

# Architecture - Technical (ARCC)

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## 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).