

Course Outline

Architectural and Engineering Technology
Faculty of Science

ARET 3300 - 3
Building Design (2,1,1)

Located on the Tk'emlups te Secwepemc territory within the unceded traditional lands of Secwepemcúl'ecw
(Secwepemc Nation)

Fall, 2021

Instructor: Dale Parkes
Office: TT167
Office Hours:

Tue. 10:30 - 12:30
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*Other times by appointment.

Calendar Description

This course provides the student with the basic tools and appreciation of building design. This involves studies of aesthetic principles and basic space planning. A term project consists of preliminary design drawings for a moderate size commercial, institutional or assembly type building. This project forms the basis for a more detailed partial set of working drawings to be developed in ARET 3310 Building Technology 2.

Course Description

The student will apply the fundamentals of building design, involving functional and aesthetic characteristics of building interiors and exteriors. Topics include design philosophy and approach; site considerations (orientation, topographical features, geological and soil conditions); environment and region (climate, temperature differential, precipitation, wind and snow loads, sun intensity); use of building; individual space requirements (space proportions and sizes, relationships amongst individual spaces and circulation requirements, entrance and exit locations); building shape (interior and exterior); structural and modular aspects; community; cost and restrictions; building code and zoning by-laws; drawing requirements; the principles of design; creating new design ideas; design fundamentals; the design process; design proposals; building planning.

Educational Objectives/Outcomes

On completion of this course, the students will be able to:

1. Apply all necessary information to the development of a building design proposal;
2. Apply aesthetic design principles to specific building types and uses;
3. Apply basic planning principles to the development of a building space layout;
4. Make a presentation of a conceptual building design to a client user-group;
5. Develop a set of comprehensive architectural design drawings.

Prerequisites

Admission to Third Year of the Architectural and Engineering Technology program, ARET 1100 and ARET 1300

Texts/Materials

Required: British Columbia Building Code, current edition

Student Evaluation

Project Design Drawings and Assignments	70%
Mid-term exam	15%
Final Exam	<u>15%</u>
	100%

Letter grades for this course will conform to TRU Policy ED-3-5, Grading System for Academic/Career/Developmental Programs.

Course Topics

1. The Fundamentals of Design

- a. The Principles of Design:
Creating new design ideas; design fundamentals
- b. History of Architectural Design:
Highlights of architectural history from classic to Renaissance and to the Twentieth Century
- c. Elements of Design:
Line; proportion; human scale; standards; building scale; space; shape; mass; movement; form; structural expression; balance; rhythm; symmetry and asymmetry; colour; texture and pattern; unity and variety
- d. How to create a new idea:
Design philosophy and methods.

2. Colour

- a. Definition of Colour.
- b. The Colour Wheel.
- c. Properties of Colour:
Hue; value; intensity; warm and cool colours; advancing and receding colours.
- d. Mixing Colours:
Additive primary colours; subtractive primary colours.
- e. How One Colour Affects Another:
Greys with greys; colours with greys; colours with colours.
- f. Colours Under Different Light Conditions:
Local colour; direct light; reflected light.
- g. Colour Proportion:
Accent colours; background colours.
- h. Colour Themes:
Set palette; colour selection.
- i. Use and Environmental Effects of Colour in Architecture:
Effects of hues, values and intensities on emotion; colours around you; effects of weather and landscapes.

3. Design Proposals

- a. Understand the project.
- b. Create a plan.
- c. Design Proposals:
 - Plan alternative 1, 2, 3 and etc.
 - Design sketches 1, 2, 3 and etc.
- d. Design Style:
 - Understand the harmony of design and conduct the combination of architectural elements toward the final concept.
- e. The Design Schedule:
 - Program confirmation; concept design; design development; construction documents and tender (site works and buildings); construction; detailed schedule.
- f. Staff Resources:
 - Staff allocation to project tasks.
- g. The Work Plan:
 - Primary and secondary responsibilities during design and construction phases.
- h. Selection of Consultants:
 - Basic consultants; specialized consultants.
- i. Fees: design fee estimate; resource allocation.
- j. Primary Design Considerations:
 - Summary of design criteria.
- k. Planning the Building:
 - Summary of drawings: plans, elevations, sections and details.

