

Architecture (ARCS, ARCC, ARCN, ARCH, ARCU)

Architecture - Studio (ARCS) Courses

ARCS 2105 [1.5 credit]

Studio 2

Supported by the core curriculum, focuses on small-scale building in a local context. Using analog methods, projects introduce the integration of basic structure and building systems while furthering fundamental concepts such as space, inhabitation, and materiality. (Core Course).

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 2111.

Prerequisite(s): ARCS 1005 and ARCS 1105.

Twelve hours studio, plus one hour lecture per week.

ARCS 2106 [1.5 credit]

Studio 3

With a focus on small to medium scale building projects, projects consider analog and digital methods to advance consideration of site, program, and the materials as the means for shaping the built environment. (Core Course).

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 2172, ARCH 2182, ARCH 2192.

Prerequisite(s): ARCS 1005 and ARCS 1105.

Twelve hours studio, plus one hour lecture per week.

ARCS 2302 [1.0 credit]

Conservation Studio 1

Conservation methodologies will be tested and studied through design exercises and historical research on existing architectures, cities and landscapes. The emphasis on the understanding and the relation with the setting will be essential.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 2172, ARCH 2182, ARCH 2192.

Prerequisite(s): Second-year standing in B.A.S. major Conservation and Sustainability or permission of the School.

Eight hours studio per week.

ARCS 2303 [1.0 credit]

Urbanism Studio 1: Fundamentals of Urbanism

Through readings, discussions and projects, students will examine a number of the forces that produce the built environment and explore a variety of approaches to documenting, representing, analyzing, organizing and controlling the growth, shape, density, and mix of uses associated with cities.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 2111, ARCU 2303 (no longer offered), ARCU 3501 (no longer offered).

Prerequisite(s): ARCS 1005 and ARCS 1105, or permission of instructor.

Eight hours studio, plus one hour lecture per week.

ARCS 2304 [1.0 credit]

Urbanism Studio 2: Urbanism in the Core

Intensification, revitalization, gentrification, brownfield redevelopment, sustainability, development standards, form-based codes, and the larger impact of migration on urban density. Through design, students explore the ramifications of practices, policies, pressures, processes and cultural preferences on the evolving form and function of the urban core.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 2172, ARCH 2182, ARCH 2192, ARCS 3303 (no longer offered).

Prerequisite(s): ARCS 1105, and third-year standing in B.A.S. Urbanism major or permission of the School.

Eight hours studio, plus one hour lecture per week.

ARCS 3105 [1.5 credit]

Studio 4

Supported by the core curriculum, focuses on a medium-scale building within a regional context. May include a small design-build. Projects further analog and digital methods. May introduce concepts like adaptive re-use while furthering the understanding of structure and building systems in a complex building. (Core Course).

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 3111.

Prerequisite(s): ARCS 2105 and ARCS 2106.

Twelve hours studio, plus one hour lecture per week.

ARCS 3107 [1.0 credit]

Studio 5

The Directed Studies Abroad (DSA) studio considers large-scale, mixed-use buildings in an international context. Design projects advance analog and digital methods to explore broader cultural and social conditions within a complex site often in conjunction with a site visit abroad. (Core Course).

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 3172, ARCH 3182, ARCH 3192, ARCS 3106 (no longer offered).

Prerequisite(s): ARCS 2105 and ARCS 2106.

Eight hours studio, plus one hour lecture per week.

ARCS 3301 [1.0 credit]**Conservation Studio 2**

Historical building projects exploring architecture as a form of cultural expression. Consideration of site, program and materials. Introduction of conservation, sustainability and adaptive re-use principles, development standards, architectural codes, using case studies in Ottawa and elsewhere. Physical, digital drawings and models to explore designs. (Core).

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 3111, ARCC 3301 (no longer offered).

Prerequisite(s): ARCS 2302 and third-year standing in B.A.S. Conservation and Sustainability major or permission of the School.

Studio eight hours per week.

ARCS 3302 [1.0 credit]**Conservation Studio 3**

The role of architecture in culture, stressing site and program with respect to their historic, social and ecological implications. Synthesis of issues, methods and techniques of the conservation and sustainability curriculum. (Core Course).

Includes: Experiential Learning Activity

Precludes additional credit for ARCC 3302 (no longer offered), ARCH 3172, ARCH 3182, ARCH 3192.

Prerequisite(s): ARCS 3301 and third-year standing in B.A.S. Conservation and Sustainability major or permission of the School.

Studio eight hours per week.

ARCS 3304 [1.0 credit]**Urbanism Studio 3: Urbanism on the Periphery**

Urbanization, sprawl, growth models, land consumption, containment strategies (smart growth, greenbelts, growth boundaries), edge cities, the Just City, Ecological Urbanism, and informal suburbanization in developed and developing countries. Through design, students explore the impact of practices, pressures, processes and cultural preferences on the expanding city.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 3111, ARCU 3304 (no longer offered).

