Instructional Program Review Update 2012/13
(fields will expand as you type)

Section 1 - Program Information

1.0 Name of Program: Manufacturing Technology  
Date: January 18, 2013

1.1 Program Review Author: Mike Peterson

1.2 Dean’s Signature: Jeff A. Cummings  
Date: 1/24/13

1.3 Individual Program Information

<table>
<thead>
<tr>
<th># of Degrees</th>
<th># of Certificates</th>
<th># of Courses</th>
<th># of GE Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
<td>15</td>
<td>1</td>
</tr>
</tbody>
</table>

The shaded cells below are to be populated by the Program Review Committee as needed.

<table>
<thead>
<tr>
<th># of Full Time Faculty</th>
<th># of Part Time Faculty</th>
<th># of Staff FTE</th>
<th>Personnel Budget</th>
<th>Discretionary Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-2011</td>
<td>2011-12</td>
<td>2011-12</td>
<td>2010-2011</td>
<td>2011-12</td>
</tr>
</tbody>
</table>

1.3.1 State briefly how the program functions support the college mission: The Manufacturing Technology (MT) program supports the college mission by providing students opportunities to be successful in gaining skills through high-quality career-technical educational (CTE) experiences.

1.3.2 Program highlights/accomplishments: On May 12, 2012, the MT program awarded 12 credentials to students that completed Associates Degrees and Certificates of Achievement in the program. Among those students was Mr. William Madaras, College of the Redwoods 2012 Valedictorian. Mr. Madaras said, “I want to contribute to our community with the skills I’ve acquired...” This level of successful program completions by outstanding CR students illustrates the value of the MT program in this community. Additionally, MT program faculty continue to engage in professional development and community outreach. Recently, College of the Redwoods Professor of Applied Technology Mike Peterson presented three topics at the Association for Technology, Management, and Applied Engineering (ATMAE) conference in Nashville Tennessee on November 15th and 16th. These speaking opportunities allowed Peterson to share some of his recent activities with administrators and educators from around the world.

Section 2 - Data Analysis

2.1 Enrollment & Fill Rate  
Review and interpret data by clicking here or going to: http://www.redwoods.edu/District/IR/Program_Select.asp  
Select your program and click on: Enrollments & fill rates

Enrollment X  
Comment if checked: In the MT courses, enrollment declined 9% from 2010-2011 to 2011-2012. This is similar to the entire
The program's enrollment decline of 10%. The associated CET courses were not offered in 2010-2011, and the associated IT courses were not offered in 2011-2012. Thus, the Program Total enrollment decline of 18% is not a meaningful statistic with only 2 years of data.

Comment if checked: The Program Total fill rate for 2011-2012 is 63%, much less than the district average of 77%. This statistic is affected by low fill rate numbers in some advanced courses that students need in order to complete the program in four semesters. Advanced courses typically have lower fill rates when compared to introductory courses because many students do not need the advanced courses to meet their educational goals. Additionally, the fill rate for MT-54L (21%) should not be included in this data set because it is an optional, non-TLU bearing laboratory course that very few students enroll in. This low fill rate for a class that should not be included brings the entire average down and makes the data unreliable.

2.2 Success & Retention
Review and interpret data by clicking here or going to: http://www.redwoods.edu/District/IR/Program_Select.asp
Select your program and click on: Success & Retention

Success □
Comment if checked:

Retention □
Comment if checked:

2.3 Persistence
Review and interpret data by clicking here or going to: http://www.redwoods.edu/District/IR/Program_Select.asp
Select your program and click on: Persistence

Comment: The persistence rate for the MT program in 2011-2012 is 33%. This is less than the district rate of 37%, however this data is based upon an extremely small sample size. MT program faculty have been encouraging students to declare the MT degrees or certificates if they intend to complete the program. If more students in the program declare their educational goals, then the resulting data on persistence will be more meaningful.

