

**New York City College of Technology – City University of New York**  
300 Jay Street, Brooklyn, New York 11201

**Department of Architectural Technology**

**ARCH 1120**

**BUILDING TECHNOLOGY I**

1 classroom hour, 4 lab/studio hours, 3 credits

**Course Description:** This course presents an introduction to basic materials of construction and the fundamental principles of architectural hand drafting and system analysis. The coursework includes surveying existing conditions, development of drawings of plans, elevations, sections, and basic details from foundation to roof as well as the study of material properties and applications with an emphasis on wood and masonry and shallow foundation systems.

**Course context:** This is the first course in the Building Technology sequence required for both the AAS and the BTech degrees offered by the Department of Architectural Technology. Each course in this sequence is a pre-requisite for the following course. There are four Building Technology courses.

**Prerequisites:** CUNY Reading and Writing Certification  
CUNY Certification in Mathematics

**Pre- or co-requisites:** ENG 1101

**Required Texts:**

- Fundamentals of Building Construction / Materials and Methods, Edward Allen (latest edition), John Wiley and Sons.
- Architectural Graphic Standards, Ramsey/Sleeper (latest edition), John Wiley and Sons.
- Building Construction Illustrated, Francis Ching (latest edition), John Wiley and Sons.

**Attendance Policy:** No more than 10% absences are permitted during the semester. For the purposes of record, two lateness are considered as one absence. Exceeding this limit will expose the student to failing at the discretion of the instructor.

**Course Structure:** This course will combine a weekly lecture focused on particular materials and methods of construction and studio lab time to develop a series of drawings, modeling investigations, and assemblies discussed in the lectures. There will be several quizzes based on key terms and concepts discussed in the class and in the assigned readings. There will be a comprehensive final exam. A portfolio will be developed to document the studio lab work as the semester progresses. Field trips will offer first hand on-site investigation of the materials and methods covered in the course.

**Grading:** Final grade will be determined according to the following grade weighting:

50%	Studio Lab Assignments
20%	Quizzes
25%	Final Exam
5%	Class Participation

**Academic Integrity:** Students and all others who work with information, ideas, texts, images, music, inventions and other intellectual property owe their audience and sources accuracy and honesty in using, crediting and citation of sources. As a community of intellectual and professional workers, the college recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension and expulsion.

**Learning Objectives:** Upon successful completion of this course the student should be able to:

1. Sketch and hand draft detailed construction assemblies in both 2 dimensions and 3 dimensions.
2. Survey existing conditions.
3. Read and interpret plans, elevations, wall sections and basic details.
4. Analyze assemblies and details, demonstrate understanding of fundamental construction types both by detailed research and visual observation
5. Develop a basic set of working drawings for wood frame and masonry construction.
6. Have clear knowledge of building materials, each material's properties, and how they are fabricated.
7. Identify the key components involved in wood and masonry construction.

**Assessment:**

Students will be given weekly quizzes, sketch assignments, lab assignments and a final exam to test their ability to:

1. Draw with basic understanding of line quality, line weight and lettering.
2. Produce a basic set of working drawings for wood frame and masonry construction.
3. Explain what is meant by each of the "key terms and concepts" listed at the end of each chapter of the assigned text.
4. Identify key components and materials in various building assembly details and suggest alternatives.
5. Draw sketches or sections of the different materials and building systems discussed in the lectures.

**Course Outline:**

**WEEK 1:**

**Week 1 Lecture: Course Overview, Introduction to Professional Practice, Architectural Education, and Architectural Curriculum**

**Week 1 Lab: Introduction to architectural drawing:** required hand-drafting equipment, explanation on how to set up a typical sheet, title block, line weights and lettering. Introduction to techniques used for field measurements.

*Week 1 Homework Assignment: Elevation Sketch*

*Week 1 Reading: Ching*

**WEEK 2:**

**Week 2 Lecture: Making Buildings: Materials and Systems:** Introduction to the materials to be discussed throughout the semester. Discussion on sustainability and economics as context for the work of the architect.

Introduction to wood and masonry construction. Discussion on nature of materials + selecting construction systems, inherent properties including fabrication, structural behavior, and building systems.

*Week 2 Lab: **Scale and Measuring:*** demonstrate how to use an architectural scale. Techniques used in measuring existing conditions. Breakdown on how to draw plans, elevations, dimensions, and architectural symbols. Review of 3-d drawing in architecture

*Week 2 Homework Assignment: Measured Drawing Exercise*

*Week 2 Reading: Chapter 1, Making Buildings*

### **WEEK 3:**

*Week 3 Lecture: **Introduction to Case Study Building.*** Fieldtrip to Site.

*Week 3 Lab:* Orientation to 3-d software. Develop 3-d massing study of case study building.

