



Jordan University of Science and Technology
Department of Architecture, College of Architecture and Design
Irbid, Jordan

2021 Visiting Team Report
Visit Two for NAAB International Certification
14–16 June 2021

B.Sc. in Arch. (169 credit hours)

The National Architectural Accrediting Board

Date of Visit One: 04–05 November 2019

Vision: The NAAB aspires to be the leader in establishing educational quality assurance standards to enhance the value, relevance, and effectiveness of the architectural profession.

Mission: The NAAB develops and maintains a system of accreditation in professional architecture education that is responsive to the needs of society and allows institutions with varying resources and circumstances to evolve according to their individual needs.

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I. Summary of Visit

a. Acknowledgments and Observations

The team wishes to acknowledge Architecture Department Chairman Anwar Ibrahim for his work in coordinating the program's Self-Evaluation Report as well as the voluminous material in the virtual team room. There is a great deal of work that takes place behind the scenes between the program head, the NAAB, and the visiting team. The work progressed smoothly thanks in large part to the role he played along with several key faculty members and staff who worked closely with him.

Many members of the Jordan University of Science and Technology faculty and staff have been involved in this NAAB International Certification process. They have worked diligently and collaboratively toward formal recognition. The process has moved forward smoothly in large part due to the shared sense of purpose in the way that the architecture program can be enhanced through the vehicle of NAAB's Conditions and Procedures.

The visiting team applauds the program's demonstrated link between self-assessment, reflection, and planning implications that emerge from the processes in place. This link accounts for the way that the path toward NAAB International Certification has progressed thus far. Decisions, investments, and strategies will continue to be important and will evolve in the coming months and years.

The visiting team wishes to thank all of the groups with whom we met during our virtual visit; everyone provided great insights. We also note the strong support the program receives within its college and at the university leadership level as well. The professional community, through the involvement of the Consultation Board, has been tremendously helpful and engaged. They show a sense of pride in and commitment to supporting students through involvement with courses and design reviews as well as employment opportunities.

b. Conditions Not Achieved

Not Met	Not Yet Met/In Progress	Not Applicable
	A.1	II.4.4
	B.6	II.4.5
	B.7	
	B.9	

c. Items to Address

1. SPC Identification, Matrix, and Process Issues: The visiting team had challenges with the identification of coursework that fulfilled aspects of the Student Performance Criteria (SPC). Some SPCs had as many as nine courses marked on the matrix while others had one. Appendix 5 of the NAAB's material relating to Conditions and Procedures for International Certification provides guidance to programs on best practices for pointing to the greatest evidence of student achievement. These guidelines will bring clarity to future visiting teams and may have the additional benefit of helping influence curricular development and progression.

2. Assessment and Curriculum development: The visiting team found numerous cases where student work was found to be at the "understanding" level and not "ability." Important work lies ahead in further clarifying this distinction as it relates to JUST's curricular sequence and pathway toward International Certification.

II. COMPLIANCE WITH THE 2019 CONDITIONS FOR NAAB INTERNATIONAL CERTIFICATION

Part One: Institutional Support and Commitment to Continuous Improvement

This part addresses the commitment of the institution, and its faculty, staff, and students to the development and evolution of the program over time.

Part One (I): Section 1—Identity and Self-Assessment

I.1.1 History and Mission: The program must describe its history, mission, and culture and how that history, mission, and culture shape the program's pedagogy and development.

- Programs that exist within a larger educational institution must also describe the history and mission of the institution and how that shapes or influences the program.
- The program must describe its active role and relationship within its academic context and university community. This includes the program's benefits to the institutional setting, and how the program as a unit and/or individual faculty members participate in university-wide initiatives and the university's academic plan. This also includes how the program as a unit develops multi-disciplinary relationships and leverages opportunities that are uniquely defined within the university and its local context in the surrounding community.

[X] Described

2021 Analysis/Review: Jordan University of Science and Technology (JUST) is a comprehensive, state-supported university located in Irbid, 70km north of Amman, Jordan's capital city. It was established in 1986 as an autonomous national institution of higher education to graduate outstanding professionals in specializations that match the needs of Jordan and the region.

The mission is clearly described both at the institutional level and with the architecture program. This includes the delivery of a "high caliber education and professional services that contribute to the progress of knowledge and the development of local communities and humanity. As technology continues to evolve, we will provide scientific and technological environments that are conducive to excellence. These goals can only be achieved by embarking on local and global partnerships, which aid the seamless transition of graduates to the job market. Thus, these graduates will appreciate diversity, be ready to contribute to sustainable development, and engage in life-long learning" (PSER p. 4). Regarding the architecture program in particular, the mission is to prepare highly qualified architects, urban planners, and designers who can excel in local and national markets (PSER p. 7). The values are also clearly described.

I.1.2 Learning Culture: The program must demonstrate that it provides a positive and respectful learning environment that encourages optimism, respect, engagement, and innovation between and among the members of its faculty, student body, administration, and staff in all learning environments, both traditional and non-traditional.

- The program must describe how faculty, staff, and students been able to participate in the development of policies related to learning culture and the ongoing assessment and evaluation of those policies.
- The program must describe the ways in which students and faculty are encouraged to learn both inside and outside the classroom through individual and collective learning opportunities that include, but are not limited to, participation in field trips, professional societies and organizations, honor societies, and other program-specific or campus-wide and community-wide activities.

[X] Described

2021 Analysis/Review: The Department of Architecture has a unique learning culture that emphasizes collegiality, respect, mentorship, and problem solving. This ethos is strengthened through a commitment to a nurturing environment that prepares students for advanced education and employment in the architecture, engineering, and construction industry in Jordan and the region.

Students, staff, and faculty expressed mutual admiration and a familial culture that enhances academic excellence. The studio culture values and standards speak directly to a series of pillars that are shared by the Department of Architecture community: teamwork, diversity, socialization, time management, and academic integrity. Students expressed an ease of communication and collaboration with colleagues that also translated to strong relationships with faculty and staff.

Outside the studio students engage in organization and peer team building that further strengthens the learning culture. These leadership opportunities provide foundational skills that build on the curricular framework. When reflecting on their experience, students mentioned a yearning for more hands-on learning opportunities. Distant learning for the past year likely has an influence on these sentiments but there may be opportunities for the department to further enrich the curriculum through reflective feedback and conversations between students, staff, and faculty. The Program Self-Evaluation Report mentions a loose framework for these types of discussions but it was unclear how they have been fully leveraged.

