SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



COURSE OUTLINE

COURSE TITLE: Residential Construction I

CODE NO.: HMI114 SEMESTER: TWO

PROGRAM: Residential Construction Technician – Home Inspection,

and Construction Carpentry Techniques

AUTHOR: Al Tucci

INSTRUCTORS: Al Tucci and Sam Spadafora

DATE: September **PREVIOUS OUTLINE** January

2014 **DATED**: 2013

APPROVED:

"Corey Meunier"

CHAIR DATE

TOTAL CREDITS: 5

PREREQUISITE(S): None

HOURS/WEEK: 5

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I. COURSE DESCRIPTION:

The first of three courses intended to familiarize the student with residential construction, building on skills and knowledge developed in Semester I courses. Topics covered in the course include: workplace safety, building layout, excavation, footings and foundations, drainage tiles, sill plates and floors. Participants will learn through hands-on application of theory taught during the course.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Adhere to health and safety, and current construction related legislation and practices.

Potential Elements of the Performance:

- Demonstrate safe work practices including injury prevention and the use of personal protective equipment
- Use tools and equipment according to specified direction / instructions
- Ladder and scaffold safety
- Fall arrest training
- Power tool safety
- Elevated platform safety
- General hand tool safety

2. Understand and read residential plans.

Potential Elements of the Performance:

- Understand all residential symbols
- Read measurements both Imperial and Metric
- Know building codes and specifications

3. Understand and discriminate various building and construction materials including engineered lumber.

Potential Elements of the Performance:

- Understand engineered lumber and its applications, including
- Wood I-beams
- Laminated Veneer Lumber (LVL)
- Glue-laminated beams
- Open web trusses
- Laminated-strand lumber

4. Prepare construction specific material lists and cost estimates.

Potential Elements of the Performance:

- Read and understand architectural drawings
- Understand the use of scale in architectural drawings
- Identify architectural symbols
- Prepare material lists for specified residential plans
- Estimate costs

5. Layout and prepare footings and foundations.

Potential Elements of the Performance:

- Site preparation
- Identify types of form systems for foundations, concrete, insulated concrete form or block (pressure treated)
- Lay out and installing footings and foundations
- Complete basic volume calculations for footing forms
- Determine weights and sizes of footings
- Proper location and securing of footings
- Drainage tile placement
- Damp-proofing below grade

6. Understand and assemble floor framing assemblies.

Potential Elements of the Performance:

- Determine sizing for floor framing using span tables
- Understand live and dead loads
- Types of floor framing
- Platform framing
- Girders and beams
- Sill plates, headers and trimmers
- Floor joists, trusses and platform finishing
- Floor sheathing
- Assemble a floor frame
- Entrance platforms and stairs

III. TOPICS:

- 1. Protect yourself and others
- 2. Safe and proper use of hand tools, power tools, elevated platforms, ladders and scaffolding
- 3. Cutting and fitting materials with the proper estimated lengths, widths and thicknesses
- 4. Understanding and reading residential plans
- 5. Building materials and cost estimating
- 6. Footings and foundation systems
- 7. Floor framing assemblies
- 8. Entrance platforms and stairs

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- Handouts, calculators, green tag safety boots, safety glasses at all times in the class / on the work site
- Text book *Modern Carpentry*, Essential Skills for the Building Trades, 11th Edition, 2008, Wagner and Smith, along with accompanying work book

V. EVALUATION PROCESS/GRADING SYSTEM:

Assignments and tests	30%
Practical activities	55%
Attendance	15%

The following semester grades will be assigned to students:

Grade	<u>Definition</u>	Grade Point Equivalent
A+ A	90 – 100% 80 – 89%	4.00
В	70 - 79%	3.00
С	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in	
V	field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a	
	student additional time to complete the	
	requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course	
	without academic penalty.	

VI. SPECIAL NOTES:

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.



HMI 114 Residential Construction I - Course Plan

Week	Outcomes	Format	Hrs	Topic/Content	Readings	Assignment	Assessment	Resources
1,2	1	Lecture	4	The carpenter's workplace; protect self and others Understand: the process of skill development and the importance competency Explain General hand tools, safety, scaffold safety, fall arrest training	Chap. 2 pp. 59-71	Workbook chapter 2, p.11	p. 72 Test, ques. # 1-11	Handouts, calculators, green tag safety boots, safety glasses. Text book <i>Modern Carpentry</i> , along with accompanying work book. Handouts / training materials
		Lau	0	Perform Proper set up of scaffolds and ladder, proper use of tools including fall arrest equipment			activities	for ladders, scaffolds, fall arrest, power tools, elevated platforms
3	1, 2, 4	Lecture Lab	3	Preparing construction specific material and cost estimates Read and understand architectural drawings Explain Preparing material lists for specified residential plans Perform Preparing materials for specific residential plans Estimating materials, costs Understanding the use of scale in plans Identify	Chap. 3 pp. 73-99	Workbook chapter 3, p.13	p. 100 Test, ques. # 1-16 Practical activities	As above and residential prints, calculators
				Identify Identify architectural symbols				