*Week 3 Homework Assignment:* Complete 3-d massing study of case study building.

*Week 3 Reading: Ching*

### **WEEK 4:**

*Week 4 Lecture: **Site Work and Shallow Foundations:*** Overview of subsoil exploration, test borings. Review type of soils, frost line, and water table. Discussion of excavation and shoring, shallow foundation systems, waterproofing and drainage.

*Week 4 Lab: **Develop the foundation plan.***

*Week 4 Homework Assignment:* Complete foundation plan.

*Week 4 Reading: Chapter 2 (partial), Foundations*

### **WEEK 5:**

*Week 5 Lecture: **Wood:*** Characteristics, structure, classification of trees and properties, softwoods and hardwoods, limitations, manufacture of lumber, grading of lumber, plywood, glue laminated lumber, composite boards, wood joining, types of wood construction.

*Week 5 Lab: **Develop floor plans***

*Week 5 Homework Assignment:* continue development of floor plans

*Week 5 Reading: Chapter 3, Wood*

### **WEEK 6:**

*Week 6 Lecture: **Wood Light Frame Construction Part I:*** history, balloon frame, platform frame, foundation connections and insulation.

*Week 6 Lab: **Continue development of floor plans, detail at foundation connection to frame***

*Week 6 Homework Assignment:* Complete floor plans and detail at foundation.

*Week 6 Reading: Chapter 5, Wood Light Frame Construction*

## **WEEK 7:**

*Week 7 Lecture: **Wood Light Frame Construction Part II:** Building the frame, roof framing.*

*Week 7 Lab: **Complete floor plans. Develop roof plan and framing plans***

*Week 7 Homework Assignment: Continue roof plan and framing plans.*

*Week 7 Reading: Chapter 5, Wood Light Frame Construction*

## **WEEK 8:**

*Week 8 Lecture: **Exterior Finishes for Wood Light Frame Construction:** protection from weather, roofing, ventilation, flashing, building paper, windows and doors, siding, exterior trim.*

*Week 8 Lab: **Complete roof plan and framing plans. Develop roof details.***

*Week 8 Homework Assignment: continue roof details.*

*Week 8 Reading: Chapter 6, Exterior Finishes for Wood Light Frame Construction*

## **WEEK 9:**

*Week 9 Lecture: **Roofing:** Steep roofs, roof finishes, green roofs, galvanic series.*

*Week 9 Lab: **Complete roof details. Develop wall sections.***

*Week 9 Homework Assignment: continue development of wall sections.*

*Week 9 Reading: Chapter 16 (partial), Roofing*

## **WEEK 10:**

*Week 10 Lecture: **Windows and Doors:** types of windows, window frames, glazing, installing windows, doors types, resistance to wind and rain, thermal performance, impact resistance.*

*Week 10 Lab: **Continue development of wall sections.***

*Week 10 Homework Assignment: Complete wall sections.*

*Week 10 Reading: Chapter 18, Window and Doors*

## **WEEK 11:**

*Week 11 Lecture: **Interior Systems and Finishes:** mechanical systems integration and coordination, building insulation, and interior finishes, stairs, fireplaces.*

*Week 11 Lab: **Designing Stairs:** code compliance, terminology. Develop enlarged stair plans and sections.*

*Week 11 Homework Assignment: Complete stair plans and sections.*

*Week 11 Reading: Chapter 7, Interior Finishes for Wood Light Frame Construction*

**WEEK 12:**

*Week 12 Lecture: **Brick Masonry:** history, brick fabrication, structural characteristics, mortar, coursing, and masonry wall construction.*

*Week 12 Lab: **Develop building sections.***

*Week 12 Homework Assignment: Complete building sections.*

*Week 12 Reading: Chapter 8, Brick Masonry*

**WEEK 13:**

*Week 13 Lecture: **Stone and Concrete Masonry:** types of building stone, quarrying and milling stone, selecting stone for buildings, stone masonry construction, concrete masonry units, fabrication, coursing, decorative units, masonry wall construction with cmu.*

*Week 13 Lab: **Develop building elevations.***

*Week 13 Homework Assignment: Complete building elevations.*

*Week 13 Reading: Chapter 9, Stone and Concrete Masonry*

**WEEK 14:**

*Week 14 Lecture: **Review for Final Exam***

*Week 13 Lab: **Drawing set coordination, editing, documenting***

*Week 13 Homework Assignment: Continue coordination and editing*

*Week 13 Reading: none*

**WEEK 15:**

*Week 15 Lecture: **Final Exam***

*Week 15 Lab: **Review of Drawing Sets***

*Week 15 Homework Assignment: none*

*Week 15 Reading: none*

**Bibliography:** tbd