

Architectural Studies

The Co-operative Education Option is available with the Bachelor of Architectural Studies.

The Azrieli School of Architecture and Urbanism cooperates with the School for Studies in Art and Culture in offering the B.A. Honours and B.A. General programs in History and Theory of Architecture (see the Art History program section of this Calendar for details).

Graduation Requirements

In addition to the requirements listed below, students must satisfy the University regulations (see the *Academic Regulations of the University* section of this Calendar), and the *Academic Regulations of the Bachelor of Architectural Studies*.

Students should consult the School when planning their program and selecting courses.

Residency Requirement

B.A.S. Hons.

- Conservation and Sustainability
- Urbanism

To be eligible to graduate, students in these programs must present a minimum of 5.0 residency credits in their degree program.

B.A.S. Hons.

- Design

To be eligible to graduate, students in this program must present a minimum of half the total number of credits required in their program as residency credits.

For more information, consult section 5.3 Minimum Number of Carleton Credits (Residency and Advanced Credits), in the Academic Regulations of the University section of this Calendar.

Academic Performance Evaluation

B.A.S. Hons.

- Conservation and Sustainability
- Design
- Urbanism

These programs follow the academic performance evaluation regulations governing Honours programs as described within sections 7.1 - 7.5 of the Academic Regulations of the University, and regarding the B.A.S. specifically.

Course Categories

Urbanism Core Electives

ARCC 1202 [0.5]	History of Structures
ARCH 4105 [0.5]	Theories of Landscape Design
ARCH 4502 [0.5]	Research and Criticism
ARCU 3405 [0.5]	Urban Design
ARCU 3902 [0.5]	Urban Studies
ARCU 4400 [0.5]	City Organization and Planning
ARCU 4808 [0.5]	Independent Study

ARCU 4901 [0.5]	Topics in Applied Urbanism
ARCN 4100 [0.5]	Historic Site Recording and Assessment
CDNS 2300 [0.5]	Critical Nationalism
CDNS 2400 [0.5]	Heritage Conservation in Canada
CDNS 3600 [0.5]	Cultural Politics and Identities in Canada
CDNS 4400 [0.5]	Cultural Landscape and Cultural Identity in Canada
CIVE 2005 [0.5]	Architectural Technology 2
ENST 2001 [0.5]	Sustainable Futures: Environmental Challenges and Solutions
GEOG 3021 [0.5]	Geographies of Culture and Identity
GEOG 3023 [0.5]	Cities in a Global World
GEOG 4021 [0.5]	Seminar in Culture, Identity and Place
GEOG 4023 [0.5]	Seminar in Special Topics on the City
GEOG 4304 [0.5]	Transportation Engineering and Planning
HIST 3209 [0.5]	Canadian Urban History

Conservation and Sustainability Core Electives

ARCC 4103 [0.5]	Energy and Form
ARCC 4300 [0.5]	Building Materials
ARCC 4400 [0.5]	Design for Construction
ARCC 4801 [0.5]	Architectural Technology
ARCH 4206 [0.5]	Recycling Architecture in Canada and Abroad
CDNS 2300 [0.5]	Critical Nationalism
CDNS 2400 [0.5]	Heritage Conservation in Canada
CDNS 3901 [0.5]	Selected Topics in Canadian Studies
CDNS 4400 [0.5]	Cultural Landscape and Cultural Identity in Canada
CDNS 4901 [0.5]	Selected Topics in Canadian Studies
CIVE 3203 [0.5]	Introduction to Structural Analysis
CIVE 3204 [0.5]	Introduction to Structural Design
CLCV 2305 [1.0]	Ancient Science and Technology
ENVE 4106 [0.5]	Indoor Environmental Quality
GEOG 2200 [0.5]	Global Connections
GEOG 2300 [0.5]	Space, Place and Culture
GEOG 3021 [0.5]	Geographies of Culture and Identity
MATH 1004 [0.5]	Calculus for Engineering or Physics

Retention of Work

Keeping a good portfolio is a most important part of architectural education. A portfolio represents a record of the student's progress and design experience over the years, and is an indispensable requirement for any future job application. A portfolio is started in first year and continues to expand until graduation. The School, therefore, requires that each student produce reductions (normally 8 1/2 x 11 inch reproductions, colour or black and white, slides, and/or digital format CD) of his or her work at the end of each term. One copy of the work should be put in the student's portfolio and the other turned in to the instructor for retention in the School's archives. (This facilitates retrospective exhibitions of work, accreditation,

publications and any future references for pedagogic purposes.) Original work is the property of the students, but the School retains the right to keep work of merit for up to two years after the date of submission. The School will make every effort to preserve the work in good condition, and will give authorship credit and take care of its proper use.

