



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**BENCHWORK
MTT3563 1 Credit Hour**

Student Level:

This course is open to students on the college level in either the freshman or sophomore year and to area high school vocational students.

Catalog Description:

MTT 3563 - BENCHWORK (1 hr)

Students will be provided the opportunity to learn and practice bench work skills such as filing, drilling, tapping, deburring and layout for projects. They will gain valuable practical experience in the use of various hand tools by producing basic bench work projects. Topics will include safety, print reading, job planning, and quality control.

Prerequisites:

INR3718 OSHA 10 (may be taken concurrently)

Controlling Purpose:

Students will be provided the opportunity to learn and practice bench work skills such as filing, drilling, tapping, deburring and layout for projects. They will gain valuable practical experience in the use of various hand tools by producing basic bench work projects. Topics will include safety, print reading, job planning, and quality control.

Learner Outcomes:

- A. Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines.
- B. Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches.
- C. Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking.
- D. Apply safety principles in a work environment to minimize hazards and prevent losses to productivity.
- E. Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields.
- F. Use CAD and CAM programs to design parts and program manufacturing machines.

The learning outcomes and competencies detailed in this course outline or syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups project for this course as approved by the Kansas Board of Regents.

Units Outcomes and Criterion Based Evaluation Key for Core Content:

The following defines the minimum core content not including the final examination period. Instructors may add other content as time allows.

Evaluation Key:

- A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.
- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.
- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D = A few of the major goals have been achieved, but the student’s achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

UNIT 1: Conduct Job Hazard Analysis For Hand Tools						
Outcomes: Upon completion of this course the student will be able to demonstrate knowledge of all the hazards associated with the hand tools used in the machine shop.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Apply safety principles in a work environment to minimize hazards and prevent losses to productivity.

UNIT 2: Conduct Job Hazard Analysis For Power Tools

Outcomes: Upon completion of this course the student will be able to demonstrate knowledge of all the hazards associated with the power tools used in the machine shop.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Apply safety principles in a work environment to minimize hazards and prevent losses to productivity.

UNIT 3: Select Hand Tools For Assigned Tasks

Outcomes: Upon completion of this course the student will be able to demonstrate the ability to select the right tool for the job at hand.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking.
						Apply safety principles in a work environment to minimize hazards and prevent losses to productivity.

UNIT 4: Select Power Tools For Assigned Tasks

Outcomes: Upon completion of this course the student will be able to demonstrate the ability to select the right tool for the job at hand.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking.
						Apply safety principles in a work environment to minimize hazards and prevent losses to productivity.

UNIT 5: Lay Out Parts For Machining Using Semi-Precision And Precision Lay Out Practices

Outcomes: Upon completion of this course the student will be able to demonstrate the ability to layout parts using a blueprint and the correct tools for semi-precision and precision tools.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches.
						Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking.

UNIT 6: Drill Holes Using Electric And Pneumatic Drills

Outcomes: Upon completion of this course the student will be able to demonstrate how to drill holes using electric and pneumatic drills.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines.
						Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches.
						Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking.

UNIT 7: Maintain Pedestal Grinders

Outcomes: Upon completion of this course the student will be able to demonstrate the ability to maintain the pedestal grinders by keeping the grinding wheels dressed and the area clean.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Apply safety principles in a work environment to minimize hazards and prevent losses to productivity.

UNIT 8: Saw Stock To Length

Outcomes: Upon completion of this course the student will be able to demonstrate the ability to cut stock to length using the Ellis band saw.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines.
						Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches.
						Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking.

UNIT 9: Sharpen Drill Bits And Lathe Tools

Outcomes: Upon completion of this course the student will be able to demonstrate the ability to sharpen drill bits and lathe tools on the pedestal grinder.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines.
						Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches.
						Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking.

UNIT 10: Use Free Hand Saws To Cut Angles And Remove Material

Outcomes: Upon completion of this course the student will be able to demonstrate the ability to use hand saws to cut angles and remove materials.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines.
						Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches.
						Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking.

UNIT 11: Finish Parts Using Electrical And Pneumatic Tools

Outcomes: Upon completion of this course the student will be able to demonstrate the ability to finish parts using electrical and pneumatic tools, sanding and polishing.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines.
						Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches.
						Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking.

UNIT 12: Use A Press To Insert Bushings, Bearings, And Pins

Outcomes: Upon completion of this course the student will be able to demonstrate the ability to use a hydraulic press to insert bushings, bearing and pins.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines.
						Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches.
						Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking.

UNIT 13: Broach Internal Key Ways

Outcomes: Upon completion of this course the student will be able to demonstrate the ability to create internal key ways using a broach.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines.
						Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches.
						Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking.

Projects Required:

As assigned

Textbook:

Contact Bookstore for current textbook.

Materials/Equipment Required:

None

Attendance Policy:

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

Grading Policy:

The grading policy will be outlined by the instructor in the course syllabus.

Maximum class size:

Based on classroom occupancy

Course Timeframe:

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

Refer to the following policies:

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

Disability Services Program:

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability, which may impact work in this class which requires accommodations, contact the Disability Services Coordinator.