**Program and Curriculum Review Template**

*Instructions: Review all information that is stored on your program and curriculum review web page.*

[***https://department.flemingcollege.ca/pcr***](https://department.flemingcollege.ca/pcr)

[*https://department.flemingcollege.ca/pcr/programs/heating-refrigeration-and-air-conditioning-hvt/3-0-program-curriculum-hvt/*](https://department.flemingcollege.ca/pcr/programs/heating-refrigeration-and-air-conditioning-hvt/3-0-program-curriculum-hvt/)

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| Program Coordinator: | James Faulkner | Chair: | Jason Jackson |
| Review Facilitator: |  | Date Completed: | June 18, 2018 |
| Program Name: | Heating, Refrigeration and Air Conditioning | Program Code: | HVT |
| 1.0 Industry Trends and Employment | | Summary of Key Findings | |
| * 1. Labour Market & Occupational Standard Trends   Review and discuss the following:   * Industry / sector changes or issues identified by the Program Advisory Committee * Recent labour market data or sector reports as provided by the Fleming Library Researchers. * Recent or anticipated changes in occupational standards, level of entry and credential and / or standards of accreditation * Based on the above, do these changes or issues necessitate changes to your program, either immediately, or in the next few years? | | * **According to the PAC from 2015 (2016 PAC meeting has been postponed), “the local market may be limited by short-term increases in demand. Established pattern of recruiting are sufficient.”.  However, the PAC also suggested that 313D apprenticeships (residential apprenticeship) are needed. Another issue that was identified is that the CSA modules for gas and oil have been updated and the curriculum also needs to be updated to reflect these changes.** * **The library research also indicates a balance between labour supply and demand over the 2013 -2022 period; with job opportunities arising from retirements.** * **This is supported by anecdotal evidence based on union (local 787) data which indicates that the average age of workers right now is 57 years old.  However, with the expectation that within the next 5 – 10 years, 1500 will be set to retire, there may be a shortage of skilled workers in this trade.  There are 100 apprentices/year; they lose 30% in the first year and 50% by the time the first year apprenticeship is complete.  This will lead to a 30 – 40% shortage of manpower.** | |

