

## Course Outline

<b>Course Title:</b>	Applied Tools and Piping Methods I		
<b>Course Number:</b>	MECH201	<b>Approval Date:</b>	2018/9/5
<b>Course Hours:</b>	45 hours	<b>Academic Year:</b>	2018
<b>Academic School:</b>	School of Trades & Technology		
<b>Faculty:</b>	Gordon Knox - gord.knox@flemingcollege.ca Jeff Hubers - Jeff.Hubers@flemingcollege.ca		
<b>Program Co-ordinator or Equivalent:</b>	Neil Maika - Neil.Maika@flemingcollege.ca		
<b>Dean (or Chair):</b>	Jason Jackson - jason.jackson@flemingcollege.ca		

## Course Description

In this hands-on practical course, safe and proper use of hand and power tools related to the plumbing trade will be emphasized. Students will learn to select and use these tools to cut, fit, and join a variety of piping materials. Students will learn to assemble piping systems and understand their applications in accordance with Codes and Regulations.

**Prerequisites:** None.

**Corequisites:** None.

## Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify, maintain and safely use various measuring instruments and hand tools required for plumbing applications.
2. Read basic pipe drawings to identify required fittings, measurements and processes.
3. Select various measuring instruments and hand tools required to construct pipe projects.
4. Demonstrate the safe and correct use of measuring instruments and hand tools to assemble pipe projects.
5. Recall the basic safe application of tools and identify common plumbing fittings used in today's systems including copper, PEX, ABS, PVC, black iron and plastic pipe.

## Learning Resources

Workbook and Handouts Provided by Faculty.

## Assessment Summary

Assessment Task	Percentage
In-class activities	30%
Labs	50%
Assignments	20%

## Student Success: Policies and Procedures

Mutually, faculty and learners will support and adhere to college Academic Regulations, and Student Rights and Responsibilities. The following policies and guidelines have been developed to support the learning process.

Please click on the link for information about:

- [Academic Integrity \(2-201A\)](https://department.flemingcollege.ca/hr/attachment/7750/download)  
(<https://department.flemingcollege.ca/hr/attachment/7750/download>)
- [Accessibility for Persons with Disabilities \(3-341\)](https://department.flemingcollege.ca/hr/attachment/5619/download)  
(<https://department.flemingcollege.ca/hr/attachment/5619/download>)
- [Grading and Academic Standing \(2-201C\)](https://department.flemingcollege.ca/hr/attachment/7752/download)  
(<https://department.flemingcollege.ca/hr/attachment/7752/download>)
- [Guidelines for Professional Practice: Students and Faculty](https://flemingcollege.ca/PDF/guidelines-for-professional-practice-students-faculty.pdf)  
(<https://flemingcollege.ca/PDF/guidelines-for-professional-practice-students-faculty.pdf>)
- [Student Rights and Responsibilities \(5-506\)](https://department.flemingcollege.ca/hr/attachment/269/download)  
(<https://department.flemingcollege.ca/hr/attachment/269/download>)

**Alternate accessible formats of learning resources and materials will be provided, on request.**

## Program Standards

The Ministry of Training, Colleges and Universities oversees the development and the review of standards for programs of instruction. Each college is required to ensure that its programs and program delivery are consistent with these standards, and must assist students to achieve these essential outcomes.

This course contributes to Program Standards as defined by the [Ministry of Training, Colleges and Universities](#) (MTCU). Program standards apply to all similar programs of instruction offered by colleges

across the province. Each program standard for a postsecondary program includes the following elements:

- **Vocational standards** (the vocationally specific learning outcomes which apply to the program of instruction in question);
- **Essential employability skills** (the essential employability skills learning outcomes which apply to all programs of instruction); and
- **General education requirement** (the requirement for general education in postsecondary programs of instruction that contribute to the development of citizens who are conscious of the diversity, complexity and richness of the human experience; and, the society in which they live and work).

Collectively, these elements outline the essential skills and knowledge that a student must reliably demonstrate in order to graduate from the program. For further information on the standards for your program, follow the MTCU link ([www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/](http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/))

## Detail Plan

<b>Term:</b>	2018 Fall
<b>Faculty:</b>	Fred McKee - fred.mckee@flemingcollege.ca Jeff Hubers - Jeff.Hubers@flemingcollege.ca Meghan Emberson - Meghan.Emberson@flemingcollege.ca
<b>Program Co-ordinator or Equivalent:</b>	Neil Maika - Neil.Maika@flemingcollege.ca
<b>Dean (or Chair):</b>	Jason Jackson - jason.jackson@flemingcollege.ca
<b>Academic Planning and Operations Department:</b>	William Howe - William.Howe@flemingcollege.ca

## Learning Plan

Wks/Hrs Units	Topics, Resources, Learning, Activities	Learning Outcomes	Assessment
1	Introduction to the course and discussion on health and safety equipment and regulations while working in the lab. Lecture and hands-on introduction to measuring devices, hand tools and processes used in the piping trades. Labs will challenge the students ability to create and assemble basic piping arrangements that meet tight measurement tolerances, joint quality in order to successfully pass a hydro-static test. Learning sequence subject to change.	1, 2	Safety assignment. On-going evaluation during lab work.

