

Table of Contents

Architectural Studies..... 1

Architectural Studies

The most basic human response to the Earth’s environment has been the development of methods which increase the probability of survival. The most obvious of these was the creation of shelters by which the impact of climate and the changing seasons could be controlled. From this simple reaction, architecture has evolved, which reflects and promotes the cultural, economic, and philosophical trends of our societies.

The four-year curriculum in architectural studies offers the beginning level of education for those who intend to pursue a career in this profession or a related field. A structured sequencing of courses is included, which provides for a gradual interactive development of required knowledge and skills. This pre-professional preparation is combined with the University Core Curriculum courses to provide a comprehensive scholarly foundation for advancement.

The Bachelor of Science in Architectural Studies (BSAS) is a four-year pre-professional program that prepares graduates for careers in architecture and related fields or to enter masters level programs. In addition, the School of Architecture offers a 1.5 year Master of Architecture (MArch) degree that is accredited by the National Architectural Accrediting Board (NAAB). The BSAS degree combined with the MArch degree is designed to fulfill accreditation requirements. In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted an eight-year, three-year, or two-year term of accreditation, depending on the extent of its conformance with established educational standards. Doctor of Architecture and Master of Architecture degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree that, when earned sequentially, constitute an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree. The NAAB grants candidacy status to new programs that have developed viable plans for achieving initial accreditation. Candidacy status indicates that a program should be accredited within six years of achieving candidacy, if its plan is properly implemented. Graduates with a BSAS degree are prepared for entry-level positions in architecture and related fields at a limited level. Ultimately, most graduates will continue their education in a professional-level Master of Architecture program in order to satisfy education requirements for licensure.

Students also are eligible for participation in the Architectural Experience Program (AXP) sponsored by the National Council of Architectural Registration Boards. A wide variety of employment options exist. Some areas include design, planning, preservation, government regulation, construction, building products, and facilities management.

The amount of material to be covered, the fast pace of assignments, and the pressure of critical reviews combine to produce a highly charged and energetic atmosphere. Successful students must be able to handle multiple projects simultaneously and demonstrate an ability to manage their time wisely.

To support students in their educational endeavors, sophomores, juniors, and seniors are provided dedicated studio space. Program facilities include a resource library, model/furniture shop, a dedicated computer graphics laboratory, a digital fabrication lab, and virtual reality facilities. The computer graphics laboratory will provide access to input/output devices. Each student is required to purchase or lease a laptop computer and software that meets program specifications prior to starting the program. Laptop and software specifications are found on the school's website.

While facilities are provided for use, cost for supplies, individual equipment, and field trips necessary to the successful completion of the program are borne by the student. Due to variation in individual materials used, it is impossible to predict the exact costs for each student. A reasonable estimate of additional expenses is in the range of \$1,000 to \$2,000 per academic year.

The Architectural Studies program maintains the right to retain student work for exhibition or for records and accreditation purposes. Students are advised to assemble photographic and digital files of their work for their portfolios.

Students are encouraged to participate in professional related student organizations, which include the American Institute of Architecture Students, Construction Specifications Institute, and Illuminating Engineering Society. Additional activities designed to enhance the overall quality of education include the University Honors Program, travel study programs, workshops and guest lectures.

Prospective students attending another college or university prior to transferring to Southern Illinois University Carbondale should concentrate on completing courses articulated or approved as substitutes for Southern Illinois University Carbondale's University Core Curriculum requirements. Prior to taking courses that appear to equate to the professional sequence, the applicant should consult with the school director or designated representative.

Students must pass all Architectural Studies prefix courses with a minimum grade of C- in order to satisfy prerequisites and to graduate. If a student receives a grade of F three times in the same course, the course cannot be taken again. Students cannot repeat Architectural Studies Prefix courses in which they received a grade of C or better.

