**Plumbing Techniques Curriculum Renewal**

**Curriculum Renewal: Analysis and Action Plan Template**

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| **A. Analysis of Indicators**  Note: Summary Data is **not** recorded in this section of the template. Please attach summary.  **Reflect on, and discuss, the following indicators in the context of the curriculum and program:** |
| **1. Industry / Sector Trends**  1.1 New or emergent industry or sector related issues and trends identified over the past year and their potential impact on the program.  Two new Nuclear Plants at Darlington will increase demand for Plumbers in this area. Funding being provided to Clean up the Waterfront and contaminated soil in Port Hope will increase demand for Plumbing in this area as well.   * 1. Advisory Committee recommendations from the past year that will affect the positioning, nature, or scope of the program.   Coordinator is in the process of setting up a new PAC and hopes to have this meeting in the Fall 2012-Need community support for the introduction of field placements for students in the program.  At Contractors Breakfast concerns were noted about Plumbers needing further training in Gas and Oil certifications.  Plumbing Coordinator will meet with HRAC Coordinator to design a pathway for Plumbing techniques students to acquire G-3 and OBT-3 certification. This will increase demand for program as well.  1.3 Information / observations generated via faculty and staff professional development, engagement in sectoral and profession associations, and involvement in community and employer networks connected to the field.  There is a significant demand for plumbers in the industry and there appears to be very few colleges running this program. According to enrolment trends, Fleming may choose to grow this certificate program. Fleming did achieve a healthy intake in its first year’s offering with 30 registered students. (Noting that student demand across the system for fall registration has a median of 24 students). Plumbing as a certificate program for OCAS purposes is grouped under either Plumbing Techniques or Mechanical Techniques. This cluster of programs has grown by over 868.8% since 2008 (300.6% growth Mean) as per Enrolment Growth Plan. |
| **2. Curriculum Development**  2.1 Curriculum changes in the last year such as changes in program positioning, course content, course / program outcomes, and delivery mode.  Refer to Course Outline Review Summary Sheet and new curriculum model. The program has undergone numerous changes and will now be offered over four seven week segments in Jan 2013. The program model for Sept 2012 will be offered over a compressed 15 week segment with noted concerns.  2.2 Recent or anticipated initiatives that promote student pathways including high school articulations, program laddering, and university transfer / articulations.  Enrolments for all Apprenticeship have declined in 2009/10 by (-18%) however there were 850 registrations, which is one of the highest number of registrations of all apprenticeship trades. With the anticipated demand, Fleming is currently investigating the possibility of applying for TDA status for Pluming Apprenticeship. The Coordinator is currently in the process of gathering letters of support  2.3 New competitor programs and/or re-positioning of existing programs.  St Clair has recently launched a Plumbing Techniques Program with 46 students in 2011. There are several college that offer Mechanical Techniques Program. Overall across the system this program has experienced a 6% increase. Currently there is only one college LaCite that offers a Plumbing Technician Program  2.4 New or changing provincial standards, standards for accreditation, credentials, and / or industry or sector certifications over the past year.  Community partners have indicated that it would be helpful for students to acquire training in Gas and Oil  2.5 Progress made from the last curriculum renewal initiative.  There is no previous renewal document on file.  **An updated curriculum map should be submitted with this document. This has been submitted to CLT and revised map will be done in the fall to reflect new program model to be introduced in Jan 2013.** |
| **3. Student and Graduate Satisfaction**  3.1 Key performance indicators # 4, 8, 9, and 11 (see **Appendix C** for a description of these).  Currently there are no KPIs for this program  3.2 Student Focus Group Summary  Coordinator has asked the Student Advisor to informally conduct a Student Focus Group.  Students expressed a concern with the Health and Safety course; material was dated. Concerns noted in the Managing Projects-felt that the course was essentially the same as Business Concepts, Students indicated that would like more applied learning and less theory in Plumbing related courses. Students indicated that having the renewable courses (Solar and Water Systems) was an added benefit to this program. These concerns have contributed to the changes in the new curriculum model for Jan 2013  3.3 Student Testimonials  Compressed 15 week format is too difficult. Community partners and students both have indicated that a more comprehensive program with course held over a 25-30 week semester system would be more beneficial that having a compressed 15 week program.  3.4 Program Award/Recognition  Milwaki Tools has indicated that they would be interested in supporting awards for all of the trades’ courses. Coordinator will schedule a meeting to explore this for the next graduating class. |
| **4. Employment Trends**  4.1 New or changing employment trends in the industry or sector.  Employment projections are rated ‘good’ according to Employment Ontario and the Construction Sector Council (CSC) rates are quite strong until 2019 with 94% of job seekers being school leavers.  CSC is predicting a large # of positions to become available until 2019 in Central ON (647 positions)  Locally with the two new nuclear plants being built, there will be excellent demand for plumbers and all trades in the area.  4.2 Curriculum issues / strengths that have been identified by employers pertaining to graduate job readiness.  Employers indicated a need for Fleming to secure the TDA status for Plumbing as well as pathways for students to pursue Gal and Oil certifications. |

