

ITT Technical Institute
PM3150
Construction Techniques
Onsite Course

SYLLABUS

Credit hours: 4.5

Contact/Instructional hours: 45 (45 Theory Hours)

Prerequisite(s) and/or Corequisite(s):

None.

Course Description:

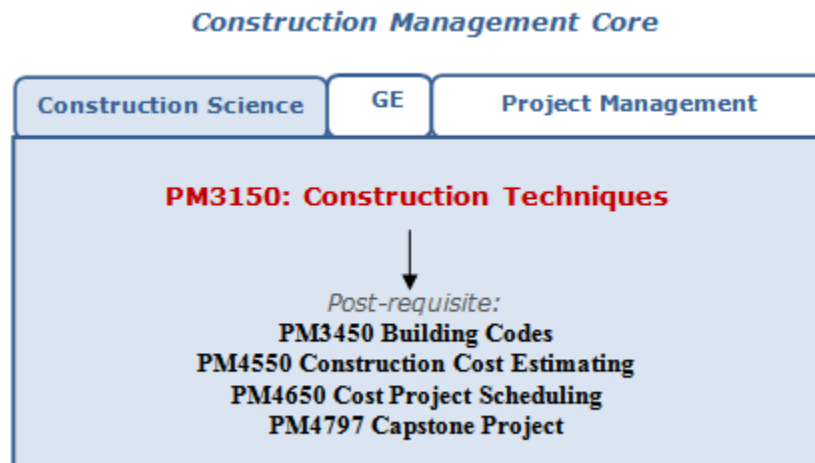
This course examines building techniques and construction materials. Topics include basic materials and installation methods for construction, site-work, concrete, masonry, metals, curtain-walls and finishes.

Where Does This Course Belong?

Construction Techniques is a course required to obtain a bachelor's degree in the Project Management-Construction program. This course introduces the construction concepts and an introduction to construction materials.

The goal of the program is to help the student acquire the necessary skills to become a versatile member of a construction team. Graduates may begin their careers in a variety of entry-level positions involving construction estimating, construction project management, or building code compliance.

The following course sequence provides an overview of how Construction Project Scheduling fits into the program.



Course Summary

Course Description

This course examines building techniques and construction materials. Topics include basic materials and installation methods for construction, site-work, concrete, masonry, metals, curtain-walls and finishes.

Major Instructional Areas

1. Commercial Construction Techniques and Systems
2. Commercial Foundations and Loads
3. Heavy Timber Frame Construction
4. Masonry Load Bearing Wall
5. Steel Frame Construction
6. Concrete Construction
7. Site-Cast Construction Framing
8. Pre-Cast Concrete Framing
9. Conveying Systems
10. Commercial Roofing
11. Thermal and Moisture Protection
12. Interior and Exterior Finishes

Course Objectives

1. Discuss the process of designing buildings and the constraints involved in choosing appropriate building systems.
2. Classify soils based on the Uniform Soil Classification System.
3. Explain the factors that affect sustainability in regard to a project's site selection, excavation, and foundations.
4. Examine the use of wood, brick, stone, structural steel, light gauge steel, concrete, and glass in erecting commercial buildings.
5. Explain the factors that affect sustainability in regard to a project's use of various materials including wood, brick, stone, structural steel, light gauge steel, concrete, and glass.
6. Compare and contrast the types of framing systems per material available in wood and concrete. (
7. Review the roof framing plan and elevations of a commercial building to understand how the various roof plan components are referenced in a roof plan.
8. Discuss the factors that need to be considered while selecting the doors and windows for a commercial building.
9. Discuss the factors that need to be considered while selecting the cladding systems for a commercial building.
10. Discuss the factors that need to be considered while selecting the interior components and finishes for a commercial building.

SCANS Objectives

SCANS is an acronym for Secretary's Commission on Achieving Necessary Skills. The committee, appointed by the National Secretary of Labor in 1990, created a list of skills and competencies that continue to be a valuable resource for individuals developing their careers in a high-tech job market. For more information on the SCANS objectives, visit The U.S. Department of Labor Employment and Training Administration: <http://www.doleta.gov>.

The following SCANS objectives are designated for this course:

1. Work cooperatively with others and contribute to group with ideas, suggestions, and effort.

2. Determine specific information needs, select possible information, and evaluate its appropriateness.
3. Select and analyze information and communicate the results using oral, written, pictorial, or multi-media methods.

