



Applied Studies (APST) 655

Whole Systems Design (Revision 1)

Status:

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

Delivery mode:

[Individualized study online](#) . Delivered via Brightspace.

Credits:

3

Area of study:

Architecture

Prerequisites:

Enrolment in the Graduate Diploma - 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:

[ARCH 527](#) 

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](#) .

Credit may be transferred for previous work considered equivalent.

Overview

Applied Studies 655: Whole Systems Design 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 further divided into a total of 10 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

After completing this course, you should be able to

- relate the human factors of environmental design to the function and characteristics of building systems.
- describe the function, characteristics, and operation of normative building systems.
- compare the opportunities and limitations of traditional and integrated design processes to create high-performance buildings.
- describe the integrated-design-process approach to the creation of high-performance buildings.
- discuss the value of whole-building energy simulations as part of the integrated design process.

Evaluation

To **receive credit** [↗](#) for APST 655, you must achieve a cumulative grade of at least 67%. 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 covers the entire course and is worth 10% of your final grade.

The weighting of the cumulative grade is as follows:

Activity	Weight
Assignment 1 (Part 1)	30%
Assignment 2 (Part 2)	30%
Assignment 3 (Part 3)	30%
Assignment 4 (Entire Course)	10%
Total	100%

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*. Wiley.

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

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 modes may vary from their individualized study counterparts.

Opened in Revision 1, July 15, 2025

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