GOLISANO INSTITUTE FOR SUSTAINABILITY PROGRAM GOALS AND STUDENT LEARNING OUTCOMES

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About GIS

Golisano Institute for Sustainability (GIS) is a global leader in sustainability education and research. We partner with business and government sponsors to solve complex, systemic problems. Much of our work aims to make industry more sustainable. To do this, we use innovative approaches and technologies to minimize the use of materials and energy while maximizing outcomes. Our expertise, combined with our state-of-the-art research facilities, allows our partners to gain new insights, fuel innovation, and move forward.

Our graduate and doctoral programs are challenging, inspirational, and world-changing. GIS graduates go on to become transformative agents of change within industry, government, academia, and the nonprofit sector. They are problem-solvers, visionaries, and decision-makers who want to create a better, sustainable world. We are part of Rochester Institute of Technology, a university that is world-renowned as an advocate and practitioner of sustainability.

GIS draws upon the skills of more than 100 full-time engineers, technicians, research faculty, and sponsored students. We are home to six dynamic research centers that operate over 84,000 square feet of industrial infrastructure for modeling, testing, and prototyping. The mix of talent, experience, and technical capabilities that we bring to every project is unparalleled.

We believe that meeting the challenges of a changing climate, a growing population, and the depletion of natural resources demands systemic transformation. To do this, we advance sustainability within manufacturing, transportation, and energy through education, research, innovation, and strategic partnerships.

RIT | Golisano Institute for **Sustainability**

Master of Architecture

Program Goal #1: 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 study and analysis of multiple theoretical, social, political, economic, cultural, and environmental contexts. Graduates must also be able to use a diverse range of skills to think about and convey architectural ideas, including writing, investigating, speaking, drawing, and modeling.

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

- 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

- 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

- 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

- 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

- A.6 Use of Precedents - Ability to examine and comprehend the fundamental principles present In relevant precedents and to make Informed choices about the Incorporation of such principles into architecture and urban design projects

- A.7 History and Global 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, ecological, and technological factors

- 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 sites, buildings, and structures

Program Goal #2: Realm B: Building Practices, Technical Skills, and Knowledge - Graduates from NAAB accredited programs 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.

- B.1 Pre-Design - Ability to prepare a comprehensive program for an architectural project that Includes 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

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assessment of their implications for the project; and a definition of site selection and design assessment criteria

- 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

- 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 life-safety and accessibility standards

- 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

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

- 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

- 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

- 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

- 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

- 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

Program Goal #3: Realm C: Integrated Architectural Solutions - Graduates from NAAB-accredited programs must be able to demonstrate that they have the ability to synthesize a wide range of variables Into an Integrated design solution.

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

- 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

- C.3. Integrative Design - Ability to make design decisions within a complex architectural 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

Program Goal #4: Realm D: Professional Practice - Graduates from NAAB-accredited programs 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.

- 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

- 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

- 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

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

- 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 the NCARB Rules of Conduct and the AIA Code of Ethics in defining professional conduct

- Graduates will meet requirements to become licensed and engage in life-long learning

Sustainable Systems (MS)

Program Goal #1: Students are prepared to create systems-level solutions to sustainability challenges

- Students can propose and evaluate solutions to sustainability challenges using a systems-based approach

Program Goal #2: Students are prepared to think innovatively and solve complex sustainability problems in diverse academic and industry settings

- Students can analyze and explain both verbally and in writing complex sustainability issues to broad stakeholders

Program Goal #3: Students are prepared to evaluate systems-level tradeoffs in support of sustainable decision making

- Students can apply life cycle assessment to compare sustainability outcomes of alternative decisions

Sustainable Systems (PhD)

Program Goal #1: Students are prepared to create systems-level solutions to sustainability challenges

- Students can integrate social, economic, and environmental methods to formulate solutions for a sustainability challenge

Program Goal #2: Students are prepared to think innovatively and solve complex sustainability problems in diverse academic and industry settings

- Students can analyze and explain both verbally and in writing complex sustainability issues to a diverse audience of stakeholders

Program Goal #3: Students can carry out novel, independent sustainability research

- Students can synthesize and critically evaluate scholarly literature in order to identify a research gap
- Students can propose systems-level sustainability research methods that address a novel research problem