1. *Describe changes that have been implemented* towards improving students’ attainment of outcomes that resulted from outcome assessments carried out in 2010-2011. These may include but are not limited to changes to content, materials, instruction, pedagogy etc.

Due to staffing changes within the department and a loss of a faculty instructor and department chair in the spring of 2011, our department failed to file our annual assessment report last year. With new SAC chairman this fall, we immediately contacted the assessment team and met to discuss our planned direction for this year.

The assessment plan that should have been outlined for the 2010-2011 report included meetings we have had to identify our certificate and degree pathways where strategic assessments at specific points would capture outcome attainment for the widest group of completers. These two identified pathways are through our one year CNC Milling certificate (49 credits) and our one year CNC Turning certificate (48.5 credits). We also updated and submitted our revised CTE Assessment Plan (see attachment 1).

The primary pathway our students follow to complete our program up through the AAS degree in Machine Manufacturing Technology is a four certificate process (see attachment 2). Our first certificate, a Career Pathways certificate for Manufacturing Technician is 25.5 credits. These include fundamental courses to get an entry level job within a manufacturing company. Our educational pathway then splits, allowing a student to select either the CNC Milling certificate path, or the CNC Turning certificate path. These two certificates add approximately 23 credits each to the Manufacturing Technician certificate content and add high employability skills in computer controlled machining common in today’s manufacturing companies. Most students in our program progress at least through one of these two CNC certificates. Many will complete both of these and some will continue on to ultimately complete the AAS degree. All content from all certificates apply directly to completing the AAS degree in Machine Manufacturing Technology. It makes sense that assessing each of the two one-year certificate completers would capture our student’s attainment of outcome data, which together also assess a large majority of the skillsets in our AAS degree.

We require students to complete a three credit instructor approved shop project class for each one year certificate. Assessing the students with an applied assigned project was determined to be a good indicator of skill attainment. We next created a matrix of courses within each certificate and compiled specific outcome skills identified in the certificates (see Certificate Outcomes document, attachment 3). This gave us two detailed lists of skills to develop two assessment projects to test those skills. We approached our MMT Industrial Advisory Committee in the fall of 2011 with an overview of this plan. It received positive support from them to begin outlining one project for each one year certificate for assessment purposes.
We have since designed both the CNC milling and CNC Turning assessment projects. The CNC Turning assessment project will be a “Screw Jack” assembly consisting of 6 subparts which comprise a support tool commonly used in machine shops. The CNC Milling assessment project will be a “Punch Tool Assembly” consisting of more than eight machined subparts which assemble into a working tool. These were designed collaboratively through weekly staff meetings by all MMT teaching staff. Both of these projects have been vetted through the MMT Industrial Advisory Committee and have been approved for use.

For each outcome assessed this year:

2. Describe the assessment design (tool and processes) used. Include relevant information about:

   • The nature of the assessment (e.g., written work, project, portfolio, exam, survey, performance etc.) and if it is direct (assesses evidence mastery of outcomes) or indirect (student’s perception of mastery). Please give rationale for indirect assessments (direct assessments are preferable).

   As stated in #1 above, we will be using two different project based assessments. The assessments are direct, and they align with the CNC Milling and CNC Turning Outcomes (attachment 3). Attachment 4 is the PCC TSA CNC Lathe Assessment Project Outline. Attachment 5 are the drawings for the various subparts for the Lathe assessment. These parts were designed internally and the detailed drawings were completed in Glen Truman’s drafting class as a class assignment. Our TSA CNC Mill Assessment project has a CAD design of the project but will also require this drawing creation process. This entire process has also made us re-examine our grading procedures and standardize how we grade projects and shop work across the department. With different instructors teaching project work, some being new to PCC and the department, this was an opportunity to get all staff on the same page. Attachment 6 is the new standardized grading rubric for project work.

   • The student sample assessed (including sample size relative to the targeted student population for the assessment activity) process and rationale for selection of the student sample. Why was this group of students and/or courses chosen?

Because we are a year behind in this process, we are currently testing our first student with the Lathe Assessment. The student is doing this as part of an internal CO-OP. We do not have data to report at this time.