Learning Materials and References

Required Resources

Textbook Package	New to this Course	Carried over from Previous Course(s)	Required for Subsequent Course(s)
Allen, E. (2014). Fundamentals of Building Construction: Materials and Methods (6th ed.). Hoboken, NJ: John Wiley and Sons, Inc.			

Recommended Resources

Internal

- ITT Tech Virtual Library:
<http://library.itt-tech.edu/Pages/default.aspx>
- Faculty Collaboration Portals:
<http://myportal.itttech.edu/employee/dept/curriculum/FC/default.aspx>
- Curriculum Database:
<http://myportal.itt-tech.edu/faculty/cdb/Pages/default.aspx>

External

- Wiley Portal:

Wiley Student Companion Site (Not required)

Wiley offers a Student Companion Site for the course's required text. Students can log on to: <http://bcs.wiley.com/he-bcs/Books?action=index&itemId=1118138910&bcsId=8359>. Then, click on the Log In link in the top right of the Student Companion Site page. Next, type in the user code that came with your book to register.

Or you can log on to www.wiley.com, then type the text ISBN (1118138910) in the search bar on the upper right hand side of the web page and click the search button. You will then be taken to a screen with the text cover image and title listed. Click on the "Visit the Companion Sites" link under the text title and then click on the "Student Companion Site" link from the drop down menu. Next, type in the user code that came with your book to register.

(Note: This site is password protected. Access to this site requires a user code which is provided with your book. The code can only be used once to register and then ceases to be valid.)

- Periodicals That Are Available Free of Charge

- *Modern Steel Construction*. American Institute of Steel Construction. One East Wacker Drive, Chicago IL 60601-2001, (312) 670-5407
 - *Form & Function*. 125 South Franklin St., Chicago IL 60606-4678.
 - *Ascent*. Precast/Prestressed Concrete Institute. 175 West Jackson Boulevard, Chicago IL 60604, (312) 786-0300.
 - *Building Design and Construction*. Cahners Plaza, 1350 E. Touhy Avenue, Des Plaines IL 60018-3358, (847) 390-2769.
 - *CMR Report*. National Concrete Masonry Association. 2302 Horse Pen Road, Herndon VA 20171.
 - *PCA Concrete Technology Today*. Portland Cement Association. 5420 Old Orchard Road, Skokie IL 60077-1083, (847) 966-6200.
 - *Construction Metrication*. Construction Metrication Council, National Institute of Building Sciences. 1690 Vermont Avenue, N.W., Washington DC 20005-4905.
 - *Copper Topics*. Copper Development Association, Inc. 260 Madison Avenue, New York NY 10016.
 - *Metal Architecture*. Modern Trade Communications, Inc. 7450 N. Skokie Boulevard, Skokie IL 60077.
 - *Automated Builder*. 1445 Donlon Street, Suite 16, Ventura CA 93003, (805) 642-9735
- Publications With Paid Subscriptions
 - *Engineering News-Record*. Two Penn Plaza, New York NY 10121-2298, (888) 867-6395
 - *The Construction Specifier*. Construction Specifications Institute, 601 Madison Street, Alexandria VA 22314-1791, (800) 689-2900.
 - *Magazine of Masonry Construction and Magazine of Concrete Construction*. The Aberdeen Group. 426 South Westgate Street, Addison IL 60101, (888) 721-2402
 - *Concrete International*. American Concrete Institute. P.O. Box 9094, Farmington Hills MI 48333, (248) 848-3700
 - *PCI Journal*. Precast/Prestressed Concrete Institute. 175 West Jackson Boulevard, Chicago IL 60604, (312) 786-0300
 - *The Journal of Light Construction*. Builderburg Partners, Ltd. 1025 Vermont Avenue, N.W., Washington DC 20005.
 - *Wood Design and Building*. 3380 Sheridan Drive, Suite 306, Amherst NY 14226.

- *Fine Homebuilding*. The Taunton Press, Inc. P. O. Box 5506, Newtown CT 06470, (800) 888-8286.

- **Job Cameras:**
 - **Oxblue** (<http://www.oxblue.com>)

- **Professional Associations:**
 - **Project Management Institute (PMI)** (<http://www.pmi.org/>)
PMI establishes standards for project management.

 - **Associated General Contractors of America (AGC)** (<http://www.agc.org/>)
AGC is a trade association for the construction industry. It has a database of members you can access.