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| 1.2 Graduate Employment & Employment Trends  Review and discuss the following:   * Graduate employment statistics over the last few years, including those of students employed in the field, in a related field, outside the field, or unemployed, and any emerging patterns in this data. * Emergent employment trends such as new types of positions, changing job market, regional distinctions, changing employer profile, or emerging skill shortages | * Based on the available data (2014 and 2015), the overall graduate employment rate has gone up from 90% – 93%.  The number of graduates employed in a related field has gone from 80% – 93%.  Both of these scores are well above both the MCU and College rates. * Anecdotal evidence suggests that there is a 94 – 95% placement rate after graduation with many of the same companies from across Canada coming back to hire Fleming students. * There is no evidence of anything new in employment trends in this field. |
| 2.0 Key Performance Indicators  Review and analyze the formal Key Performance Indicator (KPI) results for your program. | Summary of Key Findings |
| 2.1 Student Satisfaction   * In addition to the formal Student Satisfaction KPI results, comment upon any other formal or informal discussions with students and graduates such as *student focus groups*, class councils, class representatives, individuals or delegations, or debriefing sessions following a field placement, clinical placement, or practical work integrated learning experience. | |  | | --- | | * KPI results indicate good overall satisfaction with the HVT program with scores consistently in the 70%+ range in 2014 and 2015. * These results are supported by the student focus group comments which cited some of the strengths of the program: condensed curriculum, good facility and equipment, lots of practical experience, expertise of the instructors and their knowledge of the field.  They also appreciated being able to earn certificates. * The only areas which had lower scores were around speaking and writing skills.  It is hoped that the mandatory Gen. Ed., Improve, will assist with this issue. | |  | |
| 2.2 Retention Rate   * Use the IPP (Integrated Program Planning) data that focuses on Retention. * Review patterns of retention on a semester by semester basis over the last five years. * Comment on the effectiveness of any strategies adopted to improve student retention. | * The HVC program has a strong retention rate: 84% progress from semester 1 to semester 2 and 91% progress from semester 2 to semester 3.  there is about a 10 – 15% loss of students overall. * There are currently no formal retention strategies in place.  The faculty spend extra time with students in labs and lectures as well as reviews outside of class and the students that take advantage of this additional help generally progress. |
| 2.3 Graduate Rate   * Review patterns of graduation rates on a semester by semester basis over the last five years. | * The only data available was for 2014 – 2015 and the graduation rate for that year was 65%.  However, this does not follow with the retention rate data. Anecdotal evidence would indicate that number might be higher. |
| 2.4 Graduate Satisfaction   * Review patterns of graduate satisfaction and provide comment. | * There were only a small number of graduates surveyed: in 2012 – 2013 there were 9 and in 2013 – 2014 there were only 13. * Generally the graduates were satisfied with the course content and that the curriculum was up-to-date; also that they were prepared for the job market and got jobs in their field. * The dissatisfaction was with equipment.  However, it should be noted that the years reflected had higher than expected enrollment and there was not sufficient equipment for the number of students.  Subsequently, the numbers of students have been kept on target so the equipment needs are met. |
| 2.5 Enrolment Trends and Demand   * Your team will review and analyze the patterns in the number of program applicants, confirmations and actual registrants over the past 5 years. You will also examine changes, if any, in the student demographic profile and the impact, if any, of this changing student profile on program curriculum. * Assess whether the program curriculum needs to change based on the above analysis. * Use the FDR excel spreadsheet that provides Day 10 enrolment numbers for Fleming for the last 10 years, to assist you with your analysis. * Please review the IPP (Integrated Program Planning) data that focuses on trends related to student demand, and the related ‘Situational Analysis’ information included for your program – select the  Demand Trending Tab and Situational Analysis Tab. | * There has been a steady increase in enrollment since 2011 but the numbers have stabilized to approximately 80+ students (including first and upper semester students) since 2013. * The first year the summer intake was introduced (2014 – 2015), the number of students enrolled increased to 100. * The demand for Fleming’s HVT program has incerased significantly since 2010.  Applications to Fleming peaked at 513 in 2014 and enrollment peaked the same year. * Anecdotally, there are 180 – 220 applicants for 40 spots.  Those 40 spots for September 2016 were filled by the end of March 2016.  There is a documented conversion rate of approximately 26% for the last 3 years. * The Fall intake is mostly recent high-school graduates while the winter intake tends to have more mature students enrolled. |
| 3.0 Program Curriculum | Summary of Key Findings |
| 3.1 Program Learning Outcomes and/or Sector Standards   * Review program level learning outcomes in preparation for curriculum mapping (vocational, essential employability skills, general education) * Where applicable review sector standards to ensure program is keeping up with new trends, developments and requirements. | Program Vocational Learning Outcomes    Website for Ministry Standards for Heating, Refrigeration and Air Conditioning   1. Relate effectively to heating, refrigeration, and air conditioning supervisors, coworkers, and customers. 2. Work safely and in accordance with all applicable acts, regulations, legislation, and codes to ensure personal and public safety. 3. Select and use a variety of heating, refrigeration, and air conditioning tools and equipment safely and properly. 4. Solve math and applied science problems required to effectively install and maintain heating, refrigeration, and air conditioning systems, and associated components. 5. Prepare and interpret electrical, mechanical, and piping drawings. 6. Install, service, and troubleshoot heating, refrigeration, air conditioning systems, and associated components. 7. Develop strategies for ongoing personal and professional development, that will lead to enhanced work performance and career opportunities, and keep pace with industry changes. |

