

Field Measuring, Sketching, and Layouts For Plumbing Applications (PFPB 2349: Spring 2025)



**LAMAR INSTITUTE
OF TECHNOLOGY**

CREDIT

3 Semester Credit Hours (2 hours lecture, 4 hours lab)

MODE OF INSTRUCTION

Face to Face

PREREQUISITE/CO-REQUISITE:

None

COURSE DESCRIPTION

Field dimensioning, measuring, sketching, and layout of future process piping and the use, care, and setup of transit and level. (From WECM)

COURSE OBJECTIVES

- Calculate fitting and take-off
- Sketch field run piping according to piping specifications
- Set up and use of transit and level

INSTRUCTOR CONTACT INFORMATION

Instructor: Henry LaRocca

Email: hlarocca@lit.edu

Office Phone: (409) 245-8758 Cell: (409) 998-0528

Office Location: PATC 210

Office Hours: Monday and Wednesday: 8:30 a.m. – 9:00 a.m.
Tuesday and Thursday: 12:00 p.m. – 1:00 p.m.
Friday: 8:00 a.m. – 10:00 a.m.

REQUIRED TEXTBOOK AND MATERIALS

PFPB 2349: Field Measuring, Sketching, and Layout

Textbook: Core: Introduction to Basic Construction Skills

Author: NCCER, Publisher: Pearson, ISBN-13: 9780137483341 (2021 update)

Textbook: Pipefitters Blue Book

Author: W. V. Grave, Publisher: Graves Publishing Company ISBN No.: 0-9708321-2-5

Materials/Tools

Approved: **Initials/date**

Materials:

1. Blueprints/Plumbing Drawings
2. Measuring Tape
3. Plumbing Codes or Reference Materials
4. Sketching Paper or Field Note Pads

Tools:

1. Plumb Bob
2. Level
3. Framing Square
4. Chalk Line
5. Pipe Benders
6. Pipe Cutters/Saws
7. Carpenter's Square
8. Plumbing Pliers

ATTENDANCE POLICY

- I. Students are allowed to miss two days without penalty; each additional day will result in the student's grade being dropped by a letter grade.

Example:

2 days absent = If student has an A average no penalty

3 days absent = A drops to a B

4 days absent = B drops to a C

5 days absent = C drops to a D (student must retake class)

6 days absent = D drops to a F (student must retake class)

- II. Absences are counted for unexcused, excused and coming to class late.

- III. 3 tardies = 1 absences

A. Tardy- arriving within 15 minutes after class begins or leaving before the end of class.

B. More than 15 minutes late you will be counted absent.

C. If you sleep in class, you will be counted absent.

- IV. Excused absences. Only given to allow students to make up missed work.

A. Will be given for documented Injury or Illness. The doctor's excuse required showing proof. Will count toward total days missed.

B. Will be given for documented Death in immediate family. Will count toward total days missed.

C. Approved LIT school functions; E.g., SkillsUSA, SGA etc. Will not count toward total days missed

DROP POLICY

If you wish to drop a course, you are responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an “F” in the course.

COURSE CALENDAR

DATE	TOPICS	READINGS (Due on this Date)	ASSIGNMENTS (Due on this Date)
Week 1	Module 1: Course Overview & Safety Protocols Course Introduction, Objectives, and Expectations Safety Standards in Field Measuring and Plumbing Layouts.	NCCER, Chapter 1: “Safety in Construction”	Review Questions - End of Week Quiz - End of Week
Week 2	Module 2: Introduction to Measuring Tools Overview of Field Measuring Tools (Tape Measures, Levels, and Lasers.) Techniques for Accurate Measurements	NCCER, Chapter 2: “Tools of the Trade”	Review Questions - End of Week Measuring Exercises - End of Week Quiz - End of Week
Week 3	Module 3: Plumbing Materials and Measurements Common Materials in Plumbing (PVC, Cooper, PEX) Calculating Material Requirements	Pipefitters Blue Book, Chapter 1	Measuring Materials for a Given Task – End of Week Quiz End of Week

Week 4	<p>Module 4: Fundamentals of Blueprint Reading</p> <p>Basics of Blueprint Symbols and Notations</p> <p>Understanding Plumbing Layouts in Blueprints.</p>	NCCER, Chapter 4: “Construction Drawings”	<p>Review Questions - End of Week</p> <p>Analyze Sample Blueprints - End of Week</p> <p>Quiz - End of Week</p>
Week 5	<p>Module 5: Sketching Basics for Plumbing Applications</p> <p>Freehand Sketching Techniques</p> <p>Using Sketches for Communication on the Job Site</p>	NCCER, Chapter 6: “Basic Communication Skills”	<p>Review Questions - End of Week</p> <p>Create Isometric Sketches of Plumbing Layouts - End of Week</p> <p>Quiz - End of Week</p>
Week 6	<p>Module 6: Introduction to Pipe Offsets</p> <p>Understanding Pipe Offsets and Applications</p> <p>Basic Math for Plumbing Offsets</p>	Pipefitters Blue Book, Chapter 2	<p>Calculating Simple Offsets – End of Week</p> <p>Quiz – End of Week</p>
Week 7	<p>Module 7: Advanced Blueprint Interpretation</p> <p>Plumbing Systems: Water Supply, Drainage, and Venting</p> <p>Reading Detailed Blueprints</p>	NCCER, Chapter 7: “Construction Drawings for Advanced Applications”	<p>Review Questions - End of Week</p> <p>Group Analysis of Complex Blueprints - End of Week</p> <p>Quiz - End of Week</p>