<b>Wks/Hrs Units</b>	<b>Topics, Resources, Learning, Activities</b>	<b>Learning Outcomes</b>	<b>Assessment</b>
2	Discuss measuring devices, hand tools and processes used in the piping trades to calculate length, fitting allowance, area, volume and weight of various piping systems. Demonstrate pipe testing systems. Review safety assignment.	1, 2, 5	Measurement assignment. On-going evaluation during lab work.
3	Identify different types of steel pipe, fittings and sealants required to complete common steel piping connections. Review measurement assignment.	1,2,5	Black iron practice project. Steel pipe and sealants assignment. On-going evaluation during lab work.
4	Fittings identification - discussion on common piping systems fittings. Measure, cut, ream, thread and assemble black iron pipe and fittings as per drawing. Review Steel pipe and sealants assignment.	1,3, 5	Black iron project - measurement and pressure check. On-going evaluation during lab work.
5	Recognize and identify common piping fittings. Ongoing black iron project. Measure, cut, ream, thread and assemble black iron pipe and fittings as per drawing.	1,3, 5	Fittings Identification #1 On-going evaluation during lab work.
6	Discuss copper piping systems. Review how to measure, cut, ream, flux, assemble and solder copper pipe and fittings as per drawing. Review fittings identification.	1,2,3,4,5	Solder and Flux Assignment. On-going evaluation during lab work.

<b>Wks/Hrs Units</b>	<b>Topics, Resources, Learning, Activities</b>	<b>Learning Outcomes</b>	<b>Assessment</b>
7	Ongoing copper project. Measure, cut, ream, flux, assemble and solder copper pipe and fittings as per drawing. Review solder and flux assignment.	1,2,3,4,5,	Copper project #1 On-going evaluation during lab work.
8	Independent Learning Week	1,2,,4,5	
9	Ongoing copper project. Measure, cut, ream, flux, assemble and solder copper pipe and fittings as per drawing.	1,2,3,4,5,	Copper project #2 On-going evaluation during lab work.
10	Measure, cut, assemble, and solvent cement Acrylonitrile Butadiene Styrene (ABS) pipe and fittings as per drawing.	1,3,4,5	Acrylonitrile Butadiene Styrene (ABS) project. On-going evaluation during lab work.
11	Measure, cut, assemble, and crimp PEX (or crosslinked polyethylene) pipe and fittings as per drawing.	1,2,3,4,5	PEX (or crosslinked polyethylene) project. On-going evaluations during lab work.
12	Demonstrate the use of various piping system methods to construct a project made of black iron, copper, and PEX.	1,2,3,4,5	Combination project. On-going evaluations during lab work.

<b>Wks/Hrs Units</b>	<b>Topics, Resources, Learning, Activities</b>	<b>Learning Outcomes</b>	<b>Assessment</b>
13	Recognize and identify common piping fittings. Ongoing piping projects.	1,2,3,4,5	Fittings identification #2 On-going evaluations during lab work.
14 14	Pricing project- comprehensive pricing of selected project including materials and labor. Students are encouraged to use technology and or visit a local supplier to complete the assignment in either a hand written form or electronic spreadsheet.	1,2,3,4,5	Pricing Project.
15	Shop clean up, project recycling, tool repair.	1,2,3,4,5	Safety and workstation assessment.

## Assessment Requirements

<b>Assessment Task</b>	<b>Date/Weeks</b>	<b>Course Learning Outcome</b>	<b>Percentage</b>
Safety Assignment - Comprehend that requirements of safety related to the use of measuring instruments and hand tools commonly used in piping systems.	Class 1	1,2	2.5%
Safety and Workstation assessment. Student will be required to complete weekly submission on safety and workstation protocols. Assessments sheets are provided at the beginning of each lab and are to be submitted due at the end of each lab. 2% - per class over 15 weeks.	Class 1 - 15	1-5	%
Measurement Assignment - Use various measurement instruments to determine length, diameter, volume, weight, and fitting allowance.	Class 2	1,2,3	2.5%
Steel pipe and sealant assignment.	Class 3	2,3,4	2.5%
Black iron project. Measure, cut, ream, thread and assemble black iron pipe and fittings as per drawing.	Class 4	1,2,3,4,5	10%
Fittings identification #1 - identify various fittings commonly used in piping systems.	Class 5	2,3,4,5	5%
Solder and flux assignment.	Class 6	1,3,4	2.5%

