RESEARCH & CURRICULUM UNIT
*education about jobs*

# SEC – Precision Machining Blueprints

This document contains the blueprints for the concentration areas in secondary Precision Machining.

| Course Code(s) | Test Code | Program Name | Supplemental Materials/Notes |
|---|---|---|---|
| **993403, 993405, 993406** | 11380Y1-2015 | Precision Machining | |
| **993404, 993407, 993408** | 11380Y2-2015 | Precision Machining | |

| | Perkins Assessment 2016-17 | | Teacher Evaluation Pilot 2016-17 | | | |
|---|---|---|---|---|---|---|
| **Curriculum** | **Y1 Post-Test** | **Y2 Post-Test** | **Y1 Baseline** | **Y1 Post-Test** | **Y2 Baseline** | **Y2 Post-Test** |
| Precision Machining | MS-CPAS2* | MS-CPAS2* | NA* | NA* | NA* | NA* |

* These assessments are subject to change based on funding and policy changes/updates.
Information for test coordinators will be disseminated on the ordering process for the national certification by the Research and Curriculum Unit at Mississippi State University.

# MS-CPAS2 Blueprint Summary

**Assessment:** Precision Machining
**Test Code:** 11380Y1-2015
**CIP Code:** 480503
**Course Codes:** 993403, 993405, 993406
**Type:** CP

The MS-CPAS2 Blueprint Summary indicates the number of assessment questions related to each unit on the assessment and indicates the relative emphasis placed on each unit. All of the listed competencies will appear on the assessment, but because of the length of the assessment, not every competency will be equally represented in the assessment.

The MS-CPAS2 Blueprint Summary includes a variety of information, which is explained below:

| Terms and Definitions | |
|---|---|
| **Assessment:** | This signifies the name of the assessment, which corresponds with the name of the pathway or program. |
| **CIP Code:** | Developed by the U.S. Department of Education's National Center for Education Statistics (NCES), CIP codes are a federal coding system utilized for assessment and reporting of fields of study and program completions activity tracking. |
| **Test Code:** | A unique code that serves to numerically identify a specific assessment |
| **DOK Levels:** | Based on Webb's Depth of Knowledge (DOK), this signifies the assessment item difficulty factor to be expected in each unit. The three levels are as follows:<br>*1 = Recall and Reproduction, 2 = Skills and Concepts, 3 = Short-term Strategic Thinking*<br>**Some postsecondary programs will not use DOK levels until the next revision.** |
| **Instructional** | The total number of hours assigned to a unit per the pathway's curriculum |
| **Total Items:** | The total number of items assigned to each unit on the assessment. It is calculated as follows:<br>*(Unit Instructional Hours / Total Instructional Hours) * Total Active Items* |
| **Active Items:** | The number of items on the assessment that will be graded |
| **Field-test Items:** | The number of items that are being field-tested, or piloted, to determine their eligibility for inclusion as an Active Item on future assessments. These items are not graded and, thus, will not impact the student's final score. |
| **Total Assessed Items:** | The total number of items on the given assessment. It is calculated as follows:<br>*Active Items + Field-test Items* |

For more information regarding this MS-CPAS2 Blueprint Summary, please contact the Mississippi Assessment Center by phone at 1.866.901.7433 or by e-mail at helpdesk@rcu.msstate.edu.

| **Assessment:** Precision Machining<br>**Test Code:** 11380Y1-2015<br>**CIP Code:** 480503<br>**Total Hours:** 195 | DOK Level(s) | | | Instructional Hours | Total Items |
|---|---|---|---|---|---|
| **Unit 1: Orientation, Leadership, and Basic Safety** | 1 | 2 | | 25 | 10 |
| 1. Not on CPAS<br>2. Not on CPAS<br>3. Not on CPAS<br>4. Describe general safety rules for working in a shop/lab and industry.<br>5. Identify and apply safety around manufacturing operations.<br>6. Explain lifting.<br>7. Explain the material safety data sheet (MSDS).<br>8. Explain fires. | | | | | |
| **Unit 2: Math, Measuring Tools, and Instruments** | 1 | 2 | | 20 | 9 |
| 1. Apply the four basic math skills with whole numbers, fractions, and percentages.<br>2. Perform basic mathematical calculations related to machine shop operations.<br>3. Identify and perform functions using various measuring tools and instruments (micrometers, dial indicators, height gauge, and digital caliper). | | | | | |
| **Unit 3: Introduction to Blueprints and Hand and Power Tools** | 1 | 2 | | 25 | 10 |
| 1. Read, analyze, and design a blueprint<br>2. Demonstrate the use and maintenance of various hand and power tools. | | | | | |
| **Unit 4: Drill Press and Band Saw Theory and Operation** | 1 | 2 | | 20 | 8 |
| 1. Identify and describe the types of drilling machines, including hand powered and drill press, and the rules for safe operation of each.<br>2. Identify and describe the safe operation of the types of power saws. | | | | | |
| **Unit 5: Milling Machine Theory and Operation** | 1 | 2 | | 30 | 12 |
| 1. Differentiate between the types of vertical milling machines.<br>2. Identify the parts, cutting tools, and basic maintenance of a vertical milling machine.<br>3. Perform operations on a milling machine. | | | | | |
| **Unit 6: Lathe Theory and Operation** | 1 | 2 | | 75 | 31 |
| 1. Identify the parts, rules, and care of the metal lathe.<br>2. Perform procedures for a machining operation. | | | | | |
| | | | | **Active Items** | **80** |
| | | | | **Field-Test Items** | **20** |
| | | | | **TOTAL ASSESSED ITEMS** | **100** |