During COVID-19, students have been afforded the space, time, and mentorship from faculty to navigate the pandemic and course work. This focus on balance and mental health appears to have further nurtured the shared respect showcased by the community. In addition, the department has remained resilient even with the ongoing impacts of COVID-19 by leveraging university resources and ingenuity to maintain academic excellence.

I.1.3 Social Equity: The program must describe how social equity is defined within the context of the institution or the country in which it is located.

- The program must describe its approach to providing faculty, students, and staff with a culturally rich educational environment in which each person is equitably able to learn, teach, and work.
- The program must describe how its graduates have been prepared to be sensitive to differences in gender, culture, and customs, and be encouraged to assume responsibility as professionals in society.

[X] Described

2021 Analysis/Review: “JUST is committed to preserving a healthy and safe environment in many aspects for the surrounding community and the internal vicinity to provide an ideal learning and working atmosphere for students, faculty, and staff. In addition, it has been a priority for senior management since its establishment to deliver a culturally rich, diverse environment for students, faculty, and staff to pursue academic or career aspirations regardless of race, ethnicity, nationality, creed, gender, age, physical ability, or sexual orientation” (PSER p. 22). The student community of JUST includes a diverse population representing 45 nationalities and 106 students with disabilities, Fifty-six percent of the student body are females. Likewise, 13 of the total 25 faculty members are female, as are four of six staff members.

JUST core values of community and social responsibility are evident in the university's commitment to promoting social responsibility and fostering community engagement to meet real needs.

I.1.4 Defining Perspectives: The program must describe how it is responsive to the following perspectives or forces that affect the education and development of professional architects. The response to each perspective must further identify how these perspectives will continue to be addressed as part of the program's long-range planning activities.

- A. Collaboration and Leadership.** The program must describe its culture for successful individual and team dynamics, collaborative experiences, and opportunities for leadership roles.
- B. Design.** The program must describe its approach to developing graduates with an understanding of design as a multidimensional process involving problem resolution and the discovery of new opportunities that will create value.
- C. Professional Opportunity.** The program must describe its approach to educating students on the breadth of professional opportunities and career paths, including the transition to internship and licensure.

D. Stewardship of the Environment. The program must describe its approach to developing graduates who are prepared to both understand and take responsibility for stewardship of the environment and natural resources.

E. Community and Social Responsibility. The program must describe its approach to developing graduates who are prepared to be active, engaged citizens able to understand what it means to be professional members of society and to act ethically on that understanding.

[X] Described

2021 Analysis/Review: The visiting team identifies this Condition Met With Distinction. Each Defining Perspective has been thoughtfully composed and carefully represented. They address broad and conceptual overviews along with specific areas of emphasis and activity that elucidate the program's unique approach of implementing the perspectives for the benefit of students and the society they will serve as architecture professionals. While the perspectives are important as individual areas of consideration for the program and its students, they become even more compelling when seen as an interlocking set of issues. The team commends the program for the way these also serve as the springboard for ongoing work. Table 4 in the PSER provides a detailed picture of how this will play out over time with respect to the curricular and extra-curricular aspects of a student's experience at JUST. The priority categories lead into the Long-Range Planning in a seamless way.

I.1.5 Long-Range Planning: An ICert degree program must demonstrate that it has a planning process for continuous improvement that identifies multiyear objectives within the context of the institutional and program mission and culture. In addition, the program must describe its process for collecting data and using the data to inform its plan for continuous improvement.

[X] Described

2021 Analysis/Review: Long-Range Planning has served the program well as it evolves toward International Certification. The PSER outlines how the department, in collaboration with the university, has strategically and methodologically positioned growth opportunities. Through a framework of strategic goals, ownership, outcomes, and key performance indicators, the program seems well on its way to achieving the ambitions identified in the 2017-2022 Strategic Plan.

The department's commitment to attracting and hiring qualified faculty members was clearly evident as a strategic priority. This includes awarding scholarships to outstanding students to earn their master's and Ph.D. degrees abroad. Funded students are required to return to the college as tenure-track faculty. This international perspective and focus on the pipeline has generated a talented faculty that further enriches the curriculum.

In tandem with these initiatives, the program has reconstituted a Consultation Board of Jordanian professionals that helps guide the program in a strategic capacity. This engagement showcases a commitment to leveraging various voices and perspectives in helping achieve the long-range goals identified by the department.

I.1.6 Assessment:

A. Program Self-Assessment Procedures: The program must demonstrate that it regularly assesses the following:

- How well the program is progressing toward its mission and stated objectives.
- Progress against its defined multiyear objectives.
- Strengths, challenges, and opportunities faced by the program while continuously improving learning opportunities.

The program must also demonstrate that results of self-assessments are regularly used to advise and encourage changes and adjustments to promote student success.

- B. Curricular Assessment and Development:** The program must demonstrate a well-reasoned process for curricular assessment and adjustments, and must identify the roles and responsibilities of the personnel and committees involved in setting curricular agendas and initiatives, including the curriculum committee, program coordinators, and department chairs or directors.

[X] Described

2021 Analysis/Review: The procedures described in the PSER as part of the full assessment process are comprehensive and rigorously pursued by the program. There are multiple ways that assessment takes place, and this aspect of self-assessment and curricular development seems to be influential in the way the program has evolved. However, it must be noted that there is a good deal of work ahead in the area of curriculum assessment and development. All of the Not Met or In Progress Student Performance Criteria are the result of missed opportunities for synergy across courses and studios, or perhaps the shortcomings as evidenced by the students' work are tied to gaps in communication among faculty and the administration.

Part One (I): Section 2—Resources

I.2.1 Human Resources and Human Resource Development: The program must demonstrate that it has appropriate human resources to support student learning and achievement. This includes full- and part-time instructional faculty; administrative leadership; and technical, administrative, and other support staff.

- The program must demonstrate that it balances the workloads of all faculty to support a tutorial exchange between the student and the teacher that promotes student achievement.
- The program must demonstrate that faculty and staff have opportunities to pursue professional development that contributes to program improvement.
- The program must describe the support services available to students in the program, including, but not limited to, academic and personal advising, career guidance, and internship or job placement.

[X] Demonstrated

2021 Team Assessment of I.2.1: The human resources narrative in the PSER, supported by discussion with administrators and faculty during the virtual visit, established a clear commitment to the program's continued development. JUST has ample human resources to support students' learning and achievement.