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| **Program: Plumbing Techniques Program­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­ Co-ordinator: Gord Knox**  **Date: June 2012** |
| **B. Curriculum Strengths and Challenges**  Summarize the curriculum strengths and challenges identified by the team. |
| * Some of the challenges for the Plumbing program include: there have been a series of changes made to the delivery and the curriculum model since the original launch; there has not been a full-time faculty dedicated to the program and there has been no PAC in the past year * Curriculum Delivery Model for Sept 2012 has the program being condensed to fit a 15 week semester and a four week field placement has been introduced to replace the applied project that previously was a part of the program. Decision to reduce the number of hours in the program has raised concerns for faculty in the program because these changes do not permit students to have enough lab time for practical learning activities and concerns are noted by employers being willing to take students on site for a four week field placement. * Faculty are currently undergoing a program renewal and it has become clear that this program needs to move from a 15 week program to a 21 week program in order to meet the program outcomes. With a semester and a half program model, students will be permitted to engage in practical applied projects and be more prepared for field placements. * Faculty in the Plumbing program are dedicated to students and strengthening partnerships with the community. A Contractors Breakfast has been organized in order to raise awareness about the Plumbing program and to strengthen ties with Employers for field placement. * Faculty teaching in the program are currently attempting to gather letters of support for the application of TDA status for Plumbing Apprenticeship. |
| **C. Action Plan**    Identify priority actions for the next year and the rationale for their inclusion. For each, indicate the project lead, and the proposed timelines for completion. Refer to: Course Outline Review Summary Sheet. (Attach summary at the end) |
| * **New curriculum model has been developed for the Plumbing Program to be implemented for the Winter of 2013 intake-See appendix  Dean is currently applying for the TDA status for Plumbing Schedule a PAC for the Fall 2012** |
| **D. Deferred Actions**  Record any issues that will need to bemonitored, researched, or deferred for future action. |
| * **Create a new pathway between Plumbing and HRAC so that students may also acquire certification in G-3 and OBT-3** * **Launch apprenticeship pathway for Plumbing** * **Engage community for ideas on possible Con Ed offerings for Plumbers** * **Coordinator would like to research demand for possible Steam Fitting apprenticeship in the future.** |

### Course Outline Review Summary Sheet for Plumbing Techniques

**Program Name: Date:**

1. There is congruency between the course learning requirements, and the program learning outcomes.
2. There is a match between course learning requirements, course learning activities and learning resources.
3. Learning methods are published and are matched to the learning requirements.
4. Evaluation methods allow students to demonstrate the course learning requirements.
5. PLAR opportunities exist and are based on course learning requirements.

