architecture and **SUSTAINABILITY**
FERRIS STATE UNIVERSITY
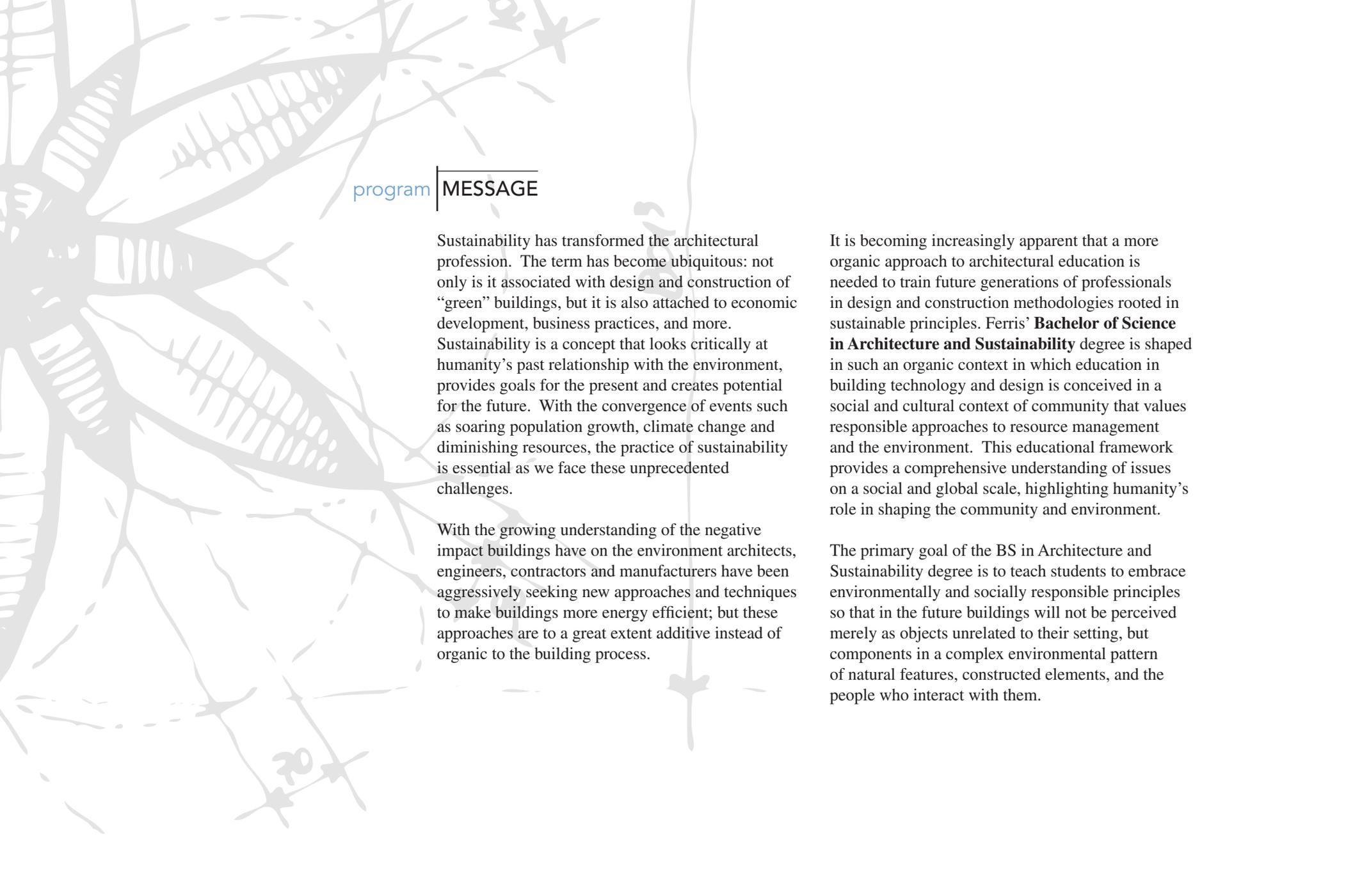
Sustainability has transformed the architectural profession. The term has become ubiquitous: not only is it associated with design and construction of "green" buildings, but it is also attached to economic development, business practices, and more. Sustainability is a concept that looks critically at humanity's past relationship with the environment, provides goals for the present and creates potential for the future. With the convergence of events such as soaring population growth, climate change and diminishing resources, the practice of sustainability is essential as we face these unprecedented challenges.

