HAWAI‘I COMMUNITY COLLEGE
PROGRAM REVIEW REPORT

MACHINE, WELDING & INDUSTRIAL MECHANICS (MWIM TECH) TECHNOLOGY PROGRAM

November 30, 2007

Assessment Period: July 1, 2004 to June 30, 2007

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PR Committee
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Darrell Miyashiro
Doug Leite

Program Review at Hawai‘i Community College is a shared governance responsibility related to strategic planning and quality assurance. It is an important planning tool for the college budget process. Achievement of Student Learning Outcomes is embedded in this ongoing systematic assessment. Reviewed by a college wide process, the Program Reviews are available to the college and community at large to enhance communication and public accountability.
A. Program Effectiveness

1. The MWIM Tech Program accepts all students from all segments of our community that meet the Community College’s open-door requirements. It is an open-entry/exit program that services multiple occupations with 2 Certificates of Completion, 2 Certificates of Achievement and 2 Associate of Applied Science Degrees and with the continued restructuring of this program, it will be able to also better service the installation, maintenance and repair occupations. The Career & Technical Education and workforce development curriculum offerings are designed to meet HawCC’s imperatives and most of the modules are scheduled at times convenient for the Employers and working students as well as the traditional student.
### TABLE 2
AVERAGE ANNUAL AND TOTAL JOB OPENINGS
2002 AND 2012
STATE OF HAWAII

<table>
<thead>
<tr>
<th>SOC Code</th>
<th>Occupational Title</th>
<th>Employment</th>
<th>Change</th>
<th>Average Annual Openings Due to Growth</th>
<th>Due to Separations</th>
<th>Total</th>
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<tr>
<td>47-0000</td>
<td>Construction &amp; Extraction Occupations</td>
<td>24,400</td>
<td>6,640</td>
<td>27.2</td>
<td>660</td>
<td>490</td>
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<td>47-2011</td>
<td>Boilermakers</td>
<td>90</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>47-2073</td>
<td>Operating Engineer &amp; Other Const Equip Operat</td>
<td>1,710</td>
<td>330</td>
<td>19.3</td>
<td>30</td>
<td>40</td>
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<tr>
<td>47-2152</td>
<td>Plumbers, Pipefitters, &amp; Steamfitters</td>
<td>1,470</td>
<td>310</td>
<td>21.1</td>
<td>30</td>
<td>30</td>
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<tr>
<td>47-2211</td>
<td>Sheet Metal Workers</td>
<td>590</td>
<td>140</td>
<td>23.7</td>
<td>10</td>
<td>10</td>
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<tr>
<td>47-2221</td>
<td>Structural Iron &amp; Steel Workers</td>
<td>210</td>
<td>60</td>
<td>28.6</td>
<td>10</td>
<td>*</td>
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<tr>
<td>47-3000</td>
<td>Helpers, Construction Trades</td>
<td>1,600</td>
<td>410</td>
<td>25.6</td>
<td>40</td>
<td>70</td>
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<tr>
<td>49-0000</td>
<td>Installation, Maintenance, &amp; Repair Occupations</td>
<td>22,040</td>
<td>2,850</td>
<td>12.9</td>
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<td>500</td>
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<tr>
<td>49-9000</td>
<td>Other Installation, Maint, &amp; Repair Occupation</td>
<td>11,680</td>
<td>1,860</td>
<td>15.9</td>
<td>190</td>
<td>250</td>
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<tr>
<td>49-9021</td>
<td>Heating, Air Cond, &amp; Refrigeration Mech &amp; Install</td>
<td>710</td>
<td>200</td>
<td>28.2</td>
<td>20</td>
<td>10</td>
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<tr>
<td>49-9041</td>
<td>Industrial Machinery Mechanics</td>
<td>480</td>
<td>80</td>
<td>16.7</td>
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<td>10</td>
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<td>49-9042</td>
<td>Maintenance &amp; Repair Workers, General</td>
<td>6,740</td>
<td>1,210</td>
<td>18.0</td>
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<td>130</td>
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<td>49-9043</td>
<td>Maintenance Workers, Machinery</td>
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<td>20</td>
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<td>49-9096</td>
<td>Riggers</td>
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<td>10</td>
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<td>49-9098</td>
<td>Helper--Installation, Maintenance, &amp; Repair Worker</td>
<td>690</td>
<td>120</td>
<td>17.4</td>
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<tr>
<td>49-9099</td>
<td>Installation, Maintenance, &amp; Repair Worker, Other</td>
<td>1,010</td>
<td>60</td>
<td>5.9</td>
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<td>Production Occupations</td>
<td>18,440</td>
<td>1,310</td>
<td>7.1</td>
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<td>51-2000</td>
<td>Assemblers &amp; Fabricators</td>
<td>1,530</td>
<td>130</td>
<td>8.5</td>
<td>20</td>
<td>40</td>
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<tr>
<td>51-2041</td>
<td>Structural Metal Fabricators &amp; Fitters</td>
<td>170</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
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<tr>
<td>51-2099</td>
<td>Assemblers &amp; Fabricators, All Others</td>
<td>470</td>
<td>40</td>
<td>8.5</td>
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<td>10</td>
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<tr>
<td>51-4000</td>
<td>Metal Workers &amp; Plastic Workers</td>
<td>1,560</td>
<td>280</td>
<td>17.9</td>
<td>30</td>
<td>40</td>
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<tr>
<td>51-4041</td>
<td>Machinists</td>
<td>310</td>
<td>30</td>
<td>9.7</td>
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<tr>
<td>51-4121</td>
<td>Welders, Cutters, Solderers, &amp; Brazers</td>
<td>870</td>
<td>250</td>
<td>28.7</td>
<td>20</td>
<td>20</td>
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<tr>
<td>51-4199</td>
<td>Metal Workers &amp; Plastic Workers, All Other</td>
<td>160</td>
<td>-10</td>
<td>-6.3</td>
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</table>
2. “The student will demonstrate the skills and knowledge required for the machine, welding and industrial mechanics occupations; demonstrate good work ethics, positive work habits and attitudes that will make him/her employable in this cluster of occupations.”