   • Any rubrics, checklists, surveys or other tools that were used to evaluate the student work. (Please include with your report). Where appropriate, identify benchmarks.

The evaluation process for both assessments includes a number of evaluation tools. The attachment 6 of the project outline lists the values in points of each subpart which accumulate and average to the final grade on the project. The process outline mandates that each subpart be dimensionally inspected using the attachment 3, sheet three form. Other data will be collected and documented directly onto the outline on pages one and two. Each subpart will also be evaluated using the attachment 4, page 3, Point Reduction Chart for MMT Project Work.
• How you analyzed results, including steps taken to ensure that results are reliable (consistent from one evaluator to another.

We intend to complete group assessments with staff and industry representatives to develop a normed grading for consistency. We are on hold in this step of the process until we get completers.

3. Provide information about the results (i.e., what did you learn about how well students are meeting the outcomes)?

We are not able to report on this at this time.

4. Identify any changes that should, as a result of this assessment, be implemented to help improve students’ attainment of outcomes. (These may include, but are not limited to, changes in curriculum, content, materials, instruction, pedagogy etc).

This will also be determined once we have student data.

5. Reflect on the effectiveness of this assessment tool and assessment process. Please describe any changes to assessment methodology that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome). Is there a different kind of assessment tool or process that the SAC would like to use for this outcome in the future? If the assessment tool and processes does not need to be revised, please indicate this.

This will also be determined once we have student data

Respectfully submitted,

Patrick Kraft
Faculty – MMT Department
### Degree/Certificate Outcome

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Demonstrate knowledge in understanding of machine shop safety.</td>
<td>Professional Competence</td>
<td>MCH 100 Final exam.</td>
<td>Term 1</td>
</tr>
<tr>
<td>Utilize an industry mechanical drawing (blueprint) to select and interpret processes,</td>
<td>Critical Thinking and</td>
<td>CNC Turning TSA (MCH158)</td>
<td>Term 7</td>
</tr>
<tr>
<td>procedures, inspection equipment and operation of necessary machine tools to produce</td>
<td>Problem Solving</td>
<td>CNC Milling TSA (MCH158)</td>
<td></td>
</tr>
<tr>
<td>the part/product to industry specifications.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verify acceptable dimensional tolerances by the use of precision measurement and</td>
<td>Professional Competence</td>
<td>MCH 150 Final exam.</td>
<td>Term 2</td>
</tr>
<tr>
<td>inspection tools.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurately perform conversions, computations and calculations that result in parts</td>
<td>Critical Thinking and</td>
<td>CNC Turning TSA (MCH158)</td>
<td>Term 7</td>
</tr>
<tr>
<td>production to specification, while maintaining optimal machining conditions.</td>
<td>Problem Solving</td>
<td>CNC Milling TSA (MCH158)</td>
<td></td>
</tr>
<tr>
<td>Write CNC programs for Fanuc (G &amp; M compatible) controlled CNC turning and machining</td>
<td>Critical Thinking and</td>
<td>CNC Turning TSA (MCH158)</td>
<td>Term 6</td>
</tr>
<tr>
<td>centers using basic programming skills.</td>
<td>Problem Solving</td>
<td>CNC Milling TSA (MCH158)</td>
<td></td>
</tr>
<tr>
<td>Perform safe maintenance, setup, and operating procedures with the manual machine tools</td>
<td>Critical Thinking and</td>
<td>MCH 121 Final exam.</td>
<td>Term 3</td>
</tr>
<tr>
<td>group.</td>
<td>Problem Solving</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform safe setup and operating procedures with the computer numerical control (CNC)</td>
<td>Critical Thinking and</td>
<td>CNC Turning TSA (MCH158)</td>
<td>Term 6</td>
</tr>
<tr>
<td>turning and machining centers.</td>
<td>Problem Solving</td>
<td>CNC Milling TSA (MCH158)</td>
<td></td>
</tr>
<tr>
<td>Construct and verify computer designed 2-D and 3-D part models and tool paths commonly</td>
<td>Critical Thinking and</td>
<td>MCH 272/MCH 273 Final exams.</td>
<td>Term 8</td>
</tr>
<tr>
<td>machined with CNC turning and machining centers.</td>
<td>Problem Solving</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We offer two one year certificates that students can choose to complete in either order sequentially. The first one chosen will take about 4 terms and the second will add about 20 credits or two more terms to complete. Our TSA’s will be a hands-on shop project in each one year certificate area and will include all outcome competencies listed on the certificate. We will use the required MCH 158 shop project class to complete the TSA for that certificate. These are being developed in the 2011-2012 year. The sum of these two TSA projects complete the outcomes for the AAS degree.
Manufacturing Technician: Career Pathway Certificate – Certificate Outcomes