Information Search

Use the following keywords to search for additional online resources that may be used for supporting your work on the course assignments:

- Construction Specifications Institute (CSI)
- Occupational Safety and Health Act (OSHA)
- Green Building Certification Institute (GBCI)
- American Institute of Constructors (AIC)

NOTE: All links to Web references are subject to change without prior notice.

Course Plan

Instructional Methods

This course is designed to promote learner-centered activities and support the development of cognitive strategies and competencies necessary for effective task performance and critical problem solving. The course utilizes individual and group learning activities, performance-driven assignments, problem-based cases, projects, and discussions. These methods focus on building engaging learning experiences conducive to development of critical knowledge and skills that can be effectively applied in professional contexts.

Suggested Learning Approach

In this course, you will be studying individually and within a group of your peers. As you work on the course deliverables, you are encouraged to share ideas with your peers and instructor, work collaboratively on projects and team assignments, raise critical questions, and provide constructive feedback.

Use the following advice to receive maximum learning benefits from your participation in this course:

DO

DON'T

<ul style="list-style-type: none"> ▪ Do take a proactive learning approach ▪ Do share your thoughts on critical issues and potential problem solutions ▪ Do plan your course work in advance ▪ Do explore a variety of learning resources in addition to the textbook ▪ Do offer relevant examples from your experience ▪ Do make an effort to understand different points of view ▪ Do connect concepts explored in this course to real-life professional situations and your own experiences 	<ul style="list-style-type: none"> ▪ Don't assume there is only one correct answer to a question ▪ Don't be afraid to share your perspective on the issues analyzed in the course ▪ Don't be negative about the points of view that are different from yours ▪ Don't underestimate the impact of collaboration on your learning ▪ Don't limit your course experience to reading the textbook ▪ Don't postpone your work on the course deliverables – work on small assignment components every day
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Course Outline

Unit	Reading Assignments	Graded Activities & Deliverables
1. Unit 1: Making Buildings and Foundations	Allen, Chapters 1-2, pp. 1-81	<ul style="list-style-type: none"> ▪ Unit 1. Assignment 1. Building Code Restrictions ▪ Unit 1. Assignment 2. Observing Construction ▪ Unit 1. Exercise 1. New Occupancy Over Downtown Loft
2. Unit 2: Wood and Heavy Timber Frame Construction	Allen, Chapters 3-4, pp. 82-169	<ul style="list-style-type: none"> ▪ Unit 2. Assignment 1. Working with Wood 1 ▪ Unit 2. Assignment 2. Working with Wood 2 ▪ Unit 2. Exercise 1. Heavy Timber Framing Plan
3. Unit 3: Wood Light Frame and Exterior Finishes	Allen, Chapters 5-6, pp. 170-263	<ul style="list-style-type: none"> ▪ Unit 3. Assignment 1. My Home's Wall Sections ▪ Unit 3. Assignment 2. Roof Framing Plans ▪ Unit 3. Exercise 1. Hunting Cabin
4. Unit 4: Interior Finishes and Brick Masonry	Allen, Chapters 7-8, pp. 264-347	<ul style="list-style-type: none"> ▪ Unit 4. Assignment 1. Stair Proportioning ▪ Unit 4. Assignment 2. Fireplace Design ▪ Unit 4. Exercise 1. Vacation Home
5. Unit 5: Stone and Concrete and Masonry Wall Construction	Allen, Chapters 9-10, pp. 348-419	<ul style="list-style-type: none"> ▪ Unit 5. Assignment 1. Masonry Walls ▪ Unit 5. Assignment 2. Stone Patterns ▪ Unit 5. Exercise 1. Masonry Home
6. Unit 6: Steel Frame Construction and Light Gauge Steel Frame Construction	Allen, Chapters 11-12, pp. 420-525	<ul style="list-style-type: none"> ▪ Unit 6. Assignment 1. Structural Steel ▪ Unit 6. Assignment 2. Light Gauge Steel ▪ Unit 6. Exercise 1. Steel Office
7. Unit 7: Concrete Construction and Site-Cast Concrete Framing Systems	Allen, Chapters 13-14, pp. 526-619	<ul style="list-style-type: none"> ▪ Unit 7. Assignment 1. Selecting Site-Cast Concrete Framing Systems ▪ Unit 7 Assignment 2: Tilt-Up Concrete ▪ Unit 7. Exercise 1. Sustainability of Concrete
8. Unit 8: Pre-Cast Concrete Framing Systems and Roofing	Allen, Chapters 15-16, pp. 620-715	<ul style="list-style-type: none"> ▪ Unit 8. Assignment 1. Pre-Cast Framing Systems ▪ Unit 8 Assignment 2: Proprietary Roofing Systems ▪ Unit 8. Exercise 1. Pre-Cast Concrete Building