The MWIM Tech Advisory Council, A County of Hawaii/Island Wide Survey of Employers, Welder Certification Requirements, The American Welding Society Curriculum recommendations, The NCCER curriculum and the historical success of the current curriculum have guided the development and constant improvement of the desired learning outcomes of this program. Specific learning outcomes and details of the curriculum are a part of the desired learning outcomes.

Assessment of PLO:
After completing the prescribed sequence of courses, which have performance and written tests for assessment, the student will be a part of a team to fabricate “live projects” that includes most of the desired learning outcomes. The courses are structured mostly in 4 hr modules, are sequential and the course syllabi require good attendance, punctuality, safety, responsibility for the work area, teamwork, accepting supervision and quality and productivity standards. Each student is advised of their strengths and weaknesses within this team environment and is encouraged to correct any shortcomings. Placement in CVE work stations are directly related to the student’s performance in this environment.

Table 1—List of Program Learning Outcomes

PROGRAM STUDENT LEARNING OUTCOMES

1. The student will demonstrate the skills and knowledge required for the machine, welding and industrial mechanics occupations; demonstrate good work ethics, positive work habits and attitudes that will make him/her employable in this cluster of occupations.

SPECIFIC LEARNING OUTCOMES:

A. The student will demonstrate:
mechanical reasoning; form perception & spatial relations; numerical reasoning and communication skills as a part of the basic entry-level skills and knowledge to gain employment in the machining, welding, industrial mechanics or related fields.

B. The student will demonstrate:
the attributes of a good employee; good safety practices; positive work ethics; working collaboratively or independently under supervision; an awareness of hazardous materials and a responsibility for the orderliness and cleanliness of the workplace.

C. The student will demonstrate:
eye and hand coordination and dexterity in the proper set-up and use of the basic machine tools and equipment; metalworking equipment; the common welding & cutting processes; industrial mechanics equipment; material handling equipment and related machinery.
D. The student will demonstrate:
the applications of and the ability to use the common hand tools; layout tools; measuring tools; precision
measuring tools; common cutting & forming tools, tools used with the common fasteners and specialty tools
and the common metalworking and mechanic tools.

E. The student will demonstrate:
form perception and spatial relations in the applications of geometric construction; the three common methods
of pattern development; industrial practices in framing and structural fabrication; practices in welding joint
design & joint preparation and the common machine shop operations & practices.

F. The student will demonstrate:
the skills of a life-long learner; the ability to read blueprints; knowledge of metals and the common materials &
supplies; the ability to do the work related math; the ability to communicate and read technical materials; and
the ability to use available technical resources.

G. The student will demonstrate:
an awareness of our cultural, social and natural environment and be a contributing member of our community.