- Gain an understanding of how to operate in, and maintain a safe work environment.
- Fundamental understanding and application of common blueprint reading in a shop environment.
- Given the necessary materials and information, the student will be able to identify geometric dimensioning symbols and interpret their use on common drawings per ASM Y14.5M - 1994 standard.
- Solve trade related math calculations using general math, formulas and shop trigonometry to perform scope of work.
- Calculate speed and feed information to operate tools and machinery as required.
- Gain a basic working knowledge of layout tools and techniques.
- Operate drill presses, manual lathes, manual vertical milling machines, and various hand tools to produce a drill grinding gauge, ball peen hammer, and mill training block.
- Apply knowledge of basic and precision measuring tools to measure projects within specified print tolerances.
- Gain industry experience through participation in a cooperative education experience.

Certificate: Machine Technician, 25.5 credit hours
MCH 100 Machine Tool Basics 1.0 cr.
MCH 105 Blueprint Reading I 1.5 cr.
MCH 110 Blueprint Reading II 1.5 cr.
MCH 115 Geometric Dimensioning & Tolerancing 3.5 cr.
MCH 120 Machine Shop Math 2.0 cr.
MCH 121 Manufacturing Processes I 4.0 cr.
MCH 125 Speeds and Feeds 1.0 cr.
MCH 130 Machine Shop Trigonometry 2.5 cr.
MCH 135 Basic Measuring Tools 1.5 cr.
MCH 145 Layout Tools 1.5 cr.
MCH 150 Precision Measuring Tools 1.5 cr.
MCH 280 Cooperative Education 4.0 cr.
One-Year Certificate: CNC Milling – Certificate Outcomes

- Operate and maintain a safe work environment to industry standards Community and Environmental Responsibility.
- Utilize industry standard mechanical drawings to select and interpret processes, procedures, inspection equipment.
- Identify geometric dimensioning symbols and interpret their use on industry standard mechanical drawings per ASM Y14.5M – 1994 standard.
- Accurately operate necessary machine tools to produce the part/product to industry specifications and standards.
- Verify acceptable dimensional tolerances through the use of basic, semiprecision, precision measurement and inspection tools.
- Accurately perform conversations, computations and calculations that result in parts production to industry standards and specifications.
- Perform safe maintenance, setup and operating procedures with CNC machining centers.
- Construct and verify computer aided designed 2-D and 3-D part models with tool paths machined with CNC machining centers.
- Perform safe maintenance, setup, and operating procedures with manual milling machine tools.
- Write CNC programs for G & M code compatible controlled CNC machining centers using basic programming. May 2011.

One-Year Certificate: CNC Milling, 49 credit hours
MCH 100 Machine Tool Basics 1.0 cr.
MCH 105 Blueprint Reading I 1.5 cr.
MCH 110 Blueprint Reading II 1.5 cr.
MCH 115 Geometric Dimensioning & Tolerancing 3.5 cr.
MCH 120 Machine Shop Math 2.0 cr.
MCH 121 Manufacturing Processes I 4.0 cr.
MCH 125 Speeds and Feeds 1.0 cr.
MCH 130 Machine Shop Trigonometry 2.5 cr.
MCH 135 Basic Measuring Tools 1.5 cr.
MCH 145 Layout Tools 1.5 cr.
MCH 150 Precision Measuring Tools 1.5 cr.
MCH 280 Cooperative Education 4.0 cr.
MCH 205 Vertical Milling Machines & Operations 3.5 cr.
MCH 268 CNC Programming-Mill 5.0 cr.
MCH 272 Mastercam Level I 5.0 cr.
MCH 278 CNC Operation-Mill 4.0 cr.
MCH 158 Shop Project Machine Technology II 3.0 cr. – Tech Skill Assessment CNC Mill
MSD 115 Improving Work Relations 3.0 cr.