Bachelor of Science (B.S.) in Architectural Studies Degree Requirements

| Degree Requirements | Credit Hours |
|--|--------------|
| University Core Curriculum - As per University requirements for baccalaureate degrees, but must include HIST 101A, HIST 101B. ¹ | 39 |
| Requirements for Major in Architectural Studies | (9) + 87 |
| MATH 111 ² | (3) + 1 |
| PHYS 203A | (3) |
| PHYS 253A | 1 |
| HORT 328A, HORT 328B | 2 + 2 |
| Electives | 9 |
| ARC 121, ARC 122, ARC 231, ARC 232, ARC 242, ARC 251, ARC 252, ARC 271, ARC 341, ARC 342, ARC 351, ARC 352, ARC 361, ARC 362, ARC 381, ARC 451, ARC 452, ARC 462, ARC 481, ARC 482 | (3) + 72 |
| Total | 126 |

¹ ARC 231, ARC 232, MATH 111 and PHYS 203A will apply toward nine credit hours of University Core Curriculum requirements making a total of 39 credit hours in that area.

² MATH 108 and MATH 109 substitute for MATH 111. Credit hours will be (3) + 3. Total credit hours for the degree remains 126 when the extra credit hours are counted as an architecture elective.

Construction Management and Operations Minor

A minor in Construction Management and Operations consists of 15 credit hours, which must include ARC 210 and/or ARC 310 along with other selections from ARC 213, ARC 410, ARC 411, ARC 412, and ARC 413. ARC 210 or ARC 310 must be satisfied before taking the upper division 400-level courses. Students must earn a minimum grade of C- in each course taken to satisfy the requirements of the minor, and students must earn a minimum grade point average of 2.0 for those minor courses. An advisor within the School of Architecture must be consulted before selecting this field as a minor.

Architectural Studies Courses

ARC121 - Design Communication I (Same as ID 121) Introduction to basic drawing and graphic modeling for interior design, architecture, and graphic communication. Instruction in two- and three-dimensional visualization of form and space. Topics: freehand drawing and drafting skills, orthographic projection, shade and shadow, paraline drawing, sketching, drawing and projection composition, and perspective geometry and projection. Restricted to Architectural Studies and Interior Design majors. Studio Fee: \$48. Credit Hours: 4

ARC122 - Design Communication II (Same as ID 122) Continuation of Design Communication I. This course is a continuation of sketching and black and white drawing techniques. The introduction of color and color presentation techniques with emphasis on advanced interior design and architectural graphics and presentation composition. Prerequisite: ARC 121 or ID 121. Restricted to Architectural Studies and Interior Design majors. Studio Fee: \$48. Credit Hours: 4

ARC199 - Individual Study Provides first-year students with the opportunity to develop a special program of studies to fit a particular need not met by other offerings. Enrollment provides access to the resources of facilities of the entire institution. Each student will work under the supervision of a sponsoring staff member. Special approval needed from the sponsor and school director. Credit Hours: 1-10

ARC210 - Construction Management and Operations: Introduction to the Profession Initial course in Construction Management and Operations (COMO) specialization series for the BSAS curriculum. Participants will develop an understanding of the wide range of opportunities for COMO, explore applicable standards of practice, industry-based code of ethics, interact with allied and associated organizations, identify certification requirements, and understand the technical challenges of COMO. Credit Hours: 3

ARC213 - Construction Estimating Fundamentals Provide overview of the estimator role in the construction industry. Analyze the different project delivery methods utilized by an estimator. Identify the fundamental skills of an estimator and the factors that impact an informed estimate. Explore bidding strategies and tactics used by estimators to factor in unknown variables in construction estimates. Credit Hours: 3

ARC231 - Architectural History I (Same as ID 231) (University Core Curriculum Course) The study of the influences and the development of architecture from prehistoric to the 19th Century, in particular, the study of structure, aesthetics, and the language of architecture. Credit Hours: 3

ARC232 - Architectural History II (Same as ID 232) (University Core Curriculum Course) Course covers development of modern architecture and urban planning from the 19th Century to the present, and includes American, British and Continental architecture and urban planning and influences of Eastern Architecture and design. Credit Hours: 3

ARC242 - Building Technology I: Wood Introduction to basic materials, components, processes, theories, and means of assembly of light wood frame construction. Building of full-scale projects on an off campus requiring the fabrication of wood structures with appropriate tools and equipment. Preparation of working drawings in light wood frame construction using BIM software. Prerequisite: ARC 122, 271. Restricted to major. Studio fee: \$36. Credit Hours: 3