<table>
<thead>
<tr>
<th>COURSE ALPHA &amp; NO</th>
<th>SLO 1A</th>
<th>SLO 1B</th>
<th>SLO 1C</th>
<th>SLO 1D</th>
<th>SLO 1E</th>
<th>SLO 1F</th>
<th>SLO 1G</th>
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<tr>
<td>MACH 20 Intro to Machine Shop</td>
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<tr>
<td>MACH 21 Measurement &amp; Layout</td>
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<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>MACH 22 Hand tools &amp; Bench work</td>
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<td>MACH 23 Basic Machine Tools</td>
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<td>X</td>
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<td>MACH 24 Lathe I, Facing &amp; Turning</td>
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<td>X</td>
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<td>MACH 25 Shape alter &amp; taper, Lathe</td>
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<td>MACH 26 Lathe II</td>
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<td>X</td>
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<td>X</td>
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<td>MACH 27 Vertical Mill &amp; Intro to CNC</td>
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<td>MACH 28 Shaper, Line bore&amp;Advance Machine</td>
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<td>B</td>
<td>C</td>
<td>D</td>
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<td>WELD 17</td>
<td>General Welding</td>
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<td>Introduction to welding</td>
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<td>WELD 23</td>
<td>Basic Metalworking</td>
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<td>X</td>
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<td>WELD 24</td>
<td>Measurement &amp; Layout</td>
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<td>X</td>
<td>X</td>
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<td>WELD 25</td>
<td>Metal Fabrication I, Sheet metal</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>Basic Arc Welding</td>
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<td>X</td>
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<td>WELD 27</td>
<td>Metal working Lab I</td>
<td>X</td>
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<td>WELD 28</td>
<td>Metalworking</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>WELD 29</td>
<td>Oxy/acetylene weld, braze &amp; cut</td>
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<td>X</td>
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<td>WELD 30</td>
<td>Intermediate weld &amp; fabrication</td>
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<td>Intermediate welding</td>
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<td>WELD 34</td>
<td>Welding Fabrication</td>
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<td>Gas Metal Arc Weld (GMAW)</td>
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<td>Flux Cored Arc Weld (FCAW)</td>
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<td>Gas Tungsten Arc Weld (GTAW)</td>
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<td>Metal Fab II, Radial Line Dev.</td>
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<td>Qualification Procedures</td>
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<td>WELD 50</td>
<td>Special processes in Welding</td>
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<td>Pattern Development</td>
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<td>GEN ED ELECTIVES</td>
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<td>Natural, Social &amp; Cultural environment</td>
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<td>MATH 50 or Higher Technical Mathematics</td>
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<td>ENG 21 or Higher Developmental Reading</td>
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<td>BLPRT 30D Blueprint reading for Machine trades</td>
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<td>BLPRT 30B Blueprint reading for Welders</td>
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</table>

**Table 3—Levels of Implementation of PLO Assessment** (for each PLO, Indicate ONE level of implementation; add rows as needed)

<table>
<thead>
<tr>
<th>PLO #1A</th>
<th>A</th>
<th>D</th>
<th>P</th>
<th>SCQI</th>
<th>Assessment Strategy</th>
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<td>Instructor observation of student’s application of learning on “live projects”. Standardized written and performance tests.</td>
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<td>PLO #1B</td>
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<tr>
<td>PLO #1D</td>
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<tr>
<td>PLO #1E</td>
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<td>PLO #1F</td>
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</table>

Key (reference: Barbara Beno’s letter, 9-12-07; ACCJC’s evaluation of Institutional effectiveness, rubric III): A=Awareness, D=Development, P=Proficiency, SCQI= Sustainable Continuous Quality Improvement

**Table 4A—Percentage of Program Courses with SLO’s**

<table>
<thead>
<tr>
<th>100% of Program courses with SLO’s</th>
<th>Of these, 100% are being assessed</th>
</tr>
</thead>
</table>

**Table 4B—Percentage of Program Courses Reviewed within the Previous 5 Years**

| 100% |

8
3. Program Strengths and Weaknesses

The MWIM Tech Program has improved since restructuring and is reasonably healthy in the demand, efficiency and effectiveness but can improve. The program continually addresses its weaknesses and the program restructuring is intended to show an improvement in the data elements in table 8. Data elements 1 to 9, demand elements, would be positively changed with implementation of the planned restructuring and expansion of the curriculum. The employers and students the program serviced will increase the enrollment and the other data elements.

Data elements 10 to 18 efficiency elements, with the continued restructuring, there should be improvement with an increase in enrollment and an increase in class sizes. Program costs per unit of measure should be reduced with an increase in enrollment.