Week 8	Module 8: Midterm Review & Assessment		Exam covering weeks 1-7
Week 9	Module 9: Layout Techniques for Residential Plumbing Planning Residential Plumbing Systems Site Layout Considerations	Pipefitters Blue Book, Chapter 3	Residential Plumbing Layout Project – End of Week Quiz – End of Week
Week 10	Module 10: Commercial Plumbing Layouts Key Differences Between Residential and Commercial Layouts Advanced Measurement Techniques for Large-Scale Projects	NCCER, Chapter 8: “Commercial Applications in Plumbing”	Review Questions - End of Week Commercial Blueprint Case Study - End of Week Quiz - End of Week
Week 11	Module 11: Pipe Bending and Fitting Alignments Methods of Bending Pipes (Manual and Machine-Assisted) Aligning fittings for Accuracy	Pipefitters Blue Book, Chapter 4	Bending and Fitting Pipe Exercises - End of Week Quiz – End of Week
Week 12	Module 12: Troubleshooting Layout Issues	NCCER, Chapter 10: “Problem- Solving in Construction”	Review Questions - End of Week Troubleshooting Scenarios and Solutions - End of Week

	Common Challenges in Field Layouts Strategies for Adjustments and Corrections		Quiz - End of Week
Week 13	Module 13: Advanced Pipefitting Math Calculations for Advanced Offsets, Rolling Offsets, and Saddle Angles Applying Geometry and Trigonometry in Pipe Layouts	Pipefitters Blue Book, Chapter 5	Advanced Pipefitting problems – End of Week Quiz – End of Week
Week 14	Module 14: Capstone Project		Develop and present a complete field sketch, measurement plan, and layout for a given plumbing scenario. Peer reviews and instruction feedback.
Week 15	Final Exam and Course Wrap-Up		Practical and Written Final Exams.

ADDITIONAL COURSE INFORMATION

SKILLMILL will be incorporated in class readings and coursework.

COURSE EVALUATION

Final grades will be calculated according to the following criteria:

Quizzes	15%
Exams	25%
Lab/Projects	40%
Final	20%

GRADE SCALE

- 90-100 A
- 80-89 B
- 70-79 C
- 60-69 D
- 0-59 F

TECHNICAL REQUIREMENTS

The latest technical requirements, including hardware, compatible browsers, operating systems, etc. can be online at <https://lit.edu/online-learning/online-learning-minimum-computer-requirements>. A functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of online technology and resources.

DISABILITIES STATEMENT

The Americans with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. LIT provides reasonable accommodations as defined in the Rehabilitation Act of 1973, Section 504 and the Americans with Disabilities Act of 1990, to students with a diagnosed disability. The Special Populations Office is located in the Eagles' Nest Room 129 and helps foster a supportive and inclusive educational environment by maintaining partnerships with faculty and staff, as well as promoting awareness among all members of the Lamar Institute of Technology community. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409)-951-5708 or email specialpopulations@lit.edu. You may also visit the online resource at [Special Populations - Lamar Institute of Technology \(lit.edu\)](#).

STUDENT CODE OF CONDUCT STATEMENT

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document.\

ARTIFICIAL INTELLIGENCE STATEMENT

Lamar Institute of Technology (LIT) recognizes the recent advances in Artificial Intelligence (AI), such as ChatGPT, have changed the landscape of many career disciplines and will impact many students in and out of the classroom. To prepare students for their selected careers, LIT desires to guide students in the ethical use of these technologies and incorporate AI into classroom instruction and assignments appropriately. Appropriate use of these technologies is at the discretion of the instructor. Students are reminded that all submitted work must be their own original work unless otherwise specified. Students should contact their instructor with any questions as to the acceptable use of AI/ChatGPT in their courses.

STARFISH

LIT utilizes an early alert system called Starfish. Throughout the semester, you may receive emails from Starfish regarding your course grades, attendance, or academic performance. Faculty members record student attendance, raise flags and kudos to express concern or give praise, and you can make an appointment with faculty and staff all through the Starfish home page. You can also login to Blackboard or MyLIT and click on the Starfish link to view academic alerts and detailed information. It is the responsibility of the student to pay attention to these emails and information in Starfish and consider taking the recommended actions. Starfish is used to help you be a successful student at LIT.