The department is in the process of following through on a five-year strategic plan through 2025 with the primary goal of decreasing the faculty to student ratio. This commitment works in tandem with university scholarships that encourage students to earn master's and Ph.D. degrees abroad and return as tenure-track faculty.

Through conversations with faculty it was clear there are opportunities for professional development that further enriches course work.

It remains unclear how the program has codified academic and personal advising as well as career guidance and internship/job placement, particularly as these relate to unique scenarios in the Jordanian context.

I.2.2 Physical Resources: The program must describe the physical resources available and how they support the pedagogical approach and student achievement.

Physical resources include, but are not limited to, the following:

- Space to support and encourage studio-based learning.
- Space to support and encourage didactic and interactive learning, including labs, shops, and equipment.
- Space to support and encourage the full range of faculty roles and responsibilities, including preparation for teaching, research, mentoring, and student advising.
- Information resources to support all learning formats and pedagogies in use by the program.

If the program's pedagogy does not require some or all of the above physical resources, for example, if online course delivery is employed to complement or supplement on-site learning, then the program must describe the effect (if any) that online, on-site, or hybrid formats have on digital and physical resources.

[X] Demonstrated

2021 Team Assessment of I.2.2: The program provided both written and visual information on the physical resources that support students and faculty in the PSER. With the uniqueness of virtual visits, the video tour was invaluable in helping the visiting team understand the program and university commitment to the department of architecture. Facilities include classrooms, design studios, offices, computer labs, model workshops, and conference rooms spread across connected building wings and courtyards.

Physical resources extend beyond architecture to university-supported assets such as the central library and a series of laboratories for thermo fluids, instrumentation, material strength, renewable energy, building materials, and solar energy.

The pandemic presented a broad challenge for the university and department to support student learning outside of the traditional "physical resources." Students seemed especially grateful for the way the program accommodated the transition to distance learning during the ongoing challenges emerging from the pandemic. This commitment and accommodation has positioned the program to continue supporting all learning formats and pedagogy while not sacrificing student achievement.

I.2.3 Financial Resources: The program must demonstrate that it has appropriate financial resources to support student learning and achievement.

[X] Demonstrated

2021 Team Assessment of I.2.3: The financial narrative in the PSER, supported by discussions with administrators during the visit, establishes that the program has sufficient resources to support faculty endeavors and student achievement. Annual budget comes mainly from tuition and fees, faculty consultations, workshops, and other projects. Allocated amounts received by the college are shared by the three departments based on justified needs. Institutional mechanisms, such as department budget committees, are leveraged to identify evolving needs on an annual basis for maintaining and upgrading available resources. The university at large remains committed to the program's success and its path toward International Certification.

I.2.4 Information Resources: The program must demonstrate that all students, faculty, and staff have convenient, equitable access to literature and information, as well as appropriate visual and digital resources that support professional education in the field of architecture.

Further, the program must demonstrate that all students, faculty, and staff have access to architecture librarians and visual-resource professionals who provide information services that teach and develop the research, evaluative, and critical thinking skills necessary for professional practice and lifelong learning.

[X] Demonstrated

2021 Team Assessment of I.2.4: The data provided indicate adequate information resources for the students and faculty including a budget for collections and e-resources, technology support, and a traditional library organizational structure.

JUST provides a robust collection of physical and digital resources to students, faculty, and staff that supports professional education and research. The central library houses printed volumes in addition to computer labs, seminar rooms, and space for student study. Electronic access to books, research journals, and digitized repositories continues to grow. Library staff provide both general and customized orientation to the Department of Architecture, ensuring that students at all levels know how to best leverage the information resources provided.

Founded in 2017, the Center for E-Learning has positioned itself as an invaluable asset to the university at large and the college. Services focus on educational technologies, capacity building, and course development. Throughout the year, the center's staff advance and build resources that train students and faculty on technologies that enhance learning. This proved useful during the COVID-19 transition to distance learning. All faculty were trained on videoconference software as well as learning management systems that help facilitate quality education in a virtual environment. Beyond training, the Center for E-Learning has built a strong quality-assurance infrastructure that allows faculty across the university to master the art of distance education. This up-front work and orientation helped create what appears to have been a smooth transition for students, faculty, and staff in the Department of Architecture during the pandemic. Students and faculty both expressed great optimism that the work produced throughout the past few "distant" semesters was equivalent to if not better than what was being produced during traditional in-person semesters. This commitment and engagement at all levels showcases a commitment by JUST to build collective confidence and capacity to facilitate quality education that is supported, if not enhanced, by technological integration. The visiting team views this vitally important Condition as Met with Distinction, particularly in light of the challenges presented by the pandemic.

I.2.5 Administrative Structure and Governance

- **Administrative Structure:** The program must describe its administrative structure and identify key personnel within the context of the program and the school, college, and institution.
- **Governance:** The program must describe the role of faculty, staff, and students in both program and institutional governance structures. The program must describe the relationship of these structures to the governance structures of the academic unit and the institution.

[X] Demonstrated

2021 Team Assessment of I.2.5: Information in the PSER, along with additional context on university faculty and governance provided to the team during the virtual visit, confirms this condition is met. The relationship between the chair of the Architecture Department, the dean of the College of Architecture & Design, and the president and vice president is clear and allows for smooth collaboration at several levels of the institution. Other factors contribute to the larger purpose of supporting architecture students and faculty including the dean's Council and University Council. At JUST, the deans are the principal administrators of faculties, and the chair of the department reports directly to the appropriate dean.

PART TWO (II): EDUCATIONAL OUTCOMES AND CURRICULUM

This part has four sections that address the following:

- **STUDENT PERFORMANCE.** This section includes the Student Performance Criteria (SPC). Internationally certified degree programs must demonstrate that graduates are learning at the level of achievement defined for each of the SPC listed in this part. Compliance will be evaluated through the review of student work.
- **CURRICULAR FRAMEWORK.** This section addresses institutional quality assurance and national authorization, credit hour requirements, general education, and access to optional studies.
- **EVALUATION OF PREPARATORY EDUCATION.** The NAAB recognizes that students entering a professional degree program from a preprofessional program and those entering from a non-professional degree program have different needs, aptitudes, and knowledge bases. In this section, programs are required to demonstrate the process by which incoming students are evaluated and to document that the SPC expected to have been met in educational experiences at other institutions have indeed been met.
- **PUBLIC INFORMATION.** The NAAB expects internationally certified degree programs to provide information to the public about International Certification activities and the relationship between the program and the NAAB, admissions and advising, and career information.