Data elements 19 to 30, effectiveness elements, measures do not include service to short term workforce development students who usually do not seek a degree. This aside, there should be some improvement in these elements with the planned increase in the traditional CA and AAS degree student in the Industrial Mechanics and RAC offerings.

Assessment of the Program Learning Outcomes is an ongoing process by the instructors as the student progresses with written tests, performance tests and assessment of individual students in teams working on “live projects”. Inputs from the industry we service are used to develop the standards for measuring the learning outcomes.

“The student will demonstrate the skills and knowledge required for the machine, welding and industrial mechanics occupations; demonstrate good work ethics, positive work habits and attitudes that will make him/her employable in this cluster of occupations.”

The real measure of the program learning outcomes, is the employment of the student and the success of the student as employees in their chosen careers. Many of the current students are already employed and are upgrading themselves for their current employer or for career changes. With the good relationship the program has with most of the employers, there is constant feedback on student success and shortcomings.

Program Strengths (S1, etc.) and Weaknesses (W1, etc.)

S1
The MWIM Tech Program has an excellent Advisory Council and good relationships with the industries it serves. Based on inputs from the industries and an Island wide survey of employers, the MWIM Tech (formerly Welding and Sheet Metal, WELSM) program received approval in February, 2003 to change and expand it’s offerings and has been restructuring to address the needs of these industries. Federal RDP grants, Perkins grants, UH EIF funds, other funding and donations from the local industry and vendors has allowed the program to expand it’s curriculum and training capabilities. The restructuring includes training that share a “common core” in metalworking and industrial mechanics. This initial phase of restructuring is a good foundation for the continued expansion of the curriculum and the expansion of the employers and students this program can service.

S2
The program has a dedicated facility (building 324) with mostly 1989 or earlier vintage equipment that can provide most of the training for metalworkers and some parts of the needs of industrial mechanics. A part of the funding has modified the Laboratory work stations with “plug-in” set-up and take-down capability. This allows sections of the lab space to be used for multiple activity training. This facility can accommodate an expanded curriculum offering with the proper scheduling and has the utilities for the installation of the needed trainers and equipment for the industrial mechanics training.
S3
The program has established itself as offering a curriculum scheduled at times convenient for the incumbent worker, employer/worker upgrading, in-service training and the traditional student. Most of the courses are scheduled in the afternoons and evenings and the instructional personnel hired accept this schedule. After the “sugar plantation economy” there was a decline in demand for welders and metalworkers. The new MWIM Tech program is designed for the Astronomy Technician; Hotel & Medical Care Maintenance Technician; Electric & Water Utilities Technician; Food Processing & Distribution Maintenance Technician; Construction worker; RAC Technician; Maintenance & Repair worker; other related trades as well as the traditional metalworking student.

W1
The program restructuring is not complete. The Industrial Mechanics/Maintenance portion of the curriculum has to be expanded to provide the training needed by the industries the program services. Refrigeration and Air Conditioning; Boiler operation and control; Hydraulics and Pneumatics; Metallurgy; Plumbing; and Industrial maintenance are needs that share a common core in metalworking and mechanics that needs to be expanded as a part of the MWIM Tech Program.

W2
The facility (building 324) needs major maintenance work to repair the damages of continuous acid rain since the volcanic eruption started in the 1980s. Re-roofing and changing all components of the gutter systems and service and repair of equipment that are a part of the facility. With the increased use of additional classroom space, there is a need for classroom furniture; whiteboards/chalkboards; audiovisual equipment and computers. Some space can be modified for faculty offices and will need the furnishing and computers with the internet connections.

W3
The MWIM Tech Program is equipment and supplies intensive and the students will not receive the proper training without current technology and adequate workstations. Most of the equipment is close to 20 years old or older and will require a systematic schedule of replacement. With the expansion of the curriculum new equipment with sufficient work stations will have to be provided and the needed supplies will also have to be provided. The Program S-account can be increased with more live-job activities and can help offset some of the increased supply needs.

B. Action Plan including Budget Request
   Tables 5, 6 & 7

The assessment and improvement of the Program Learning Outcomes and Student Learning Outcomes is a vital part of the restructuring of the MWIM Tech Program and will change as the program completes the restructuring. The development of the new curriculum and course offerings will be dependent on having the MWIM Laboratory equipped with the necessary Trainers, Equipment and Supplies. The RDP Funding has provided a good start of the Industrial Mechanics part of this program and these budgetary requests are needed to complete the program restructuring and to maintain the present level of instruction.

