DURHAM COLLEGE
SUCCESS MATTERS

Faculty of STA (Skld Trds)

HVAC Sheet Metal Fabrication 1

2023-24 Academic Year

Program Title	Ministry Title	Major	Year	Semester
STA-Heating, Ventilation and Air Conditioning Techniques	--	HVAC	1	1

Course Code:	HVMF 1401	**Course Equiv. Code(s):**	N/A
Course Hours:	42	**Course GPA Weighting:**	3
Prerequisite:	N/A		
Corequisite:	N/A		
Laptop Course:	**Yes** [ ] **No** [X]		
Delivery Mode(s):	**In class** [X] **Online** [ ] **Hybrid** [ ] **Flexible** [ ] **HyFlex** [ ]		
Remote proctoring required	**Yes** [ ] **No** [X]		
Authorized by (Dean or Director):	Rebecca Milburn	**Date:**	August 2023

Prepared by		
First Name	**Last Name**	**Email**
Daniel	Sauve	daniel.sauve@durhamcollege.ca

Course Description:

This course is gives the technician an entry level understanding of the competencies required in assembly and fabrication of residential ductwork. With an emphasis on safe work practices, the student will use a variety of tools and machines in the development of a duct-work project consisting of an assortment of seams and joints required for a furnace installation. Students will complete projects in a simulated work environment as they would expect to see on the job.

Campus Closure Notice

In the event of a campus closure during which time classes cannot be conducted or attended in person, course delivery will be conducted remotely where possible. Should teaching and learning resume on campus, students may

be organized into smaller groups for classroom delivery, in accordance with directions from public health authorities. In either situation, the learning plan sequence and/or evaluation methods may be adjusted to address topics requiring hands-on, practical learning activities.

Subject Eligibility for Prior Learning Assessment & Recognition (PLAR):

Prior Learning Assessment and Recognition (PLAR) is a process a student can use to gain college credit(s) for learning and skills acquired through previous life and work experiences. Candidates who successfully meet the course learning outcomes of a specific course may be granted credit based on the successful assessment of their prior learning. The type of assessment method (s) used will be determined by subject matter experts. Grades received for the PLAR challenge will be included in the calculation of a student's grade point average.

The PLAR application process is outlined in http://www.durhamcollege.ca/plar. Full-time and part-time students must adhere to all deadline dates. Please email: PLAR@durhamcollege.ca for details.

PLAR Eligibility

Yes [ ] **No** [X]

PLAR Assessment (if eligible):

- [ ] Assignment
- [ ] Exam
- [ ] Portfolio
- [ ] Other

Course Learning Outcomes

Course Learning Outcomes contribute to the achievement of Program Learning Outcomes for courses that lead to a credential (e.g. diploma). A complete list of Vocational/Program Learning Outcomes and Essential Employability Skill Outcomes are located in each Program Guide.

Course Specific Learning Outcomes (CLO)

Student receiving a credit for this course will have reliably demonstrated their ability to:

CLO1	Solve trade related problems related to various situations. Fabricating with hand tools only.
CLO2	Calculate and develop drawings of a plenum and a duct system. Use of hand tools available on the job site.
CLO3	Student will work in a simulated work environment installing prefabricated fittings.

Essential Employability Skill Outcomes (ESSO)

This course will contribute to the achievement of the following Essential Employability Skills:

- [ ] EES 1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
- [ ] EES 2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
- [X] EES 3. Execute mathematical operations accurately.
- [X] EES 4. Apply a systematic approach to solve problems.
- [X] EES 5. Use a variety of thinking skills to anticipate and solve problems.
- [ ] EES 6. Locate, select, organize, and document information using appropriate technology and information systems.
- [ ] EES 7. Analyze, evaluate, and apply relevant information from a variety of sources.
- [ ] EES 8. Show respect for the diverse opinions, values, belief systems, and contribution of others.
- [ ] EES 9. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
- [X] EES 10. Manage the use of time and other resources to complete projects.
- [ ] EES 11. Take responsibility for one's own actions, decisions, and consequences.

Evaluation Criteria:

The Course Learning Outcomes and Essential Employability Skills Outcomes are evaluated by the following evaluation criterion.

Evaluation Description	Course Learning Outcomes	EESOs	Weighting
Project: Project 1 Fabricate a duct 5 3/8 X 5 3/5 and 11 inches long.	CLO1, CLO2, CLO3	EES3, EES4, EES5, EES10	10
Project: Project 2 Fabrication of a rectangle duct 4 3/4 X 10, 11 inches long.	CLO1, CLO2, CLO3	EES3, EES4, EES5, EES10	10
Project: Project 3 Assembly of duct-work using Drive and S cleat. How to prepare and make a drive cleat.	CLO1, CLO2, CLO3	EES3, EES4, EES5, EES10	10
Project: Project 4 Develop and fabricate a transition joining project 1 and 2.	CLO1, CLO2, CLO3	EES3, EES4, EES5, EES10	10
Project: Project 5 Develop and fabricate an elbow with optional seam.	CLO1, CLO2, CLO3	EES3, EES4, EES5, EES10	10
Project: Project 6 Demonstration on optional seam, double hem, fabricate a 6 X 6 short duct 6 inches long.	CLO1, CLO2, CLO3	EES3, EES4, EES5, EES10	10
Project: Project 7 Demonstration and practice cutting a square hole in a large duct.	CLO1, CLO2, CLO3	EES3, EES4, EES5, EES10	10
Project: Final practical project, measure, install duct-work.	CLO1, CLO2, CLO3	EES3, EES4, EES5, EES10	25
Assignment: Hand in completed work-book	CLO1, CLO2	EES3, EES4, EES5, EES10	5
Total			**100%**