Prerequisite(s): ARCS 2303 and ARCS 2304 and third-year standing in B.A.S. Urbanism major or permission of the School.

Eight hours studio, plus one hour lecture per week.

ARCS 3306 [1.0 credit]**Urbanism Studio 5: Global Perspectives**

Urbanization as a global phenomenon. Study of various forms of urbanization and de-urbanization in relation to economic, political and cultural forces. Through design, students explore the (trans)formation of settlements and communities outside of the North American context.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 3172, ARCH 3182, ARCH 3192, ARCS 4304 (no longer offered).

Prerequisite(s): ARCS 2303 and ARCS 2304 and third-year standing in B.A.S. Urbanism major or permission of the School.

Eight hours studio, plus one hour lecture per week.

ARCS 4105 [1.5 credit]**Comprehensive Studio**

Focussing on multi-unit housing, students from BAS majors collaborate to develop strategies for redevelopment of large urban sites. Engages urban design, site planning, programming, adaptive reuse, and community consultation. Students produce detailed designs for buildings, emphasizing building systems and envelope design. (Core Course).

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 4111.

Prerequisite(s): ARCS 3105 and ARCS 3107, or ARCS 3303 and ARCS 3304.

Twelve hours studio, plus one hour lecture per week.

ARCS 4107 [1.0 credit]**Option Studio**

Offers a range of topics for exploration. Students use analog and digital methods and techniques to culminate the undergraduate studio sequence while offering focused research-led investigation into key social, political, spatial issues. (Core Course).

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 4172, ARCH 4182, ARCH 4192, ARCS 4106 (no longer offered).

Prerequisite(s): ARCS 3105 and ARCS 3107.

Eight hours studio, plus one hour lecture per week.

Architecture - Technical (ARCC) Courses**ARCC 2100 [0.5 credit]****Design and the Environment**

Examines varied methods and techniques to understand the people, places, and potentials of landscapes with a focus on equity and an ethics of care for social and physical environments.

Precludes additional credit for ARCH 1222.

Prerequisite(s): Second-year standing or permission of the School.

Lecture three hours per week

ARCC 2202 [0.5 credit]**Architectural Technology 1**

General introduction to materials and methods of construction with focus on wood and timber frame construction. Site conditions, foundations, structure and envelope design in terms of their response to local climate: sun (light and heat) wind, moisture. (Core course).

Precludes additional credit for ARCH 2221.

Prerequisite(s): permission of the School.

Lectures three hours a week.

ARCC 2203 [0.5 credit]**Architectural Technology 3**

Wood frame, post and beam, steel and concrete systems and construction techniques. Structural systems and building envelope principles and practise are explored in conjunction with mechanical and electrical systems in smaller buildings. Emphasis on precedent, tradition and methodology of architectural detailing for construction.

Includes: Experiential Learning Activity

Precludes additional credit for ARCH 3221.

Prerequisite(s): ARCC 2202 and third-year standing for B.A.S. students and third-year standing for students in B.Eng. Architectural Conservation and Sustainability.

Lectures three hours a week.

ARCC 3202 [0.5 credit]**Architectural Technology 4**

Medium scale steel, concrete, and wood frame buildings as case studies to explore approaches to building science principles, building envelope design, advanced construction methods and materials, acoustics and sound control, and fire protection. Focus on sustainable design strategies and environment impact. (Core course).

Precludes additional credit for ARCH 4221.

Prerequisite(s): ARCC 2203 and third-year standing for B.A.S. students or ARCC 2203 and third-year standing for students in B.Eng. Architectural Conservation.

Lectures three hours a week.

ARCC 4200 [0.5 credit]**Structural Morphology**

Interdisciplinary study of structural and developmental morphology focusing on dynamic generative design processes, integrative systems, spatial modulations and fundamental generative principles of spatial form and structure as it relates to architecture. (Workshop).

Includes: Experiential Learning Activity

Lectures, seminar, workshop or field work six hours a week.

ARCC 4207 [0.5 credit]**Advanced Building Assessment**

In-depth study of the conventions, methods, and tools used in the assessment of buildings and their sties including traditional field survey, photogrammetry, laser scanning technologies, and hybrid representations.

Includes: Experiential Learning Activity

Precludes additional credit for ARCC 4900 (no longer offered).

Prerequisite(s): enrolment in the BAS Conservation and Sustainability program and fourth-year standing.

Laboratories, lectures, field trips, six hours a week.

ARCC 4500 [0.5 credit]**Design Economics**

Principles of building economics. Determinants and prediction of building costs. Uncertainty and investment economics. Creative cost control for buildings during schematic design, design development, construction document preparation and construction. Economic evaluation during all phases of design process; emphasis on sustainable strategies.

Precludes additional credit for ARCC 3500, ARCH 4772.

Prerequisite(s): fourth-year standing in the B.A.S. program or permission of the School.

Three hours a week.

ARCC 4801 [0.5 credit]**Architectural Technology**

A specific aspect of architecture in the area of architectural technology. Topics vary from year to year. (Elective Course).