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| 3.2 Program of Study, Course Outlines, Delivery and Program Map   * Review the feedback and suggestions received from Course-level survey completed by faculty at the end of each semester. * Review the balance and frequency of assessment types across the curriculum and their appropriateness to learning outcomes for the course and program level outcomes. * Collect a cross section of samples of student work as evidence of achievement of learning outcomes. * Reflect and comment upon the variety of methods used to demonstrate program outcomes. * Reflect and comment upon the degree of technology-enhanced delivery of the program outcomes. * Discuss the degree and depth to which the program is providing work integrated learning experiences. * Discuss the degree and depth to which the program includes Indigenous perspectives and record the courses in the curriculum in which Indigenous perspectives are covered * Record the course in the curriculum that covers the college-wide sustainability learning outcome * Review (or create) Program Curriculum Map(s) to ensure that there is alignment of current courses to the overall program outcomes, including the Vocational Learning Outcomes, the Essential Employability Skills, and adherence to the General Education Policy. * Review pre and co-requisites to ensure that they do not hinder progress in the program, unnecessarily. * Make recommendations to address any gaps identified or improvements required. * Review the program’s current admission requirements and their suitability in relation to program rigour and student preparedness. * Include an updated program curriculum map on your program and curriculum review web page. | Review the feedback and suggestions received from Course-level survey completed by faculty at the end of each semester.  Review the balance and frequency of assessment types across the curriculum and their appropriateness to learning outcomes for the course and program level outcomes.  Collect a cross section of samples of student work as evidence of achievement of learning outcomes.  Reflect and comment upon the variety of methods used to demonstrate program outcomes.  Reflect and comment upon the degree of technology-enhanced delivery of the program outcomes.  Discuss the degree and depth to which the program is providing work integrated learning experiences.  Record the course in the curriculum that covers the college-wide sustainability learning outcome  Review (or create) Program Curriculum Map(s) to ensure that there is alignment of current courses to the overall program outcomes, including the Vocational Learning Outcomes, the Essential Employability Skills, and adherence to the General Education Policy.  Make recommendations to address any gaps identified or improvements required.  Review the program’s current admission requirements and their suitability in relation to program rigor and student preparedness.  Include an updated program curriculum map on your program and curriculum review web page.  Comments:  There are few improvements recommended in the course-level survey completed by faculty. The need for major changes were indicated for non-core courses only. There were minor suggestions for core courses, mostly related to course delivery and development: more current relays/newer technology in Oil Heating 1 (MECH 209); revision of the assessment to create smaller/simpler progressive lab projects in MECH 214; and in general, trying to ensure the same instructor for both lecture and lab components of all core courses for maximum consistency of content delivery. As mentioned in other sections of this review, it is critical that all core courses, specifically MECH 212 (Intro to Gas Appliances) and MECH 220 (Hydronic Heating Systems), be updated to meet current TSSA standards.  Tests and assignments are spread out among the core courses to ease the burden on students. Any assessment is directly related to course content and learning outcomes; practical tests are given for practical skills and written tests for theory. However, there have been some testing center issues that need to be resolved.  For each project students do, they have a sample project that they can look at: control boards (gas and electrical), rooftop units, A/C unit (installed), refrigeration trainer. Before students are asked to demonstrate a skill, they have done it in lab. They are also required to learn how to fill out several different types of work orders which are assessed for accuracy, math, spelling and grammar.  To demonstrate program outcomes, the students are taught the theory in lecture, apply it in the lab and then tested on the skill.  The technology used to enhance the delivery of program outcomes includes: D2L, power point (AODA compliant), YouTube videos, use of testing equipment that will be required in the field (lab has all current equipment).  The program itself is centered around providing a work integrated learning experience; everything they do in their labs will be something they will have to do in the field.  