With the growing understanding of the negative impact buildings have on the environment architects, engineers, contractors and manufacturers have been aggressively seeking new approaches and techniques to make buildings more energy efficient; but these approaches are to a great extent additive instead of organic to the building process.

It is becoming increasingly apparent that a more organic approach to architectural education is needed to train future generations of professionals in design and construction methodologies rooted in sustainable principles. Ferris' **Bachelor of Science in Architecture and Sustainability** degree is shaped in such an organic context in which education in building technology and design is conceived in a social and cultural context of community that values responsible approaches to resource management and the environment. This educational framework provides a comprehensive understanding of issues on a social and global scale, highlighting humanity's role in shaping the community and environment.

The primary goal of the BS in Architecture and Sustainability degree is to teach students to embrace environmentally and socially responsible principles so that in the future buildings will not be perceived merely as objects unrelated to their setting, but components in a complex environmental pattern of natural features, constructed elements, and the people who interact with them.

program STRUCTURE

The Bachelor of Science in Architecture and Sustainability program has been designed as an upper level specialization for graduates of Ferris and community college Associate Degree programs in Architectural Technology.

As a 2+2 program, the first two years of the undergraduate experience begins with a foundation of technical and graphic skills leading to an **AAS degree in Architectural Technology.** Ferris' Architectural Technology program has a long history of recognized success and provides the appropriate preparatory coursework for the upper-level degree; with a focus on the fundamentals of design, visual communication, technology, building systems and performance, and construction materials and detailing.

The second two years of the undergraduate experience leads to a **BS degree in Architecture and Sustainability.** The program focuses on the process of architectural problem solving within the context of human, social, and natural ecosystems through the application of the fundamentals learned in the first two years.

At both levels, the architectural curriculum is unique in its emphasis on sustainability and the practice of the profession. Courses and studios are structured to mirror the office environment. Course content and projects are designed to incorporate a set of practices and ways of thinking about the making of buildings for the sustainable development of the built environment. Taught by practitioners, the curriculum provides skills, knowledge, and aspirations necessary to allow students to become successful professionals.

program OBJECTIVES

There are two primary objectives of the BS in Architecture and Sustainability program: 1) To prepare graduates for employment in the architectural profession at career-entry levels; 2) To prepare graduates to continue their education in a NAAB-accredited graduate program leading to licensure as an architect.

To this end, students who complete the program will possess the ability to:

- Produce professional-quality graphic presentations and technical documents

- Conduct independent and directed research to gather information about architectural and community planning problems

- Develop fundamental and advanced design principles and concepts

- Demonstrate collaborative skills and synthesis thinking

- Practice responsible approaches to environmental conservation

- Demonstrate knowledge of building materials and assemblies

- Demonstrate an understanding of structural systems

- Demonstrate an understanding of building environmental and control systems

- Demonstrate an understanding of the technology and aesthetics of building envelope systems

- Integrate building codes and systems –including HVACR, electrical, life-safety, communication, and acoustics - into comprehensive architectural solutions

# program SPECIALTIES

THE SMALL TOWN STUDIO

Architects and architectural students must retain connections to the patterns of everyday life if they are to do their work effectively. The BS in Architecture and Sustainability program integrates a unique approach to connecting students with these patterns through its Small Town Studio, which serves to contextualize the work that students do, and introduce them to the challenges and opportunities presented by real clients and real problems.