Program Requirements

Design

B.A.S. Honours (20.0 credits)

Requirements

1. 4.0 credits in:	4.0
ARCS 1005 [0.5] Drawing	
ARCS 1105 [1.0] Studio 1	
ARCN 2106 [0.5] Introduction to Multimedia	
ARCH 1000 [0.5] Intro. to Architecture	
ARTH 1100 [0.5] Art and Society: Prehistory to the Renaissance	
ARTH 1101 [0.5] Art and Society: Renaissance to the Present	
ARCC 1202 [0.5] History of Structures	
2. 4.0 credits in:	4.0
ARCH 2300 [0.5] Intro. to Modern Architecture	
ARCC 2202 [0.5] Architectural Technology 1	
CIVE 2005 [0.5] Architectural Technology 2	
ARCN 2105 [0.5] Computer Modeling of Form	
ARCC 2203 [0.5] Architectural Technology 3	
ARCU 3100 [0.5] The Morphology of the City	
ARCC 3202 [0.5] Architectural Technology 4	
ARCC 4500 [0.5] Design Economics	
3. 8.0 credits in:	8.0
ARCS 2105 [1.5] Studio 2	
ARCS 2106 [1.5] Studio 3	
ARCS 3105 [1.5] Studio 4	
ARCS 3107 [1.0] Studio 5	
ARCS 4105 [1.5] Studio 6	
ARCS 4107 [1.0] Studio 7	
4. 2.0 credits in approved history/theory elective from approved list	2.0
5. 1.0 credit in a free elective	1.0
6. 1.0 credit in a workshop or free elective.	1.0
Total Credits	20.0

Note: in the first and second year of the B.A.S. Design program, studios must be taken in sequence. In the third and fourth years, studios may be taken out of sequence, with the permission of the CSPA.

Urbanism

B.A.S. Honours (20.0 credits)

A. Credits Included in the Major (15.0 credits)

1. 1.5 credits in:	1.5
ARCH 1000 [0.5] Intro. to Architecture	
ARTH 1100 [0.5] Art and Society: Prehistory to the Renaissance	
ARTH 1101 [0.5] Art and Society: Renaissance to the Present	
2. 10.5 credits in:	10.5

ARCC 2202 [0.5] Architectural Technology 1	
ARCC 2203 [0.5] Architectural Technology 3	
ARCC 3202 [0.5] Architectural Technology 4	
ARCC 4500 [0.5] Design Economics	
ARCH 2300 [0.5] Intro. to Modern Architecture	
ARCH 4201 [0.5] History of Modern Housing	
ARCU 3100 [0.5] The Morphology of the City	
ARCU 3303 [1.0] Urbanism in Practice 1: Urbanism in the Core	
ARCU 3304 [1.0] Urbanism in Practice 2: Urbanism on the Periphery	
ARCU 3501 [0.5] Fundamentals of Urbanism	
ARCU 4300 [0.5] History of Theories of Urbanism	
ARCU 4303 [1.5] Urbanism in Practice 3: Housing	
ARCU 4304 [1.0] Urbanism in Practice 4: Global Perspectives	
ARCU 4600 [0.5] Post-WWII Urbanism	
ARCU 4700 [0.5] Urban Utopias	
ARCU 4801 [0.5] Selected Topics in Urbanism	
3. 3.0 credits in:	3.0
CIVE 4303 [0.5] Urban Planning	
GEOG 1020 [0.5] People, Places and Environments	
GEOG 2200 [0.5] Global Connections	
GEOG 2300 [0.5] Space, Place and Culture	
GEOG 2400 [0.5] Cities and Urbanization	
GEOM 2007 [0.5] Geographic Information Systems	
B. Credits Not Included in the Major (5.0 credits)	
4. 2.0 credits in:	2.0
ARCN 2106 [0.5] Introduction to Multimedia	
ARCS 1005 [0.5] Drawing	
ARCS 1105 [1.0] Studio 1	
5. 0.5 credit in:	0.5
ARCN 2105 [0.5] Computer Modeling of Form	
6. 1.0 credit in Urbanism core electives	1.0
7. 1.5 credits in free electives	1.5
Total Credits	20.0

Note: no more than 1.5 credits in directed readings and/or the honours research project may be used to fulfil B.A.S. Urbanism program requirements, except by permission of the School.

