



Applied Studies (APST) 480

Mechanical Equipment of Buildings (Revision 3)

Status:

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

Delivery mode:

Individualized study online with eText

Credits:

3

Area of study:

Applied Study

Prerequisites:

APST 470

Precluded:

None

Challenge:

APST 480 is not available for challenge.

Faculty:

Faculty of Science and Technology

Notes:

APST 480: Mechanical Equipment of Buildings 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**

Overview

APST 480: Mechanical Equipment of Buildings provides an overview of the fundamentals of the design of mechanical systems for buildings. This discussion will include the relationships between building envelope design and mechanical system design, particularly with regard to sustainability, energy use and human comfort. Basic components and equipment involved in mechanical systems will be discussed, as well as their place and integration in the development of design concepts. An understanding of mechanical system terminology and an elementary knowledge of sizing procedures and system controls will be developed.

Outline

Part One: Environmental Basics for Heating, Ventilation and Air Conditioning (HVAC)

- Unit One: Climate, Thermal Comfort & Indoor Environmental Quality (IEQ)
- Unit Two: Heat Transfer & Heat Loss Calculation – A Quantitative Approach
- Unit Three: Fenestration and Heat Gain

Part Two: HVAC Systems for Buildings

- Unit Four: Small Building HVAC Systems
- Unit Five: Large Building HVAC Systems I
- Unit Six: Large Building HVAC Systems II

Part Three: Concept Sizing and Sustainable Design

- Unit Seven: HVAC System Concept Sizing
- Unit Eight: Integrated Building Control Systems
- Unit Nine: Sustainable Design & Energy Conservation in Mechanical Systems

Part Four: Other Mechanical Systems

- Unit Ten: Fire Protection and Life Safety
- Unit Eleven: Water Use and Conservation
- Unit Twelve: Technological Convergence


Learning outcomes

After completing the course, you should be able to

- describe the function, characteristics, and operation of mechanical systems in buildings, including heating, ventilation and cooling systems, water supply, drainage systems and fire protection systems.
- relate the function, characteristics, and operation of mechanical systems in buildings to the overall design concept, sustainable design principles, building construction and operational strategies.
- relate the physiological processes of human temperature regulation to the body's perceptions of comfort, the external environment and the building envelope.
- perform basic heat transfer calculations.
- estimate approximate sizing of ducts and other mechanical system components in the early stages of a project to ensure that the design concept is viable.
- evaluate the interrelationships between building mechanical systems and other systems, such as envelope, structure and comfort.


Evaluation

Your final grade in APST 480 is based on the grades you achieve on five assignments. The assignments consist of long-answer questions that must be submitted at specified periods during the course of study. To receive


credit for APST 480 you must achieve a minimum overall grade of **C+ (67%)**  for the entire course.

The table below summarizes the course activities and the credit weight associated with each.



Activity	Weight	Complete by
Assignment 1	20%	Following Unit 3
Assignment 2	20%	Following Unit 6
Assignment 3	20%	Following Unit 8
Assignment 4	20%	Following Unit 12
Assignment 5 (Final Project)	20%	Following the completion of all other course work and assignments
Total	100%	

To learn more about assignments and examinations, please refer to Athabasca University's **online Calendar** .

Materials

Grondzik, W. T., & Kwok, A. G. (2019). *Mechanical and electrical equipment for buildings* (13th ed.) [eText]. John Wiley & Sons.  (eText)

eText

Registration in this course includes an electronic textbook. For more information on **electronic textbooks** , please refer to our **eText Initiative site** .

Online Materials

The course website contains the items listed immediately below.

Course Orientation

The Course Orientation contains important information about APST 480 and the procedures you must follow to successfully complete it. The suggested study schedule is of particular importance, although you may want to modify it to suit your own schedule. Discuss modifications with your academic expert to ensure that you complete the course in a timely fashion. We recommend you read the Course Orientation entirely before you begin the course because there are many useful sections to help you complete this course successfully.

Study Guide

The Study Guide for APST 480 in many ways plays the role that lectures play in a conventional classroom setting. The guide contains twelve units that are designed to share the course author's expertise and elaborate on key concepts. Each unit contains commentary, learning objectives, study questions, and the list of readings assigned for that unit. The course also contains twelve lectures that are associated with each unit. These are accessible within each unit.

Student Manual

The Student Manual provides essential information about studying at Athabasca University and outlines the procedures you should follow to complete this course successfully. Please read it through carefully before beginning your studies.

Digital Reading Room

The **Digital Reading Room** [↗](#) (DRR) contains a compiled list of the required online materials for this course. You will be directed to these readings at the appropriate points in the Study Guide. You may also access the DRR directly through either the course home page or the AU Library home page.

Required Readings

You will be directed to the required readings at the appropriate points.





Resources

Other useful resources, including Supplementary Resources (recommended, but not required), are available on your course home page.

Forms

The forms you will need to apply to write examinations, request extensions, and so on, are available through your myAU Portal.

Important links

- › [Academic advising](#) 
- › [Program planning](#) 
- › [Request assistance](#) 
- › [Support services](#) 

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.

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View [previous revision](#) 