9. Unit 9: Glass and Glazing and Windows and Doors	Allen, Chapters 17-18, pp. 716-789	<ul style="list-style-type: none"> ▪ Unit 9. Assignment 1. Types of Windows and Doors ▪ Unit 9 Assignment 2: Sustainability of Windows and Doors ▪ Unit 9. Exercise 1. Specifying Windows and Doors
10. Unit 10: Designing Cladding Systems and Selecting Interior Finishes	Allen, Chapters 19-24, pp. 790-965	<ul style="list-style-type: none"> ▪ Unit 10. Assignment 1. Cladding Systems Around Town ▪ Unit 10 Assignment 2: This Building's Finishes ▪ Unit 10. Exercise 1. Specifying a Cladding System ▪ Unit 10. Project 1. Portfolio
11. Course Review and Final		Final Exam

Evaluation and Grading

Evaluation Criteria

The graded assignments will be evaluated using the following weighted categories:

Category	Weight
Assignment	40%
Exercise	30%
Project	10%
Exam	20%
TOTAL	100%

Grade Conversion

The final grades will be calculated from the percentages earned in the course, as follows:

Grade	Percentage	Credit
A	90–100%	4.0
B+	85–89%	3.5
B	80–84%	3.0
C+	75–79%	2.5
C	70–74%	2.0
D+	65–69%	1.5
D	60–64%	1.0
F	<60%	0.0

Graded Activities and Deliverables

Grading Category	Category Weight	Graded Deliverable	Weight
Assignment	40%	Unit 1. Assignment 1. Building Code Restrictions	2%
		Unit 1. Assignment 2. Observing Construction	2%
		Unit 2. Assignment 1. Working with Wood 1	2%
		Unit 2. Assignment 2. Working with Wood 2	2%
		Unit 3. Assignment 1. My Home's Wall Sections	2%
		Unit 3. Assignment 2. Roof Framing Plans	2%
		Unit 4. Assignment 1. Stair Proportioning	2%
		Unit 4. Assignment 2. Fireplace Design	2%
		Unit 5. Assignment 1. Masonry Walls	2%
		Unit 5. Assignment 2. Stone Patterns	2%
		Unit 6. Assignment 1. Structural Steel	2%
		Unit 6. Assignment 2. Light Gauge Steel	2%
		Unit 7. Assignment 1. Selecting Site-Cast Concrete Framing Systems	2%
		Unit 7. Assignment 2. Tilt-Up Concrete	2%
		Unit 8. Assignment 1. Pre-Cast Framing Systems	2%
		Unit 8. Assignment 2. Proprietary Roofing Systems	2%
		Unit 9. Assignment 1. Types of Windows and Doors	2%
		Unit 9. Assignment 2. Sustainability of Windows and Doors	2%
		Unit 10. Assignment 1. Cladding Systems Around Town	2%

Grading Category	Category Weight	Graded Deliverable	Weight
		Unit 10. Assignment 2. This Building's Finishes	2%
Exercise	30%	Unit 1. Exercise 1. New Occupancy Over Downtown Restaurant	3%
		Unit 2. Exercise 2. Heavy Timber Framing Plan	3%
		Unit 3. Exercise 1. Hunting Cabin	3%
		Unit 4. Exercise 1. Vacation Home	3%
		Unit 5. Exercise 1. Masonry Home	3%
		Unit 6. Exercise 1. Steel Office	3%
		Unit 7. Exercise 1. Sustainability of Concrete	3%
		Unit 8. Exercise 1. Pre-Cast Concrete Building	3%
		Unit 9. Exercise 1. Specifying Windows and Doors	3%
		Unit 10. Exercise 1. Specifying a Cladding System	3%
Project	10%	Unit 10. Project 1. Portfolio	10%
Exam	20%	Final Exam	20%
			100%

Academic Integrity

All students must comply with the policies that regulate all forms of academic dishonesty, or academic misconduct, including plagiarism, self-plagiarism, fabrication, deception, cheating, and sabotage. For more information on the academic honesty policies, refer to the Student Handbook and the Course Catalog.

(End of Syllabus)