COWLEY COLLEGE
& Area Vocational Technical School

COURSE PROCEDURE FOR

MACHINING I
MTT3561 3 Credit Hours

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 3561 - MACHINING I (3 hrs)
Fundamental machine shop instruction involving safety, use and care of hand and measuring tools, basic lathe operations, and single point tool grinding. Screw threads and their application, classes of fits, and tolerances are stressed.

Prerequisites:
INR3718 OSHA 10

Controlling Purpose:
Students will learn to conduct job hazard analysis for conventional mills and lathes, develop math skills for machine tool operations, perform preventive maintenance and housekeeping on conventional mills and lathes, select work holding devices for mills, lathes and other machine tools, calculate feeds and speeds, remove material using milling and turning processes, align milling head, use a vertical mill to center drill, drill and ream holes, change tools and tool holders on milling machines, and maintain saws and grinders.

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 (JHA) For Conventional Mills And Lathes Outcomes: Upon completion of this course the student will be able to identify safety hazards on the mills and lathes and demonstrate how to operate them safely.						
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: Develop Math Skills For Machine Tool Operations

Outcomes: Upon completion of this course the student will be able to demonstrate how to figure tapers, angle cuts, and hole locations using applied math skills.

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.
						Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields.

UNIT 3: Convert Metric/English Measurements

Outcomes: Upon completion of this course the student will be able to demonstrate how to convert metric and English measurements needed to machine parts on the lathes and mills.

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.

UNIT 4: Perform Preventive Maintenance On Manual Lathes

Outcomes: Upon completion of this course the student will be able to demonstrate how to clean and do preventive maintenance such as check and fill oil, lube ways, and adjust tail stock.

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.
						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: Select Work Holding Devices

Outcomes: Upon completion of this course the student will be able to demonstrate how to select the proper work holding devices for the machining process.

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.
						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 6: Calculate Cutting Speeds And Feeds For An Assigned Project

Outcomes: Upon completion of this course the student will be able to demonstrate how to calculate cutting speeds and feeds using formulas for machining.

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 7: Perform Operations Using Tailstock

Outcomes: Upon completion of this course the student will be able to demonstrate how to utilize the tailstock for long parts and how to set up to do a taper.

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.
						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 8: Set Speeds, Feeds And Depth Of Cut On Milling Machines

Outcomes: Upon completion of this course the student will be able to demonstrate how to set feeds, speeds, and depth of cut using formulas for conventional machining.

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.
						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 9: Perform O.D. Facing And Turning Operations

Outcomes: Upon completion of this course the student will be able to demonstrate how to perform O.D. facing and turning operations.

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.
						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.
						Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields.

UNIT 10: Perform Maintenance On Vertical/Horizontal Milling Machines

Outcomes: Upon completion of this course the student will be able to demonstrate how to perform preventive maintenance on vertical/horizontal milling machines.

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.
						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 11: Change Tools And Holders On Milling Machines

Outcomes: Upon completion of this course the student will be able to demonstrate how to change tools and holders on milling machines.

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.
						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.
						Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields.

UNIT 12: Align Vertical Mill Head

Outcomes: Upon completion of this course the student will be able to demonstrate how to align vertical mill head, align head to vise within .0005 in 15 minutes.

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.
						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.
						Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields.

UNIT 13: Use Vertical Mill To Center Drill, Drill And Ream Holes

Outcomes: Upon completion of this course the student will be able to demonstrate how to use the vertical mill to center drill, drill and ream holes.

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.
						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.
						Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields.

UNIT 14: Remove Material Using Milling And Turning Processes

Outcomes: Upon completion of this course the student will be able to demonstrate how to remove material using milling and turning processes.

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.

UNIT 15: Machine Parts Square On Milling Machines Outcomes: Upon completion of this course the student will be able to demonstrate how to machine parts square on milling machines.						
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 16: Maintain Saws Outcomes: Upon completion of this course the student will be able to demonstrate how to maintain both horizontal and vertical band saws.						
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.
						Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields.

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.