Prerequisite(s): permission of the School.

Architecture - Techniques (ARCN) Courses**ARCN 1005 [0.5 credit]****Introduction to Drawing: Seeing Through the Hand**

Fundamental concepts of line and line weight, light and shadow, perspective, contrast and composition. Exercises will include some mixed media and will introduce students to drawing as a way of translating ideas into images.

Includes: Experiential Learning Activity

One hour lecture and two hours drawing/discussion.

ARCN 3999 [0.0 credit]**Co-operative Work Term**

Includes: Experiential Learning Activity

ARCN 4100 [0.5 credit]**Historic Site Recording and Assessment**

Methods of heritage building documentation including hand recording, photography, rectified photography, total station, gps, photogrammetry, and laser scanning. Non-destructive testing techniques; environmental assessment tools for determining air quality and energy efficiency. Multidisciplinary teams for all project work.

Includes: Experiential Learning Activity

Also listed as ACSE 3207, CIVE 3207.

Precludes additional credit for ARCN 3100 (no longer offered), ARCH 3881.

Prerequisite(s): second-year standing in B.A.S. Conservation and Sustainability.

Lectures three hours a week, lab or field work two hours a week.

ARCN 4200 [0.5 credit]**Building Pathology and Rehabilitation**

Deterioration mechanisms for concrete, timber, steel and masonry structures. Identification of design deficiencies; criteria for selection and design of rehabilitation systems. Design techniques to reduce deterioration in new construction and historical structures.

Includes: Experiential Learning Activity

Also listed as ACSE 4601, CIVE 4601.

Prerequisite(s): ARCN 4100 and third-year standing in B.A.S. Conservation and Sustainability.

Lectures three hours a week, lab/field work two hours a week.

Architecture - Theory/History (ARCH) Courses**ARCH 1000 [0.5 credit]****Introduction to Architecture**

Architecture in the matrix of human conditions: linkages among architecture, fine arts, humanities, social sciences, physical sciences, mathematics and philosophy. Architectural ideas will be introduced through a discussion of cities, buildings and landscapes. (Core Course).

Precludes additional credit for ARCH 1331.

Lectures three hours a week.

ARCH 1111 [1.0 credit]**Studio 1A: Land**

Studio course involving land-based workshops and fieldwork to introduce orientation, siting, topography, land work, material tectonic and building foundations. Students learn drawing conventions, architectural drafting, and physical modeling, applying basic spatial norm and sequencing through the design of a small-scale building in a non-urban context.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 1005.

Prerequisite(s): Registration in the Bachelor of Architectural Studies (BAS) program.

Studio 10 hours a week.

ARCH 1112 [1.0 credit]**Studio 1B: Fundamentals of Design**

Studio course considering siting, orientation, and building design. With hybrid drawings and models, students move from spatial abstraction to inhabitation. Designing a small domestic program on an urban site, they learn basic programmatic organization, accessibility, spatial hierarchy, material selection, structural systems, and envelope design.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 1105.

Prerequisite(s): Minimum grade of C- or above in ARCH 1111.

Studio 10 hours a week.

ARCH 1221 [0.5 credit]**Material Histories of Architecture**

Historical survey of architecture and conservation through material practices, transformation, and innovation around the world. Study of thousand-year old methods, monuments, and heritage sites, following materials including clay, metals, wood, or concrete, and studying their relations to landscapes, built forms, cultures, and climate.

Precludes additional credit for ARCC 1202 (no longer offered), ARCC 3502 (no longer offered).

Prerequisite(s): Registration in the Bachelor of Architectural Studies (BAS) program.

Three hour lecture

ARCH 1222 [0.5 credit]**Design, Climate, Environment**

Environmental histories following the migration of peoples, practices, and resources across territories and times to introduce buildings' climate impacts and environmental design. Consideration of construction principles, energy management, material selection, building siting, and environmental control design along larger consideration of climate and environmental justice.

Precludes additional credit for ENVE 1001, ARCC 2100.

Prerequisite(s): Registration in the Bachelor of Architectural Studies (BAS) program.

Three hour lecture

ARCH 1331 [0.5 credit]**Introduction to Architecture**

Introduction of architecture from the perspective of land and climate, examining social, cultural, and environmental relationships between peoples, places, and practices. Consideration of Indigenous land rights, topographical conditions and land formation, stratigraphy and soil composition, landmarks and foundations, placement and displacement, lived-experience and land-based practices.

Precludes additional credit for ARCH 1000.

Three hour lecture

ARCH 1441 [0.5 credit]**Drawing and Media**

Introduction to various representational media, including orthographic drawings and alternative multimedia techniques. Historical, theoretical, and practical explorations of visual communication, moving between analogue, digital, and graphic image making processes to document, develop, and communicate sites or design projects. Includes assignments conducted in parallel with studio.

Includes: Experiential Learning Activity

Precludes additional credit for ARCN 2106 (no longer offered).