In the context of architecture and community planning, relatively little attention has been paid to issues of small towns in the United States. Many such towns have seen significant economic hardship and deterioration of their small town fabric. The advent of big-box stores, as well as municipalities chasing the tax revenue they provide, has resulted in increased vacancy and decreased viability for small towns in addition to increasing negative environmental impact.

Ferris State University is in a unique position to provide remedies for these problems through the Small Town Studio. The BS in Architecture and Sustainability program, with the integration of community planning concepts, provides an educational experience that can engage directly with the city of Big Rapids to address their unique architectural and environmental problems. Moreover, the Small Town Studio can serve as a clearinghouse for small towns across Michigan; through which a wide range of design and planning problems can be addressed, with a specific focus on preservation of community as an act of sustainability.

Distinguishing aspects of the Small Town Studio include:

- The problems its students address are based in reality, with real clients, thus creating a working relationship between the university and the community
- The studio setting allows greater interaction between students and clients, replicating more realistically the character of architectural practice and planning
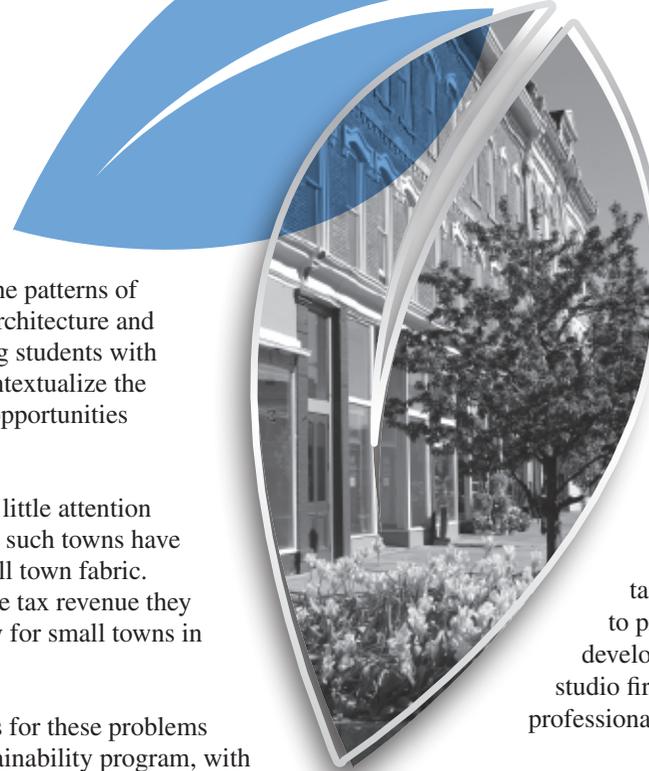
VISITING PROFESSOR

Among the factors that keep an architecture program vital is a link to the world of practice. It is important for students to be educated in a context of stylistic and technological currency. The BS in Architecture and Sustainability program integrates a Visiting Professor who journeys to Big Rapids on a regular schedule throughout the semester; works in tandem with a full-time faculty member to provide a framework of project creation, development and review; and brings to the studio first-hand experience with the critical professional issues of the day.

PLACE MATTERS LECTURE AND FILM SERIES

The Place Matters Lecture and Film Series combines community outreach with educational practice to create a public forum for the exchange of ideas between students, professionals, and community members. Lecturers are drawn from regionally and nationally-recognized architects, writers, designers, and environmentalists who share their work and ideas with students and other interested parties. Visiting lecturers are also given the opportunity to interact with students in the classroom, which proves to be an invaluable addition to their education. Documentary films that address a wide range of topics relating to architecture are also presented to encourage discussion and engagement with the profession.

program | CURRICULUM

THIRD YEAR - FALL SEMESTER

ARCH 341	Architectural Design 1
ARCH 323	Structural Design (ARCH 223)
ARCH 361	Environmental Systems 1 (HVAC 337, PHYS 211)
ENGL 3xx	English Elective
PLSC 121	American Government 1: People & Politics (R, S)
PLSC 122	American Government 2: Policy Making (R, S)