# MS-CPAS2 Blueprint Summary

**Assessment:** Precision Machining
**Test Code:** 11380Y2-2015
**CIP Code:** 480503
**Course Codes:** 993404, 993407, 993408
**Type:** CP

The MS-CPAS2 Blueprint Summary indicates the number of assessment questions related to each unit on the assessment and indicates the relative emphasis placed on each unit. All of the listed competencies will appear on the assessment, but because of the length of the assessment, not every competency will be equally represented in the assessment.

The MS-CPAS2 Blueprint Summary includes a variety of information, which is explained below:

| Terms and Definitions | |
|---|---|
| **Assessment:** | This signifies the name of the assessment, which corresponds with the name of the pathway or program. |
| **CIP Code:** | Developed by the U.S. Department of Education's National Center for Education Statistics (NCES), CIP codes are a federal coding system utilized for assessment and reporting of fields of study and program completions activity tracking. |
| **Test Code:** | A unique code that serves to numerically identify a specific assessment |
| **DOK Levels:** | Based on Webb's Depth of Knowledge (DOK), this signifies the assessment item difficulty factor to be expected in each unit. The three levels are as follows:<br>*1 = Recall and Reproduction, 2 = Skills and Concepts, 3 = Short-term Strategic Thinking*<br>**Some postsecondary programs will not use DOK levels until the next revision.** |
| **Instructional Hours:** | The total number of hours assigned to a unit per the pathway's curriculum |
| **Total Items:** | The total number of items assigned to each unit on the assessment. It is calculated as follows:<br>*(Unit Instructional Hours / Total Instructional Hours) * Total Active Items* |
| **Active Items:** | The number of items on the assessment that will be graded |
| **Field-test Items:** | The number of items that are being field-tested, or piloted, to determine their eligibility for inclusion as an Active Item on future assessments. These items are not graded and, thus, will not impact the student's final score. |
| **Total Assessed Items:** | The total number of items on the given assessment. It is calculated as follows:<br>*Active Items + Field-test Items* |

For more information regarding this MS-CPAS2 Blueprint Summary, please contact the Mississippi Assessment Center by phone at 1.866.901.7433 or by e-mail at helpdesk@rcu.msstate.edu.

| Assessment: Precision Machining<br>Test Code: 11380Y2-2015<br>CIP Code: 480503<br>Total Hours: 193 | DOK Level(s) | | | Instructional Hours | Total Items |
|---|---|---|---|---|---|
| **Unit 9: Orientation, Advanced Leadership, and Employability** | 1 | | | 8 | 3 |
| 1. Not on CPAS<br>2. Describe employment opportunities and responsibilities.<br>3. Demonstrate the ability to follow verbal and written instructions and communicate effectively in on-the-job situations | | | | | |
| **Unit 10: Not on CPAS** | | | | | |
| **Unit 11: Advanced Lathe Operation** | 1 | 2 | | 115 | 48 |
| 1. Describe safety precautions, methods for measuring thread-pitch diameters, and calculation of dimensions using taper formulas to 0.003 tolerance.<br>2. Perform various operations according to specifications. | | | | | |
| **Unit 12: Advanced Milling Operation** | 1 | 2 | | 70 | 29 |
| 1. Adjust speed and feed rates, clean and lubricate, mount arbors and adjust arbor support bushing, mount a cutter, mill a key-way, and perform selected operations.<br>2. Mount and remove cutters and cutter holders, align a vise using a dial indicator, and perform selected vertical milling and boring operations | | | | | |
| | | | | **Active Items** | **80** |
| | | | | **Field-Test Items** | **20** |