Attachment 2 (page 2 of 4)
One-Year Certificate: CNC Turning – Certificate Outcomes

- Operate and maintain a safe work environment to industry standards Community and Environmental Responsibility.
- Identify geometric dimensioning symbols and interpret their use on industry standard mechanical drawings per ASM Y14.5M – 1994 standard.
- Accurately operate necessary machine tools to produce the part/product to industry specifications and standards.
- Verify acceptable dimensional tolerances through the use of basic, semiprecision, precision measurement and inspection tools.
- Accurately perform conversations, computations and calculations that result in parts production to industry standards and specifications.
- Perform safe maintenance, setup, and operating procedures with manual turning machine tools.
- Write CNC programs for G & M code compatible controlled CNC turning centers using basic programming skills.
- Perform safe maintenance, setup and operating procedures with CNC turning centers.
- Construct and verify computer aided designed 2-D and 3-D part models with tool paths machined with CNC turning machines. May 2011.

One-Year Certificate: CNC Turning, 48.5 credit hours
MCH 100 Machine Tool Basics 1.0 cr.
MCH 105 Blueprint Reading I 1.5 cr.
MCH 110 Blueprint Reading II 1.5 cr.
MCH 115 Geometric Dimensioning & Tolerancing 3.5 cr.
MCH 120 Machine Shop Math 2.0 cr.
MCH 121 Manufacturing Processes I 4.0 cr.
MCH 125 Speeds and Feeds 1.0 cr.
MCH 130 Machine Shop Trigonometry 2.5 cr.
MCH 135 Basic Measuring Tools 1.5 cr.
MCH 145 Layout Tools 1.5 cr.
MCH 150 Precision Measuring Tools 1.5 cr.
MCH 280 Cooperative Education 4.0 cr.
MCH 180 Turning Machines & Operations 4.0 cr.
MCH 190 Boring on the Lathe 1.0 cr.
MCH 195 Threading on the Lathe 3.0 cr.
MCH 259 CNC Programming-Lathe 5.0 cr.
MCH 279 CNC Operation-Lathe 4.0 cr.
MCH 158 Shop Project Machine Technology II 3.0 cr. - Tech Skill Assessment CNC Lathe.

MSD 115 Improving Work Relations 3.0cr.
AAS: Machine Manufacturing Technology – Certificate Outcomes

- Demonstrate knowledge in understanding of machine shop safety.
- Utilize an industry mechanical drawing (blueprint) to select and interpret processes, procedures, inspection equipment and operation of necessary machine tools to produce the part/product to industry specifications.
- Verify acceptable dimensional tolerances by the use of precision measurement and inspection tools.
- Accurately perform conversions, computations and calculations that result in parts production to specification, while maintaining optimal machining conditions.
- Write CNC programs for Fanuc (G & M compatible) controlled CNC turning and machining centers using basic programming skills.
- Perform safe maintenance, setup, and operating procedures with the manual machine tools group.
- Perform safe setup and operating procedures with the computer numerical control (CNC) turning and machining centers.
- Construct and verify computer designed 2-D and 3-D part models and tool paths commonly machined with CNC turning and machining centers.