All of the core courses teach sustainable practices and there is one course dedicated to renewable energy which addresses the college-wide sustainability learning outcome.  There are no gaps in content related to VLOs or EESs, however, as previously mentioned, the courses will need to be updated to reflect the changes in the CSA and TSSA standards. All tests and assignments for semester 2 and 1/2 of semester 3 need to be reviewed for spelling and grammatical errors (semester 1 tests completed).  Students entering the HVT program should have college-level grade 12 math and science (the best science is physics). Currently grade 12 math and physics has had to be incorporated into the program to compensate. The students should also be able to read for comprehension and write properly. |
| 4.0 Strategic Positioning and New Opportunities | Summary of Key Findings |
| 4.1 College and School Alignment   * Review program alignment with college priorities such as vision, mission, values, strategic plan, academic plan and the educational mandate, and / or academic priorities of the School. * Review program webpage and promotional messaging to ensure accuracy and currency. | * The HVT curriculum is dictated by TSSA. * The program’s alignment with the college and school relate primarily to applied learning.  This applied learning, AODA compliant course material, high expectations for the students and close interaction with faculty lead to enhanced student learning experience. * Additionally, the HVT program focuses on sustainable practices at the college and teaches the students how to apply them in the field. |
| 4.2 Competitor Programs   * Analyze key parallels and differences between this program and those of its closest competitors, where applicable. * Comment on the ’Value-added’ program distinctions and their attractiveness to prospective students. | * Enrollment in competitor HVT programs at medium-sized colleges is similar to enrollment at Fleming. * Algonquin college also has a compressed curriculum so is the biggest competitor. * All HVT programs must adhere to CSA and TSSA standards so the courses/outcomes are the same.  Not all colleges programs are set up to give students both G2 and OBT2 fuels cirtificates * Fleming not only has a compressed program (seen as a strength by students), but also builds all health and safety certifications, ODP, 636, gas tite and trac pipe into the program. |
| 4.3 Learning Pathways   * Comment on recent or anticipated initiatives that promote student pathways including secondary school partnerships, dual credits, program laddering, dual diplomas, and university transfer, articulations, and partnerships. * Review all transfer credits. * Identify any new pathways that could be developed. | * HVC is basically a stand-alone program.  There are no educational post-diploma options. * There could be some consideration of partnerships with secondary schools but none have materialized yet. The students (Peterborough, Kawartha Lakes, Oshawa) could get a dual credit course with a sampling of 4 different trades. * There is a possibility to link with plumbing if the PLM program adopts the HRAC piping and tubing course. |
| 4.4 New Program or Redesign Ideas   * Are there opportunities for new program initiatives based on Program, School, or community strengths and alliances? | * Apprenticeship 313D refrigeration * Sheet Metal Worker |
| 5.0 External Relations | Summary of Key Findings |
| 5.1 Community Partnerships   * Does your program have significant partnerships, relationships, connections, or offers of support from the community that help to enrich the program and the student experience? * Are faculty, staff, and student involved in volunteer projects and events? | * The HVC program has relationships with companies that hire students and also with wholesalers (Trent Metals, Bardon). * The relationship with the Union (Local 787) encourages students to go through them for apprenticeships. * There are not a lot of volunteer projects or events that are available because of the certifications required to work in the field.  The college also has to make sure not to undermine local businesses. |
| 5.2 Program Advisory Committee   * Comment on the distribution of Committee membership by constituency, sector, and / or region. * Comment on the vitality of the Committee (frequency of meetings, members’ level of participation, engagement, and turnover.) | * The PAC Committee is made up of members from various regions: Peterborough, Kawartha Lakes, Toronto. * It also includes UA Local 787 (Heating and Refrigeration Local) which represents all of Ontario. * The meetings are generally held once a year and so far, have exhibited high levels of participation and engagement from the members. |
| 5.3 Alumni Relations   * Describe the type and range of alumnae involvement in the program. * Current and future strategies to engage alumnae in the program. | * There is not yet significant alumni engagement in the program.  This is because in order to return as technicians or instructors, the former student needs to be liscenced and that takes 5 years of work — it is just now coming up to that timeframe for the first graduating class. * There have been a few students come back to speak to the class and give them a sense of the relevancy of the program in the field and describe what they are currently working on, however, getting time away from work during school hours has been asn issue for many. |