Programs demonstrate their compliance with Part Two in four ways:

- A narrative report that briefly responds to each request to “describe, document, or demonstrate.”
- A review of evidence, artifacts, and observations by the visiting team, as well as through interviews conducted during the visit.
- A review of student work that demonstrates student achievement of the SPC at the required level of learning.
- A review of websites, URLs, and other electronic materials.

Part II, Section 1: Student Performance—Education Realms and Student Performance Criteria

II.1.1 Student Performance Criteria: The SPC are organized into realms to more easily understand the relationships between individual criteria.

Realm A: Critical Thinking and Representation: Graduates from NAAB-accredited programs must be able to build abstract relationships and understand the impact of ideas based on the research and analysis of multiple theoretical, social, political, economic, cultural, and environmental contexts. This includes using a diverse range of media to think about and convey architectural ideas, including writing, investigative skills, speaking, drawing, and model making.

Student learning aspirations for this realm include:

- Being broadly educated.
- Valuing lifelong inquisitiveness.
- Communicating graphically in a range of media.
- Assessing evidence.
- Comprehending people, place, and context.
- Recognizing the disparate needs of client, community, and society.

A.1 Professional Communication Skills: *Ability* to write and speak effectively and use appropriate representational media for both, within the profession and with the public.

[X] Not Yet Met

2021 Team Assessment of A.1: There is some evidence of student achievement at the prescribed level in ARCH 301 Technical Writing & Verbal Communication. However, in examining a number of other cited areas in the SPC Matrix, the visiting team was unable to gain a full picture of how this criterion is being fully satisfied. It is clear that the program has a process in place to further develop these skills and to do a better job of identifying these within the evidence of student outcomes.

A.2 Design Thinking Skills: *Ability* to raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test alternative outcomes against relevant criteria and standards.

[X] Met

2021 Team Assessment of A.2: Evidence of student achievement at the prescribed level was found in student work prepared for ARCH 312 Architectural Design IV.

A.3 Investigative Skills: *Ability* to gather, assess, record, and comparatively evaluate relevant information and performance in order to support conclusions related to a specific project or assignment.

[X] Met

2021 Team Assessment of A.3: Evidence of student achievement at the prescribed level was found in student work prepared for ARCH 411 Architectural Design V. However, while there may be other areas that achieve this criterion, the organization of the student outcomes in the virtual team room made it difficult to identify. One such area is likely to be included in ARCH 481 Human Behavior in Built Environment as an example. The team saw some evidence there as well as in ARCH 592–Graduation Project.

A.4 Architectural Design Skills: *Ability* to effectively use basic formal, organizational, and environmental principles and the capacity of each to inform two- and three-dimensional design.

[X] Met

2021 Team Assessment of A.4: Evidence of student achievement at the prescribed level was found in student work prepared for ARCH 111 Basic Design I. There is evidence in other studios as well, but the organization of the virtual team room made it difficult to discern where the specific strengths exist. The visiting team has a sense that there could be more clarity and coordination around this criterion in the overall design studio sequence.

A.5 Ordering Systems: *Ability* to apply the fundamentals of both natural and formal ordering systems and the capacity of each to inform two- and three-dimensional design.

[X] Met

2021 Team Assessment of A.5: Some evidence of student achievement at the prescribed level was found in student work prepared for ARCH 111 Basic Design 1 and ARCH 112 Basic Design II. However, the team notes that these courses are limited. Student work prepared for ARCH 412–Architecture Design VI and ARCH 592 – Graduation Project clearly shows the requisite abilities.

A.6 Use of Precedents: *Ability* to examine and comprehend the fundamental principles present in relevant precedents and to make informed choices regarding the incorporation of such principles into architecture and urban design projects.

[X] Met

2021 Team Assessment of A.6: Evidence of student achievement at the prescribed level was found in student work prepared for ARCH 592 Graduation Project 1. Three other courses also satisfied this SPC: ARCH 312 Architectural Design IV, ARCH 411 Architectural Design V with particularly good precedent examples, and ARCH 442 Theory of Urban Design.

A.7 History and Culture: *Understanding* of the parallel and divergent histories of architecture and the cultural norms of a variety of indigenous, vernacular, local, and regional settings in terms of their political, economic, social, and technological factors.

[X] Met

2021 Team Assessment of A.7: Evidence of student achievement at the prescribed level was found in student work prepared for ARCH 231 History of Architecture I, ARCH 331 Modern Architecture, ARCH 232 History of Architecture II, ARCH 333 Architecture in the Islamic Context, and ARCH 432 Local Architecture & Heritage Conservation. Taken together, this suite of strong courses provides a rich intellectual experience for the students. The visiting team views this criterion as Met with Distinction.

A.8 Cultural Diversity and Social Equity: *Understanding* of the diverse needs, values, behavioral norms, physical abilities, and social and spatial patterns that characterize different cultures and individuals and the responsibility of the architect to ensure equity of access to buildings and structures.

[X] Met

2021 Team Assessment of A.8: Evidence of student achievement at the prescribed level was found in ARCH 481 Human Behavior in the Built Environment and supported by work in several of the history courses.

Realm A General Team Commentary: Student work for Realm A: Critical Thinking and Representation showcases a diverse set of courses that expose students to the learning aspirations for this realm. A.1 Professional Communication Skills is the only not-yet-met SPC in this realm because the visiting team was unable to gain a full picture of how it is being fully satisfied at the “ability” level. A.7 History and Culture is met with distinction; it provides students with a rich intellectual sequence of courses that is unique and to be applauded.

Realm B: Building Practices, Technical Skills and Knowledge: Graduates from internationally certified degree program must be able to comprehend the technical aspects of design, systems, and materials and be able to apply that comprehension to architectural solutions. In addition, the impact of such decisions on the environment must be well considered.

Student learning aspirations for this realm include:

- Creating building designs with well-integrated systems.
- Comprehending constructability.
- Integrating the principles of environmental stewardship.
- Conveying technical information accurately.

B.1 **Pre-Design:** *Ability* to prepare a comprehensive program for an architectural project, which must include an assessment of client and user needs; an inventory of spaces and their requirements; an analysis of site conditions (including existing buildings); a review of the relevant building codes and standards, including relevant sustainability requirements, and an assessment of their implications for the project; and a definition of site selection and design assessment criteria.