Required Core Courses (62 credit hours)

MCH 100 Machine Tool Basics 1.0 cr.
MCH 105 Blueprint Reading I 1.5 cr.
MCH 110 Blueprint Reading II 1.5 cr.
MCH 115 Geometric Dimensioning & Tolerancing 3.5 cr.
MCH 120 Machine Shop Math 2.0 cr.
MCH 125 Speeds and Feeds 1.0 cr.
MCH 130 Machine Shop Trigonometry 2.5 cr.
MCH 135 Basic Measuring Tools 1.5 cr.
MCH 145 Layout Tools 1.5 cr.
MCH 150 Precision Measuring Tools 1.5 cr.
MCH 160 Drilling Machines & Operations 2.0 cr.
MCH 175 Band Saws 1.0 cr.
MCH 180 Turning Machines & Operations 4.0 cr.
MCH 190 Boring on the Lathe 1.0 cr.
MCH 195 Threading on the Lathe 3.0 cr.
MCH 205 Vertical Milling Machines & Operations 3.5 cr.
MCH 225 Surface Grinding Machines & Operations 2.0 cr.
MCH 259 CNC Programming-Lathe 5.0 cr.
MCH 268 CNC Programming-Mill 5.0 cr.
MCH 272 Mastercam Level I 5.0 cr.
MCH 273 Mastercam Level II 5.0 cr.
MCH 278 CNC Operation-Mill 4.0 cr.
MCH 279 CNC Operation-Lathe 4.0 cr.

Plus 28 credits of MMT Technical Electives and 16 Credits of General Education Credits.
### One-Year Certificate: CNC Milling – Certificate Outcomes

<table>
<thead>
<tr>
<th>Course</th>
<th>Course</th>
<th>Course</th>
<th>Course</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operate and maintain a safe work environment to industry standards Community and Environmental Responsibility.</td>
<td>MCH100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilize industry standard mechanical drawings to select and interpret processes, procedures, inspection equipment.</td>
<td>MCH105 MCH110</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify geometric dimensioning symbols and interpret their use on industry standard mechanical drawings per ASME Y14.5M – 1994 standard.</td>
<td>MCH115</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Accurately operate necessary machine tools to produce the part/product to industry specifications and standards.</td>
<td>MCH121</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verify acceptable dimensional tolerances through the use of basic, semiprecision, precision measurement and inspection tools.</td>
<td>MCH135 MCH150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurately perform conversations, computations and calculations that result in parts production to industry standards and specifications.</td>
<td>MCH120 MCH125 MCH130</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform safe maintenance, setup and operating procedures with CNC machining centers.</td>
<td>MCH121 MCH180 MCH190 MCH195</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construct and verify computer aided designed 2-D and 3-D part models with tool paths machined with CNC machining centers.</td>
<td>MCH272 MCH278</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform safe maintenance, setup, and operating procedures with manual milling machine tools.</td>
<td>MCH121 MCH205 MCH158</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Write CNC programs for G &amp; M code compatible controlled CNC machining centers using basic programming.</td>
<td>MCH268</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Classified courses in certificate</td>
<td>MSD115 MCH145 MCH280</td>
<td></td>
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</tbody>
</table>

### One-Year Certificate: CNC Turning – Certificate Outcomes

<table>
<thead>
<tr>
<th>Course</th>
<th>Course</th>
<th>Course</th>
<th>Course</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operate and maintain a safe work environment to industry standards Community and Environmental Responsibility.</td>
<td>MCH100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify geometric dimensioning symbols and interpret their use on industry standard mechanical drawings per ASME Y14.5M – 1994 standard.</td>
<td>MCH105 MCH110 MCH115</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurately operate necessary machine tool to produce the part/product to industry specifications and standards.</td>
<td>MCH121 MCH279 MCH130</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verify acceptable dimensional tolerances through the use of basic, semiprecision, precision measurement and inspection tools.</td>
<td>MCH135 MCH150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurately perform conversations, computations and calculations that result in parts production to industry standards and specifications.</td>
<td>MCH120 MCH125 MCH130</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform safe maintenance, setup, and operating procedures with manual turning machine tools.</td>
<td>MCH121 MCH180 MCH190 MCH195</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write CNC program for G &amp; M code compatible controlled CNC turning centers using basic programming skills.</td>
<td>MCH269 MCH158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform safe maintenance, setup and operating procedures with CNC turning centers.</td>
<td>MCH279 MCH158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construct and verify computer aided designed 2-D and 3-D part models with tool paths machined with CNC turning machines.</td>
<td>MCH279 MCH158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Classified courses in certificate</td>
<td>MSD115 MCH145 MCH280</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Outcome removed by Curric. Committee this year
PCC TSA CNC Lathe Assessment Project Outline