Prerequisite(s): Registration in the Bachelor of Architectural Studies (BAS) program.

Three hour lecture + three hour lab

ARCH 1442 [0.5 credit]**Digital Drawing and Modelling**

Introduction to the logics of computer software for digital drawing, modeling, and visual coding. Extensive practical work using appropriate applications. Includes assignments conducted in parallel with studio, typically incorporating case study analyses.

Includes: Experiential Learning Activity

Precludes additional credit for ARCN 2105 (no longer offered).

Prerequisite(s): Registration in the Bachelor of Architectural Studies (BAS) program.

Three hour lecture + three hour lab

ARCH 2006 [0.5 credit]**Theory and History of Design**

The theoretical and historical background of industrial design and design; disciplinary foundations and interdisciplinary connections; methodological aspects and economic and social contexts; contemporary scenarios in design; technological innovation and manufacturing processes. (Elective course).

Also listed as IDES 1000.

Lectures three hours a week.

ARCH 2101 [0.5 credit]**Industrial Design Analysis**

Principles of comparative product design analysis covering marketing and sales, manufacturing techniques and materials, ambiance and qualities of the object/context relationship, and design analysis from the perspective of the designer, the end-user and the environment. (Elective course).

Includes: Experiential Learning Activity

Also listed as IDES 1001.

Prerequisite(s): ARCH 2006 or IDES 1000.

Lectures three hours a week.

ARCH 2111 [1.0 credit]**Studio 2A: Fundamentals of Urbanism**

Urbanism studio introducing, documenting, and analyzing forces producing urban environments. Students design a medium-scale public infrastructure project in a local urban context, foregrounding site analysis and urban design skills. Consideration given to accessibility, public realm, and to broad impact of infrastructural, environmental, and ecological systems.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 2105, ARCS 2303.

Prerequisite(s): A minimum grade of C- or above in ARCH 1111 and ARCH 1112.

Studio 10 hours a week.

ARCH 2172 [1.0 credit]**Studio 2B: Local (Design)**

Design studio working with community with appropriate ethics training on a small to medium building project. Students use analog and digital methods to advance consideration of site, program, and materials as the means for shaping the built environment, understanding the settings, and their communities.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 2302, ARCS 2106, ARCS 2304.

Prerequisite(s): Minimum grade of C- or above in ARCH 2111 and Registration in the Bachelor of Architectural Studies (BAS) Design stream.

Studio 10 hours a week.

ARCH 2182 [1.0 credit]**Studio 2B: Local (C&S)**

Conservation & Sustainability studio working with community with appropriate ethics training on a small to medium building projects. Students test and study conservation methodologies through design exercises and historical research on existing architectures, cities, and landscapes, with emphasis on understanding the settings and its communities.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 2302, ARCS 2106, ARCS 2304.

Prerequisite(s): Minimum grade of C- or above in ARCH 2111 and Registration in the Bachelor of Architectural Studies (BAS) Conservation and Sustainability stream.

Studio 10 hours a week

ARCH 2192 [1.0 credit]**Studio 2B: Local (Urbanism)**

Urbanism studio working with community with appropriate ethics training. Students design small scale projects exploring ramifications of practices, policies, and cultural preferences on urban cores. Consideration of intensification, revitalization, gentrification, brownfield redevelopment, development standards, form-based codes, and the larger impact of migration on urban density.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 2302, ARCS 2106, ARCS 2304.

Prerequisite(s): Minimum grade of C- or above in ARCH 2111 and Registration in the Bachelor of Architectural Studies (BAS) Urbanism stream.
Studio 10 hours a week

ARCH 2221 [0.5 credit]**Ecological & Regulatory Systems**

Lecture-based course considering buildings' ecological and climate change impacts. Course covers how regulations, material choices, siting, and assembly methods of small-scale buildings impact energy consumption, carbon footprints, and GHG emissions. Regulatory content includes applicable codes, regulations, best practices, universal design standards and life-safety systems principles.

Includes: Experiential Learning Activity

Precludes additional credit for ARCC 2202, ARCC 5096.

Prerequisite(s): ARCH 1221 and ARCH 1222.

Also offered at the graduate level, with different requirements, as ARCH 5221., for which additional credit is precluded.

Three hour lecture + three hour lab

ARCH 2222 [0.5 credit]**Structures**

Fundamental structural principles and their building design applications. Concepts of equilibrium and mechanics of materials, including stress and strain. Structural calculations and qualitative understanding of static and dynamic loads, including gravitational and lateral forces. Includes consideration of wood, masonry, concrete, and steel structural systems.

Precludes additional credit for CIVE 2005, ARCC 5097.

Prerequisite(s): ARCH 2221.

Also offered at the graduate level, with different requirements, as ARCH 5222., for which additional credit is precluded.