(OR)

THIRD YEAR - SPRING SEMESTER

ARCH 246	Twentieth Century Architecture
ARCH 342	Architectural Design 2 (ARCH 341)
ARCH 362	Environmental Systems 2 (ARCH 361)
ARCH elec	Architectural elective
FMAN 432	Principles of Interior Architecture

FOURTH YEAR - FALL SEMESTER

ARCH 441	Architectural Design 3 (ARCH 342)
ARCH 419	Sustainability in Architecture: Advanced Topics (ARCH 342)
ARCH 421	Current Issues in Architecture (ARCH 342)
PLSC 411	Urban and Regional Planning (PLSC 121 or 122)
Elective	Science Elective

FOURTH YEAR - SPRING SEMESTER

ARCH 499	Architectural Design 4 (ARCH 441)
ARCH elec	Architectural elective
FMAN 322	Project Management
Elective	Global Elective

ARCHITECTURAL ELECTIVES:

ARCH 270	BIM and Parametric Design
ARCH 285	House: An American Evolution
ARCH 350	Site Design

course | DESCRIPTIONS
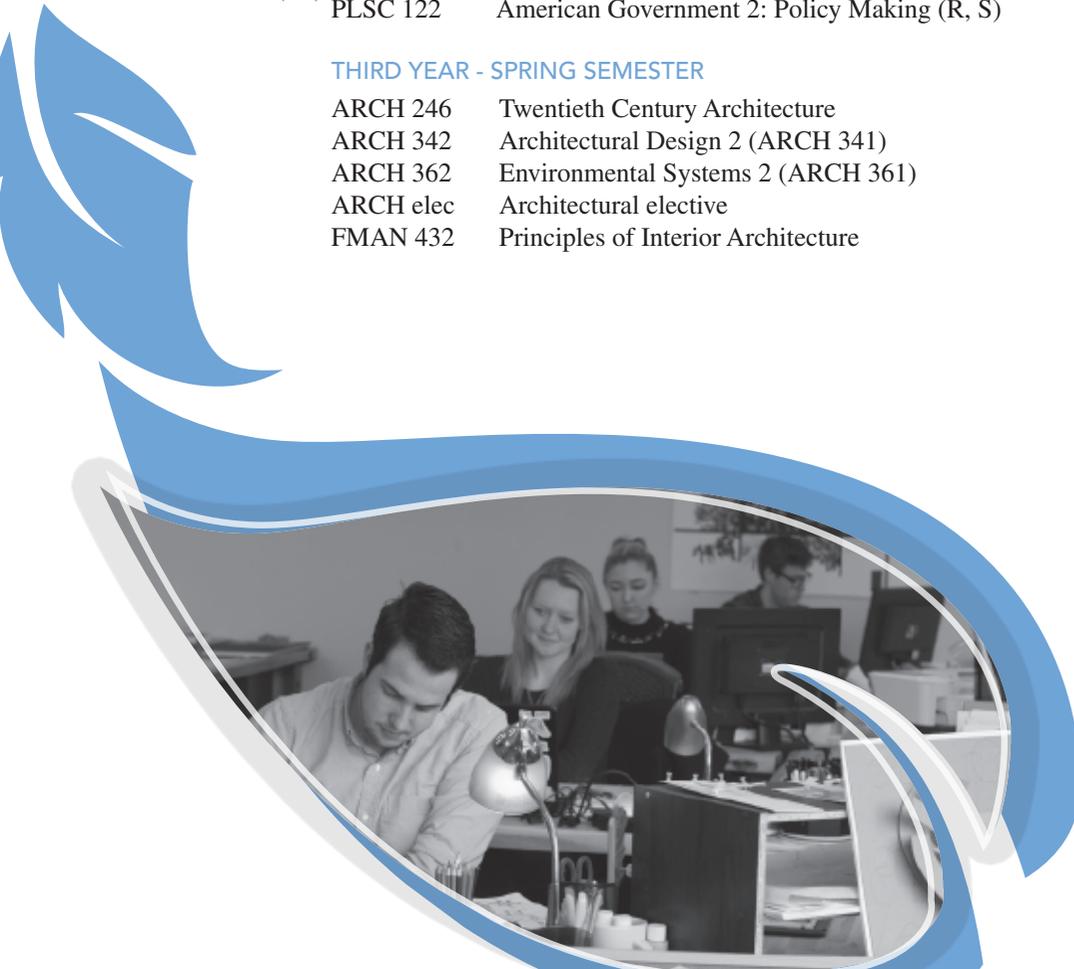
ARCH 323
STRUCTURAL DESIGN