2.4 Completions
Review and interpret data by clicking here or going to: http://www.redwoods.edu/District/IR/Program_Select.asp
Select your program and click on: Completions & Transfers

Comment:

Student Equity Group Data

2.5 Enrollments by group
Review and interpret data by clicking here or going to: http://www.redwoods.edu/District/IR/Program_Select.asp
Select your program and click on ~ by Student Equity Group next to Enrollments & fill rates

Comment: The manufacturing industry is traditionally a male-dominated field. Thus, it is not surprising that the MT program
has only 16% female students which is a substantial variation from district ratios. Global efforts are being conducted to encourage non-traditional careers and MT program faculty are very interested and involved in this effort. Similarly, MT students are 81% Caucasian which mirrors industry for this field. The largest age group represented in the MT program are students who are 25 to 34, a substantial variation from district data. This could be a result of less emphasis on career technical programs in the K-12 system. Younger students simply have not been exposed to options in CTE. The data shows that the MT program has fewer DSPS student when compared to the district. Nothing stands out that could be affecting this, however, the basic skill variance from district numbers could be a result of the fact that no courses in the MT program have math or English prerequisites.

2.6 Success & Retention by group
Review and interpret data by clicking here or going to: http://www.redwoods.edu/District/IR/Program_Select.asp
Select your program and click on ~ by Student Equity Group next to success & retention
Comment: With one exception, all data in this section show either a high than district percentage or are based upon too small of a sample size. The one exception is the 61% success rate of students in the 24 or less age group. Perhaps this result is affected by the diminished emphasis on CTE in the K-12 system.

2.7 Persistence by group
Review and interpret data by clicking here or going to: http://www.redwoods.edu/District/IR/Program_Select.asp
Select your program and click on ~ by Student Equity Group next to persistence
Comment: This program had no corresponding degrees or certificates with more than twenty students in the declared cohort.

Additional Indicators
2.8 Faculty Information
Review and interpret data by clicking here or going to: http://www.redwoods.edu/District/IR/Program_Select.asp
Select your program and click on: Faculty (FT/PT) & FTES/FTEF
Comment: The MT program has a substantially lower FTES per FTEF ratio when compared to the district. This is a result of the fact that most Applied Technology courses have smaller capacities compared to district averages. Applied Technology courses have lower capacities because of pedagogical techniques and safety issues.

2.9 Labor Market Data (CTE/Occupational programs only)
Refer to the California Employment Development Division:
http://www.edd.ca.gov/
www.labormarketinfo.edd.ca.gov
Provide a narrative that addresses the following:
   a. Documentation of labor market demand
   b. Non-duplication of other training programs in the region
   c. Effectiveness as measured by student employment and program completions.

Narrative:
The Manufacturing Technology (MT) program at College of the Redwoods prepares students for employment in a variety of occupations in the manufacturing and maintenance industry. According to the California Employment Development Department (EDD) website, there are an estimated average of 126 annual job openings in the occupations that are directly related to manufacturing, maintenance, repair, and production in the North Coast region. Maintenance and repair worker occupations are expected to grow by 8.4%, assembler and
fabricator occupations are expected to grow by 13.9%, and production occupations are expected to grow by 4.5%. Statewide data indicates an estimated 950 annual openings for machinists alone. Occupations related to Manufacturing Technology have high wages, for example, statewide data shows that machinists earn a mean hourly rate of $20.28. The Manufacturing Technology program is an alternative pathway to university studies in mechanical engineering. Statewide data indicates an estimated 940 annual openings with a mean hourly rate of $45.41 for mechanical engineers.

North Coast Prosperity website lists niche manufacturing as one of the six targets of opportunity for the counties served by CR. The website states “The growth rate in number of firms in...Niche Manufacturing (19%)...[is a] much greater rate than the regional economy as a whole (1.5%).” (http://www.northcoastprosperity.com/local-economy/targets) In the Targets of Opportunity report the authors write “Niche Manufacturing includes more than 500 small, specialized producers spread across more than 20 industry classifications...These firms are growing operations and, according to a focus group of CEOs, already experiencing labor shortages that could affect their ability to continue growing in the region.”

Mike Peterson completed a needs assessment for niche manufacturers in Humboldt County as part of the requirement for a master's degree at Purdue University in 2009. The report, "Skill Needs Assessment of Niche Manufacturers in Humboldt County California" concluded that "at least 67 companies make up the entire population of niche manufacturers in Humboldt County, even under a less than optimal economic situation, 114 new employees will be hired this year." This report also stated, "Employers in Humboldt County have difficulty finding skilled employees."