[X] Met

2021 Team Assessment of B.1: Evidence of student achievement at the prescribed level was found in student work prepared for ARCH 592 Graduation Project 1.

B.2 **Site Design:** *Ability* to respond to site characteristics, including urban context and developmental patterning, historical fabric, soil, topography, ecology, climate, and building orientation in the development of a project design.

[X] Met

2021 Team Assessment of B.2: Evidence of student achievement at the prescribed level was found in student work prepared for ARCH 541.

B.3 **Codes and Regulations:** *Ability* to design sites, facilities, and systems that are responsive to relevant codes and regulations, and include the principles of local life-safety and accessibility standards.

[X] Met

2021 Team Assessment of B.3: Evidence is included in ARCH 454 Working Drawings & Integrated Systems.

B.4 **Technical Documentation:** *Ability* to make technically clear drawings, prepare outline specifications, and construct models illustrating and identifying the assembly of materials, systems, and components appropriate for a building design.

[X] Met

2021 Team Assessment of B.4: Evidence of student achievement at the prescribed level was found in student work prepared for ARCH 454 Working Drawings & Integrated Systems and ARCH 571 Qualities and Specifications. It should be noted that the suite of courses identified to satisfy this criterion work to prepare students for an ability to make clear drawings throughout their academic career. Student work related to outline specifications was light needs further development. Overall, the team felt that this criterion was Met with Distinction based on the impressive growth in the students' work over the course sequence.

B.5 **Structural Systems:** *Ability* to demonstrate the basic principles of structural systems and their ability to withstand gravity, seismic, and lateral forces, as well as the selection and application of the appropriate structural system.

[X] Met

2021 Team Assessment of B.5: Evidence of student achievement at the prescribed level was found in student work prepared for ARCH 261 Engineering Mechanics and ARCH 262 Structural Analysis and Systems. Student work in these courses shows an ability to demonstrate basic principles of structural systems in design work. Further emphasis is demonstrated in ARCH 412 – Architectural Design VI.

- B.6 Environmental Systems:** *Ability* to demonstrate the principles of environmental systems' design, how design criteria can vary by geographic region, and the tools used for performance assessment. This demonstration must include active and passive heating and cooling, solar geometry, daylighting, natural ventilation, indoor air quality, solar systems, lighting systems, and acoustics.

[X] Not Yet Met

2021 Team Assessment of B.6: ARCH 353 – Environmental Controls 1 and ARCH 452 Environmental Controls 2 are identified as satisfying this criterion. These appear to be very good courses and the student outcome evidence points to a solid “understanding” level. However, they do not rise to the level of “ability” as a synthesis issue. The visiting team identifies this as “Not Yet Met” based on the foundational strength already in place and the knowledge that the program recognizes that this is an important area of refinement and improvement. At this time, it is unclear if students possess an ability to apply the conceptual principles presented in the courses to design work. Judging from the work we have seen, it seems that ARCH 412 – Architectural Design VI is the most promising area for greater integration and integrated design work in a design studio. There is some evidence that students have considered these issues; however there is more that needs to be done and demonstrated to satisfy this criterion.

- B.7 Building Envelope Systems and Assemblies:** *Understanding* of the basic principles involved in the appropriate selection and application of building envelope systems relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.

[X] Not Yet Met

2021 Team Assessment of B.7 ARCH 252 Building Construction II Systems, ARCH 353 Environmental Control Systems I Temperature & Humidity, ARCH 452 Environmental Control Systems II Illumination & Acoustics, and ARCH 412 Architectural Design VI are noted as satisfying this criterion. Course work does not sufficiently showcase an understanding of performance, energy, and material resources. ARCH 252 does appear to provide a basic understanding of aesthetics, moisture transfer and durability as well as appropriate selection and application techniques. The virtual team room does not include clear evidence of how the areas described in the criterion statement are fully covered at the “understanding” level.

- B.8 Building Materials and Assemblies:** *Understanding* of the basic principles used in the appropriate selection of interior and exterior construction materials, finishes, products, components, and assemblies based on their inherent performance, including environmental impact and reuse.

[X] Met

2021 Team Assessment of B.8: Evidence of student achievement at the prescribed level was found in student work prepared for ARCH 352 Building Construction III Finishing.

- B.9 Building Service Systems:** *Understanding* of the basic principles and appropriate application and performance of building service systems, including lighting, mechanical, plumbing, electrical, communication, vertical transportation, security, and fire protection systems.

[X] Not Yet Met

2021 Team Assessment of B.9: ARCH 456–Mechanical Systems addresses these issues at the “understanding” level. However, it does not cover communications, vertical transport, security, and fire protection. ARCH 452 Environmental Control Systems II Illumination & Acoustics is noted as satisfying some of the topics. Course work shows an understanding of the application and performance of building service systems such as mechanical, plumbing, vertical transportation, and fire protection. However, the student outcomes evidence was not as clear with regard to lighting, communication, and security.

B.10 Financial Considerations: *Understanding* of the fundamentals of building costs, which must include project financing methods and feasibility, construction cost estimating, construction scheduling, operational costs, and life-cycle costs.

[X] Met

2021 Team Assessment of B.10: Evidence of student achievement at the prescribed level was found in student work prepared for ARCH 571 Qualities & Specifications. Student work related to operational costs and life-cycle costs was light.

Realm B. General Team Commentary: The key issue for this realm has to do with alignment of courses and design studios with the expectations of “Building Practices, Technical Skills and Knowledge.” B.6 Environmental Systems, B.7 Building Envelope Systems and Assemblies, and B.9 Building Service Systems are interrelated courses that have not fully captured the broad array of topics included in the SPC. B.4 Technical Documentation is met with distinction based on the impressive growth in student work over a course sequence that focuses on the craft of drawings and documentation.

Realm C: Integrated Architectural Solutions.

Graduates from internationally certified degree program must be able to demonstrate that they have the ability to synthesize a wide range of variables into an integrated design solution.

Student learning aspirations for this realm include

- Comprehending the importance of research pursuits to inform the design process.
- Evaluating options and reconciling the implications of design decisions across systems and scales.
- Synthesizing variables from diverse and complex systems into an integrated architectural solution.
- Responding to environmental stewardship goals across multiple systems for an integrated solution.
- Knowing societal and professional responsibilities

The internationally certified degree program must demonstrate that each graduate possesses skills in the following areas:

C.1 Research: *Understanding* of the theoretical and applied research methodologies and practices used during the design process.

