

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: TRADE CALCULATIONS

CODE NO: IRN 803 SEMESTER: N / A

PROGRAM: IRONWORKER - ADVANCED

AUTHOR: D. SOCCHIA

DATE: June 1993 PREVIOUS OUTLINE DATED:

•APPROVED:


Dean, School of Technical Trades

COURSE NAME: TRADE CALCULATIONS CODE NO. IRN 803

TOTAL CREDIT HOURS: 24 (8 x 3hrs)

PREREQUISITE(S): Ironworker apprenticeship plus the successful completion of the basic and intermediate levels of training.

I. PHILOSOPHY/GOALS:

To provide apprentices with the necessary background and academic training to solve job related problems that require or are made easier to handle thru the use of mathematical calculations. The short term goal is to assist the advanced apprentice in his / her efforts to pass the provincial C of Q Exam.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

- 1). Identify and select mathematical formula appropriate to the needs of the trade.
- 2) Perform typical job related calculations involving: weights; volume; staircase development; rise / run and point to point determinations.

III. TOPICS TO BE COVERED:

1. Course Introduction and Orientation	1 Hr.
2. Volume / Weight of Squares, Cylinders and Cones.	5
3. Use of Percentages.	2
Review Assignment // 1.	Homework
THEORY TEST // 1. and REVIEW	2
4. Ratio, Proportion and Trig Ratios	6
Review Assignment // 2.	Homework
THEORY TEST // 2. and REVIEW	2
5. Staircase Layout using the Rise / Run Relationship.	5
Review Assignment // 3.	Homework
THEORY TEST // 3. and REVIEW	1

NOTE: The instructor reserves the right to modify and / or change course objectives and topics in order to better serve the needs of the class.

LEARNING ACTIVITIES

<u>TOPIC NO.</u>	<u>NUMBER OF PERIODS</u>	GENERAL TOPIC DESCRIPTION	<u>RESOURCES</u>
1	1	INTRODUCTION and ORIENTATION 1.1 Describe and explain the following: a) course outline b) course guidelines c) course marking system d) attendance requirement	Handouts
2	5	VOLUMES of SQUARES, CYLINDERS and CONES 2.1 Provide formulas and explain the concepts, use of same. 2.2 Calculate volumes of each shape using decimal sofa foot. 2.3 Determine weight of contents for each shape using volume and material density. 2.4 Determine the empty weight of each shape when fabricated from steel plate. 2.5 Determine the 'total weight ¹ or load for each shape for rigging and lifting purposes. 2.6 Review the following as required: a) use of decimals of a foot b) use of four place decimals c) rounding off to the nearest 1/16 th. d) converting mm to decimals of a foot.	
	2	USE of PERCENTAGES 3.1 Provide formula and explain the concepts, use of same. 3.2 Calculate percentage from given amounts. 3.3 Calculate amounts from given percentage(s). 3.4 Apply the use of percentage to some typical trade related circumstance(s) involving: a) % of volume b) % of effectiveness c) % of maximum tension. Review Assignment # 1.	
	2	THEORY TEST # 1 and REVIEW	

LEARNING ACTIVITIES

<u>TOPIC NO.</u>	<u>NUMBER OF PERIODS</u>	<u>GENERAL TOPIC DESCRIPTION</u>	<u>RESOURCES</u>
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RATIO; PROPORTION and TRIG. RATIOS

- 4.1 Describe and explain the concepts behind the use of ratio and proportion.
- 4.2 Calculate the actual rise for a measured run given the ratio of rise to run.
- 4.3 Calculate the actual run for a measured rise given the ratio of rise to run.
- 4.4 Explain the application of trig ratios where the following terms are applied to the existing formula:
 - a) rise
 - b) run
 - c) point-to-point
- 4.5 Provide the standard formula and explain their concepts with regard to:
 - a) sine
 - b) cosine
 - c) tangent
 - d) cotangent
- 4.6 Solve typical job related problems involving to degrees of
 - a) conversion of bevels to degrees of slope.
 - b) conversion of degrees of slope to standard bevels
 - c) cross bracing
 - d) staircase bevel
 - e) standard elevations.

Review Assignment # 2.

THEORY TEST # 2 and REVIEW

STAIRCASE LAYOUT USING the RISE / RUN RELATIONSHIP

- 5.1 Provide the concept of maximum safe rise and explain its relationship to the building codes.
- 5.2 Provide the 'Imperial¹' and the 'Metric' standard for maximum safe rise.
- 5.3 Calculate the number of rises for a given elevation.
- 5.4 Calculate the number of inches (or mm) for

LEARNING ACTIVITIES

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<u>TOPIC NO,</u>	<u>NUMBER OF PERIODS</u>	<u>GENERAL TOPIC DESCRIPTION</u>	<u>RESOURCES</u>
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- each rise.
- 5.5 Provide the formula for 'run' distance and explain the concept of minimum vs maximum run.
 - 5.6 Calculate the number of inches (or mm) for each run.
 - 5.7 Provide the formula for 'bevel' and explain the concept of minimum vs maximum bevel .
 - 5.8 Calculate the amount of bevel in inches (or mm) as required.
 - 5.9 Use ratio and proportion to calculate the master bevel for the staircase.
 - 5.10 Explain and determine tread size vs run distance.

Review Assignment # 3

2 THEORY TEST # 3

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EVALUATION METHODS: (INCLUDES ASSIGNMENTS, ATTENDANCE REQUIREMENTS ETC.)

General Assessment	*Final Mark
A = 85 - 100 %	Test // 1. 25 %
B = 75 - 84 %	Test // 2. 25 %
C = 60 - 74 %	Test // 3. 25 %
D = 50 - 59 %	Assignments 25 %
F = 0 - 49 %	

REQUIRED STUDENT RESOURCES

Calculator - (basic functions)
3 Pens - (1 blue, 1 black, 1 red
Binder c/w paper
Ironworker Texts

SPECIAL NOTES

Attendance to all classes is mandatory and will be recorded on an hour by hour basis using the 'Record of Attendance' form.