ARC251 - Design I: Concept (Same as ID 251) Introduction to the basic principles and elements of design by means of practical and abstract applications. Development of two- and three-dimensional solutions and presentations for conceptual design problems. Emphasis is on three-dimensional thinking and communication. Prerequisite: ARC 122. Restricted to Architectural Studies and Interior Design majors. Studio fee: \$48. Credit Hours: 4

ARC252 - Design II: Order A series of studio exercises to develop an understanding of the use of a model for structuring design information, fundamentals of programming, research, communication skills and the design process. This course is designed to satisfy the writing portion of the Communication-Across-the-Curriculum requirements. Prerequisites: ARC 251, 271 and ENGL 101. Restricted to Architectural Studies and Interior Design majors. Studio fee: \$48. Credit Hours: 4

ARC258 - Work Experience Credit Credit granted for job skills, management-worker relations, and supervisor experience for past work experience while employed in industry, business, the profession, or service occupations. Credit will be established by school director evaluation. Restricted to major. Credit Hours: 1-30

ARC259 - Occupational Education Credit A designation for credit granted for past occupational educational experiences related to the student's educational objectives. Credit will be established by school director evaluation. This credit may only be applied at the 100- and 200-level for the architectural studies degree unless otherwise determined by the director. Restricted to major. Credit Hours: 1-60

ARC271 - Computers in Architecture (Same as ID 271) This course serves as an introduction to various electronic media employed within the practice of interior design and architecture. Creative and effective skills in the use of computers in interior design and architecture applications are consistently stressed. Restricted to major. Credit Hours: 3

ARC299 - Individual Study Provides students with opportunity to develop a special program of studies to fit a particular need not met by other offerings. Enrollment provides access to the resources of facilities of the entire institution. Each student will work under the supervision of a sponsoring staff member. Special approval needed from the sponsor and school director. Credit Hours: 1-16

ARC310 - Construction Management and Operations: Program Management Explore project scope and delivery methods, compensation, forms, contract types during program phase, pre-design, and pre-construction management. Identify importance of contract delivery, administration, documentation, and control across all project phases from concept through facilities management and de-construction. Project performance, stakeholder decisions, documentation tools, and applications are examined. Credit Hours: 3

ARC314I - Expressions in Architecture (University Core Curriculum) A study of the interconnected nature of the arts, history, environmental psychology, and architecture using the built environment as the foundation for the study. Students will learn to critically examine the built environment by learning how architecture expresses human cultures, social structures, economic and political status, and spiritual beliefs. Credit Hours: 3

ARC319 - Occupational Internship Each student will be assigned to a University approved organization engaged in activities related to the student's academic program and career objectives. The student will perform duties and services as assigned by the preceptor and coordinator. Reports and assignments are required to be completed by the student. Hours and credits to be individually arranged. Mandatory Pass/Fail. Restricted to major in architectural studies. Special approval needed from the instructor. Credit Hours: 1-15

ARC320 - Architectural Cooperative Education The student will participate in an Architectural Studies approved cooperative education program that includes formal instruction, training and/or career related work experiences. Students receive a salary or wages and engage in pre-arranged assignments related to their academic program and career objectives. Program faculty evaluations, cooperative agency student performance evaluations and student reports are required. Cooperative experience may be in one or more of the following broad areas: (a) schematic design, (b) design development, (c) construction documents, (d) bidding or negotiations, (e) construction administration. Hours and credit to be individually arranged. Restricted to major in architectural studies. Special approval needed from the instructor. Credit Hours: 1-12

ARC341 - Building Technology II: Masonry and Concrete Continuing study of materials and practices in document preparation for buildings using masonry and reinforced concrete construction. Investigation and use of local, state and federal codes regulating health and safety. Investigation of construction techniques relating to criteria of permanence, low maintenance and budget requirements. Produce a set of working drawings for a two-level, light commercial/industrial building. Prerequisite: ARC 242. Restricted to major. Studio fee: \$48. Credit Hours: 4

ARC342 - Building Technology III: Steel Correlation of the design development and construction documents phases of a building project. Development of the project from design development through construction drawing phases with appropriate drawings required for each phase. Prerequisite: ARC 242. Restricted to major. Studio fee: \$48. Credit Hours: 4