Building 324 was completed in 1989 and is in need of Repairs and Maintenance. The roof and water collection system deterioration has been accelerated with the acid rain from the continuous volcanic eruption and needs replacement. The Equipment that is a part of the building has not been properly serviced and maintained for almost 20 years and needs to be serviced. The equipment purchased when the facility was opened in 1989 has to be replaced and is included in this budget on a 5 year replacement schedule.
Table 5—Top 6 Non-Cost Items (Including SLO & PLO completion, and assessment)  
(add rows as needed; examples given)

<table>
<thead>
<tr>
<th>Task:</th>
<th>Academic yr.</th>
<th>Who is responsible</th>
<th>Best Fits which ADP Goal</th>
<th>Addresses which strength or weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assess and implement SLO &amp; PLO changes</td>
<td>2007-08 and beyond as needed</td>
<td>Program Coord.</td>
<td>B,C</td>
<td>W1</td>
</tr>
<tr>
<td>2. Develop industrial mech curriculum/approvals</td>
<td>2007-08</td>
<td>Program Coord.</td>
<td>Goal C</td>
<td>W1</td>
</tr>
<tr>
<td>3. With approvals, initiate course offerings</td>
<td>Fall 2009</td>
<td>Program Coord.</td>
<td>Goal C</td>
<td>W1</td>
</tr>
<tr>
<td>4. With the acquisition of equipment/trainers-expand offerings</td>
<td>Spring 2009, Fall 2009</td>
<td>Program Coord.</td>
<td>Goal C</td>
<td>W1</td>
</tr>
<tr>
<td>5. With the funding continue expanding offerings</td>
<td>Fall 2009</td>
<td>Program Coord.</td>
<td>Goal C</td>
<td>W1</td>
</tr>
<tr>
<td>6. Evaluate/modify MWIM curriculum</td>
<td>Continuous/ with funding/ expansion</td>
<td>Program Coord.</td>
<td>Goal C</td>
<td>W1</td>
</tr>
</tbody>
</table>

Key to abbreviations:  
ADP Goals are: A, B, C, D, E  
Strengths/Weaknesses are numbered (S1, S2… W1, W2…—from A.3.)
Table 6A. —Top 6 Cost Items (add rows as needed; examples given)

<table>
<thead>
<tr>
<th>Task:</th>
<th>Academic Yr.</th>
<th>Who is responsible</th>
<th>$ amount &amp; budget category Exempt R/M</th>
<th>Best fits which ADP Goal</th>
<th>Supported by ADP Resource Requirement? Y/N</th>
<th>Addresses which strength or weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Furnish RAC/ Mech Lab</td>
<td>2008-09</td>
<td>Program Coord.</td>
<td>$150K, Equip</td>
<td>C,E</td>
<td>N</td>
<td>W1, W3</td>
</tr>
<tr>
<td>2. One-time startup supplies/ (small tools) for RAC/ Mech Lab</td>
<td>2008-09</td>
<td>Prog. Coord.</td>
<td>$30K Supplies /small tools; S1x</td>
<td>C</td>
<td></td>
<td>W1,W3</td>
</tr>
<tr>
<td>3. Hire 1 FTE- Faculty</td>
<td>2008-09</td>
<td>Program Coord.</td>
<td>$50K, P</td>
<td>A,C</td>
<td>N</td>
<td>W1</td>
</tr>
<tr>
<td>4. Furnish (2) Faculty Office</td>
<td>2008-09</td>
<td>Program Coord.</td>
<td>$8K, Equip./ Furniture; S1x</td>
<td>A, C</td>
<td></td>
<td>W2</td>
</tr>
<tr>
<td>5. Furnish class room/Lab</td>
<td>2008-09</td>
<td>Program Coord.</td>
<td>$10K, Equip./ Furniture</td>
<td>C, E</td>
<td></td>
<td>W2</td>
</tr>
<tr>
<td>7. Increase Supply(B) Budget</td>
<td>2008-beyond</td>
<td>Program Coord.</td>
<td>Increase startup costs of program expand. 5 yr adj. $7K/yr</td>
<td>C,E</td>
<td></td>
<td>W1,W3</td>
</tr>
</tbody>
</table>

Key to abbreviations:
- ADP Goals are: A, B, C, D, E
- Budget Categories: P=Personnel; S1x=Program Review Special Fund; SE=Supplies Enhanced; Eq=Equipment
- Strengths/Weaknesses are numbered (S1, S2, S3, W1, W2, W3—from A.3
### Table 6B—Repair and Maintenance