Notes:

1. Fabricate projects marked on quality as demonstrated by instructor.
2. Test on all course content student will measure and install a duct run on a furnace in a simulated work area. Hand in completed work book.

Required Text(s) and Supplies:

1. Binder for hand-outs and completed ductwork development sketches

2. Pencil, pen, sharpie, Tape measure, calculator, safety gloves

Recommended Resources (purchase is optional):

N/A

Policies and Expectations for the Learning Environment:

General Policies and Expectations:

General College policies related to	**General policies related to**
+ Acceptable Use of Information Technology + Academic Policies + Academic Integrity + Standards for Student Conduct for all Learning Environments can be found at https://durhamcollege.ca/wp-content/uploads/Standards-of-Student-Conduct-for-all-Learning-Environments.pdf + Information about academic policies and procedures can be found on-line at https://durhamcollege.ca/about/governance/policies	+ attendance + absence related to tests or assignment due dates + excused absences + writing tests and assignments + classroom management can be found in the Program Guide (full time programs only) in MyDC https://durhamcollege.ca/mydc/

All students at Durham College have the responsibility to familiarize themselves with and abide by the college's Academic Integrity Policy. Students are expected to complete and submit their own work in an honest manner, in accordance with the policy. Durham College has zero tolerance for breaches of academic integrity. All suspected breaches of academic integrity will be investigated and documented following procedures outlined in the policy, and should a breach be confirmed, appropriate penalties will be levied. Breaches of academic integrity refer to a variety of practices including, but not limited to:

• copying another person's work;
• using unauthorized materials or resources during an evaluation;
• obtaining unauthorized copies of evaluations in advance;
• collaborating without permission;
• colluding or providing unauthorized assistance;
• falsifying academic documents or records;
• misrepresenting academic credentials;
• buying, selling, stealing, soliciting, exchanging or transacting materials or information for the purpose of academic gain;
• bribing or attempting to bribe personnel;
• impersonation;
• submitting the same work in more than one course without authorization;
• improper use of computer technology and the internet;
• depriving others of academic resources;
• misrepresenting reasons for special consideration of academic work;
• plagiarizing or failing to acknowledge ideas, data, graphics or other content without proper and full acknowledgement;
• any unauthorized use of generative or other artificial intelligence.

If you have questions or concerns about what constitutes appropriate academic conduct or research and citation methods, and what your responsibilities are towards academic integrity, please visit the Academic Integrity website on MyDC, reach out to Student Academic Learning Services (SALS), or speak with your professor or Student Advisor.

Course Specific Policies and Expectations:

Every class students will follow Durham College policies on safety:
-not permitted in class without PPE, or shorts. Distractions in class as in ear plugs, music, phones will not be allowed.
All of the class is responsible for clean-up (sweeping) safety gloves are required.

General Course Outline Notes:

1. Students should use the course outline as a learning tool to guide their achievement of the learning outcomes for this course. Specific questions should be directed to their individual professor.
2. The college considers the electronic communication methods (i.e. DC Mail or DC Connect) as the primary channel of communication. Students should check the sources regularly for current course information.
3. Professors are responsible for following this outline and facilitating the learning as detailed in this outline.
4. Course outlines should be retained for future needs (i.e. university credits, transfer of credits etc.)
5. A full description of the Academic Appeals Process can be found at https://durhamcollege.ca/about/governance/policies/academic-policies .
6. Faculty are committed to ensuring accessible learning for all students. Students who would like assistance with academic access and accommodations in accordance with the Ontario Human Rights Code should register with the Access and Support Centre (ASC). ASC is located in room SW116, Oshawa Campus and in room 180 at the Whitby Campus. Contact ASC at 905-721-3123 for more information.
7. Durham College is committed to the fundamental values of preserving academic integrity. Durham College and faculty members reserve the right to use electronic means to detect and help prevent plagiarism. Students agree that by taking this course all assignments could be subject to submission either by themselves or by the faculty member for a review of textual similarity to Turnitin.com. Further information about Turnitin can be found on the Turnitin.com Web site.

Learning Plan

The Learning Plan is a planning guideline. Actual delivery of content may vary with circumstances.

Students will be notified in writing of changes that involve the addition or deletion of learning outcomes or evaluations, prior to changes being implemented, as specified in the Course Outline Policy and Procedure at Durham College.