Three hour lecture

ARCH 2300 [0.5 credit]**Introduction to Modern Architecture**

Architectural and urban ideals of modernism with emphasis upon the development of the avant-garde in the early twentieth century. The phenomenon of modern architecture within the broader framework of the development of western thought. (Core Course).

Precludes additional credit for ARCH 2331, ARCH 3009.

Prerequisite(s): B.A.S. students require ARTH 1100 or ARTH 1200 and ARTH 1101 or ARTH 1201.

Lectures three hours a week.

ARCH 2331 [0.5 credit]**Modernism and Global Urbanism**

Thematic survey of cities, modernist ideas, projects, and movements, considering their theoretical, historical, and practical expressions in urban morphology and housing typologies, and their relation to larger societal and environmental questions, locally and globally. Acquisition of critical reading, writing, and representation skills through case-study analysis.

Precludes additional credit for ARCH 2300, ARCU 3100.

Prerequisite(s): ARTH 1201.

Also offered at the graduate level, with different requirements, as ARCH 5331., for which additional credit is precluded.

Three hour lecture

ARCH 2332 [0.5 credit]**Architectures in Canada**

Architectures in Canada, including Indigenous settlements, practices, and relationships to the land to this day. Survey of selected buildings to consider relational, symbolic, stylistic, and technological developments. Critical analysis of styles, methods, materials, and building typologies from social, cultural, economic, and constructional perspectives.

Precludes additional credit for ARCH 4002.

Prerequisite(s): ARCH 2331.

Three hour lecture

ARCH 3111 [1.0 credit]**Studio 3A: Adaptive Reuse**

Adaptive architecture studio critically considering buildings' adaptability in diverse communities' contexts and in relation to environmental responsibilities. Standards, principles, basic regulatory systems, and codes of conservation introduced through case-studies and the designing a medium-scale project, with focus on program analysis, detailing and material assembly.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 3105, ARCS 3301, ARCS 3304.

Prerequisite(s): Minimum grade of C- or above in ARCH 2111.

Studio 10 hours a week.

ARCH 3172 [1.0 credit]**Studio 3B: Global (Design)**

The global partnership Design studio (DSA) considers the role of design in communities, stressing site and program with respect to their historic, social, and ecological implications in a mid-scale cultural building. Synthesis and expansion of issues, methods, and techniques of the design curriculum.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 3302, ARCS 3107, ARCS 3306.

Prerequisite(s): Minimum of a C- or above in ARCH 3111. Studio 10 hours a week.

ARCH 3182 [1.0 credit]**Studio 3B: Global (C&S)**

The global partnership Conservation & Sustainability studio (DSA) considers the role of design in communities, stressing site and program with respect to their historic, social, and ecological implications in a mid-scale cultural building. Synthesis of issues, methods, and techniques of the conservation and sustainability curriculum.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 3302, ARCS 3107, ARCS 3306.

Prerequisite(s): Minimum grade of C- or higher in ARCH 3111 and Registration in the Conservation and Sustainability stream of the Bachelor of Architectural Studies.

Studio 10 hours a week.

ARCH 3192 [1.0 credit]**Studio 3B: Global (Urbanism)**

The global partnership Urbanism studio (DSA) considers the role various forms of urbanization and de-urbanization in relation to economic, political, and cultural forces. Students design a mid-scale public building, synthesizing issues, methods, and techniques of the urbanism curriculum, learning about urbanization as a global phenomenon.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 3302, ARCS 3107, ARCS 3306.

Prerequisite(s): Minimum grade of C- or above in ARCH 3111.

Studio 10 hours a week

ARCH 3221 [0.5 credit]**Assemblies**

Wood, steel, concrete, and alternate construction materials, and systems. Building envelope principles and practices explored in conjunction with mechanical and electrical systems in buildings. Emphasis on precedents, traditions, and methodology of architectural detailing for construction and adaptation. Introduction of environmental impact assessment and life-cycle analysis.

Precludes additional credit for ARCC 2203, ARCH 5223.

Prerequisite(s): ARCH 2222.

Three hour lecture

ARCH 3331 [0.5 credit]**Architectural Conservation Philosophy and Ethics**

Analysis of philosophical theories and related approaches to the material transformation of buildings. Micro-histories in architectural conservation theory and practice; overview of historical and contemporary concepts in architectural conservation. Preservation, restoration, rehabilitation, reconstruction, adaptive re-use, conservation anamnesis, diagnosis.

Precludes additional credit for ARCH 4200.

Prerequisite(s): Third year standing in the Bachelor of Architectural Studies or the Bachelor of Engineering in Architectural Conservation and Sustainability Engineering.

Three hour lecture

ARCH 3441 [0.5 credit]**Digital Computation and Simulation**

Intermediate computer drawing and modeling with a focus on visualization, simulation, computation, and coding.

Assignments conducted in parallel with studio, includes an introduction to Building Information Modeling and building documentation strategies and technologies.

Includes: Experiential Learning Activity

Prerequisite(s): ARCH 1442.

