

Applied Studies (APST) 480

Mechanical Equipment of Buildings (Revision 2)

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 [↗](#)

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

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 Syllabus Diploma](#) [↗](#).



➤ Overview

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

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 & 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

Learning Outcomes

- 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

Evaluation

To receive credit for APST 480, students must achieve a minimum composite course grade of 67%. The minimum passing mark for the final project is 50%.

Activity	Weight
Assignment 1	20%
Assignment 2	20%
Assignment 3	20%
Assignment 4	20%
Assignment 5 (Final Project)	20%
Total	100%


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

Note: 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

Materials



Grondzik, W., Kwok, A. G., (2015). *Mechanical and electrical equipment for buildings* (12th ed.). Hoboken, NJ: Wiley.  (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

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 twelve 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.

Important Links

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.

Opened in Revision 2, December 13, 2018

Updated November 9, 2021, by Student & Academic Services

View [previous revision](#) 