Week/ Module	**Hours:** 3 **Delivery:** Shop
1	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Safety lecture
	Intended Learning Activities information on health and safety self protection
	Resources and References PowerPoint, hand-out
	Evaluation

Week/ Module	Hours: 3 Delivery: Shop
2	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Familiarize with the shop, understand the way that sheet metal items are fabricated. Use of hand tools and power tools. note taking.
	Intended Learning Activities Develop definition and demonstration and practice exercises use of tools and their proper use. Fabricate a small duct to understand the tools and methods required in HVAC
	Resources and References notes and hand-outs PowerPoint
	Evaluation
Week/ Module	**Hours:** 3 **Delivery:** Lab
3	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Fabricate a duct 5 3/8 X 5 3/5 and 11" long.
	Intended Learning Activities Demonstration
	Resources and References hand-out, PowerPoint live demonstration cam
	Evaluation **Weighting** Project: Project 1 10 Fabricate a duct 5 3/8 X 5 3/5 and 11 inches long.

Week/ Module	Hours: 3 Delivery: Lab
4	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Fabrication of a rectangle duct 4 3/4 X 10, 11"long.
	Intended Learning Activities Demonstration and practice
	Resources and References power point , hand-outs
	Evaluation **Weighting** Project: Project 2 10 Fabrication of a rectangle duct 4 3/4 X 10, 11 inches long.
Week/ Module	**Hours:** 3 **Delivery:** Lab
5	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Assembly of duct-work using Drive and "S" cleat. How to prepare and make a drive cleat.
	Intended Learning Activities Fabricate a long duct section, group activity.
	Resources and References demonstration, hand-out, power point live cam demonstration
	Evaluation **Weighting** Project: Project 3 10 Assembly of duct-work using Drive and S cleat. How to prepare and make a drive cleat.

Week/ Module	Hours: 3 Delivery: Lab
6	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Develop and fabricate a transition joining project 1 and 2.
	Intended Learning Activities Practical test demonstrate skills fabricate and assemble three parts.
	Resources and References hand-out PowerPoint demonstration cam and
	Evaluation **Weighting** Project: Project 4 10 Develop and fabricate a transition joining project 1 and 2.
Week/ Module	**Hours:** 3 **Delivery:** Lab
7	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Develop and fabricate an elbow with optional seam.
	Intended Learning Activities Demonstrate and practice method hand tools only.
	Resources and References notes, power point
	Evaluation **Weighting** Project: Project 5 10 Develop and fabricate an elbow with optional seam.

Week/ Module	Hours: 3 Delivery: Lab
8	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Demonstration on optional seam, double hem, fabricate a 6 X 6 short duct 6" long.
	Intended Learning Activities Hand tools only.
	Resources and References notes demonstration cam
	Evaluation **Weighting** Project: Project 6 10 Demonstration on optional seam, double hem, fabricate a 6 X 6 short duct 6 inches long.
Week/ Module	**Hours:** 3 **Delivery:** Lab
9	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Demonstration and practice cutting a square hole in a large duct.
	Intended Learning Activities Demonstrate and practice using right and left snips.
	Resources and References notes live demonstration cam
	Evaluation **Weighting** Project: Project 7 10 Demonstration and practice cutting a square hole in a large duct.

Week/ Module	Hours: 3 Delivery: Lab
10	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Fabricate fitting attach with Drive cleat
	Intended Learning Activities Assembly of ducts
	Resources and References Notes and hand-outs power point
	Evaluation
Week/ Module	**Hours:** 3 **Delivery:** Lab
11	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Continue of fitting assembly
	Intended Learning Activities Assembly of ducts and disassembly
	Resources and References notes, hand-out
	Evaluation

Week/ Module	Hours: 3 Delivery: Lab
12	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Demonstration of fabrication of an off-set duct to fit the past projects, group activity.
	Intended Learning Activities Develop and fabricate, working with others.
	Resources and References notes, hand-out
	Evaluation
Week/ Module	**Hours:** 3 **Delivery:** Lab
13	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Complete final Project
	Intended Learning Activities Complete notes for final test
	Resources and References notes
	Evaluation **Weighting** Project: Final practical project, measure, install duct-work. 25

Week/ Module	**Hours:** 3 **Delivery:** Lab
14	**Course Learning Outcomes** CLO1, CLO2, CLO3
	Essential Employability Skills
	Taught: EES3, EES4, EES5, EES10 **Practiced:** EES3, EES4, EES5, EES10
	Intended Learning Objectives/Topics Hand in the completed work book for 5%
	Intended Learning Activities Demonstrate, skill
	Resources and References all notes and hand-outs
	Evaluation **Weighting** Assignment: Hand in completed work-book 5

This course supports the following program(s) and program learning outcomes.

HVAC: Heating, Ventilation and Air Conditioning Techniques	#3. Select and use hand tools and operate test equipment for their intended purposes. #4. Solve routine heating, refrigeration, and air conditioning problems and perform calculations by applying the fundamentals of mathematics and physics. #5. Read, develop, and interpret various drawings and utilize the information to follow the proper sequence of operations for heating, refrigeration, air conditioning systems, and associated components. #6. Assist in the installation and start-up operations of heating, refrigeration, and air conditioning systems under the supervision of a certified technician.