Conservation and Sustainability

B.A.S. Honours (20.0 credits)

A. Credits Included in the Major (14.5 credits)

1. 2.0 credits in:	2.0
ARCH 1000 [0.5] Intro. to Architecture	
ARTH 1100 [0.5] Art and Society: Prehistory to the Renaissance	
ARTH 1101 [0.5] Art and Society: Renaissance to the Present	
ARCC 1202 [0.5] History of Structures	
2. 9.5 credits in:	9.5
ARCH 2300 [0.5] Intro. to Modern Architecture	
ARCH 4200 [0.5] Architectural Conservation Philosophy and Ethics	
ARCC 2202 [0.5] Architectural Technology 1	
ARCC 2203 [0.5] Architectural Technology 3	
ARCC 3202 [0.5] Architectural Technology 4	

ARCC 3301 [1.0]	Conservation in Practice 1: Historical Analysis and Adaptive Re-use	
ARCC 3302 [1.0]	Conservation in Practice 2	
ARCC 3501 [0.5]	Fundamentals of Conservation and Sustainability	
ARCC 4301 [1.5]	Conservation in Practice 3	
ARCC 4500 [0.5]	Design Economics	
ARCH 4002 [0.5]	Canadian Architecture	
ARCC 4207 [0.5]	Advanced Building Assessment	
ARCU 3100 [0.5]	The Morphology of the City	
ARCN 4100 [0.5]	Historic Site Recording and Assessment	
ARCN 4200 [0.5]	Building Pathology and Rehabilitation	
3. 3.0 credits in:		3.0
CIVE 2005 [0.5]	Architectural Technology 2	
CIVE 2700 [0.5]	Civil Engineering Materials	
CIVE 2200 [0.5]	Mechanics of Solids I	
ENVE 4105 [0.5]	Green Building Design	
CDNS 2400 [0.5]	Heritage Conservation in Canada	
ENVE 1001 [0.5]	Architecture and the Environment	
B. Credits Not Included in the Major (5.5 credits)		
4. 2.0 credits in:		2.0
ARCN 2106 [0.5]	Introduction to Multimedia	
ARCS 1005 [0.5]	Drawing	
ARCS 1105 [1.0]	Studio 1	
5. 0.5 credit in:		0.5
ARCN 2105 [0.5]	Computer Modeling of Form	
6. 1.0 credit in history/theory electives from approved list		1.0
7. 1.0 credits from Conservation and Sustainability core electives		1.0
8. 1.0 credit in free electives		1.0
Total Credits		20.0

Note: no more than 1.5 credits in directed readings and/or the honours research project may be used to fulfill B.A.S. Conservation and Sustainability program requirements, except by permission of the School.

Architecture - Studio (ARCS) Courses

Azrieli School of Architecture and Urbanism

Faculty of Engineering and Design

ARCS 1005 [0.5 credit]

Drawing

Free-hand drawing as a way of observing and understanding the world. Various media and techniques introduced through a wide range of studio and outdoor exercises. (Core Course).

Prerequisite(s): registration in the B.A.S. program.
Six hours a week.

ARCS 1105 [1.0 credit]

Studio 1

Spatial and temporal experience of architecture through various drawings and modeling exercises. Observation of existing and imagination of possible architectural environments. On location at selected sites. (Core Course).

Prerequisite(s): registration in the B.A.S. program.
Studio eight hours a week.

ARCS 2105 [1.5 credit]

Studio 2

Development of cultural imagination within the field of architecture. Inhabitation and spatial definition are explored through analysis and design of small-scale environments. Representational skills developed, including the conventions of architectural drawing and modeling. (Core Course).

Prerequisite(s): ARCS 1105.

Twelve hours studio, plus one hour lecture per week.

ARCS 2106 [1.5 credit]

Studio 3

Small-scale building projects explore architectural design as a form of cultural expression. Consideration of site, program, and the materials of building as the means for shaping architecture. (Core Course).

Prerequisite(s): ARCS 2105.

Twelve hours studio, plus one hour lecture per week.

ARCS 3105 [1.5 credit]

Studio 4

Sensory components of architecture: their use, effect, and symbolic potential. Light and lighting, sound, the sensation of heat and cold, and related phenomena studied in modest building proposals. Social considerations of architecture. The conventions of architectural drawing. (Core Course).

Prerequisite(s): ARCS 2106.

Twelve hours studio, plus one hour lecture per week.

ARCS 3107 [1.0 credit]

Studio 5

Building materials and practices within the context of increasingly complex building programs. Social context of architecture in relation to material expression. Modeling is stressed. (Core Course).

Precludes additional credit for ARCS 3106 (no longer offered).

Prerequisite(s): ARCS 2106.

Eight hours studio, plus one hour lecture per week.

ARCS 4105 [1.5 credit]

Studio 6

Issues of program and site as the culturally defining aspects of architectural practice within complex urban and social situations, using difficult sites and hybrid programs. Projects brought to a high degree of formal and graphic resolution. (Core Course).