Student’s Name ___________________________________________ Date __________________
Instructor of Record _________________________________________ Term: _____________

Part – Base – Value 100 points

1. Manufacture on Haas CNC Lathe – Start 2 parts, one to be graded.
2. Raw stock: 2-1/2” CRS Rod. Saw to 3-1/8” long
4. All CNC “G” code to be manually programmed -Mastercam not allowed.
5. Instructor to inspect each CNC program before run.
6. Instructor to inspect each CNC setup before run.
7. 1st operation – Grip on area that finishes at 2” diameter. Machine 2.375 diameter area, face base, finish 1.75” c/bore.
8. 2nd operation – Grip on 2.375 Diameter using supplied lathe soft jaws. Machine 2” diameter area, 3/16 fillets, upper step are. Drill through, c/sink and finish internal thread.
9. Supply 100% inspection report.

Part - Large Thread– Value 100 points

1. Manufacture on Haas CNC Lathe.
2. Raw stock: CRS – Diameter to be determined by student and approved by instructor.
5. All CNC “G” code to be manually programmed -Mastercam not allowed.
6. Instructor to inspect each CNC program before run.
7. Instructor to inspect each CNC setup before run.
8. 1st operation – Machine entire outside and end internal 1” diameter c/bore to finish.
9. Inspect external thread with thread wires, record values.
   a. Thread wires used: __________________________________________
   b. Measurement over wires: _________________________________
   c. Computed actual pitch diameter: __________________________
   d. Listed Machinery Handbook Tolerance: Min - ____________ Max-__________
   e. List Machinery handbook version and page number: _____________
10. 2nd operation – Using manual mill and 5C hex collet holder, mill flats (6 places).
11. 3rd operation - Using manual mill and 5C hex collet holder, drill and tap internal hole.
12. Supply 100% inspection report.
Part – Small Thread – Value 100 points

1. Manufacture on Takasawa CNC Lathe.
2. Raw stock: CRS – Diameter to be determined by student and approved by instructor.
3. Saw to 4.87” long.
5. All CNC “G” code to be manually programmed -Mastercam not allowed.
6. Instructor to inspect each CNC program before run.
7. Instructor to inspect each CNC setup before run.
8. 1st operation – Grip on area that finishes as thread. Turn .75 sphere area and sphere base to finish and overall length to 4.765” (.015” oversize). Turn hex area oversize and concentric to sphere area.
9. 2nd operation – grip on oversize hex diameter, face to overall final length, c/drill, use tailstock and turn thread complete.
10. Inspect external thread with thread micrometer, record dimension: ________________
11. 3rd operation - Using manual mill and 5C hex collet holder, mill flats (6 places). Drill and ream .25 diameter holes (6 places).
12. Supply 100% inspection report.

Part – 1 Inch Step Riser – Value 100 points

2. Raw stock: 2-1/2” CRS Rod. Saw to 1.5” long
4. Supply 100% inspection report.

Part – 2 Inch Step Riser – Value 100 points

2. Raw stock: 2-1/2” CRS Rod. Saw to 2.5” long
4. Supply 100% inspection report.

Part – Swivel Top – Value 100 points

2. Raw stock: 1.25” CRS Rod. Saw to 1” long
4. Supply 100% inspection report.
# PCC MMT TSA CNC Lathe Inspection Form

**Student’s Name:** __________________________________  **Instructor:** ________________________________

**Part Name:** ___________________________________________________________________________

In the columns below, list the print dimension and tolerance as listed on the drawing, followed by the actual measurement recorded when measured. **All dimensions must be inspected.** This sheet to be turned in with finished parts after all parts are complete.