ARC350 - Technical Career Subjects In-depth competency and skill development and exploration of innovative techniques and procedures used in business, industry, professions, and health service occupations offered through various workshops, special short courses, and seminars. Hours and credit to be individually arranged. This course may be classified as independent study. Special approval needed from the instructor and school director. Credit Hours: 1-32

ARC351 - Design III: Context Continuing study of architectural design. Projects of increased scope and complexity. Continue design process study (synthesis) and appropriate design presentation (communication). Working with impingement introduced by external agencies such as social, government, and community, as part of a larger context of planning. Study of the impact of site development, for on-site as well as external, contextual issues. Prerequisite: ARC 252. Restricted to major. Studio fee: \$60. Credit Hours: 5

ARC352 - Design IV: Complexity Completion of complex design projects in varied environmental settings. Rapidly paced projects designed to provide the maximum exposure to complex architectural typologies. Analysis of facility program toward management of complex patterns. Prerequisites: ARC 351, ARC 381. Restricted to major. Studio fee: \$60. Credit Hours: 5

ARC353 - Architectural Vertical Studio A series of studio exercises designed to allow students to earn credit for ARC 251, 252, 351, 352, 451, 452, or ID 251 or 252. Projects are designed to fulfill the goals of the course for which this is substituted. Prerequisites and course work load vary according to the course for which this is substituted. Sophomore standing or higher required. Course may be repeated for up to 14 credit hours. Prerequisite: Approval of School Director required. Studio fee: \$12 per credit hour. Credit Hours: 4-6

ARC361 - Structures I: Statics and Steel Elementary study of forces and force systems using graphic and analytic methods. Basic structural concepts: reactions, shear and moment diagrams, axial, eccentric and combined loading on beams and columns. Design of floor and roof structural systems: load analysis, acting and resisting stresses. Truss stress analysis. Introduction to steel design. Prerequisites: PHYS 203A, PHYS 253A. Restricted to major. Credit Hours: 3

ARC362 - Structures II: Wood and Concrete Study of wood and concrete structural framing systems: investigation of wood and concrete materials and their limitations, and the use of appropriate structural design procedures for wood and concrete structures through selection of appropriate, common and economical shapes to satisfy building structural requirements and applicable building code requirements. Prerequisite: ARC 361. Restricted to major. Credit Hours: 3

ARC381 - Environmental Design I: Site Planning The fundamentals of site planning with reference to the historical, environmental, climatic, technologic, and legal aspects in site design. Introduction to use of surveying equipment and the preparation of a site design with emphasis on the principles of sustainable design. Restricted to major. Studio fee: \$24. Credit Hours: 2

ARC399 - Individual Study Provides students with the opportunity to develop a special program of studies to fit a particular need not met by other offerings. Enrollment provides access to the resources of the entire institution. Each student will work under the supervision of a sponsoring staff member. Special approval needed from the faculty sponsor and school director. Credit Hours: 1-16

ARC401 - Design Leadership-Design Thinking, Creative Culture, Complex Problem-Solving, Innovative Processes A theoretical-practical course that introduces a mixture of multiple theories,

methods, and studio-based problem-solving applications incorporated in current design and architectural programs as they relate to our greater socio-environmental world. This course is designed to provide participants the concepts and tools to better understand the art and value of creativity and design leadership; and the understanding of applicative methods to become better leaders and change agents that are able to effectively interact, communicate, and implement innovative ideas across differing contexts and group dynamics. Instruction is primarily through lecture, critical discussion of readings, workshop participation, presentation, and reflective critique in a mixed seminar-studio setting. Restricted to senior or graduate student standing or approval by the Director of the Architectural Studies Program. Credit Hours: 4

ARC402 - Urban Intelligence: Systems and Models The advent of information and communication technology (ICT) and the internet of things (IoT), availability of big data, and advances in artificial intelligence (AI) under the smart city umbrella have dramatically changed today's cities. Despite the challenges, these emergent technologies provide opportunities to integrate and model multifaceted and complex urban systems at unprecedented scales. This allows gaining insight and achieving actionable intelligence for developing sustainable, resilient, and healthy built environments. The course delivers lectures and workshops on: a) theories of smart cities and state-of-the-art methods and frameworks for leveraging urban intelligence; b) understanding various urban systems, including but not limited to environmental, built infrastructures, and human systems; c) big data acquisition and data analysis, mapping, and visualization; and e) development of data-driven models (based on conventional and AI-based computations) to extract knowledge and predict/forecast future scenarios. Restricted to senior or graduate student standing or approval by the Director of the Architectural Studies Program. Credit Hours: 4