Prerequisite(s): ARCS 3106.

Twelve hours studio, plus one hour lecture per week.

ARCS 4107 [1.0 credit]**Studio 7**

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 undergraduate studio program. (Core Course).

Precludes additional credit for ARCS 4106 (no longer offered).

Prerequisite(s): ARCS 4105.

Eight hours studio, plus one hour lecture per week.

Architecture - Technical (ARCC) Courses**Azrieli School of Architecture and Urbanism****Faculty of Engineering and Design****ARCC 1202 [0.5 credit]****History of Structures**

A survey of the history, theory, and science of structures pertaining to buildings and civic works. Structural systems, construction techniques, materials and details, and the cultural factors involved in the synthesis of traditional structural design.

Prerequisite(s): registration in B.A.S. or B.Eng.

Architectural Conservation and Sustainability.

Lectures three hours a week, laboratory is block scheduled.

ARCC 1305 [0.5 credit]**The Behaviour of Materials**

Introduction to organizational patterns, forms and properties of materials such as cohesion, elasticity, strain energy, work of fracture, crack stopping, and the general theory of strength; a survey of the metallic and non-metallic traditions, plastics, composites, and materials of the future. (Elective Course).

Lectures three hours a week.

ARCC 2001 [0.5 credit]**Structures in Architecture**

Survey of structural planning, including a historical survey of structural systems, details and the study of the factors involved in the synthesis of a suitable structural scheme. The course is intended as a survey of the science and the structural properties of materials. (Elective Course).

Precludes additional credit for ARCC 1103.

Lectures three hours a week, laboratory is block scheduled.

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).

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.

Prerequisite(s): CIVE 2005 and third-year standing for B.A.S. students, or ECOR 1101 and second-year standing for students in B.Eng. Architectural Conservation and Sustainability.

Lectures three hours a week.

ARCC 3004 [0.5 credit]**Workshop: Energy and Form**

Relationship between environmental factors, energy and architectural form. Ways in which buildings and building elements can be planned and designed to take advantage of natural cycles in order to minimize the need for supportive energy inputs. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six 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).

Prerequisite(s): ARCC 2203 and fourth-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 3301 [1.0 credit]**Conservation in Practice 1: Historical Analysis and Adaptive Re-use**

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 and Digital drawings and models to explore designs. (Core course).

Prerequisite(s): ARCH 4200, CDNS 2400 and third-year standing in BAS (Conservation & Sustainability) or permission of the School.

Lecture and workshop eight hours a week.

ARCC 3302 [1.0 credit]**Conservation in Practice 2**

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).

Prerequisite(s): ARCC 3301 or permission of the School.

Lecture and workshop eight hours a week.

ARCC 3305 [0.5 credit]**Materials Application**

Application of building materials, including the forming of building parts and the design of joints for performance and assembly. Practical constructions using new technology are emphasized. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCC 3501 [0.5 credit]**Fundamentals of Conservation and Sustainability**

The question of historical and cultural value is explored through readings and discussions. Methodology is examined and tested through design exercises and historical research practices on heritage properties.

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

Conservation and Sustainability, or permission of the school.

Lecture three hours a week.

ARCC 3902 [0.5 credit]**Architectural Technology**

A specific aspect of architecture in the area of architectural technology. Offerings vary from year to year. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCC 4100 [0.5 credit]**Lighting for Architecture**

A study of daylighting and/or lighting design techniques, with a focus on project-based learning. (Workshop).

Prerequisite(s): ARCC 2203 or permission of the School.

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

ARCC 4102 [0.5 credit]**Acoustics in Architecture**

Sound in enclosures, including interior design of auditoria and special applications. Sound reproduction and reinforcement systems. Acoustic privacy and protection, sound control in buildings, materials for noise control, community noise, industrial noise. Acoustic measurements and instrumentation. (Elective Course).

Precludes additional credit for ARCC 3002.

Lectures two hours, laboratory two hours a week.

ARCC 4103 [0.5 credit]**Energy and Form**

Energy as a criterion in decision-making for architectural design. Conventional energy resources and state-of-the-art alternative energy resource systems with respect to building shape, size, materials, openings, orientation, siting, and use. (Elective Course).

Precludes additional credit for ARCC 3003.

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).

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

ARCC 4202 [0.5 credit]**Wood Engineering**

Introduction to structural design in timber. Properties, anatomy of wood, wood products, factors affecting strength and behaviour, strength evaluation and testing. Design of columns, beams and beam-columns. Design of trusses, frames, glulam structures, plywood components, formwork, foundations, connections and connectors.

Inspection, maintenance and repair. (Elective Course).