4. Design Considerations

- a. Site Considerations:
 - Site location; orientation; topographical features; geological and soil conditions.
- b. Environment and Region:
 - Climate; temperature differential; precipitation; wind and snow loads; sun.
- c. Use of Buildings:
 - General classifications of use and occupancies; specific uses; multiple uses.
- d. Space Requirements:
 - Space proportions and size; traffic flow requirements; relationships among individual spaces; entrance and exit locations.
- e. Building Shape:
 - Simplicity and complexity of building shapes; space efficiency.
- f. Construction Materials:
 - Material characteristics; material used as veneer; texture and material association; compatible materials.
- g. Structural and Modular Aspects:
 - Design to standard sizes of building materials; modular dimensions.
- h. Community:
 - Community acceptance; architectural character; economic character of community; services available.
- i. Cost and Restrictions:
 - Site work requirements; site assessments; deed restrictions.
- j. Building Code, Zoning By-Laws and Energy Conservation Requirements:
 - Preliminary overview of use and occupancy; building size; fire separation and exit requirements; permissible uses; site coverage; site setbacks; height restrictions; parking requirements; landscaping and open space requirements.

5. Design Tools

- a. Models:
Working models; presentation models.
- b. Conceptual Design Sketches:
Space planning; “elevating” the building.
- c. Use of CADD:
Drawings; 3-D modeling.
- d. Requirements for Architectural Design Drawings:
General information; site plan; floor plans; elevations; building section; wall sections and details; pictorial representation.
- e. Requirements for Working Drawings:
Architectural drawings; structural drawings; electrical drawings; mechanical drawings; plumbing drawings; landscaping drawings.

6. Planning the Building

- a. Design Development - Planning the Building.
- b. Planning Multi-unit Residential Buildings:
Important residential design considerations.
- c. Planning Light-Commercial Buildings:
Approaches to design of light-commercial buildings; general uses to consider; planning problems; planning resources.
- d. Development of Floor Plans, Generally:
Relationship of plan to site; preliminary space studies; traffic diagrams; further development of preliminary sketches; single-line floor plans; comprehensive floor plans.
- e. Development of Building Shape:
Develop building massing; develop structure and structural grid; plan the outline of building; efficiency of shapes and spaces.
- f. Development of Elevations and Sections:
Foundation layout; wall locations; structure; finishes; openings; heights of spaces.
- g. Development of Preliminary Construction Details:
Functions of details in design work.

Methods for Prior Learning Assessment & Recognition

Students applying for credit on the basis of prior learning assessment and recognition must consult with the department chairperson. In general, students who have taken a similar course that covers at least 80 percent of the course material within the last five (5) years will receive advanced credit. Students who are seeking credit on the basis of life experience will be expected to demonstrate their comprehension of the course material to the satisfaction of the department chairperson.

Use of Technology

All types of media (manual and/or digital) will be considered as a means to deliver the architectural message. The current release of Autodesk Architectural Software and Microsoft PowerPoint[®] software will also be used. Utilization will involve the development, copying, scanning, cutting, pasting and combining of computer images, text and data for building project design drawings and presentation work.

Relevant policies:

TRU policy on attendance: https://www.tru.ca/_shared/assets/Policy_ED_03-135351.pdf

“In the case of deficient attendance without cause, a student may, on recommendation of the instructor to the instructor’s Dean or Chairperson, be withdrawn from a course.”

TRU policy on Academic Integrity: https://www.tru.ca/_shared/assets/Student_Academic_Integrity_Policy_ED_5-036334.pdf

“Thompson Rivers University (TRU) students are required to comply with the standards of academic integrity set out in this policy. It is the responsibility of TRU employees to take reasonable steps to prevent and to detect acts of academic dishonesty.

It is an instructor’s responsibility to confront a student when such an act is suspected and to take appropriate action if academic dishonesty, in the opinion of the instructor, has occurred.

Members of the TRU community, including students, engaged in research or scholarship, are also required to comply with the University’s policy on Integrity in Research and Scholarship ED 15-2.”

Late submissions of assignments:

Late assignments will be accepted in this class, but a penalty of 10% per calendar day will be subtracted from the total grade until the assignment is handed back to the class. Once the assignment is handed back, any outstanding assignments will receive a grade of zero. Late assignments will be accepted without penalty for medical or other reasons approved by the instructor.

Photography:

No photos, videos, or screenshots are to be taken in the classroom or lab without the prior approval of the instructor.