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| **Course Name and Number** | **Criteria (see Course Outline review chart)** | | | | | **Comments – particular strengths to be recognized or recommendations for changes needing to be made** |
| **1** | **2** | **3** | **4** | **5** |
| Plumbing Systems Theory |  |  |  |  |  | Course Description needs to be revised, Create an aim for the course. EE’s and VLO’s (1,5,7) need to be inputted into the system. Course learning outcomes have been revised and need to be matched to activities and evaluations. This course is currently offered in a condensed 90 hr format over 15 weeks @ 6hrs a week. Recommendation moving forward with the new curriculum model would be to have Plumbing Systems Theory I,II,III (42hrs,42hrs,42hrs) whereby Plumbing Systems Theory and Codes are combined and offered over three seven week blocks.  Co-requisites include: Applied Tooling and Piping Methods, Trade Calculation and Codes and Regulations. |
| Plumbing Codes/Regulations |  |  |  |  |  | This program will discontinue in Jan 2013 as it will be combined with Plumbing Systems Theory I |
| Applied Tool and Piping Methods |  |  |  |  |  | With the removal of the Applied Project, course title will be renamed. Course Description needs to be revised, Create an aim for the course. EE’s and VLO’s (2,3,4) need to be inputted into the system. Course learning outcomes have been revised and need to be matched to activities and evaluations. This course is currently offered in a condensed 60 hr format over 15 weeks @4hrs a week. Recommendation moving forward with the new curriculum model would be to have Applied Tool and Piping Methods I, II, III (42hrs,42hrs, 42 or 21hrs) whereby Plumbing Systems Theory and Applied Tools and Piping Methods could align curriculum. There needs to be more applied learning into the program and there needs to be materials budget to allow for applied lab assessments.  Co-requisites include: Plumbing Systems Theory I, Trade Calculation and Codes and Regulations. |
| Trade Calculations |  |  |  |  |  | Need to clarify if this will be offered as a 42 hours course or a 45hr. The learning outcomes for this course need to be approved by the apprenticeship office to ensure that this meets the requirements for GR 12 math. Recommend having a meeting with math faculty to ensure that this course meets the equivalencies required for Gr 12 Math for Plumbers. |
| Preparing for a Career in Skilled Trades |  |  |  |  |  | This is a new Gen Ed that will replace Business Concepts. |
| Solar and Hot Water Heating |  |  |  |  |  | This course has been re-titled to Renewable Energy Sources for Plumbing and Hot Water Heating. It has been put into the third segment of the new curriculum model. |
| Business Concepts |  |  |  |  |  | This course will no longer be offered in this program. Does not meet the needs of students or program outcomes. This course has been replaced by Communications Course COMM 166 |
| Computer Applications |  |  |  |  |  | This course will continue to be offered in the program. |
| Welding for Plumbers |  |  |  |  |  | This course will continue to be offered in the program |
| Health and Safety Theory |  |  |  |  |  | This is a new course that has been developed. This course will be offered to all of the Skilled Trades programs. Concerns have been noted with the previous Health and Safety Course which is why this new course will replace it. |
| Health and Safety Applied Applications |  |  |  |  |  | This is a new course that has been developed. This course will be offered to all of the Skilled Trades programs. Concerns have been noted with the previous Health and Safety Course which is why this new course will replace it. |
| Plumbing Prints and Drafting |  |  |  |  |  | This course has been moved to Segment III in the new program model. |
| Plumbing Fixtures, Installation and Service |  |  |  |  |  | This course has been revised and mapped to the VLO’s and is now a 49 hr course offered over 7 weeks. |
| Water Systems |  |  |  |  |  | This course has been reduced to 21 hours over 7 weeks offered now in Segment One. Still to be determined is whether or not we will offer the well certificate or other certifications. This course may need to increase in hours should these certifications be included. |
| Field Placement |  |  |  |  |  | New program model includes a 140 field placement. Community indicated that they would support field placements at the Contractors Breakfast. Faculty are unsure if there will be enough local support for these placement opportunities. To ensure that students are given the opportunity to go home to complete the field placement- this is now offered in Segment Four. In the event that faculty are not able to gather enough community support for student field placements-Applied Project will be put back into the program. |
| Field Prep for Plumbing |  |  |  |  |  | This is a new course that will prepare students for their field placement. This is a 2hr course offered over seven weeks in Segment Three. |