[X] Met

2021 Team Assessment of C.1: Research is covered in ARCH 372: Architectural Analysis and Programming and is the only course indicated by the program for this SPC. It appears to be a well-designed course covering the topics in C.1. At the same time, the team also found considerable evidence of this criterion in student work for ARCH 592–Graduation Project.

C.2 Integrated Evaluations and Decision-Making Design Process: *Ability* to demonstrate the skills associated with making integrated decisions across multiple systems and variables in the completion of a design project. This demonstration includes problem identification, setting evaluative criteria, analyzing solutions, and predicting the effectiveness of implementation.

[X] Met

2021 Team Assessment of C.2: ARCH 592–Graduation Project. Several impressive design projects were included in the team room collection. Based on the specific language of SPC C.2, the team concluded that this is met based on the ambitions of the syllabus and the complex decision-making

process represented in the student work. Indeed, these projects look quite complex and multi-dimensional. They are also presented very well in graphic and textual form. However, we note that the presentation mode of final boards, absent a clear inclusion of process, makes it difficult to fully understand how the integrated decisions are accomplished.

C.3 Integrative Design: *Ability* to make design decisions within a complex architecture project while demonstrating broad integration and consideration of environmental stewardship, technical documentation, accessibility, site conditions, life safety, environmental systems, structural systems, and building envelope systems and assemblies.

[X] Met

2021 Team Assessment of C.3: ARCH 592 Graduation Project II and ARCH 412 Architectural Design VI are indicated as satisfying this requirement. In the initial submission of ARCH 412 in the team room, only competition-like boards were included. When the program subsequently provided full displays of the students' process, it became clear that most of the specific items in C.3 have been met. It is possible that one or two might have been covered to a lesser degree, but these are impressive projects, comprehensively developed. However, ARCH 592 does not appear to satisfy this criterion despite its appearance on the SPC Matrix. That studio has many impressive and highly expressive projects. However, several of the student projects do not show any indication of building systems and assemblies including structure, environmental controls, legible considerations about accessibility, and more. Part of the problem involves limited demonstration based on the single board format. It may be very difficult to control these projects in terms of scale and focus given the different ambitions that students have when they think about the role of their thesis or "graduation project" in this case.

Realm C. General Team Commentary: Realm C inherently requires a systematic approach in building on the foundation that the students experience in earlier years with the program. There are many positive qualities in the students' work and the faculty's ambition for the three courses/studios associated with this realm. The faculty is clearly working seriously and well in orchestrating this challenging realm. The projects are at a very large scale. A smaller scale might allow for more detailed consideration of several of the integrated systems involved.

Realm D: Professional Practice.

Graduates from internationally certified degree program must understand business principles for the practice of architecture, including management, advocacy, and the need to act legally, ethically, and critically for the good of the client, society, and the public.

Student learning aspirations for this realm include

- Comprehending the business of architecture and construction.
- Discerning the valuable roles and key players in related disciplines.
- Understanding a professional code of ethics, as well as legal and professional responsibilities.

The internationally certified degree program must demonstrate that each graduate possesses skills in the following areas:

D.1 Stakeholder Roles in Architecture: *Understanding* of the relationships among key stakeholders in the design process—client, contractor, architect, user groups, local community—and the architect's role to reconcile stakeholder needs.

[X] Met

2021 Team Assessment of D.1: ARCH 572 Project Management is the only course cited as covering this SPC. It is an interesting course, but much of the student work looks "generic" in the sense that parts of this course are not particularly about architecture practice, construction, or the interaction of these

various stakeholders in the process of design and construction. Nonetheless, 25% of the grade is based on a project that satisfies this criterion.

D.2 Project Management: *Understanding* of the methods for selecting consultants and assembling teams; identifying work plans, project schedules, and time requirements; and recommending project delivery methods.

[X] Met

2021 Team Assessment of D.2: ARCH 572 Project Management is the only course cited as covering this SPC.

D.3 Business Practices: *Understanding* of the basic principles of a firm's business practices, including financial management and business planning, marketing, organization, and entrepreneurship.

[X] Met

2021 Team Assessment of D.3: ARCH 572 Project Management is the only course covering this SPC. The topics cited in the description of this SPC are well organized and major aspects of the course.

D.4 Legal Responsibilities: *Understanding* of the architect's responsibility to the public and the client as determined by local regulations and legal considerations involving the practice of architecture and professional service contracts.

[X] Met

2021 Team Assessment D.4: ARCH 575 Professional Practice covers these issues during a student's fifth year in the program. In addition, students receive some exposure to these responsibilities in the required internship experience during the summer (ARCH 490). The structure of this latter course appears to be very effective in guiding the student's internship experience.

D.5 Professional Conduct: *Understanding* of the ethical issues involved in the exercise of professional judgment in architectural design and practice and understanding the role of local rules of conduct and ethical practice.

[X] Met

2021 Team Assessment D.5: ARCH 575 Professional Practice covers these issues during a student's fifth year in the program. In addition, students receive some exposure to these issues in the required Internship experience during the summer (ARCH 490), depending on the type of internship secured.

Realm D. General Team Commentary: There are many positive qualities in the courses that comprise this realm. There could be even more productive or explicit connections between these courses to ensure that all students will be exposed to the architectural aspects of these criteria during their summer work experience.

Part II, Section 2: Curricular Framework

II.2.1 National Authorization and Institutional Quality Assurance: The institution offering the internationally certified degree program must be or be part of an institution that has been duly authorized to offer higher education in the country in which it is located. Such authorization may come from a government ministry or other type of agency.

The institution must have explicit, written permission from all applicable national education authorities in that program's country or region. At least one of the agencies granting permission must have a system of

institutional quality assurance and review which the institution is subject to and which includes periodic evaluation.

[X] Met

2021 Team Assessment of II.2.1: Evidence is included in the Program Self-Evaluation Report, and this was confirmed by the visiting team's interviews with program administrators. Jordan University of Science and Technology is the top-ranked university in the Kingdom of Jordan. JUST has relationships with numerous international universities as well collegial relationships with others in Jordan.