<table>
<thead>
<tr>
<th>Nature of Problem</th>
<th>Describe Location: e.g. Building(s) &amp; Room(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaking roof, irreparable gutter system, Deterioration of building Exterior</td>
<td>Building 324</td>
</tr>
<tr>
<td>Repair and maintenance of 3Ton Overhead Crane</td>
<td>Building 324</td>
</tr>
<tr>
<td>Service/Repair Forced Air Ventilation systems (7ea.)</td>
<td>Building 324</td>
</tr>
<tr>
<td>Service/Repair Air Compressor</td>
<td>Building 324</td>
</tr>
<tr>
<td>Service and Repair Roll-up Doors</td>
<td>Building 324</td>
</tr>
</tbody>
</table>

### Table 7—Equipment Depreciation, if applicable

(Add rows as needed; examples given)

<table>
<thead>
<tr>
<th>Program Assigned Equipment (E) and Controlled Property (CP)</th>
<th>Category: CP or E</th>
<th>Expected Depreciation Date</th>
<th>Estimated Replacement Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1989) 5 ea. GTAW Power Sources</td>
<td>E</td>
<td>1 each/year: 2009, 10, 11, 12, 13</td>
<td>$6K each Total cost: 5 yrs=$30K</td>
</tr>
<tr>
<td>(1989) 5 ea. GMAW Power Sources with Feedr &amp; Gun</td>
<td>E</td>
<td>1 each/year: 2009, 10, 11, 12, 13</td>
<td>$7K each Total cost: 5 yrs=$35K</td>
</tr>
<tr>
<td>(pre 1989) 5 ea, Individual SMAW (Inverter Type) Power Sources</td>
<td>E</td>
<td>1 each/year: 2009, 10, 11, 12, 13</td>
<td>$6K each Total cost: 5 yrs=$30K</td>
</tr>
<tr>
<td>(1989) Oxy/Acet Manifold system, Weld, Braze</td>
<td>E</td>
<td>2009</td>
<td>$5K</td>
</tr>
<tr>
<td>(1989) Oxy/Acet Manifold system, Cutting,</td>
<td>E</td>
<td>2010</td>
<td>$7K</td>
</tr>
<tr>
<td>Update Faculty (3) PCs and connect Fiber optics</td>
<td>CP</td>
<td>2010</td>
<td></td>
</tr>
</tbody>
</table>

**Key to abbreviations:**
- CP = Controlled Property w/item value $1K-$5K
- E = Equipment w/item value >$5K;
### Table 8—Data Elements

