





# Architecture (ARCH) 527

## Architectural Design: Building Systems (Revision 1)

**Status:** Replaced with new revision, see the [course listing](#)  for the current revision 

**Delivery mode:** [Individualized study online](#) 


**Credits:** 3

**Area of study:** Architecture

**Prerequisites:** Enrollment in the Graduate Diploma in Architecture program, or referral from the Canadian Architectural Certification Board (CACB) for individuals with a professional degree in architecture from a university outside Canada.

**Precluded:** None

**Faculty:** [Faculty of Science and Technology](#) 

**Notes:** For those students interested in pursuing a career as a registered architect, this course contributes to the RAIC Syllabus Diploma. Information about the [RAIC Syllabus Diploma](#)  is available on the RAIC website.



**Credit may be transferred for previous work considered equivalent.**

## Overview

This course is intended to provide you with an in-depth understanding of the integrated design process, including analyses, of designing high-performance buildings.

In an increasingly demanding economic, design, and construction environment, the performance expectations of buildings escalate while expectations of capital and operating costs decrease. Architects and engineers are expected to consider a wider range of design constraints and considerations and at the same time to work with greater efficacy. To address these systemic changes, the integrated approach to the design and analysis of building systems is increasingly being used.

This course is intended to increase your understanding of major buildings systems, from the standpoints of design requirements for human occupancy, through a detailed examination of a design process that stresses integration and a comprehensive approach to building energy analysis.

## Outline

The course is divided into three major parts, and is further divided into a total of ten units, as listed below:

### **Part 1: Human Factors in Building Design**

- Unit 1 Climate-Responsive Design and Human Factors in Building Design
- Unit 2 Human Comfort
- Unit 3 Case Study: The Manitoba Hydro Building

### **Part 2: The People in IDP: Roles and Responsibilities**

- Unit 4 The Integrated Design Process in Theory and Practice

- Unit 5 The People of IDP: Roles and Responsibilities
- Unit 6 Facilitating the Integrated Design Process

### Part 3: Whole-Building Energy Simulation

- Unit 7 Energy Consumption in Buildings
- Unit 8 Calculations for Demonstrating Energy Efficiency
- Unit 9 Simulating the Performance Properties of Architectural Systems
- Unit 10 Energy Consumption in Buildings: An Eight-City Analysis

## Learning outcomes

1. Relate the human factors of environmental design to the function and characteristics of building systems.
2. Describe the function, characteristics, and operation of normative building systems.
3. Compare the opportunities and limitations of traditional and integrated design processes to create high-performance buildings.
4. Describe the integrated design process approach to the creation of high-performance buildings.
5. Discuss the value of whole-building energy simulations as part of the integrated design process.

## Evaluation

Your work in this course will be evaluated based on four assignments. Assignments 1, 2, and 3 are each worth 30% of your final course grade. The final assignment will cover the entire course and is worth 10% of your final grade.

This information is summarized in the table below.

Activity	Weight
Assignment 1 (Part 1)	30%

Activity	Weight
Assignment 2 (Part 2)	30%
Assignment 3 (Part 3)	30%
Assignment 4 (entire course)	10%
<b>Total</b>	<b>100%</b>

You must achieve a cumulative grade of 67% or higher to receive credit for ARCH 527.

## Materials

### Digital course materials

Links to the following course materials will be made available in the course:




7group (Boecker, J., Horst, S., Keiter, T., Lau, A., Scheffer, M., & Toevs, B.), & Reed, B. (2009). *The integrative design guide to green building: Redefining the practice of sustainability*. Hoboken, NJ: Wiley.

Brophy, V., & Lewis, J. (2011). *A green Vitruvius: Principles and practice of sustainable architectural design*, 2<sup>nd</sup> ed. Washington, DC: Earthscan.

### Other Materials

The course materials also include an online study schedule, study guide and course website

## Important links

- › [RAIC Centre for Architecture](#) 
- › [Graduate Diploma in Architecture](#) 
- › [Courses](#) 

> [Fees and Funding](#) 

Athabasca University reserves the right to amend course outlines occasionally and without notice. Courses offered by other delivery methods may vary from their individualized study counterparts.

*Opened in Revision 1, May 1, 2013*

*Updated January 8, 2025*

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