II.2.2 Professional Degrees and Curriculum:

For International Certification, the NAAB requires degree programs in architecture to demonstrate that the program is comparable in all significant aspects to a program offered by a U.S. institution. Further, the program must demonstrate that the degree awarded at the conclusion of this program of study entitles the graduate to practice architecture in his/her home country, subject to meeting any requirements for experience and/or examination. Internationally Certified degree programs must include (or otherwise acknowledge) general studies, professional studies, and electives.

Curricular requirements are defined as follows:

- **General Studies.** A professional degree program must include general studies in the arts, humanities, and sciences, either as an admission requirement or as part of the curriculum. It must ensure that students have the prerequisite general studies to undertake professional studies. The curriculum leading to the architecture degree must include a course of study comparable to 1.5 years of study or 30% of the total number of credits for an undergraduate degree. These courses must be outside architectural studies either as general studies or as electives with content other than architecture.

NB: If this education is acquired prior to university-level education, the program must describe the system for general studies education in the local context, and how it is substantially equivalent to the requirement stated above.

- **Professional Studies.** The core of a professional degree program consists of the required courses that satisfy the NAAB Student Performance Criteria (SPC). The professional degree program has the discretion to require additional courses including electives to address its mission or institutional context.
- **Electives.** A professional degree program must allow students to pursue their special interests. The curriculum must be flexible enough to allow students to complete minors or develop areas of concentration, inside or outside the program.

[X] Met

2021 Team Assessment of II.2.2: Evidence of this Condition is thoroughly included in the material presented in the program's Self-Evaluation Report.

Part II, Section 3: Evaluation of Preparatory Education

The program must demonstrate that it has a thorough and equitable process for evaluating the preparatory or preprofessional education of individuals admitted to the ICert degree program.

- Programs must document their processes for evaluating a student's prior academic course work related to satisfying NAAB student performance criteria when a student is admitted to the professional degree program.

- In the event a program relies on the preparatory educational experience to ensure that admitted students have met certain SPC, the program must demonstrate it has established standards for ensuring these SPC are met and for determining whether any gaps exist.

[X] Not Applicable

2021 Team Assessment: Although there is indication that these matters are handled professionally and appropriately by the program, additional information is needed to confirm the compliance with this Condition.

There are multiple streams through which students can pass as they work toward a successful completion of the Bachelor of Architecture degree. It is commendable that the program is designed in such a way that students can enter from several different points. This provides equitable access for students who might otherwise not be able to pursue just one path.

PART TWO (II): SECTION 4 – PUBLIC INFORMATION

The NAAB expects programs to be transparent and accountable in the information provided to students, faculty, and the public. As a result, the following conditions require all ICert degree programs to make certain information publicly available online.

II.4.1 Statement on International Certification Degrees: In order to promote an understanding of the internationally certified degree by prospective students, parents, and the public, all schools offering the certified degree program must include in catalogs and promotional media the *exact language* found in the *Conditions for NAAB International Certification*, Appendix 6.

[X] Met

2021 Team Assessment II.4.1: The correct statement is on the website: <https://www.just.edu.jo/FacultiesandDepartments/FacultyofArchitectureandDesign/Departments/Architecture/Pages/NAAB%20International%20Certification.aspx>”.

II.4.2 Access to Conditions and Procedures for NAAB International Certification: In order to assist parents, students, and others as they seek to develop an understanding of the body of knowledge and skills that constitute a professional education in architecture, the school must make the following documents available online and accessible by all students, parents, and faculty:

- *2019 Conditions for NAAB International Certification*
- *Procedures for NAAB International Certification* (edition currently in effect)

[X] Met

2021 Team Assessment II.4.2: The appropriate information is included on the program’s website: <https://www.just.edu.jo/FacultiesandDepartments/FacultyofArchitectureandDesign/Departments/Architecture/Pages/NAAB%20International%20Certification.aspx>.

II.4.3 Access to Career Development Information: In order to assist students, parents, and others as they seek to develop an understanding of the larger context for architecture education and the career pathways available to graduates of internationally certified degree programs, the program must make appropriate resources related to a career in architecture available to all students, parents, staff, and faculty.

[X] Met

2021 Team Assessment II.4.3: While Career Development information is available on the program’s website, and there are valuable sources of support through links, these resources could be enhanced for the benefit of students. More specific resources on careers in architecture would be beneficial.

II.4.4 Public Access to Program Self-Evaluation Reports and Visiting Team Reports: In order to promote transparency in the process of International Certification in architecture education, the program is required to make the following documents available to the public:

- The final decision letter from the NAAB (not applicable to visit two)
- The most recent Program Self-Evaluation¹ (not applicable to visit two)
- The final edition of the most recent Visiting team Report, including attachments and addenda

These documents must be housed together and accessible to all. Programs are required to make these documents available electronically from their websites.

[X] Not Applicable

II.4.5. Admissions and Advising: The program must publicly document all policies and procedures that govern how applicants to the program being reviewed for International Certification are evaluated for admission. These procedures must include first-time, first-year students as well as transfers within and from outside the institution.

This documentation must include the following:

- Application forms and instructions
- Admissions requirements, admissions decisions procedures, including policies and processes for evaluation of transcripts and portfolios (where required), and decisions regarding remediation and advanced standing
- Forms and a description of the process for the evaluation of degree content
- Requirements and forms for applying for financial aid and scholarships
- Student diversity initiatives

[X] Not Applicable

2016 Team Assessment II.4.5: While there are indications in the program's Self-Evaluation Report that these issues are handled professionally and appropriately, additional material about these processes would be helpful.

¹ This is understood to be the Program Self-Evaluation Report from the previous visit (if applicable), not the Program Self-Evaluation for the visit currently in process.

Appendix 1: Conditions Met with Distinction

Condition I.1.4 – Defining Perspectives

The team wishes to highlight the importance of this area and to commend the program for the excellent articulation of how the “Perspectives” exert an influential role for students pursuing their degree at JUST. All of the perspectives are articulated with clarity, and these issues are clearly evident in the way they roll forward into self-assessment within the program and strategic planning for its future.

Condition I.2.4 – Information Resources

SPC A,7 History and Culture

Appendix 2: Team SPC Matrix

The program is required to provide the team with a blank matrix that identifies courses by number and title on the y axis and the NAAB SPC on the x axis. This matrix is to be completed in Excel and converted to Adobe PDF and then added to the final VTR.

The team is required to complete an SPC matrix that identifies the course(s) in which student work demonstrated the program's compliance with Part II, Section 1.

The team matrix follows on page 21.