<table>
<thead>
<tr>
<th>MWIM_WELS_MST</th>
<th>AY 04-05</th>
<th>AY 05-06</th>
<th>AY 06-07</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Annual new and replacement positions in the State</td>
<td>276</td>
<td>276</td>
<td>276</td>
</tr>
<tr>
<td>2. Annual new and replacement positions in the County</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>3. Number of majors</td>
<td>31</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>4. Student Semester Hours for program majors in all program classes</td>
<td>170</td>
<td>192</td>
<td>182</td>
</tr>
<tr>
<td>5. Student Semester Hours for Non-program majors in all program classes</td>
<td>24</td>
<td>80</td>
<td>88</td>
</tr>
<tr>
<td>6. Student Semester Hours all program classes</td>
<td>194</td>
<td>272</td>
<td>270</td>
</tr>
<tr>
<td>7. FTE Program enrollment</td>
<td>12.93</td>
<td>18.13</td>
<td>18</td>
</tr>
<tr>
<td>8. Number of classes taught</td>
<td>8</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>9. Determination of program's health based on demand (Health, Cautionary, or Unhealthy)</td>
<td>HEALTHY</td>
<td>HEALTHY</td>
<td>HEALTHY</td>
</tr>
<tr>
<td>10. Average Class Size</td>
<td>11.13</td>
<td>14.4</td>
<td>11.25</td>
</tr>
<tr>
<td>11. Class fill rate</td>
<td>134.85%</td>
<td>83.72%</td>
<td>72.58%</td>
</tr>
<tr>
<td>12. FTE of BOR appointed program faculty</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>13. Student/Faculty ratio</td>
<td>31:1</td>
<td>21:1</td>
<td>24:1</td>
</tr>
<tr>
<td>14. Number of Majors per FTE faculty</td>
<td>23.31</td>
<td>13.13</td>
<td>12</td>
</tr>
<tr>
<td>15. Program Budget Allocation (Personnel, supplies and services, equipment)</td>
<td>$67,460.90</td>
<td>$80,780.00</td>
<td>$99,460.00</td>
</tr>
<tr>
<td>16. Cost Per Student Semester Hour</td>
<td>$347.74</td>
<td>$296.99</td>
<td>$368.37</td>
</tr>
<tr>
<td>17. Number of classes that enroll less than ten students</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>18. Determination of program's health based on Efficiency (Healthy, Cautionary, or Unhealthy)</td>
<td>HEALTHY</td>
<td>HEALTHY</td>
<td>HEALTHY</td>
</tr>
<tr>
<td>19. Persistence of majors fall to spring</td>
<td>74.19%</td>
<td>57.14%</td>
<td>79.17%</td>
</tr>
<tr>
<td>20. Number of degrees earned (annual)</td>
<td>0</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>21. Number of certificates earned (annual)</td>
<td>7</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>22. Number of students transferred (enrolled) to a four-year institution in UH</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>23. Perkins core indicator: Academic Attainment(1P1)</td>
<td>44.44%</td>
<td>83.33%</td>
<td>60.00%</td>
</tr>
<tr>
<td>24. Perkins core indicator: Technical Skill Attainment (1P2)</td>
<td>100.00%</td>
<td>100.00%</td>
<td>83.33%</td>
</tr>
<tr>
<td>25. Perkins core indicator: Completion Rate (2P1)</td>
<td>13.33%</td>
<td>40.00%</td>
<td>16.67%</td>
</tr>
<tr>
<td>26. Perkins core indicator: Placement in Employment Education, and Military (3P1)</td>
<td>.00%</td>
<td>.00%</td>
<td>100.00%</td>
</tr>
<tr>
<td>27. Perkins core indicator: Retention in Employment (3P2)</td>
<td>.00%</td>
<td>.00%</td>
<td>50.00%</td>
</tr>
<tr>
<td>28. Perkins core indicator: Non Traditional Participation (4P1)</td>
<td>4.35%</td>
<td>14.29%</td>
<td>4.55%</td>
</tr>
<tr>
<td>29. Perkins core indicator: Non Traditional Completion (4P2)</td>
<td>.00%</td>
<td>50.00%</td>
<td>.00%</td>
</tr>
<tr>
<td>30. Determination of program's health based on effectiveness (Healthy, Cautionary, Or Unhealthy)</td>
<td>HEALTHY</td>
<td>HEALTHY</td>
<td>HEALTHY</td>
</tr>
<tr>
<td>31. Determination of program's overall health (Healthy, Cautionary, or Unhealthy)</td>
<td>HEALTHY</td>
<td>HEALTHY</td>
<td>HEALTHY</td>
</tr>
<tr>
<td>32. Number of FTE Faculty</td>
<td>1.33</td>
<td>1.6</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: Items 9 & 18, 30 & 31 are determined by writer, Items 23-29 use Perkins data from previous year. Approved 10/25/07
HAWAII COMMUNITY COLLEGE, 2006-2007
Machine, Welding and Industrial Mechanics Technologies (MWIM) and
WELDING & SHEET METAL OPTION

Program Requirements (AAS Overall [71 credits, cumulative GPA 2.0 required from all courses])
(CA Overall [38 credits, cumulative GPA 2.0 required from all courses])
(CC Overall [20 credits, cumulative GPA 2.0 required from all courses])