Also listed as CIVE 4202.

Prerequisite(s): fourth-year registration or permission of the School.

Lectures three hours a week, problem analysis three hours alternate weeks.

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

An 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.

Precludes additional credit for ARCC 4900.

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

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

ARCC 4208 [0.5 credit]**Workshop: Structure and Form**

Study of structural nature of non-conventional space enclosure systems like cable structures, membranes, shells, submerged structures, excavated structural forms and lunar structures. (Workshop).

Prerequisite(s): ARCC 4200 or permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCC 4300 [0.5 credit]**Building Materials**

Contemporary and traditional construction techniques and materiality are discussed within the framework of current practices, with emphasis on the analysis of material properties, structure and sustained performance, as well as their contribution to the adaptive reuse of existing and/or historical building. (Elective Course).

Precludes additional credit for ARCC 3300.

Laboratories, lectures, field trips four hours a week.

ARCC 4301 [1.5 credit]**Conservation in Practice 3**

Issues of program and site as the culturally defining aspects of sustainable architectural practice within complex urban and social situations, using difficult sites, historically significant buildings and/or locations and hybrid programs. projects brought to a high degree of formal and graphic resolution. (Core course).

Prerequisite(s): ARCC 3302 or permission of the School.
Twelve hours studio, plus one hour lecture per week.

ARCC 4400 [0.5 credit]**Design for Construction**

Design in relation to materials and building construction including the effects of building codes, zoning bylaws, approvals, processes and legislation, the organization of the building industry, and cost estimating control. (Elective Course).

Prerequisite(s): ARCC 3300 or permission of the School.
Lectures, seminars, field work three 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.

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

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.

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

(Elective Course).

ARCC 4900 [0.5 credit]**Directed Reading**

Supervised readings and research projects. Guidelines must be obtained from BAS Academic Advisors prior to registration.

Precludes additional credit for ARCC 4207.

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

ARCC 4909 [1.0 credit]**Honours Project**

Students propose a topic of study in Conservation & Sustainability for approval and produce a substantial research project, supervised by BAS faculty. (Core Course).

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

Architecture - Techniques (ARCN) Courses**Azrieli School of Architecture and Urbanism****Faculty of Engineering and Design****ARCN 2105 [0.5 credit]****Computer Modeling of Form**

Computer modeling as a medium of architectural analysis, documentation, and presentation. Principles and techniques of 2D drawing and 3D modeling. Extensive practical work using appropriate applications. (Core Course).

Precludes additional credit for ARCN 1101.

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

Lectures three hours a week.

ARCN 2106 [0.5 credit]**Introduction to Multimedia**

Analogue and digital systems and graphic processes used in the making of images. Fundamentals of still photography and videography combined with current computer technologies in the application of visual communication techniques.

Precludes additional credit for IDES 2106.

Lectures three hours a week, laboratory three hours a week.

ARCN 3003 [0.5 credit]**Theatre Production**

Design and fabrication of theatre productions, one of which is staged on campus. Visiting directors, designers, technical consultants and others. Visits to theatres and production facilities. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCN 3206 [0.5 credit]**Computer Applications**

Application of existing software and programming techniques to various architectural problems. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCN 3302 [0.5 credit]**The Anatomy of Architecture**

The architectural anatomy of selected contemporary buildings. Use of graphic techniques of analysis to develop an understanding of their basic compositional principles and language. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCN 3303 [0.5 credit]**Architecture as Painting**

Analysis of architecture for its elemental, formal and narrative properties. These relationships through the medium of painting. Architecture as analogy to painting. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCN 3400 [0.5 credit]**Visual Design**

Development of the capacity to visualize and communicate in several graphic media. Development of sensitivity to form, structure, space, texture and colour. May involve historical investigation. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCN 3401 [0.5 credit]**Photography**

Traditional and alternative techniques for image making and manipulation. Basic image formation techniques, advanced darkroom manipulations, past-darkroom imaging, and digital imaging within a theoretical overview of current photographic processes and techniques. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCN 3901 [0.5 credit]**Architectural Techniques**

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

Prerequisite(s): permission of the School.

ARCN 3902 [0.5 credit]**Architectural Techniques**

A specific aspect of architecture in the area of architectural techniques and cooperative problem solving. Topics vary from year to year. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

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

Also listed as CIVE 3207.

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

Prerequisite(s): third-year standing in B.A.S. Conservation and Sustainability or third-year standing in B.Eng. in Architectural Conservation and Sustainability.

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

ARCN 4102 [0.5 credit]**Problems in Computing**

Various types of non-numeric data, their representation within primary and secondary storage, and the manipulation of various representations. Comparative evaluation of languages for non-numeric problems. (Elective Course).

