 2022, pp. 1–7, doi: 10.1109/ETECTE56908.2022.10005208.

[20] M. Mohammadi-Aragh, L. Strawderman, U. Iqbal, S. Brauer, D. Eakin, J. Johnson, R. Sullivan, A. Knizley, "Improving Engineering Transfer Student Onboarding and Retention through Scholarship and Programmatic Interventions" *2022 American Society for Engineering Education Annual Conference (ASEE 22)*, Minneapolis, MN, June 2022, pp. 1-5.

[21] K. A. Douglas et al., "Diversity and Inclusion in Engineering: Students' Perceptions of Learning and Engaging with Difference," in *Proc. of the 2020 ASEE Virtual Annual Conference Content Access*, Virtual, 2020. Available: https://peer.asee.org/34481.

[22] U. Iqbal, D. Salem, D. Strong, "Implementation of the Second-year course in an Engineering Professional Spine," *Proceedings of the Canadian Engineering Education Association* (CEEA), Vancouver BC, Dec. 2018, doi: https://doi.org/10.24908/pceea.v0i0.13070.

[23] Illinois State University Facilities Services, "College of Engineering Complex." Available: https://facilities.illinoisstate.edu/projects/engineering-complex/. Accessed on: Jan. 14, 2025.

[24] Illinois State University News, "ADM commits $1 million to Illinois State University's College of Engineering," Jan. 2025. Available: https://news.illinoisstate.edu/2025/01/adm-commits-1-million-to-illinois-state-universitys-college-of-engineering/. Accessed on: Jan. 14, 2025.