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| **Course Code\*** | **Course Title (and brief course description)** |
|  | Segment One |
| MECH 203 | Plumbing Systems Theory I (42)  (2 three hour lectures @ Training Facility)  This course introduces students to plumbing systems theory which includes pipe materials, fittings, hangars and supports. Students will learn to identify and select appropriate materials and sizes based on the application in accordance with Codes and Regulations. This course will introduce students to the Ontario Building Code relating to Plumbing. Drainage, waste, and venting methods are covered in detail.  Pre-requisite:  Co: requisite: Health and Safety Theory , Applied Tool and Piping Methods I , Trade Calculations |
| MECH 201 | Applied Tools and Piping Methods (42)  (2 one hour lectures booked at the same time with 2 two hour labs @ the Training Facility on the same days as Plumbing Systems Theory).  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.    Pre-requisite:  Co: requisite: Health and Safety Theory, Plumbing Systems Theory, Trade Calculations |
| MATH109 | Trade Calculations (42hrs=-21/21)  (One three hour lecture over two seven week segments)  This course covers the basic mathematical principles required by the learner entering a trade. Topics covered include fractions, decimals, the International System of Units (S.I.) and Imperial Systems of measurement, including conversions between the systems. Measurement, ratio and proportion will also be covered. |
| MECH 207 | Water Systems (21)  One lecture and two hour lab delivered together at the Training Facility  This course is designed to introduce students to private water supply and sewage disposal systems. Students will learn fundamentals relating to wells and supply pumps as well as operating characteristic of septic systems. Potable water, water purification systems and procedures to avoid water contamination will be covered.  Pre-requisite:  Co: requisite: |
| CNST151 | Health and Safety Theory (21)  This course emphasizes the safety aspects encountered on a job site. Students will obtain workplace and industry related safety certifications. In addition to learning occupational health and safety regulations, students will also received training in fall arrest, and hoisting and rigging. |
| COMM 166 | **Communications**  This course uses a practical, vocation-oriented approach to help students develop the communication skills that employers look for in service, technical and business environments. Students will build on their skills in reading, writing, speaking and listening in order to prepare a variety of technical documents including memos, work orders, invoices, and short, informal reports on progress and service calls. The course will focus on critical thinking and problem-solving techniques; logical organization of technical information; electronic methods of communication; and elements of clear writing, including grammar and punctuation skills. Students will refine their written and verbal communication skills through a variety of assignments, assessments and in-class practice.  One hour lecture and two hour seminar over two seven week segments. |
| COMP370 | **Computers Skills in Trades**  This course covers the use of operating systems and how to utilize the internet to generate professional reports and quotations. Students will develop the skills and abilities to produce technical and business reports used in the industry. Using relevant computer applications, students will learn to apply systematic record keeping processes used for operating a small business. |
| GENED101 | Preparing for a Career in Skilled Trades  This course introduces students to theories and strategies in the area of self awareness and relating to others and applying this learning to finding a job in the skilled trades’ field.  \*General Education |
|  | Segment Two |
| NEW | Plumbing Systems Theory II (42)  (2 three hour lectures @ Training Facility)  This course builds on the material covered in Plumbing Systems Theory I. Students will continue to learn about plumbing systems theory which includes pipe materials, fittings, hangars and supports. Students will learn to identify and select appropriate materials and sizes based on the application in accordance with Codes and Regulations. This course will introduce students to the Ontario Building Code relating to Plumbing. Drainage, waste, and venting methods are covered in detail.  Pre-requisite: Plumbing Systems Theory I, Applied Tool and Piping Methods I , Health and Safety Theory  Co: requisite: Trade Calculations, Applied Tool and Piping Methods II, Health and Safety Applied Application |
| NEW | Applied Tools and Piping Methods II (42)  (2 one hour lectures booked at the same time with 2 two hour labs @ the Training Facility on the same days as Plumbing Systems Theory).  In this hands-on practical course, safe and proper use of hand and power tools related to the plumbing trade will be emphasized. This course build on the material covered in Applied Tools and Piping Methods I. Students will continue to 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.    Pre-requisite: Plumbing Systems Theory I, Applied Tool and Piping Methods I , Health and Safety Theory  Co: requisite: Trade Calculations, Plumbing Systems Theory II, Health and Safety Applied Application |
| MATH109 | Trade Calculations (42hrs=-21/21)  (One three hour lecture over two seven week segments)  This course covers the basic mathematical principles required by the learner entering a trade. Topics covered include fractions, decimals, the International System of Units (S.I.) and Imperial Systems of measurement, including conversions between the systems. Measurement, ratio and proportion will also be covered. |