Expansion of general structural principles and methods of analysis from prior course work in statics and strength of materials with advanced analysis and design of steel, concrete, and masonry systems. Material properties and structural behavior of each are examined in terms of safety, sustainability, economy, planning and construction.

ARCH 341
ARCHITECTURAL DESIGN 1

Students will utilize basic architectural design concepts to explore architectural form and space. Program requirements and user needs are addressed in a manner that sustains and enhances the natural and social environment.

ARCH 246
TWENTIETH CENTURY ARCHITECTURE

An investigation of the primary styles and movements in Western architecture from the late 19th century to the late 20th century. The course will examine cultural and architectural changes wrought by the Industrial Revolution and responses to them through the Arts and Crafts Movement, the International Style and Modernism, as well as the development of Post-Modern and Deconstructivist architectural theories.

ARCH 342
ARCHITECTURAL DESIGN 2

Students will explore the constraints and opportunities presented by an existing architectural environment. Projects may include renovation of or addition to an existing building. Solutions will address needs of users in a manner that sustains the natural environment and enhances the social context of the community.

ARCH 361
ENVIRONMENTAL SYSTEMS 1

An exploration of sustainable building strategies and practices. Topics covered include; climate and site analysis, water and energy conservation, sustainable materials, alternative energy sources, rating systems and code requirements for building energy conservation.

ARCH 362
ENVIRONMENTAL SYSTEMS 2

An exploration of electrical systems, power distribution, communication systems and building controls. Other environmental factors explored include illumination and acoustics. Special emphasis will be placed on sustainable practices.

ARCH 419
SUSTAINABILITY IN ARCHITECTURE:
ADVANCED TOPICS

Rooted in a topical, deep reading, this seminar critically considers holistic strategies for sustainability within the built environment and how these strategies contextually relate to architectural problem solving. Through independent research, analysis, critical readings, and peer review, students develop – and defend in writing – their own professional and personal sustainability ethic. Student led discussion, presentations, and individual research projects will require active student engagement.

ARCH 421
CURRENT ISSUES IN ARCHITECTURE

A seminar that responds to the issues of the day and how they relate to architecture; this course integrates ecology, sociology, history, literature and technology, allowing students to apply what they are learning to the conditions of the times in which we live.

ARCH 441
ARCHITECTURAL DESIGN 3

A course that addresses a real world architectural problem in its social and environmental context. Students will research and analyze existing conditions and client needs, define project requirements, and develop macro level schematic solutions based on input and feedback of a client community. Emphasis is placed on the analysis, process, and synthesis of architectural problems and their solutions.

course | DESCRIPTIONS

ARCH 499
ARCHITECTURAL DESIGN 4

A capstone course that comprehensively addresses a real world architectural problem in its social and environmental context. Students will focus on the detailed development of a specific architectural problem integrating knowledge, skills and content gained in previous courses. Projects require students to consider issues of building science, environmental responsibility, and community planning.

FMAN 322
PROJECT MANAGEMENT

Overview of facility project management concepts, phases and processes. Course topics include: development of project plans and teams, sequencing of activities, development of schedules, estimating of resources, coordinating and monitoring of facility projects, and review of project delivery methods and contracts.