1. Listed: ___________________________  Actual: ___________________________
2. Listed: ___________________________  Actual: ___________________________
3. Listed: ___________________________  Actual: ___________________________
4. Listed: ___________________________  Actual: ___________________________
5. Listed: ___________________________  Actual: ___________________________
6. Listed: ___________________________  Actual: ___________________________
7. Listed: ___________________________  Actual: ___________________________
8. Listed: ___________________________  Actual: ___________________________
9. Listed: ___________________________  Actual: ___________________________
10. Listed: ___________________________  Actual: ___________________________
11. Listed: ___________________________  Actual: ___________________________
12. Listed: ___________________________  Actual: ___________________________
13. Listed: ___________________________  Actual: ___________________________
14. Listed: ___________________________  Actual: ___________________________
15. Listed: ___________________________  Actual: ___________________________
16. Listed: ___________________________  Actual: ___________________________
17. Listed: ___________________________  Actual: ___________________________
18. Listed: ___________________________  Actual: ___________________________
19. Listed: ___________________________  Actual: ___________________________
20. Listed: ___________________________  Actual: ___________________________
21. Listed: ___________________________  Actual: ___________________________
22. Listed: ___________________________  Actual: ___________________________
23. Listed: ___________________________  Actual: ___________________________
24. Listed: ___________________________  Actual: ___________________________
25. Listed: ___________________________  Actual: ___________________________
26. Listed: ___________________________  Actual: ___________________________
27. Listed: ___________________________  Actual: ___________________________
28. Listed: ___________________________  Actual: ___________________________
29. Listed: ___________________________  Actual: ___________________________
30. Listed: ___________________________  Actual: ___________________________
31. Listed: ___________________________  Actual: ___________________________

**Student’s signature confirming measurements:** _____________________________________________

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Attachment 4 (page 3 of 3)
NOTES:
1) STOCK SIZE Ø 2 1/2 X 3 1/8
2) BREAK ALL SHARP EDGES
NOTE:
BREAK ALL SHARP EDGES
NOTES:
1) BREAK ALL SHARP EDGES

DRAWN BY: JASON BROWN
DATE: 03 MAY 2012
MATL: CRS 1018
HEAT TREAT TO: 4 PLACE (XXXX) ± .0005

UNLESS SPECIFIED DIMENSIONS ARE IN INCHES
2 PLACE (XX) ± .010
3 PLACE (XXX) ± .005
4 PLACE (XXXX) ± .0005

FRACTION ± 1/64
ANGLE ± 1°
SURFACE FINISH 125

PCC MACHINE MANUFACTURING TECHNOLOGY
TITLE: TSA SCREW JACK - SMALL THREAD
SCALE: FULL
SHEET: 4 OF 6
SIZE: A

Produced by an Autodesk Educational Product.
NOTES:
BREAK ALL SHARP EDGES

<table>
<thead>
<tr>
<th>DRAWN BY:</th>
<th>UNLESS SPECIFIED DIMENSIONS ARE IN INCHES</th>
<th>PCC MACHINE MANUFACTURING TECHNOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>J. HANSON</td>
<td>2 PLACE (XX) ± .010</td>
<td>TITLE: SWIVEL TOP</td>
</tr>
<tr>
<td>DATE: 5/3/12</td>
<td>3 PLACE (XXX) ± .005</td>
<td>SCALE: 1:1</td>
</tr>
<tr>
<td>MATL: CRS</td>
<td>ANGLE ± 1&quot;</td>
<td>SHEET: 6 OF 6</td>
</tr>
<tr>
<td>HEAT TREAT TO:  N/A</td>
<td>4 PLACE (XXXX) ± .0005</td>
<td>SIZE: A</td>
</tr>
<tr>
<td></td>
<td>SURFACE FINISH 125</td>
<td></td>
</tr>
</tbody>
</table>

ø1.125

ø.750 x 9/16 TIP DEPTH

ø.875

.250

7 8

60°
<table>
<thead>
<tr>
<th>Point Reduction Chart For MMT Project Work</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>-15 points</strong></td>
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<tr>
<td><strong>External Threads</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>(Using Over and Under Thread Gauge Standards)</td>
</tr>
<tr>
<td><strong>Overall Appearance</strong></td>
</tr>
<tr>
<td>(Blemishes, Burrs, Required Surface Finishes)</td>
</tr>
</tbody>
</table>

Parts receiving a 69% or Less have the option to re-do the part with an averaging of the first and second attempt being your final grade.