Three hour lecture + three hour lab

ARCH 3601 [0.5 credit]**Architectural Discourse I**

Examines ideas relevant to contemporary architectural discourses and practices focused on the development of critical thinking and communication skills situated in emerging inquiries within a longer lineage of existing architectural theory. (Core Course).

Precludes additional credit for ARCH 4771.

Prerequisite(s): Third-year standing or permission of the School.

Lecture 3 hours per week

ARCH 3881 [0.5 credit]**Historic Site Recording and Assessment**

Methods of heritage building documentation including hand recording, photography, rectified photography, total station, gps, photogrammetry, and laser scanning. Non-destructive testing techniques; environmental assessment tools for determining air quality and energy efficiency. Multidisciplinary teams for all project work.

Includes: Experiential Learning Activity

Also listed as ACSE 3207, CIVE 3207.

Precludes additional credit for ARCN 4100.

Prerequisite(s): Second-year standing in B.A.S.

Conservation and Sustainability stream.

Lectures three hours a week, lab or field work two hours a week.

ARCH 4002 [0.5 credit]**Canadian Architecture**

Canadian architecture from the seventeenth century to the present. Building styles, methods, construction techniques, and materials in the context of social and economic conditions of both indigenous and settlement approaches to the built environment.

Includes: Experiential Learning Activity

Also listed as ARTH 3002.

Precludes additional credit for ARCH 2332, ARCH 3002.

Prerequisite(s): ARCH 2300 or permission of the School.

Lectures, seminars three hours a week.

ARCH 4105 [0.5 credit]**Theories of Landscape Design**

Introduction to landscape architecture as the organization of outdoor space. Historical, cultural, economic and political factors as a basis for interpreting spatial organization in urban and rural areas of human settlement. Emphasis on the period from the fifteenth to the nineteenth century. (Theory/History Elective).

Precludes additional credit for ARCH 4773.

Prerequisite(s): second-year standing or above.

Lectures three hours a week.

ARCH 4111 [1.0 credit]**Studio 4A: Integrated**

Integrated studio working in parallel with technology course to support students as they design a sustainable mixed-use housing project. Consideration of site planning, programming, regulatory systems, materials, and structures in a comprehensive building design incorporating environmental and structural systems as well as detailed envelope design.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 4105, ARCS 4301 (no longer offered).

Prerequisite(s): Minimum of a C- or above in ARCH 3111.

Studio 10 hours a week

ARCH 4172 [1.0 credit]**Studio 4B: Option (Design)**

Options of Design topics for speculative exploration in preparation for graduate studies. Projects can range in scale, and locations. Topics can variously expand upon acquired technical, historical, theoretical, or technology skills through focused research-led investigations into key spatial, material, social, or environmental issues.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 4107, ARCS 4302

(no longer offered).

Prerequisite(s): Minimum of a C- or above in ARCH 4111.

Studio 10 hours a week

ARCH 4182 [1.0 credit]**Studio 4B: Option (C&S)**

Options of Conservation and Sustainability topics for speculative exploration in preparation for graduate studies. Projects can range in scale, and locations. Topics can variously expand upon acquired technical, historical, theoretical, or technology skills through focused research-led investigations into key spatial, material, social, or environmental issues.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 4107, ARCS 4302

(no longer offered).

Prerequisite(s): Minimum of a C- or above in ARCH 4111.

Studio 10 hours a week

ARCH 4192 [1.0 credit]**Studio 4B: Option (Urbanism)**

Options of Urbanism topics for speculative exploration in preparation for graduate studies. Projects can range in scale, and locations. Topics can variously expand upon acquired technical, historical, theoretical, or technology skills through focused research-led investigations into key spatial, material, social, or environmental issues.

Includes: Experiential Learning Activity

Precludes additional credit for ARCS 4107, ARCS 4302

(no longer offered).

Prerequisite(s): Minimum of a C- or above in ARCH 4111.

Studio 10 hours a week

ARCH 4200 [0.5 credit]**Architectural Conservation Philosophy and Ethics**

Analysis of philosophical theories and related approaches to the material transformation of buildings. Micro-histories in architectural conservation theory and practice; overview of historical and contemporary concepts in architectural conservation. Preservation, restoration, rehabilitation, reconstruction, adaptive re-use, conservation anamnesis, diagnosis.

Precludes additional credit for ARCH 3100 (no longer offered), ARCH 3331.

Prerequisite(s): Third-year standing in B.A.S.; OR third-year status in B.Eng. (Architectural Conservation and Sustainability).

Lectures three hours a week.

ARCH 4201 [0.5 credit]**History of Modern Housing**

Study of housing as a function of social organization, demographics, market demand and public policy. Topics include the evolution of housing form, the role of the state, and the participation of architects in the housing marketplace in the 19th and 20th century. (Theory/History Elective).

Precludes additional credit for ARCH 4991.

Prerequisite(s): third-year standing in the B.A.S. program or permission of the School.

Lectures three hours a week.