FMAN 432
PRINCIPLES OF INTERIOR ARCHITECTURE

Overview of the elements of interior design and their application. Students apply the principles of interior design with regard to program requirements, context, environment, ergonomics, code and regulatory issues. The visual effects and physical attributes of various components of the interior space are studied.

PLSC 121
AMERICAN GOVERNMENT 1:
PEOPLE & POLITICS

Explores basic political concepts and what distinguishes democracy from other forms of government. Traces formative ideas and forces that shaped the U.S. Constitution. Expansion of civil liberties and rights is examined; along with attention to relations of national, state and local governments. Considers how public opinion through the media, interest groups, political parties, and elections makes demands on, and places restraints on, government. What new challenges for government arise from scientific, demographic, economic, and social change?

PLSC 122
AMERICAN GOVERNMENT 2: POLICY MAKING

Careful examination of the institutions of American national government and its policies. How the legislative, executive, and judicial branches work with, and against, each other to shape public policy. Explores the labyrinth of the bureaucracy. The complex interactions of these political structures are illustrated with current events. Considerable time is given to the resulting policies on the budget, the economy, technology, health care, welfare, military, foreign relations, and issues of gender and equality.

PLSC 411
URBAN AND REGIONAL PLANNING

This course examines planning concepts and the role of planning in the formulation of public policy and the meeting of critical social problems regarding "livability" that shape our urban and regional environments. Also the uses of planning will be covered to show how people's concerns about their quality of life can be accommodated while providing employment, services and facilities. This course will delineate the impacts of people upon their environment, society, and governments.

ARCHITECTURAL ELECTIVES:

ARCH 270
BIM AND PARAMETRIC DESIGN

An introduction to the fundamentals of computational and parametric design within a BIM environment. The potential for data driven BIM models to aid the architectural design process is examined with emphasis placed on self-directed exploration of advanced parametric and computational tools. Working within Revit generated BIM models, generative scripting, computational methods, and basic parametric tools are used to develop architectural solutions informed by environmental data, performance criteria, code requirements, and/or other contextual factors. Graphical Scripting Interfaces and their ability to generate parametric and computationally derived forms are also introduced.

ARCH 285
HOUSE: AN AMERICAN EVOLUTION

A survey of the development of various housing styles in the USA and their relationship to each other as well as social and economic developments. Students study the essence of architectural elements common in successful residential design. Students will design a house following the design conventions of the style of their choice for a given program.

ARCH 350
SITE DESIGN

A study of the physical, biological, and cultural aspects of a site and its development, with emphasis placed on connecting a site to its surrounding context through the use of sustainable design principles. Analysis, technical and legal knowledge, and design skills are used to prepare site development plans.

Upon graduation, students have the option to seek employment in the architectural field or transfer into an accredited Master of Architecture program, thereby providing students the educational path to architectural licensure.

The licensing of architects is necessary to protect the health, safety, and welfare of the people. The entire path to licensure varies from state to state, but typically requires eight to ten years – five to seven years in school plus a three-year internship as a salaried employee working under the supervision of registered professionals. In addition, successful passing of a comprehensive examination is required. Once the education, internship and examination requirements of a jurisdiction are complete, licensure or registration is obtained.

The first step in this process is completion of an accredited degree in architecture. The National Architectural Accrediting Board (NAAB) is the sole agency authorized to accredit US professional degree programs in architecture. Since most state registration boards in the United States require an applicant for licensure to have graduated from a NAAB-accredited program, obtaining such a degree - typically a Master of Architecture - is an essential aspect of preparing for the professional practice of architecture.

Ferris' BS in Architecture and Sustainability degree is conceived as the initial step toward architectural licensure for its graduates. As an undergraduate degree, however, it cannot fulfill accreditation requirements on its own; students must complete a Master of Architecture degree at another institution.

Typically Ferris' graduates will articulate into a two-year Master of Architecture track at another university. Ferris' BS degree and its emphasis on community studies, the environmental context, and the inclusion of technology, design, and history provides the appropriate undergraduate background for entry into these two-year MArch tracks. However, admission into a Master of Architecture program is competitive with requirements set by each institution. Admission decisions involve a review of the student's past academic history, test scores and a portfolio. Because architecture is a visual discipline, a portfolio is often the key determining factor for admission.