Assessment Task	Date/Weeks	Course	Percentage
		Learning Outcome	
Copper Project #1 - Measure, cut, ream, flux, assemble and solder copper pipe and fittings as per drawing.	Class 7	1,3,4	10%
Independent Learning Week	Class 8		%
Copper project #2	Class 9	1,3,4	5%
Acrylonitrile Butadiene Styrene (ABS) project.	Class 10	1,4,5	5%
PEX (or crosslinked polyethylene) project	Class 11	1,4,5	5%
Combination Project -	Class 12	1,2,3,4,5	10%
Fittings identification #2 - identify various fittings commonly used in piping systems.	Class 13	2,3,4,5	5%
Pricing project- comprehensive pricing of selected project including materials and labor.	Class 14	1,2,3,4,5	5%
Shop clean up, project recycling, tool repair. Safety and Workstation Assessment. Student will be required to complete weekly submission on safety and workstation protocols. Assessments sheets are provided at the beginning of each lab and are to be submitted due at the end of each lab. 2% - per class over 15 weeks.	Class 15	1,2,3,4,5	30%

In order to be considered successful in this course, students need to attend regularly and submit assignments on time.

## Exemption Contact

Coordinator: Neil Maika Office: D0116.2

## Prior Learning and Assessment and Recognition (PLAR)

PLAR uses tools to help learners reflect on, identify, articulate, and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms. PLAR options include authentic assessment activities designed by faculty that may include challenge exams, portfolio presentations, interviews, and written assignments. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course. Any student who wishes to have any prior learning acquired through life and work experience assessed, so as to translate it into a college credit, may initiate the process by applying through the Registrar's office. For more information please click on the following link: <http://flemingcollege.ca/admissions/prior-learning-assessment-and-recognition>

## Course Specific Policies and Procedures

It is the responsibility of the student to retain this course outline for future reference. Course outlines may be required to support applications for advanced standing and credit transfer to other educational institutions, portfolio development, PLAR and accreditation with professional associations.

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Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process. It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the Academic Planning & Operations Office, Student Services, and Admissions and Records, will not accept any assignments or projects. Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline. Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member. Lab activities in this course support skill and knowledge development. In order to be eligible for 100% of the marks associated with this course, attendance and participation is required. Students are eligible to participate in lab activities if they have not missed consecutive labs and are present for 13 out of 15 labs offered. This policy supports a safe learning environment for all individuals. Any exceptions will be dealt with on an individual bases with your instructor. **Cell phone use is NOT allowed in lecture/lab; cell phones must be turned off as they are a distraction to the class.** Cell phones are not allowed during testing. Each student has the responsibility to support academic integrity. Students are expected to work individually on assignments: no student should have direct input into another student's solution. If group work is permitted, each student in the group is expected to contribute an equitable amount of effort. Reports must be hand or type-written and the sole work of each individual. Assignments that are submitted below a minimum level of competence as determined by the professor will be returned as incomplete. Assignments must be handed in to the professor no later than the beginning to the scheduled lab or lecture on the assigned due date. Any assignment handed in after the due date will receive a mark determined by Academic policies and procedures. Make-up arrangements for tests and assignments are normally not allowed. In the event of documented illness or circumstances that prohibit the student from completing work, make-up provisions may be provided. All requests must be received in writing. Classes will begin on time. Those students arriving late may be refused admission. If a student misses a lecture or lab, it is the student's responsibility to obtain the material and information from those lectures and labs. Learning sequence is subject to change.

### **MANDATORY REQUIREMENTS (As per course)**

- CSA Approved Hard Hat (Class E), CSA approved Safety Glasses, Prescription safety glasses must have side shields, CSA Approved work boots, Work Gloves, Utility Knife, Tape Measure,



Code Book, Pencil, and Calculator. **STUDENTS MUST HAVE ALL MANDATORY EQUIPMENT FOR LABS**

- A professional work environment will be stressed at all times, locations and activities. This includes attitude, communication skills, ability to work in teams or groups, safety and appearance.
- Any student who has any restrictions on his or her ability to participate or perform any aspect of the Mechanical Techniques – Plumbing Program, must contact Program Co-ordinator at the beginning of the semester.
- Operating equipment in an unsafe manner or, even worse, unlawful manner, will result in ejection from the lab, plus possible disciplinary action.
- Any student considered by the instructor to be abusive to the equipment, fellow students or the instructor, will be ejected from the course.
- Students not actively participating in assignments must keep safely away from equipment and tools in operation.
- The shop must be left clean at all times before leaving lab. Failure to do so may result not being able to participate in future lab activities.
- At the end of each lab period, tools and equipment must be cleaned and returned to their proper places. Failure to do so may result not being able to participate in future lab activities.
- Stealing tools is unlawful; missing equipment affects all users of the Plumbing and Mechanical shops
- Any student arriving late without a valid reason will be considered absent.
- Any person found in possession of, using or still under the influence of intoxicating beverages or stimulants, will be ejected from the lab and could face disciplinary action.
- All exposed jewelry to be removed prior to labs.
- Long hair must be tied back to the base of the neck and tucked under coveralls.
- No hoodies or loose fitting clothing
- Only MOL approved safety equipment and apparel will be allowed during class
- The best safety tool is your own common sense. USE IT.