At the National level, the manufacturing industry is currently receiving a great amount of attention. In December of 2012, President Obama said, “American manufacturing is growing at the fastest pace since the 1990s...” (http://www.washingtonpost.com/politics/obama-manufacturing-growing-at-fastest-pace-since-1990s/2012/12/11/e71678ae-43a4-11e2-8e70-e1993528222d_video.html)

Clearly there is a well-documented labor market demand for employees trained in Manufacturing Technology. This demand affects the economy nationally, at the State level, and on the North Coast.

The MT program does not duplicate other public or private training programs in the region.

The effectiveness of the MT program is evaluated through regular meetings of the Manufacturing Technology Advisory Committee. This committee has members from local manufacturing companies, educators, former students, and representatives from the Small Business Development Center. The MT program relies on its advisory committee to evaluate curriculum, review student learning outcomes, and recommend changes to the program to adapt to industry trends and technological innovations. Minutes from the MT advisory committee meetings are on file in the office of the CTE Division.
The MT program is part of the Applied Technology department. This department has initiated a project working with institutional research to develop and administer graduate and employer surveys designed to gather student employment data. This data will be used to evaluate the effectiveness of Applied Technology programs.

**Overall, what has been the impact of the change in indicators on student achievement and learning?**
No significant change in indicators on student achievement and learning has been identified.

**Provide narrative on the factors that may have contributed to the improvement or decline in the identified population:**
No improvement or decline of any student population has been identified.

### Section 3 – Critical Reflection of Assessment Activities

#### Curriculum & Assessment Data

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are all courses on track for complete assessment of all outcomes in two years? Y/N</td>
<td>Y</td>
</tr>
<tr>
<td>What courses, if any, are not on track with regard to assessment? Explain.</td>
<td>n/a</td>
</tr>
<tr>
<td># of PLOs Assessed and Reported during the 2011-2012 academic year.</td>
<td>5</td>
</tr>
<tr>
<td>% of Course Outlines of Record updated</td>
<td>2</td>
</tr>
<tr>
<td>If there is no plan for updating outdated curriculum, when will you inactivate?</td>
<td></td>
</tr>
<tr>
<td>View curriculum status: <a href="http://www.redwoods.edu/District/IR/Program_Select.asp">click here</a> or go to: <a href="http://www.redwoods.edu/District/IR/Program_Select.asp">http://www.redwoods.edu/District/IR/Program_Select.asp</a></td>
<td></td>
</tr>
<tr>
<td>Select your program and click on: Curriculum Status</td>
<td></td>
</tr>
<tr>
<td>Assessment Reporting completed? Y/N</td>
<td>Y</td>
</tr>
<tr>
<td>Program Advisory Committee Met? Y/N</td>
<td>Y</td>
</tr>
</tbody>
</table>

#### 3.0 How has assessment of course level SLOs led to improvement in student learning (top three):

1. Teaching methods have been revised and modified related to hands-on laboratory techniques
2. SLOs will be revised to be more measurable and meaningful
3. Lecture topics have been expanded in areas that assessment revealed problems

#### 3.1 How has assessment of program level outcomes led to degree/certificate improvement (top three):

1. PLOs will be revised to be more measurable and meaningful
2. Assessment activities have lead to more meaningful dialog between department colleagues
3. Interdisciplinary collaboration and planning has occurred as a result of dialog

#### 3.2 (Optional) Describe unusual assessment findings/observations that may require further research or institutional support:
### Section – 4 Evaluation of Previous Plans

**4.1 Describe plans/actions identified in the last program review and their current status. What measurable outcomes were achieved due to actions completed.**

<table>
<thead>
<tr>
<th>Actions</th>
<th>Current Status</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop a plan to increase enrollment</td>
<td>Ongoing</td>
<td>Increased fill rates and completions</td>
</tr>
<tr>
<td>Obtain accreditation through ATMAE (formerly NAIT)</td>
<td>Ongoing</td>
<td>This action has not been completed</td>
</tr>
<tr>
<td>Gain information on budget allocations</td>
<td>Complete</td>
<td>The budget for MT and WT are still combined, however, MT and WT faculty have developed a strategy to distribute and track the combined budget.</td>
</tr>
</tbody>
</table>

**4.2 (If applicable) Describe how funds provided in support of the plan(s) contributed to program improvement:** CTEA grant funds were provided to allow professional development through ATMAE. This professional development helped to keep program faculty involved in current trends in technology and ultimately will contribute to external program accreditation.