| 6.0 Program Resources | Summary of Key Findings |
| 6.1 Program Revenue and Expenses   * Please review Integrated Program Planning (IPP) information for your program. * Are program resources adequate, in the context of program currency and student numbers? (e.g. laboratory equipment, software, library holdings, or tools essential to program delivery and student learning. * Are there opportunities for further program specific external revenue such as sponsorship, grants, donations or gifts-in-kind? * Review the existing revenue and expenses associated with your program using the IPP tool and provide comments below. * Review all textbooks for cost, format (hard-copy, e-book, rental), use in multiple semesters, content (curriculum alignment, Canadian content, readability, engagement level), ancillary materials (question bank, Powerpoint, online support, image bank), publisher support, AODA compliance, and conflict of interest. | * The IPP score for the HVT Program has ranged from 50% – 89%. In the 2015 Fiscal year the score was 65%. * The program resources are considered adequate.  Anecdotally, the budget is $86,000/year of which about $80,000 is spent. * The program has just received approximately $40,000 gifts in kind. * There may also be a grant possibility (speak with Shirlanne Pawley-Boyd). * There is consideration of bringing in Con Ed revenue: a G1 program (gas program) for those who have been in the field at least 5 years; OBT1 (oil burner tech) licences (above G2), also tor those who have at least 5 years’ experience; 313D exam prep course; other new licences geared to alumni specifically. * The existing revenue from the program is relatively high — a consistent contribution margin of approximately 30% (43% in 2014). |
| 6.2 Faculty and Staff Resources  Please comment on:   * The number and distribution of all faculty, technicians, and technologists associated with the program including full-time, part-time, sessional, and cross-appointments. * Profile of the faculty, and staff associated with the program including cumulative credentials, scholarship, work-related and teaching experience, and expertise in education. * Significant faculty or staff accomplishments such as professional recognition and awards, achievement of credentials, and appointments. * Hiring priorities over the next few years based on the above. | * The HVC program has 2 full-time faculty, 5 partial load faculty, 2 part time faculty, 1 technician (designated).  There will be an additional full-time faculty in 2016 and a plan for a full-time lab technician by 2017. * **James Faulkner:**Engineering Technician Diploma; Teaching certification from Michigan State as well as In-Service Teacher Training Certification (St. Clair College); 30 years teaching experience; government certified for controls installation and troubleshooting; certification for ice machines; star certified (U.S.); certified in computer room A/C; braising (welding) certified * **Ken Stevenson** * **Scott Moore** * **Keith McClure** * **George Frogget** * All faculty have a minimum of 5 years post-licence experience; a minimum certification of G2, OBT2, ; all licences and health and safety certificates.  James Faulkner and Scott Moore also have their 313D certification. |
| 6.3 Program Delivery Capital Assets   * Please review existing program space and equipment * Determine needs for space and equipment to fulfill future needs | none |

**Program Improvement Plan**

Based on the analysis of your key findings, identify areas that require attention and action in the next 1-3 year timeframe. Ensure that you only recommend actions that reflect the program’s priorities and its capacity to achieve them, and record the success of any changes implemented and the means by which they are being evaluated.

To make sure your goals are clear and reachable, each one should be:

* **S**pecific (simple, sensible, significant).
* **M**easurable (meaningful, motivating).
* **A**chievable (agreed, attainable).
* **R**elevant (reasonable, realistic and resourced, results-based).
* **T**ime bound (time-based, time limited, time/cost limited, timely, time-sensitive).

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| New Recommended Improvements | Timeframe | Person(s) Responsible | Approval: Dean, Chair, or VPA or  Not Feasible, with rationale |
| Time for lab development, rubrics development, course update to new CSA modules. This is required for all courses | now | Full time faculty  Electrical 1 and 2 have Ainsley update |  |
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| Previous Recommended Improvements | Timeframe | Person(s) Responsible | Update and Rationale: Proceeding = P  Completed = C  Not Feasible = NF |
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