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Name</th>
<th>Semester, Year &amp; Grade</th>
<th>CC</th>
<th>CA</th>
<th>AAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL:</td>
<td>WELD 26 Basic Arc Welding</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>WELD 27 Metalworking Lab I</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td></td>
<td>WELD 28 Metalworking</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td></td>
<td>WELD 29 Oxy-fuel Weld, Braze and Cut</td>
<td>2</td>
<td>2</td>
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<tr>
<td></td>
<td>MACH 20 Intro to Machine Technology</td>
<td>---</td>
<td>1</td>
<td>1</td>
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<tr>
<td></td>
<td>MACH 21 Measurement and Layout</td>
<td>---</td>
<td>1</td>
<td>1</td>
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</tr>
<tr>
<td></td>
<td>MACH 22 Hand tools and Bench work</td>
<td>---</td>
<td>1</td>
<td>1</td>
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<tr>
<td></td>
<td>MACH 23 Basic Machine Tools</td>
<td>---</td>
<td>1</td>
<td>1</td>
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<tr>
<td>SPRING:</td>
<td>WELD 31 Intermediate Welding</td>
<td>2</td>
<td>2</td>
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<td></td>
<td>WELD 40 Qualification Procedures</td>
<td>2</td>
<td>2</td>
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<td></td>
<td>BLPR 30D Blueprint Reading for Machine Trades</td>
<td>---</td>
<td>3</td>
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<tr>
<td></td>
<td>MACH 24 Lathe Facing, Tuming and Knurling</td>
<td>---</td>
<td>2</td>
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<tr>
<td></td>
<td>MACH 25 Lathe Shape and Altering and Tapering</td>
<td>---</td>
<td>2</td>
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<tr>
<td></td>
<td>WELD 24 Measurement and Layout</td>
<td>---</td>
<td>2</td>
<td>2</td>
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<tr>
<td></td>
<td>WELD 25 Metal Fab I, Sheet Metal</td>
<td>---</td>
<td>2</td>
<td>2</td>
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</tr>
<tr>
<td>FALL:</td>
<td>WELD 34 Weld Fabrication</td>
<td>2</td>
<td>---</td>
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<tr>
<td></td>
<td>WELD 35 Metalworking Lab II</td>
<td>2</td>
<td>---</td>
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<tr>
<td></td>
<td>WELD 36 Gas Metal Arc Welding (GMAW)</td>
<td>2</td>
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<td></td>
<td>WELD 37 Flux-Cored Arc Welding (FCAW)</td>
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<td></td>
<td>WELD 41 Advanced Welding</td>
<td>---</td>
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<td>ELECTIVES WELD or MACH Electives</td>
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<td>SPRING:</td>
<td>WELD 50 Special Processes in Welding</td>
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<td>ELECTIVES WELD or MACH Electives</td>
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<td>6</td>
<td>---</td>
<td></td>
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<tr>
<td></td>
<td>WELD 93V (Optional) Cooperative Vocational Education (1-3 cr.)</td>
<td>---</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>EN5 21 or higher OR EN5 22/ESL 15 or higher</td>
<td>Developmental Reading</td>
<td>Introduction to Expository Writing</td>
<td>--</td>
<td>--</td>
<td>3</td>
</tr>
<tr>
<td>MATH 50 or higher</td>
<td>Technical Mathematics I</td>
<td></td>
<td>--</td>
<td>--</td>
<td>3</td>
</tr>
</tbody>
</table>

**Cultural Environment Elective [1 COURSE REQUIRED — 3 cr.]**


**Natural Environment Elective [1 COURSE REQUIRED — 3 cr.]**


**Social Environment Elective [1 COURSE REQUIRED — 3 cr.]**

| AJ 101, 180, 210, 280, 290B, 290C, 290D, ANTH 121, 150, 200, ASAN 120†, 121†, 122†, BUS 71, ECON 20, 50, 120, 130, 131, ED 105, 131, FAMR 230, GEOG 102, HD 234, HSER 110, 140, 245, 248† (see SUBS 248), HWST 221†, LAW 20, 24, MGT 20, 24, POLS 110, PSY 100, 170, 214, 230, 235, SOC 100, 208, 218, 231, 289, 290, SPCO 51, 130, 151, 260, SSCI 75, 85, 60, 111, 150, 160† (see HUM 160), 250, SUBS 248† (see HSER 248), 268, 270, 275, WS 151 |

**Total Credits:** 20 38 71

**Courses completed that do not apply to major**

<table>
<thead>
<tr>
<th>Course</th>
<th>Sem., Yr. &amp; Grade</th>
<th>Course</th>
<th>Sem., Yr. &amp; Grade</th>
</tr>
</thead>
</table>

† These courses are cross-listed but will only count once for graduation requirements.
<table>
<thead>
<tr>
<th>Course</th>
<th>Course Name</th>
<th>Semester, Year &amp; Grade</th>
<th>CC</th>
<th>CA</th>
<th>AAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL:</td>
<td>MACH 20 Intro to Machine Technology</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MACH 21 Measurement and Layout</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MACH 22 Hand tools and Benchwork</td>
<td>1</td>
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<td>WELD 28 Metalworking</td>
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<td>WELD 29 Oxy-fuel Weld, Braze and Cut</td>
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<td>MACH 25 Lathe Shape and Altering and Tapering</td>
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<td>WELD 24 Measurement and Layout</td>
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<td>WELD 25 Metal Fab I, Sheet Metal</td>
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<td>WELD 93V (Optional) Cooperative Vocational Education</td>
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<td>ENG 21 or higher or higher OR ENG 22/ ESL 15 or higher</td>
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Total Credits: 20 36 71

Courses completed that do not apply to major

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† These courses are cross-listed but will only count once for graduation requirements.