### Section – 5 Planning

**5.0 Program Plans**

Based on data analysis, student learning outcomes and program indicators, assessment and review, and your critical reflections, describe the program’s Action Plan for the 2012/13 academic year. If more than one plan, add rows. Include necessary resources. (Only a list of resources is needed here. Provide detailed line item budgets, supporting data or other justifications in the Resource Request).

**5.1 Program Plans**

<table>
<thead>
<tr>
<th>Action to be taken</th>
<th>Relationship to Institutional Plans</th>
<th>Relationship to Assessment</th>
<th>Expected Impact on Program/Student Learning</th>
<th>Resources Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work toward external accreditation through ATMAE</td>
<td>This goal is related to Goal 4 of the Strategic Plan - Technological Relevance</td>
<td>ATMAE accreditation requires adherence to outcome based standards</td>
<td>Alignment with international industrial standards</td>
<td>CTEA or other CTE grant funding for attending ATMAE meetings</td>
</tr>
<tr>
<td>Continue to work toward increasing enrollment</td>
<td>Improve College-Level KPIs</td>
<td>Data from assessment activities is more meaningful with larger</td>
<td>More students increase synergy in the classroom</td>
<td>None</td>
</tr>
</tbody>
</table>
Develop options for a technical mathematics course to satisfy degree and certificate requirements, working in coordination with the mathematics department

<table>
<thead>
<tr>
<th>Request</th>
<th>Check One</th>
<th>Amount ($)</th>
<th>Recurring Cost Y/N</th>
<th>Rationale Linkage</th>
</tr>
</thead>
<tbody>
<tr>
<td>New manually operated machine tools</td>
<td>Planning</td>
<td>$25,000</td>
<td>N</td>
<td>This purchase will update the machine laboratory to current industry standards and replace worn equipment. This request will be submitted through the CTEA grant application process. No district funds will be requested. This purchase supports Goal 4 of the Strategic Plan - Technological Relevance</td>
</tr>
<tr>
<td>Annual Mastercam and Solidworks software updates</td>
<td>Planning</td>
<td>$5,000</td>
<td>Y</td>
<td>Current software technology supports recruitment of students and the program-level plan of increasing enrollment</td>
</tr>
<tr>
<td>Professional development related to</td>
<td>Planning</td>
<td>$2,000</td>
<td>Y</td>
<td>Funded by CTEA or other</td>
</tr>
</tbody>
</table>

5.2 Provide any additional information, brief definitions, descriptions, comments, or explanations, if necessary.

ATMAE: The Association of Technology, Management, and Applied Engineering

Section 6 - Resource Requests

6.0 Planning Related, Operational, and Personnel Resource Requests. Requests must be submitted with rationale, plan linkage and estimated costs.
obtaining ATMAE accreditation |  |  |  | CTE grants, attendance at the annual ATMAE conferences is crucial in efforts to gain external accreditation.

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**Section 7 - PRC Response by section (completed by PRC after reviewing the program review)**

### 7.0 The response will be forwarded to the author and the supervising Director and Vice President:

#### S.1. Program Information:  Satisfactory

#### S.2. Data Analysis:  Good evaluation of data, which raised some questions. Fill rate is lower than district. Narrative suggested non-declared students are a problem. There are variations in equity enrollments. Data relative to persistence is not explained. Labor market data notes anticipated growth in fields; there is good employment data and some salary expectations; program is working to collect more graduate and employer student data.

**Summary:** Strong in completers and employment, but numbers are low. PRC would like this program monitored over the next few years, to look for improvement in success, persistence and enrollment—it was noted this program has lower numbers due to pedagogical issues and safety. PRC would like to know what outside accreditation (ATMAE) requires for enrollments.

#### S.3. Critical Reflection of Assessment Activities:  Assessments are up to date; curriculum updates need to be completed; satisfactory

#### S.4. Evaluation of Previous Plans:  PRC suggests including why obtaining outside accreditation has not yet been completed

#### S.5. Planning:  Planning was done thoroughly, well aligned and well related to institutional plans

#### S.6. Resource Requests:  PRC has a concern about the lack of resource requests; an accurate assessment of a program should still point out resource needs, whether there is budget to support it or not.