Precludes additional credit for ARCN 3102.

Prerequisite(s): permission of the School.

Lectures two hours a week, laboratory two hours a week.

ARCN 4103 [0.5 credit]**Digital Fabrication and Theory**

The changing relationship of architectural design and digital technology with a focus on 1:1 constructions using emerging computational software and fabrication techniques. (Workshop/Elective Course).

Prerequisite(s): permission of the School.

Lectures two hours a week, laboratory 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.

Also listed as CIVE 4601.

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

Conservation and Sustainability or fourth-year status in B.Eng. Architectural Conservation and Sustainability program.

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

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

(Elective Course).

Architecture - Theory/History (ARCH) Courses**Azrieli School of Architecture and Urbanism****Faculty of Engineering and Design**

ARCH 1000 [0.5 credit]**Intro. 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). Lectures three hours a week.

ARCH 1005 [0.5 credit]**Contemporary Society**

The relationship of architecture, architectural thought and the architectural profession to the societies in which they exist (and which they must serve). Topics are selected to emphasize key issues. (Elective Course). Lectures and seminars, three hours a week.

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

Theoretical overview including: definitions and dimensions of design and industrial design, its nature and historical evolution; quality; quality aspects in synthetic objects; formal qualities as determinants for categories of design; design methods; design management in industry; professional industrial design and its promotion. Practicing industrial designers are invited to present case studies of their activities. (Elective Course). Also listed as IDES 1000. Lectures three hours a week.

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

Analysis of various industrial design problems, including: relationship with principal techniques and mass-production technology; uniformity and variety; specialty and versatility in production; tolerances; ergonomics and anthropometrics; industrial design and environment; future industrial design approaches to pollution and resource conservation; adaptation of value-analyses to industrial design. (Elective Course). Also listed as IDES 1001. Prerequisite(s): ARCH 2006 or IDES 1000. Lectures three hours a week.

ARCH 2300 [0.5 credit]**Intro. 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 3009. Prerequisite(s): BAS students require ARTH 1100 and ARTH 1101 or permission of the School. B.Eng. Architectural Conservation and Sustainability students require ARCC 1202. Lectures three hours a week.

ARCH 3208 [0.5 credit]**Urban Space Architecture**

Design explorations that are directed towards the search for aesthetic form and meaning in urban space, with particular application to the Canadian context. Project-oriented. (Workshop). Prerequisite(s): permission of the School. Lecture, seminar, lab or field work six hours a week.

ARCH 3902 [0.5 credit]**Theory of Architecture**

Workshop focuses on one specific aspect of architecture in the area of theory and history. Workshop offerings change from year to year. (Workshop). Prerequisite(s): permission of the School. Lecture, seminar, lab or field work six hours a week.

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

Canadian architecture from the seventeenth century to the present day, covering both stylistic and technological developments. Building styles, methods, and materials in the context of social and economic conditions and construction techniques. (Theory/History Elective). Also listed as ARTH 3002. Precludes additional credit for ARCH 3002. Prerequisite(s): ARCH 2300 or permission of the School. Lectures, seminars three hours a week.

ARCH 4004 [0.5 credit]**Architectural Theory**

An exploration of architectural intentions in the early period of Western history, with special emphasis on Renaissance treatises and ideas. Architectural intentions in relation to shifting world-views, as a basis of historical interpretation. (Theory/History Elective). Precludes additional credit for ARCH 3007. Prerequisite(s): ARCH 2300 or permission of the School. Lectures three hours a week.

ARCH 4006 [0.5 credit]**Origins of Modernism**

Exploration of architectural theories with special emphasis on the European context from the seventeenth century to the late nineteenth century. (Theory/History Elective). Precludes additional credit for ARCH 3008. Prerequisite(s): ARCH 2300 or permission of the School. Lectures three hours a week.

ARCH 4008 [0.5 credit]**Foundations of Modernism**

Major critical perspectives as applied to architecture as a fine art. The debate between classicism and romanticism with consideration of its cultural roots. (Theory/History Elective). Prerequisite(s): ARCH 2300 or permission of the School. Lectures three hours a week.

ARCH 4009 [0.5 credit]**Theory of the Avant-Garde**

Exploration of architectural theories with special emphasis on the development of the avant-garde in the early twentieth century, looking at the avant-garde within the larger framework of modernism. (Theory/History Elective).
Precludes additional credit for ARCH 3009.

Prerequisite(s): ARCH 2300 or permission of the School.
Lectures 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 3105.
Prerequisite(s): ARCH 2300 or permission of the School.
Lectures three 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).

Prerequisite(s): third-year standing 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).