4	1, 3	Lecture	2	Building materials, with a focus on engineered lumber and its applications Explain Various building materials, engineered lumber and its applications, wood 'I' beams, laminated veneer lumber, glue laminated beams, open web tresses. Perform	Chap. 1	Workbook chapter 1, pp. 5 -10 Questions as assigned	p. 55 Test, selected questions	As above and building material samples, including engineered lumber, hangars and nails.
				Matching hangars with proper nailing patterns and proper nailing patterns for lamination Identify Difference between laminated beams and strand beams.			Practical activities	
5,6	1,2,5	Lab	6	Site preparations and building layout Explain The operation of the builder's level and level- transit The basic operation of a laser level system Perform Measure and layout angles using levelling equipment Read the vernier scale and use a plumb line Apply Use a builder's level to make a square corner Use a tape measure to square off a building Use a transit and plumb bob for a starting point and locate building lines Find grade levels and elevations Proper use of laser levels and receiver	Chap. 6 pp. 149- 166	Workbook Chapter 6 pp. 29-32	p. 167 Test, ques. #1-11	As above and builder's level, transit, plumb bob, 100' tape, laser level and receiver.

Lecture	6	Footings and foundations	Chap. 7	Workbook	pp.220- 221	As above and provided
		<u>Explain</u>	pp. 169-	chapter 7	Test, week 7	forming materials, ICF
		Layout lines of the building	219	pp. 33-39	Ques. #1-20,	samples
		Describe excavation procedures			week 8	
		Footing requirements and how to build			Ques. #21-35	
		footing forms				
		The terms concrete cement and aggregate				
		The building, erecting and use of forms				
		Types of foundation systems				
Lab	9	<u>Apply</u>				
		Footing design				
		Forms for footings			Practical	
		concrete			activities	
		Erecting wall forms				
		Placing concrete				
		<u>Identify</u>				
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		Estimating materials				
	Lab	Lab 9	Layout lines of the building Describe excavation procedures Footing requirements and how to build footing forms The terms concrete cement and aggregate The building, erecting and use of forms Types of foundation systems Lab 9 Apply Footing design Forms for footings concrete Erecting wall forms Placing concrete	Layout lines of the building Describe excavation procedures Footing requirements and how to build footing forms The terms concrete cement and aggregate The building, erecting and use of forms Types of foundation systems 4 Apply Footing design Forms for footings concrete Erecting wall forms Placing concrete Identify Concrete blocks Insulating foundation walls ICF foundation wall systems Pouring basement floors Sidewalks and drives Perform	Layout lines of the building Describe excavation procedures Footing requirements and how to build footing forms The terms concrete cement and aggregate The building, erecting and use of forms Types of foundation systems Apply Footing design Forms for footings concrete Erecting wall forms Placing concrete Identify Concrete blocks Insulating foundation walls ICF foundation wall systems Pouring basement floors Sidewalks and drives Perform	Lab Usyout lines of the building Describe excavation procedures Footing requirements and how to build footing forms The terms concrete cement and aggregate The building, erecting and use of forms Types of foundation systems Lab PApply Footing design Forms for footings concrete Erecting wall forms Placing concrete Identify Concrete blocks Insulating foundation walls ICF foundation wall systems Pouring basement floors Sidewalks and drives Perform

10,	1,2,6	Lecture	6	Floor framing	Chap. 8	Workbook	Test ques. 1-	As above and samples of
11,1				<u>Describe</u>	pp. 223-	Chap. 8 pp.	10	engineered lumber, standard
2				Type of floor framing	250	41-47		lumber and platform
				Platform framing				materials
				Girders and beams				
				Sill plates and headers				
				Floor joist and platform finishing				
				Overhangs and projections				
				Materials for sub-flooring				
		Lab	9	<u>Identify</u>				
				Material sizes including engineered materials,			Practical	
				girder and beam size, posts and columns			activities	
				Procedures for sill and header construction				
				Apply				
				Estimating material and material size				
				<u>Perform</u>				
				Floor framing and sheathing				
13,1	1,2,6	Lecture	4	Entrance platforms and stair construction	Chap. 7	Prepare for	Practical	As above and staircase
4				<u>Describe</u>	pp.211-	final test	activities	materials
				Construction of entrance platforms and stairs	212 and			
		Lab	6	<u>Identify</u>	Chap.18,			
				Various types of stairs	pp.597-			
				Stair parts and terms	615			
				<u>Perform</u>				
				Calculate the rise-run ratio, number and size				
				of risers and stairwell length				
				Apply				
				Prepare sketches of types of stringers				
				Layout stringers for a given stair rise and run				
				Splitting angles for mitre cuts				
				Using stock stair parts				

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15	1,2,3,4,	Lecture,	5	Building project completion	Practical	
	5,6	lab		Complete term project work and all practical	activities	
				activities	Final test	
16	1,2,3,4,	Lecture	5	Review; take up and discuss final test /		
	5,6,	/ lab		assignments / practical activities / sharing and		
				feedback		