Jordan University of Science & Technology
College of Architecture & Design
Department of Architecture

Visiting Team Student Performance Criteria Matrix

Curriculum Map
Courses to Cover Realms A, B, C, & D
NYM = Not Yet Met

Jordan University of Science & Technology College of Architecture & Design Department of Architecture				Realm A: Critical Thinking & Representation				Realm B: Integrated Building Practices, Technical skills and knowledge										Realm C: Integrated Architectural Solutions			Realm D: professional Practice												
				Professional Communication Skills	Design Thinking Skills	Investigative Skills	Architectural Design Skills	Ordering Systems	Use of Precedents	History & Global Cultures	Cultural Diversity and Social Equity	Pre-Design	Site Design	Codes & Regulations	Technical Documentation	Structural Systems	Environmental Systems	Building Envelope Systems & Assemblies	Building Materials & Assemblies	Building Services Systems	Financial Considerations	Research	Integrated Evaluations & Decision-Making Design Processes	Integrative Design	Stakeholder Roles in Architecture	Project Management	Business Practice	Legal Responsibilities	Professional Conduct				
Semester	Course Code	Cr.	Course Title	Documented Semesters	SPC #	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	C1	C2	C3	D1	D2	D3	D4	D5		
First Year	First Semester	ARCH101	3	Architectural Drafting	Fall 2018, Summer 2019, Fall 2019, Fall 2020																												
		ARCH111	3	Basic Design I	Fall 2018, Fall 2019, Fall 2020				X	X																							
	Second Semester	DV102 (ARCH102)	3	Visual Communication I	Spring 2019, Spring 2020																												
Second Year		ARCH112	3	Basic Design II	Spring 2019, Spring 2020																												
		ARCH152	3	Building Construction I Materials	Spring 2019, Spring 2020																												
	Third Semester	ARCH201	3	Computer Aided Design I	Summer 2019, Fall 2019, Fall 2020																												
		ARCH202	3	Visual Communication II	Fall 2018, Spring 2019, Fall 2020																												
		ARCH211	5	Architectural Design I	Fall 2018, Fall 2019, Fall 2020																												
		ARCH231	3	History of Architecture I	Fall 2019, Summer 2020, Fall 2020								X																				
		ARCH261	3	Engineering Mechanics	Fall 2018, Fall 2019, Fall 2020														X														
	Fourth Semester	ARCH204	3	Computer Aided-Design II	Spring 2019, Spring 2020, Summer 2020																												
		ARCH212	5	Architectural Design II	Spring 2019, Spring 2020																												
Third Year		ARCH232	3	History of Architecture II	Spring 2019, Spring 2020							X																					
		ARCH252	3	Building Construction II Systems	Fall 2018, Summer 2019, Spring 2020, Summer 2020																												
		ARCH262	3	Structural Analysis & Systems	Fall 2018, Spring 2019, Spring 2020, Summer 2020														X														
	Fifth Semester	ARCH301	2	Technical Writing & Verbal Communication	Summer 2019 - Fall 2020																												
		ARCH311	5	Architectural Design III	Fall 2019, Fall 2020																												
		ARCH331	3	Modern Architecture	Fall 2019, Summer 2020, Fall 2020								X																				
		ARCH343	3	Surveying	Fall 2018, Spring 2019, Fall 2019, Spring 2020, Summer 2020, Fall 2020																												
		ARCH372	2	Architectural Analysis & Programming	Summer 2019, Fall 2019, Summer 2020, Fall 2020																					X							
	Sixth Semester	ARCH312	5	Architectural Design IV	Spring 2019, Spring 2020			X																									
		ARCH332	3	Contemporary Architecture	Spring 2019, Spring 2020								X																				
		ARCH341	3	Landscape Architecture	Fall 2018, Spring 2019, Spring 2020, Fall 2020																												
		ARCH352	3	Building Construction III Finishing	Spring 2019, Spring 2020																												
		ARCH353	3	Environmental Control Systems I Temperature & Humidity	Summer 2020, Summer 2019																												
	Fourth Year		ARCH333	3	Architecture in the Islamic Context	Fall 2018, Summer 2019, Fall 2019, Fall 2020							X																				
		Seventh Semester	ARCH411	5	Architectural Design V	Fall 2019, Fall 2020				X																							
		ARCH441	3	Theory of Urban Design	Fall 2018, Summer 2019, Fall 2019, Summer 2020, Fall 2020																												
		ARCH452	3	Environmental Control Systems II Illumination & Acoustics	Fall 2020, Summer 2019																												
		ARCH456	2	Mechanical Systems	Fall 2018, Spring 2019, Fall 2019, Fall 2020																												
		ARCH412	5	Architectural Design VI	Spring 2019, Spring 2020								X						X														
Eighth Semester		ARCH432	3	Local Architecture & Heritage Conservation	Spring 2020								X																				
		ARCH454	3	Working Drawings & Integrated Systems	Spring 2019, Spring 2020, Fall 2020														X	X													
		ARCH481	3	Human Behavior in Built Environment	Fall 2018, Spring 2019, Fall 2019, Spring 2020									X																			
Summer Semester		ARCH490	3	Architectural Training	Summer 2019, Spring 2020, Summer 2020																											X	X
Fifth Year		ARCH541	3	Planning & Urban Design	Fall 2018, Fall 2019, Fall 2020																												
	Ninth Semester	ARCH571	2	Qualities & Specifications	Spring 2019, Summer 2019, Summer 2020, Fall 2020																												
		ARCH572	2	Project Management	Fall 2018, Fall 2018, Summer 2020, Fall 2020																												
		ARCH591	2	Graduation Project I	Fall 2019, Fall 2020																												
		ARCH575	2	Professional Practice	Spring 2020																												
	Tenth Semester	ARCH592	5	Graduation Project II	Spring 2019, Spring 2020			X		X	X				X											X	X						

Appendix 3: Visiting Team Roster

Team chair

Kenneth Schwartz, FAIA
Michael Sacks Chair in Civic Engagement and Social Entrepreneurship
Executive Director, Phyllis Taylor Center for Social Innovation and Design Thinking
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Report Signatures

Submitted by

A handwritten signature in black ink, appearing to read 'K. Schwartz', written in a cursive style.

Kenneth Schwartz, *team chair*

A handwritten signature in black ink, appearing to read 'Ryan Gann', written in a cursive style.

Ryan Gann, *team member*