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

Lectures three hours a week.

ARCH 4204 [0.5 credit]**The Design Professions**

Architecture and design professions in relation to traditional professions and to occupations in art and design. Professions in the development of culture and society; education, career and work; knowledge in the design professions; and the nature of design practice. (Elective Course).

Also listed as SOCI 4204.

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

Seminar three hours a week.

ARCH 4205 [0.5 credit]**User-Building Synopsis**

Projects to develop skills in the analysis of building performance. Examination of occupancy analysis, safety and risk assessment, post-occupancy evaluation, and social impact assessment. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six 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 4300 [0.5 credit]**Neo-Classical Architecture**

18 th - and 19 th - century architecture and urban form in Western Europe. Emphasis on the cultural and philosophical framework of rising modernity to illuminate architectural production and theory as well as the development of urban form. (Theory/History Elective).

Precludes additional credit for ARCH 1201 and ARCH 2200.

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

Lectures three hours a week.

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 4302 [0.5 credit]**Pre-Columbian Architecture**

Monumental temples of the ancient Mesoamericans are compared with other world traditions at similar levels of cultural development. Selected examples considered in terms of morphology, technology, iconography, social/political context, world view and general architectural theory. (Theory/History Elective).

Prerequisite(s): ARCH 2300 or permission of the School.
Lectures three hours a week.

ARCH 4303 [0.5 credit]**Greek Architecture**

Architecture of Greek antiquity and its relationship to its philosophical, artistic, and mythical contexts. The development of the idea of the city; the presence of architecture within its symbolic landscape. (Theory/History Elective).

Prerequisite(s): ARCH 2300 or permission of the School.
Lectures three hours a week.

ARCH 4304 [0.5 credit]**The Architecture of Rome**

Rome in its classical to late-antique periods. Its founding mythologies and landscape. In-depth analysis of Rome, with special attention to its public buildings. Early Christian architecture within the Roman context. (Theory/History Elective).

Prerequisite(s): ARCH 2300 or permission of the School.
Lectures three hours a week.

ARCH 4305 [0.5 credit]**Medieval Architecture**

Gothic architecture and its relation to its philosophic and artistic predecessors. Special attention to the coexistence of the monastic tradition, late Romanesque building, and new experiments in gothic during this period, marked by intellectual and political ferment. (Theory/History Elective).

Prerequisite(s): ARCH 2300 or permission of the School.
Lectures three hours a week.

ARCH 4306 [0.5 credit]**Renaissance Theory**

The rise of architectural theory within the context of the Italian Renaissance. Canonic texts explored and compared in the context of the architectural developments of the period. (Theory/History Elective).

Prerequisite(s): ARCH 2300 or permission of the School.
Lectures three hours a week.

ARCH 4307 [0.5 credit]**Muslim Architecture**

Historical and theoretical discussions about the architecture of Muslim cultures. Selected sites and monuments from eighth to eighteenth century, covering the vast geography from North Africa to Southeast Asia. (Theory/History Elective).

Prerequisite(s): ARCH 2300 or permission of the School.
Lectures three hours a week.

ARCH 4308 [0.5 credit]**Asian Architecture**

Anthropological history of the architecture of the Near and Far East. The architecture and urban form of Ancient Egypt, Anatolia, Sumer and Persia; ancient China and India. (Theory/History Elective).

Prerequisite(s): ARCH 2300 or permission of the School.
Lectures three hours a week.

ARCH 4309 [0.5 credit]**Mesoamerican Architecture**

Selected works of Mesoamerican architecture in terms of iconography, morphology, technology, function, historical development, and concept. Mesoamerican architectural features compared with other world traditions. Emphasis on design. (Theory/History Elective).

Prerequisite(s): ARCH 2300 or permission of the School.
Lectures three hours a week.

ARCH 4400 [0.5 credit]**Theory**

A survey of the architectural and urban history of a specific culture. These discussions address the present reality of a country, region or city being visited by the fourth year of the program. (Elective Course).

Prerequisite(s): clear standing to fourth year and permission of the School.

Lectures three hours a week.

ARCH 4502 [0.5 credit]**Research and Criticism**

Preparation for the independent research and design work. Work related to the nature of research and criticism in architecture, with emphasis on current issues. (Theory/History Elective).

Lectures and seminars three hours a week.

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 4801 [0.5 credit]**Theory of Architecture**

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 4900 [0.5 credit]**Directed Reading**

Supervised readings and research projects. Guidelines must be obtained from BAS Academic Advisors prior to registration. (Core course).

Prerequisite(s): fourth-year standing in B.A.S (Philosophy and Criticism).