| MECH 204 | Welding for Plumbers (28)  One 1 hour lecture and one three hour lab  This course covers both Oxy-Fuel (fusion) and Arc Welding (SMAW) as required by industry. The student will be able to demonstrate the safe assemble/disassemble of equipment related to oxy-fuel welding It will also covers set up, safe use and operating principles of the related equipment. Fusion welding, such as tack, butt and laying of bead on light and heavy steel in the flat position, brazing and manual flame cutting. Arc welding principles will be applied to create simply assemblies (such as support brackets) using skills acquired. |
| CNST 152 | Health and Safety Applied Applications (28) |
| GENED101 | Preparing for a Career in Skilled Trades  This course introduces students to theories and strategies in the area of self awareness and relating to others and applying this learning to finding a job in the skilled trades’ field.  \*General Education |
| COMP370 | **Computers Skills in Trades**  This course covers the use of operating systems and how to utilize the internet to generate professional reports and quotations. Students will develop the skills and abilities to produce technical and business reports used in the industry. Using relevant computer applications, students will learn to apply systematic record keeping processes used for operating a small business. |
| COMM 166 | **Communications**  This course uses a practical, vocation-oriented approach to help students develop the communication skills that employers look for in service, technical and business environments. Students will build on their skills in reading, writing, speaking and listening in order to prepare a variety of technical documents including memos, work orders, invoices, and short, informal reports on progress and service calls. The course will focus on critical thinking and problem-solving techniques; logical organization of technical information; electronic methods of communication; and elements of clear writing, including grammar and punctuation skills. Students will refine their written and verbal communication skills through a variety of assignments, assessments and in-class practice.  One hour lecture and two hour seminar over two seven week segments. |
|  | Segment Three |
| NEW | Plumbing Systems Theory III (42)  (2 three hour lectures @ Training Facility)  This course builds on the material covered in Plumbing Systems Theory II. Students will continue to learn about plumbing systems theory which includes pipe materials, fittings, hangars and supports. Students will learn to identify and select appropriate materials and sizes based on the application in accordance with Codes and Regulations. This course will introduce students to the Ontario Building Code relating to Plumbing. Drainage, waste, and venting methods are covered in detail.  Pre-requisite: Plumbing Systems Theory II, Applied Tool and Piping Methods II , Health and Safety Theory  Co: requisite: Applied Tool and Piping Methods III, Plumbing Fixtures Installation and Service |
| NEW | Applied Tools and Piping Methods III(42)  (2 one hour lectures booked at the same time with 2 two hour labs @ the Training Facility on the same days as Plumbing Systems Theory).  In this hands-on practical course, safe and proper use of hand and power tools related to the plumbing trade will be emphasized. This course build on the material covered in Applied Tools and Piping Methods II. Students will continue to 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.    Pre-requisite: Plumbing Systems Theory II, Applied Tool and Piping Methods II , Health and Safety Theory  Co: requisite: Plumbing Systems Theory III, Plumbing Fixtures Installation and Service |
| MECH 205 | Plumbing Fixtures, Installation and Service (49)  One two hour lecture and one five hour lab delivered at the Training Facility on the same day.  This course provides students with hands on experience in the installation and servicing of residential/commercial plumbing fixtures and appliances.  Pre-requisite: Plumbing Systems Theory II, Applied Tool and Piping Methods II  Co: requisite: Plumbing Systems Theory III, Applied Tool and Piping Methods III |
| MECH 202 | Plumbing Prints and Drafting (28)  One four lecture  This course covers the interpretation of information found in architectural drawings such as lot plans, floor plans, elevations, and mechanical layouts. Students will learn to identify and interpret symbols relating to drains, vents, fixtures and other trade specific items. Students will develop and practice drawing plumbing layouts and drain plans.  Pre-requisite: Plumbing Systems Theory II  Co: requisite: |
| MECH 208 | Renewable Energy Sources For Plumbing and Hot Water Heating Systems (21)  One 1 hour lecture and two hour lab delivered together at the Training Facility.  This course will introduce students to renewable energy sources used in plumbing and hot water heating systems. Students will learn about solar, hot water, hydronic, and geothermal applications as they relate to the piping trade. Other aspects of green plumbing and water efficiency systems will be explored. |
| NEW | Field Prep for Plumbing (14)  One two hour seminar  This course will provide students with the necessary skills to prepare for obtaining a field placement in the plumbing industry.  Pre-requisite: Plumbing Systems Theory II, Applied Tool and Piping Methods II  Co: requisite: Plumbing Systems Theory III, Applied Tool and Piping Methods III, Plumbing Fixtures, Installation and Service |
| NEW | Field Placement for Plumbing  Students will be required to complete a 140 hour field placement in the plumbing industry.  Pre-requisite: Successful completion of all courses in the Plumbing Technique program. |

**New Curriculum Mode for Plumbing Techniques**

Note: Each of the Segments is seven week therefore permitting the program to be aligned with the semester system.\*the red courses could be offered over two seven week blocks to align with semester system. \*\*Codes and Regulations for Plumbing could be amalgamated with the plumbing Systems Theory. Total Program Hours 602 plus 140hrs of field placement=742 hours in total. Alternatively students could take the Gas and Oil 3 certification training.