ARC410 - Construction Management and Operations: Construction Safety Management Introduce principles of safety and health in the construction industry and their relationship to Construction Management and Operations (COMO). Include identification of safety and health hazards, risk reduction measures, personal protection, and safety attitudes and training. Explore Occupational Safety and Health Regulations for Construction. Credit Hours: 3

ARC411 - Construction Management and Operations: Time, Value and Risk Management Overview of management issues and scheduling for a project. Explain importance of time and risk management in construction and construction business. Study how fundamentals of scheduling, liability, and value are interrelated and explore impacts on project, scope, and budget. Apply constructability, sustainability, return on investment strategies, quality management terms and definitions throughout project phases. Prerequisite: ARC 210 or ARC 310. Credit Hours: 3

ARC412 - Sustainable Construction Management and Green Building This course focuses on the methods, processes and information necessary to achieve sustainability in design and construction management. Course contents include the study of green building practices and investigate how sustainability is being implemented nationally throughout construction industries. The U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) rating system categories and criteria are discussed. Prerequisite: ARC 210 or ARC 310 with a grade of C- or better. Credit Hours: 3

ARC413 - Budget and Cost Management Provide overview of various estimating tools and methods for managing budgets, project estimates, and costs during program, construction and facilities management phases. Identify roles and responsibilities for controlling and monitoring project cost. Identify and develop methods for creating valid project estimates and budgets. Explore Integrated Project Delivery (IPD) for budget and cost management. Prerequisite: ARC 213, and ARC 210 or ARC 310 with grades of C- or better. Credit Hours: 3

ARC434 - Preservation Summer (Same as HIST 496B) Field experience in research and historic preservation issues related to regionally and nationally significant historic sites in southernmost Illinois between the Ohio and Mississippi rivers. Not for graduate credit. Special approval needed from the instructor. Credit Hours: 3

ARC444 - Architectural Field Studies In site study of specified world area(s) concerning the influence of the region's particular culture on architecture, landscape, urban and interior design. The course reviews both historic and current; ethnicity, social, philosophical, religious, economic and political values of the region being visited to gain insights on the symbiotic relationship between culture and design. Not for graduate credit. Fees: cost of transportation, lodging, access fees and general cost related to delivery of

the curriculum items that are in addition to on-site courses. Special approval needed from the instructor and school director. Credit Hours: 1-6

ARC451 - Urban Design and Community Study of urban design and community as cultural and spatial development of human settlement patterns. All previous design course experience will be brought to bear on the architectural projects within the context of urban and community criteria. Not for graduate credit. Prerequisite: ARC 352. Restricted to major. Studio fee: \$72. Credit Hours: 6

ARC452 - Design VI: Integration This comprehensive design studio focuses the knowledge and skills developed in all previous courses on a single project. The course emphasizes the design integration of the building's structural and environmental systems. Not for graduate credit. Prerequisites: ARC 342, ARC 362, ARC 451, all with passing grades of C-. Restricted to major. Studio fee: \$72. Credit Hours: 6

ARC462 - Structures III: Analysis and Lateral Forces Continuing study of framing materials and systems for buildings using advanced concepts of structural analysis. Included are earth-quake resistant structures, wind resistant design, composite beams, plastic theory, statically indeterminate structures, long spans, moment distribution, multi-story structures, and other related topics. Not for graduate credit. Restricted to major. Credit Hours: 3

ARC470 - Architectural Visualization This course is designed to give the student a fundamental understanding of the practices of 3D architectural modeling and visualization. Themes emphasized are: 3D modeling; still frame rendering; animation production; image editing and post production. Priority enrollment is given to graduate students in ARC 570 before ARC 470 is offered. Prerequisite: ARC 271. Restricted to architecture and interior design majors. Special approval needed from the advisor. Credit Hours: 3

