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| **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:**  **INSTRUCTORS:** | Al Tucci  Al Tucci and Sam Spadafora | | | | |
| **DATE:** | September 2014 | **PREVIOUS OUTLINE DATED:** | | January  2013 | |
| **APPROVED:** | **“Corey Meunier”** | | |  | |
|  | CHAIR | | | **DATE** | |
| **TOTAL CREDITS:** | 5 | | | | |
| **PREREQUISITE(S):** | None | | | | |
| **HOURS/WEEK:** | 5 | | | | |
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| *For additional information, please contact Corey Meunier, Chair* | | | | | |
| ***Technology & Skilled Trades*** | | | | | |
| ***(705) 759-2554, Ext. 2610*** | | | | | |

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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 |

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| **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 |

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| **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 |

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| **V.** | **EVALUATION PROCESS/GRADING SYSTEM:**  Assignments and tests 30%  Practical activities 55%  Attendance 15% |
|  | The following semester grades will be assigned to students: |

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|  | Grade | Definition | *Grade Point Equivalent* |
|  | A+ | 90 – 100% | 4.00 |
|  | A | 80 – 89% |
|  | B | 70 - 79% | 3.00 |
|  | C | 60 - 69% | 2.00 |
|  | D | 50 – 59% | 1.00 |
|  | F (Fail) | 49% and below | 0.00 |
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|  | 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 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. |  |

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| **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. | |

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| **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**

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| Week | Outcomes | Format | Hrs | Topic/Content | Readings | Assignment | Assessment | Resources |
| 1,2 | 1 | Lecture  Lab | 4  6 | ***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  Perform  Proper set up of scaffolds and ladder, proper use of tools including fall arrest equipment | Chap. 2  pp. 59-71 | Workbook chapter 2, p.11 | p. 72 Test, ques. # 1-11  Practical activities | Handouts, calculators, green tag safety boots, safety glasses.  Text book ***Modern Carpentry,*** along with accompanying work book.  Handouts / training materials for ladders, scaffolds, fall arrest, power tools, elevated platforms |
| 3 | 1, 2, 4 | Lecture  Lab | 2  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  Identify architectural symbols | Chap. 3  pp. 73-99 | Workbook chapter 3, p.13 | p. 100 Test, ques. # 1-16  Practical activities | As above and residential prints, calculators |
| 4 | 1, 3 | Lecture  Lab | 2  3 | ***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  Matching hangars with proper nailing patterns and proper nailing patterns for lamination  Identify  Difference between laminated beams and strand beams. | Chap. 1 | Workbook chapter 1, pp. 5 -10 Questions as assigned | p. 55 Test, selected questions  Practical activities | As above and building material samples, including engineered lumber, hangars and nails. |
| 5,6 | 1,2,5 | Lecture  Lab | 4  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. |
| 7,8,9 | 1, 5 | Lecture  Lab | 6  9 | ***Footings and foundations***  Explain  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  Estimating materials | Chap. 7  pp. 169-219 | Workbook chapter 7 pp. 33-39 | pp.220- 221 Test, week 7  Ques. #1-20,  week 8  Ques. #21-35  Practical activities | As above and provided forming materials, ICF samples |
| 10,  11,12 | 1,2,6 | Lecture  Lab | 6  9 | ***Floor framing***  Describe  Type of floor framing  Platform framing  Girders and beams  Sill plates and headers  Floor joist and platform finishing  Overhangs and projections  Materials for sub-flooring  Identify  Material sizes including engineered materials, girder and beam size, posts and columns  Procedures for sill and header construction  Apply  Estimating material and material size  Perform  Floor framing and sheathing | Chap. 8 pp. 223-250 | Workbook Chap. 8 pp. 41-47 | Test ques. 1-10  Practical activities | As above and samples of engineered lumber, standard lumber and platform materials |
| 13,14 | 1,2,6 | Lecture  Lab | 4  6 | ***Entrance platforms and stair construction***  Describe  Construction of entrance platforms and stairs  Identify  Various types of stairs  Stair parts and terms  Perform  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 | Chap. 7 pp.211-212 and Chap.18, pp.597-615 | Prepare for final test | Practical activities | As above and staircase materials |

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