ARCH 4909 [1.0 credit]**Honours Project**

Students propose a topic of study in Philosophy and Criticism for approval and produce a substantial research project, supervised by BAS faculty. (Core course).

Prerequisite(s): fourth-year standing in B.A.S (Philosophy and Criticism).

Architecture - Urban (ARCU) Courses**Azrieli School of Architecture and Urbanism****Faculty of Engineering and Design****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 2004, ARCH 4100, and ARCU 4100.

Prerequisite(s): permission of the School of Architecture. Lectures three hours a week.

ARCU 3203 [0.5 credit]**Landscape Architecture**

Practical significance of landscape elements as they relate to built-form by integrating structure and site. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCU 3303 [1.0 credit]**Urbanism in Practice 1: 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.

Precludes additional credit for ARCU 3102 and ARCU 3301 (no longer offered).

Prerequisite(s): ARCN 2105, ARCU 3405 or ARCU 3501, and third-year standing in BAS (Urbanism) or permission of the School.

Lecture and workshop eight hours per week.

ARCU 3304 [1.0 credit]**Urbanism in Practice 2: 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.

Precludes additional credit for ARCU 3101 and ARCU 3302 (no longer offered).

Prerequisite(s): ARCN 2105, ARCU 3303 and third-year standing in BAS (Urbanism) or permission of the School. Lecture and workshop eight hours per week.

ARCU 3405 [0.5 credit]**Urban Design**

Project-based workshop investigating current design attitudes and solutions affecting the physical morphology of cities. Formally sophisticated urban design projects. Various procedures and basic urban design ideas. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCU 3409 [0.5 credit]**City Organization and Planning Processes**

Interdisciplinary investigation, analysis and synthesis of the institutions, processes, environments and demography of Canadian cities. Guest lecturers. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

ARCU 3501 [0.5 credit]**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.

Prerequisite(s): second year standing in the BAS – Urbanism Major, or permission of instructor.

Lecture three hours a week.

ARCU 3902 [0.5 credit]**Urban Studies**

A specific aspect of architecture in the area of urban studies. Topics vary from year to year. (Workshop).

Prerequisite(s): permission of the School.

Lecture, seminar, lab or field work six hours a week.

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

Theories of urbanism throughout history; emphasis on schools of post-WWII academic thought. The impact of Marxist theory, location and systems theory; the expanding array of models, tools and techniques that have contributed to various theorizations of urbanism.

Prerequisite(s): ARCU 3100.

ARCU 4303 [1.5 credit]**Urbanism in Practice 3: Housing**

Housing as it affects urban form. The design of multi-unit housing in a variety of forms and for a range of demographic groups. After thorough research of applicable codes and bylaws, students engage the design of housing at the site, building and detail level.

Prerequisite(s): ARCU 3303 and ARCU 3304 and fourth-year standing in B.A.S. Urbanism or permission of the School.

Studio twelve hours a week and one hour lecture.

ARCU 4304 [1.0 credit]**Urbanism in Practice 4: 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.

Precludes additional credit for ARCU 4909.

Prerequisite(s): ARCU 3303 and ARCU 3304 and fourth-year standing in B.A.S. Urbanism or permission of the School.

Lecture and workshop eight hours per week.

ARCU 4400 [0.5 credit]**City Organization and Planning**

Structure, form and functioning of cities. Infra-structure, facilities and networks, ecosystems, demographic and social organization, government, quality of life, goals and perceptions, urban management, development, regulation and codes, design, planning and policy-making. (Elective Course).

Precludes additional credit for ARCU 3400.

Three hours a week.

ARCU 4500 [0.5 credit]**Human Shelter**

Background factors pertaining to housing in both industrial and developing countries; traditional and contemporary housing approaches; social housing; and people's right to adequate housing. Guest lecturers. (Elective Course).

Precludes additional credit for ARCU 3500.

Three hours a week.

ARCU 4600 [0.5 credit]**Post-WWII Urbanism**

Urban renewal in the post-war period in response to housing shortages, suburbanization, transportation infrastructure and other factors. Gentrification and the emerging form of the post-industrial city, including new urbanism and sustainable communities. Case studies from Canada, Europe and the U.S. (Theory/History Elective).

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

Lectures three hours a week.

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): ARCU 4600.

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

Advanced seminar in selected topics related to urbanism.

Topics may include Dutch planning and housing, New Urbanism, public housing, suburbanization, real estate development, Title I urban renewal, post-unification Berlin. (Core course).

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

Lecture three hours per week.

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

(Elective Course).

ARCU 4901 [0.5 credit]**Topics in Applied Urbanism**

Advanced investigation into issues related to urbanism and urban form. Topics will vary from year to year.

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

Lecture three hours per week.