ARC481 - Environmental Design II: Energy and Systems (Same as ID 481) The study of the influence of energy, human comfort, climate, context, heating, cooling and water on the design of buildings and sites. The design of passive and active environmental systems and strategies for sustainability. Restricted to major in Interior Design or Architectural Studies; Junior standing with permission. Credit Hours: 3

ARC482 - Environmental Design III: Lighting and Acoustics (Same as ID 482) This course provides a comprehensive overview of the study of the influences of energy, human comfort, climate, and context, luminous and sonic environment with emphasis on energy-conscious design. Restricted to major; Junior standing with permission. Credit Hours: 3

ARC499 - Individual Study Provides students with the opportunity to develop a special program of studies to fit a particular need not met by other offerings. Enrollment provides access to the resources of the entire institution. Each student will work under the supervision of a sponsoring staff member. Not for graduate credit. Special approval needed from the faculty sponsor and school director. Credit Hours: 1-16

Architectural Studies Faculty

Anderson, Robert, Lecturer, M.Arch., Southern Illinois University, 2014; 2000.

Ashayeri, Mehdi., Assistant Professor, Ph.D., Illinois Institute of Technology, 2020, M.Arch., Tehran Azad University, 2012.

Baysinger-Hensley, Sheila, Associate Professor of Practice, J.D., Southern Illinois University Carbondale, B.Arch., University of Illinois, 1989.

Gonzalez-Torres, Rolando E., Associate Professor and School Director, Ph.D., Universitat Politècnica de Catalunya, Spain, 2008, M.Ed., Western Kentucky University at Bowling Green, 2001, MLA, Texas A&M, 1996.

Huang, Qian., Associate Professor, Ph.D., Purdue University, 2013.

Kalua, Amos, Assistant Professor, Ph.D., Virginia Polytechnic Institute and State University, 2021, M.S. Arch., Virginia Polytechnic Institute and State University, 2018, Master of Engineering in Architecture, Harbin Institute of Technology, China, 2015.

Kheiri, Farshad, Assistant Professor, Ph.D., Texas A&M, 2020, M.Arch., Iran University of Science and Technology, 2011.

Lugo, Jose, Lecturer, M.Arch., Southern Illinois University, 2006.

Morthland, Laura, Associate Professor and Interior Design Program Director, M.I.Arc., University of Oregon, 2003.

Roy, Sanjit, Assistant Professor of Practice, M.S.Arch., University of Cincinnati, 2004, B.Arch., New Delhi, India, 2001.

Smith, Peter B., Associate Professor and Design Foundations Coordinator, M.Arch., University of Illinois, 1980.

Turnipseed, Steven, Senior Lecturer, M.S.Arch., Columbia University, 1976. B.Arch., Ball State, 1975.

Emeriti Faculty

Anz, Craig K., Professor, Emeritus, Ph.D., Texas A&M, M.S. ArchSt., University of Texas, M.Arch., University of Texas at Arlington, 1991.

Brazley, Michael D., Associate Professor, Emeritus, Ph.D., University of Louisville, B.Arch., Howard University, 1978.

Dobbins, John K., Associate Professor, Emeritus, M.Arch., M.B.A., University of Illinois, 1986.

Hays, Denny M., Associate Professor, Emeritus, M.Arch., University of Utah, 1971.

Lach, Norman, Assistant Professor, Emeritus, M.Arch., University of Illinois Champaign, 1974.

LaGarce, Melinda, Associate Professor, Emerita, M.F.A., Texas Technology University, 1972.

Owens, Terry A., Associate Professor, Emeritus, M.S., Southern Illinois University Carbondale, 1984.

Poggas, Christy, Assistant Professor, Emerita, M.S. Ed., Southern Illinois University Carbondale, 1990. B.Arch., University of Arizona, 1975.

Swenson, Robert, Associate Professor, Emeritus, M.Arch., Yale University, 1969.

Tully, Timothy R., Assistant Professor, Emeritus, M.S., Southern Illinois University Carbondale, 1990.

Wendler, Walter V., Professor Emeritus, Ph.D., University of Texas, 1991, M.Arch., University of California, Berkeley, 1975.

White, David J., Associate Professor, Emeritus, M.S.Ed., Southern Illinois University Carbondale, 1991.

Wright, James K., Assistant Professor, Emeritus, M.Arch., University of Pennsylvania, 1966.

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