



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**MANUFACTURING PROCESSES AND SYSTEMS
MEC3488 3 Credit Hours**

Student Level:

This course is open to high school and post-secondary level students.

Catalog Description:

MEC 3488 - MANUFACTURING PROCESSES AND SYSTEMS (3 hrs)

The students will obtain knowledge of structures, characteristics, production and fields, of application of metallic, organic and inorganic non-metallic materials. Economic efficiency and environmental compatibility in manufacturing setting will be stressed.

Prerequisites:

None

Controlling Purpose:

This course is designed to help the student increase their knowledge regarding fundamentals of manufacturing processes and systems.

Learner Outcomes:

Upon completion of the course, the student will be able to demonstrate a proficiency in basic materials, processes, EPA and safety concerns and manufacturing systems.

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

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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: Manufacturing Processes Introduction

Outcomes: Upon completion of this unit, the student will be able to successfully identify manufacturing processes.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Explain ten processes used in manufacturing.
						Understand the impact manufacturing has on industrial development.
						Describe how basic systems used in the manufacturing process have evolved.

UNIT 2: Materials

Outcomes: Upon completion of this unit, the student will be able to successfully understand material types.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Apply applications for materials including metallic, organic and inorganic non-metallic materials.
						List and describe material sources used in manufacturing.
						Understand the fundamental safety concerns when using materials such as metallic, organic and inorganic non-metallic materials.
						Review and summarize material applications including structural concerns when using various materials.

UNIT 3: Environmental Concerns

Outcomes: Upon completion of this unit, the student will be able to successfully understand impact of materials.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						State environmental concerns when using various types of materials.
						Understand appropriate safety concerns when using various types of materials in a manufacturing setting.
						Determine an appropriate understanding of environmental disposal requirements when using various types of industrial materials.

UNIT 4: Material Usage

Outcomes: Upon completion of this unit, the student will be able to successfully understand applications used for materials.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Determine the most appropriate materials for a given project.
						Perform budgetary functions including preparing job estimations using specified materials.
						Make oral and written recommendations to companies on use of materials in an industrial setting.

UNIT 5: Materials Properties

Outcomes: Upon completion of this unit, the student will be able to successfully understand key properties of specific material types.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						List and describe material properties of ferrous and non-ferrous alloys.
						List and describe material properties for monomers and polymers.
						List and describe material properties for ceramics and composites.

UNIT 6: Material Measurements and Tolerances

Outcomes: Upon completion of this unit, the student will be able to successfully apply precision measuring techniques to materials.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Understand and GD&T coordinates as they apply to tolerance zones, feature control frame surface finish.
						Understand industrial tolerance requirements.
						Perform measurements using a Coordinate Measuring Machine (CMM)
						Perform measurements using scales, calipers, micrometers and other instruments commonly used in industry.

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

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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.