

# Applied Studies (APST) 350

## Applied Architectural Sciences (Revision 2)

**Delivery Mode:** Individualized Study Online [↗](#) with eText [↗](#)

**Credits:** 3

**Area of Study:** Applied Study

**Prerequisites:** APST 230

**Precluded:** None

**Challenge:** APST 350 is not available for Challenge.

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

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

**Notes:** APST 350: Applied Architectural Sciences is intended for students enrolled in the BSc (Architecture) program at the RAIC Centre for Architecture at Athabasca University. For those students interested in pursuing a career as a registered architect, this course also contributes to the [RAIC Syllabus Diploma](#) [↗](#).

## Overview

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*APST 350: Applied Architectural Sciences* introduces the scientific basis underlying the design, analysis, and evaluation of the building envelope as a separator of different environments. The purpose of this course is to link theoretical knowledge to applications in practice. This approach will support an increase in evidence-based practice.

This course relates building assemblies, components, and materials to different thermal, hydrostatic, and hygrometric conditions. A building's impact on its own microclimatic conditions and the interactions of building form, orientation, and envelope with building energy consumption are discussed.

## Outline

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#### **Part 1 Factors in the Environment**

- Unit 1 Principles in Sustainable Design
- Unit 2 Climate
- Unit 3 Water

#### **Part 2 Concepts and Principles**

- Unit 4 Envelope Design for Air and Water
- Unit 5 Thermal Comfort: A Qualitative Approach
- Unit 6 Heat and Thermal Transfer



## Part 3 Managing Environmental Factors in Design

- Unit 7 Design for Heating and Cooling
- Unit 8 Passive Solar Energy Systems
- Unit 9 Active Solar Heating and Photovoltaics
- Unit 10 Solar Geometry and Shading
- Unit 11 Passive Cooling
- Unit 12 Site Design Strategies

### Learning Outcomes

## Learning Outcomes

This course presents both qualitative and quantitative techniques to relate the principles of equilibrium to building design to the climatic factors and principles that influence building performance, including solar radiation, wind, precipitation, temperature, thermal dynamics, and vapour migration.

After completing this course, you should be able to:

1. Discuss the relationships between building performance and environmental and climatic factors.
2. Discuss the concepts of heat transfer, thermal gradients, thermal bridges, air leakage, convection, and stack effect.
3. Predict the responses of common building assemblies and materials to climatic cycles through a systematic analysis of environmental factors including radiation, precipitation, heating, and cooling.
4. Discuss the impact that buildings have on the microclimate of their environment, including such factors as snow drifting, shading and reflection.
5. Relate the performance of windows and mechanical systems in passive and active building systems.


### Evaluation




## Evaluation

Your work in this course will be evaluated based on 4 assignments and the final examination. Assignments 1 and 2 are each worth 15% of your final course grade, Assignment 3 is worth 30%, and Assignment 4 is worth 20%. The final examination will cover the entire course and is worth 20% of your final grade. You must achieve a cumulative grade of 67% or greater to receive credit for APST 350. The minimum passing mark for the final exam is 50%. This information is summarized in the table below.

Activity	Weight
Part 1 Factors in the Environment Assignment 1	15%
Part 2 Concepts and Principles Assignment 2	15%
Part 3 Managing Environmental Factors in Design Assignment 3	30%
Assignment 4	20%
Final Examination	20%
<b>Total</b>	<b>100%</b>


The **final examination** for this course must be taken online with an AU-approved exam invigilator at an approved invigilation centre. It is your responsibility to ensure your chosen invigilation centre can accommodate online exams. For a list of invigilators who can accommodate online exams, visit the [Exam Invigilation Network](#) .

To learn more about assignments and examinations, please refer to Athabasca University's [online Calendar](#) .



Students who wish to be certified by the Canadian Architectural Certification Board must achieve and maintain a final grade point average of 2.3 or greater



## Materials

Grondzik, Walter T. / Kwok, Alison G., (2015). *Mechanical and Electrical Equipment for Buildings* (12th ed.), Wiley NY.  (eText)

### eText

Registration in this course includes an electronic textbook. For more information on [electronic textbooks](#) , please refer to our [eText Initiative site](#) .

**Course Home Page (online):** The course home page houses all the online components of your course.

**Study Schedule (online):** The study schedule on your course home page includes the Course Information, the nineteen units of the Study Guide, links to the online readings, and links to your assignments.


**Course Information (online):** The Course Information provides specific information about how to proceed through the course. Read the Course Information carefully before you begin reading the Study Guide.

**Study Guide (online):** The Study Guide units are embedded in the Study Schedule on the course home page.

**Assignments (online):** The assignments are on the course home page, along with helpful instructions.

**Forms:** Forms you may need are available through the [myAU](#)  portal.



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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 2, February 8, 2018*

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