ARCH 4206 [0.5 credit]**Recycling Architecture in Canada and Abroad**

Concepts of mediating old and new architecture at the scale of the city through to the detail of the construction joint. Issues in sustainability and cultural identity illuminated by recycled architecture and adaptive reuse are explored through readings, drawings and case studies. (Theory/History Elective).

Prerequisite(s): third-year standing in the B.A.S. program or by permission of the instructor or fourth-year standing in the B.Eng. Architectural Conservation and Sustainability program.

Lectures three hours a week.

ARCH 4221 [0.5 credit]**Environmental Systems**

Lecture-based technology course reinforcing building science principles of environmental mediation through building envelope, structural systems, passive and active systems, material selection, MEP, daylight, and acoustic. Consideration of fire protection, life-safety, climate adaptation and mitigation through life-cycle analysis, energy, and performance assessment in integrated studio project.

Precludes additional credit for ARCC 3202.

Prerequisite(s): ARCH 3221.

Three hour lecture

ARCH 4301 [0.5 credit]**Post-War Architecture**

Theoretical, ideological and artistic debates that have influenced the development of world architecture since 1950. (Theory/History Elective).

Also listed as ARTH 4604.

Prerequisite(s): ARCH 2300 or ARTH 3609 or permission of the instructor.

Lecture or seminar three hours per week.

ARCH 4332 [0.5 credit]**Contemporary Theories in Architecture**

Survey of cultural theories from the beginning of colonialism to this day. Considerations of how technological, socio-political, material, and ecological transformations inform architectural discourse. Students acquire research skills, considering topics such as race, gender, disability, environmental justice, Indigenous worldviews, climate, decolonization, or artificial intelligence.

Precludes additional credit for ARCH 5020, ARCH 4601.

Prerequisite(s): Fourth year standing in the Bachelor of Architectural Studies program.

Also offered at the graduate level, with different requirements, as ARCH 5332., for which additional credit is precluded.

Three hour lecture

ARCH 4505 [0.5 credit]**Seminar in Theory and History**

History and theory of architecture. Topics will vary from year to year. Limited enrolment. (Elective Course).

Prerequisite(s): fourth-year standing in the B.A.S. or B.A. (Honours) Architecture/Art History programs, or permission of the School.

Lectures three hours a week.

ARCH 4601 [0.5 credit]**Architectural Discourse II**

Examines ideas and methods relevant to contemporary architectural discourse with a focus on cultural diversity and global perspectives. Architectural Discourse II builds on learned skills from previous work and acts as a preparatory course for research skills necessary at the graduate level. (Core Course).

Precludes additional credit for ARCH 4332.

Prerequisite(s): ARCH 3601 and fourth-year standing or permission of the School.

Lecture three hours per week.

ARCH 4771 [0.5 credit]**Architectural Discourse and Methods**

Survey of ideas and methods relevant to contemporary architectural discourse and practices, selected to represent a broad range of approaches and perspectives.

Development of critical thinking and communication skills, and introduction to design research methods along with those across humanities, sciences, and social sciences.

Precludes additional credit for ARCH 3601.

Prerequisite(s): Third year standing in the Bachelor of Architectural Studies (BAS) program.

Three hour lecture

ARCH 4772 [0.5 credit]**The Cost of Building**

The course explores the social, environmental, and economic costs of building. Topics range from pro-forma exercises for individual buildings to explorations of supply chains, environmental impact of various construction materials and methods, and the social impact of development and displacement on vulnerable sites and communities.

Precludes additional credit for ARCC 4500.

Prerequisite(s): Fourth year standing in the Bachelor of Architectural Studies (BAS) program.

Three hour lecture

ARCH 4773 [0.5 credit]**Designed Landscapes**

Introduction to the complex nature of designed landscapes, their material, socio-political, and historical relationships, their tensions, implications, plural geographies, and cultures. Topics include cross-disciplinarity and links with other design fields, issues of climate and adaptation, urbanism and infrastructure, representation and visuality, time and place.

Precludes additional credit for ARCH 4105.

Prerequisite(s): Third year standing or above.

Three hour lecture

ARCH 4777 [0.5 credit]**Land Ethics and Identities**

Exploration of land ethics and identities in relation to social, culture, political, and economic forces, through an investigation of the built and unbuilt environments. Topics include the setting of human activities, indigenous and non-indigenous relations, indigenous knowledges, geopolitics, sovereignty, settler-colonialism, and shifting identity politics.

Three hour lecture

ARCH 4801 [0.5 credit]**Special Topics**

An aspect of architecture in the area of theory and history. Topics vary from year to year. (Theory/History Elective).

Prerequisite(s): ARCH 2300 or permission of the School.

Lectures three hours a week.

ARCH 4808 [0.5 credit]**Independent Study**

(Elective Course).

ARCH 4881 [0.5 credit]**Advanced Building Assessment**

In-depth study of the conventions, methods, and tools used in the assessment of buildings and their sites including traditional field survey, photogrammetry, laser scanning technologies, and hybrid representations.