The path to licensure in the State of Michigan, for a typical Ferris graduate, will include:

- Education:

  - 2 years (Ferris' AAS in Architectural Technology or an approved equivalent degree)
  - 2 years (Ferris' BS in Architecture and Sustainability)
  - 2 years (Master of Architecture)
  - 3 years of Internship through the Architectural Experience Progam (AXP)

  - Successful completion of the Architect Registration Examination (ARE)

great | CAREER

A recent study by the National Council of Architectural Registration Boards (NCARB) suggests that the next generation of architects will need to be capable of integrating the practices of sustainability into established work methods. Specialized training in sustainability as it relates to building materials, design and planning, as well as the development of an organic relationship between buildings and their environment, will be a valuable credential in the decades ahead.

There are no geographic limitations on employment opportunities; however, educational requirements for architectural licensure vary by state, so students should research these requirements, as well as the requirement for graduate education should they choose to pursue a master's degree.

Entry-level positions in architectural firms range from $44,000 to $52,000 per year, depending on geographic location and company size. The average salary range for an associate architect is $55,000 - $75,000. The average salary range for architects with an average 10 years of experience and an architectural license is $95,000 - $125,000.
(Source: www.salary.com 2018)

Entry into the BS in Architecture and Sustainability program is competitive and open to Ferris AAS graduates and transfer students at the third year with appropriate preparation. Minimum requirements include:

- AAS in Architectural Technology (or approved equivalent)

- College transcripts

- 2.75 GPA

- Design Portfolio (including letter of intent/personal statement)

Applications and portfolios should be submitted by February 1 prior to fall semester requested. To apply online go to: **www.ferris.edu/admissions.**

Further information may be obtained by calling the Architecture and Facility Management Office at 231-591-3100, email atfm@ferris.edu, or visit program web site www.ferris.edu/BSArch.

faculty | DIRECTORY

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BS Architecture, University of Michigan
Master of Architecture, University of Michigan

Chris Cosper, AIA, LEED AP, Associate Professor
Email: christophercosper@ferris.edu
Bachelor of Architecture, Mississippi State University
Master of Arts, English, Mississippi State University
Master of Design Studies, Harvard University

Dane Johnson, RA, Registered Historic Architect, Professor
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Master of Architecture, Lawrence Technological University
Master of Science in Career and Technical Education, Ferris State University

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Master of Architecture, Lawrence Technological University