Includes: Experiential Learning Activity

Also offered at the graduate level, with different requirements, as ARCH 5404., for which additional credit is precluded.

Three hour lecture

ARCH 4882 [0.5 credit]**Topics in Conservation**

Advanced seminar in conservation and sustainability.

Topics may include histories and theories related to adaptive architecture, heritage considerations, and critical approaches to conservation of buildings, cities, and landscapes.

Three hour lecture

ARCH 4883 [0.5 credit]**Evaluation of Existing Properties**

The cultural, political, economic, and legal factors that shape our definition of and approaches to existing architecture. Processes for and implications of heritage designation, cultural value, and costs associated with restoration and ongoing preservation of heritage and other existing properties.

Includes: Experiential Learning Activity

Prerequisite(s): Fourth year standing in the Bachelor of Architectural Studies (BAS) Conservation & Sustainability stream.

Also offered at the graduate level, with different requirements, as ARCH 5402., for which additional credit is precluded.

Three hour lecture

ARCH 4885 [0.5 credit]**Building Pathology and Rehabilitation**

Deterioration mechanisms for concrete, timber, steel and masonry structures. Identification of design deficiencies; criteria for selection and design of rehabilitation systems. Design techniques to reduce deterioration in new construction and historical structures.

Includes: Experiential Learning Activity

Also listed as ACSE 4601, CIVE 4601.

Prerequisite(s): ARCH 3881.

Lectures three hours a week, lab/field work two hours a week.

ARCH 4991 [0.5 credit]**History of Modern Housing**

Study of housing as a function of social organization, demographics, market demand and public policy. Topics include the evolution of housing form, the role of the state, and the participation of architects in the housing marketplace in the 19th and 20th century.

Precludes additional credit for ARCH 4201.

Prerequisite(s): Third year standing in the Bachelor of Architectural Studies (BAS) program.

Three hour lecture

ARCH 4992 [0.5 credit]**Theories of Urbanism**

Contemporary urban theory and critical scholarship that engages evolving social, political, economic and environmental perspectives, addresses multiple scales, geographic contexts, and disciplinary boundaries, and investigates the expanding array of models, tools and techniques that have contributed to various theories of urbanism.

Precludes additional credit for ARCU 4300.

Prerequisite(s): Third year standing in the Bachelor of Architectural Studies (BAS) program.

Three hour lecture

ARCH 4993 [0.5 credit]**Topics in Urbanism**

Advanced seminar in selected topics related to urbanism. Topics may include histories and theories related to urban systems, design, and planning.

Precludes additional credit for ARCU 4801.

Prerequisite(s): Third year standing in the Bachelor of Architectural Studies (BAS) Urbanism stream.

Three hour seminar

Architecture - Urban (ARCU) Courses**ARCU 3100 [0.5 credit]****The Morphology of the City**

Primary structural, spatial and formal organization and elements that characterize the morphology of cities; historical and contemporary significance for architecture and urban design. (Core).

Precludes additional credit for ARCH 2331.

Prerequisite(s): First-year standing in the B.A.S. Urbanism major, second or third-year standing in other B.A.S. majors, or permission of the School.

Lecture two hours a week and tutorial one hour a week.

ARCU 4103 [0.5 credit]**Cities**

Course addresses cities such as Istanbul, Mexico City, Venice, Paris, Ottawa, Mumbai, and New Orleans.

Topics presented by the instructor and guests include environmental resilience and climate change; social justice and informal settlement; smart cities and data privacy; and urban design, memory, and imagination.

Precludes additional credit for ARCU 3902 (no longer offered).

Prerequisite(s): Second-year standing or permission of the Instructor.

Lecture two hours per week and tutorial one hour per week.

ARCU 4300 [0.5 credit]**Theories of Urbanism**

Contemporary urban theory and critical scholarship that engages evolving social, political, economic and environmental perspectives, addresses multiple scales, geographic contexts, and disciplinary boundaries, and investigates the expanding array of models, tools and techniques that have contributed to various theories of urbanism.

Precludes additional credit for ARCH 4992.

Prerequisite(s): ARCU 3100.

ARCU 4700 [0.5 credit]**Urban Utopias**

Urban utopias throughout history, with emphasis on the 20th century. Garden Cities, anti-urbanism and radical decentralization, the city in the region, Italian Rationalist cities, Le Corbusier and CIAM, post-WWII New Towns (England, Scandinavia and the US), Sustainable Urbanism.

Prerequisite(s): third or fourth-year standing in B.A.S. Urbanism program or permission of the School.

Lectures three hours a week.

ARCU 4801 [0.5 credit]**Topics in Urbanism**

Advanced seminar in selected topics related to urbanism. Topics may include histories and theories related to urban systems, design, and planning. (Core course).

Precludes additional credit for ARCH 4993.

Prerequisite(s): third-year standing in B.A.S. (Urbanism) or permission of the Instructor.

Seminar three hours per week.