Dr. Tanzia Sharmin, Associate Professor
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PhD, Civil and Environmental Engineering, University of Alberta
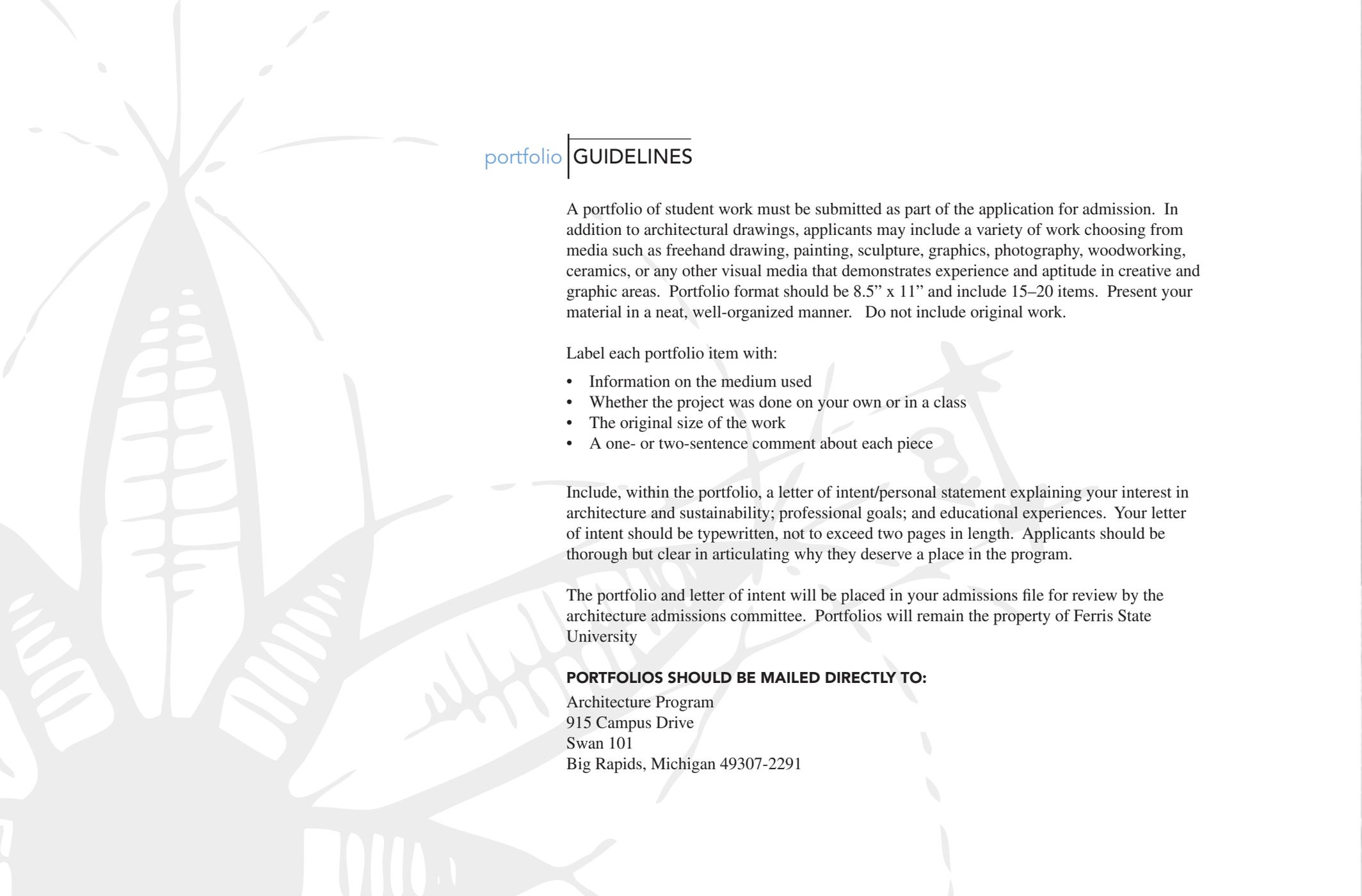
portfolio | GUIDELINES

A portfolio of student work must be submitted as part of the application for admission. In addition to architectural drawings, applicants may include a variety of work choosing from media such as freehand drawing, painting, sculpture, graphics, photography, woodworking, ceramics, or any other visual media that demonstrates experience and aptitude in creative and graphic areas. Portfolio format should be 8.5" x 11" and include 15–20 items. Present your material in a neat, well-organized manner. Do not include original work.

Label each portfolio item with:

- Information on the medium used
- Whether the project was done on your own or in a class
- The original size of the work
- A one- or two-sentence comment about each piece

Include, within the portfolio, a letter of intent/personal statement explaining your interest in architecture and sustainability; professional goals; and educational experiences. Your letter of intent should be typewritten, not to exceed two pages in length. Applicants should be thorough but clear in articulating why they deserve a place in the program.

The portfolio and letter of intent will be placed in your admissions file for review by the architecture admissions committee. Portfolios will remain the property of Ferris State University

PORTFOLIOS SHOULD BE MAILED DIRECTLY TO:

Architecture Program
915 Campus Drive
Swan 101
Big Rapids, Michigan 49307-2291

FERRIS STATE UNIVERSITY

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