



## COURSE OUTLINE: MCH244 - MANUFACT. PROCESS

Prepared: Howard Gray

Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	MCH244: MANUFACTURING PROCESS
<b>Program Number: Name</b>	4039: MECH. ENG. TN-MANUFA 4040: MACHINE SHOP 5082: MECH.TECH.IND.MAINT.
<b>Department:</b>	MECHANICAL TECHNIQUES PS
<b>Academic Year:</b>	2022-2023
<b>Course Description:</b>	The general objective of this course is to give students a basic introduction to manufacturing processes, process sequences and an introduction to the 5Ms of industrial processing. The course centers on the steel production and steel manufacturing industries, but the concepts introduced are applicable to most manufacturing environments.
<b>Total Credits:</b>	4
<b>Hours/Week:</b>	3
<b>Total Hours:</b>	42
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Vocational Learning Outcomes (VLO's) addressed in this course:</b>	<p><b>4039 - MECH. ENG. TN-MANUFA</b></p> <p>VLO 1 Complete all work in compliance with current legislation, standards, regulations and guidelines.</p> <p>VLO 2 Apply quality control and quality assurance procedures to meet organizational standards and requirements.</p> <p>VLO 3 Comply with current health and safety legislation, as well as organizational practices and procedures.</p> <p>VLO 4 Apply sustainability best practices in workplaces.</p> <p>VLO 5 Use current and emerging technologies to support the implementation of mechanical engineering projects.</p> <p>VLO 6 Analyze and solve mechanical problems by applying mathematics and fundamentals of mechanical engineering.</p> <p>VLO 10 Verify the specifications of materials, processes and operations to support the design and production of mechanical components.</p> <p>VLO 11 Contribute to the planning, implementation and evaluation of projects.</p> <p>VLO 12 Develop strategies for ongoing personal and professional development to enhance work performance.</p> <p><b>4040 - MACHINE SHOP</b></p> <p>VLO 1 Complete all work in compliance with current legislation, standards, regulations and guidelines.</p>
<b>Please refer to program web page for a complete listing of program outcomes where applicable.</b>	



- VLO 2 Contribute to the application of quality control and quality assurance procedures to meet organizational standards and requirements.
- VLO 3 Comply with current health and safety legislation, as well as organizational practices and procedures.
- VLO 4 Support sustainability best practices in workplaces.
- VLO 7 Contribute to the interpretation and preparation of mechanical drawings and other related technical documents.
- VLO 10 Select, use and maintain machinery, tools and equipment for the installation, manufacturing and repair of basic mechanical components.

**5082 - MECH.TECH.IND.MAINT.**

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**Essential Employability Skills (EES) addressed in this course:**

- EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
- EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.
- EES 4 Apply a systematic approach to solve problems.
- EES 5 Use a variety of thinking skills to anticipate and solve problems.
- EES 6 Locate, select, organize, and document information using appropriate technology and information systems.
- EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.
- EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.
- EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
- EES 10 Manage the use of time and other resources to complete projects.
- EES 11 Take responsibility for ones own actions, decisions, and consequences.

**General Education Themes:** Science and Technology

**Course Evaluation:** Passing Grade: 50%, D

A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.



**Other Course Evaluation & Assessment Requirements:**

Grade  
 Definition Grade Point Equivalent  
 A+ 90 - 100% 4.00  
 A 80 - 89%  
 B 70 - 79% 3.00  
 C 60 - 69% 2.00  
 D 50 - 59% 1.00  
 F (Fail) 49% and below 0.00

CR (Credit) Credit for diploma requirements has been awarded.  
 S Satisfactory achievement in field /clinical placement or non-graded subject area.  
 U Unsatisfactory achievement in field/clinical placement or non-graded subject area.  
 X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.  
 NR Grade not reported to Registrar's office.  
 W Student has withdrawn from the course without academic penalty.

**Books and Required Resources:**

Handout provided by Robert Ackert

**Course Outcomes and Learning Objectives:**

<b>Course Outcome 1</b>	<b>Learning Objectives for Course Outcome 1</b>
1. Upon successful completion of this course, the student will distinguish the various processes:	1.1 Give the definitions of process and process sequence. 1.2 Describe linear processes. 1.3 Describe parallel processes.
<b>Course Outcome 2</b>	<b>Learning Objectives for Course Outcome 2</b>
2. Upon successful completion of this course, the student will be able to explain the 5Ms of Manufacturing Systems:	2.1 Describe each of the 5M elements in manufacturing processes and how they interrelate in a total quality management system. i. Man ii. Material iii. Machines iv. Methods v. Measurement 2.2 Relationship to Quality Management System
<b>Course Outcome 3</b>	<b>Learning Objectives for Course Outcome 3</b>
3. Upon successful completion of this course, the student will be able to describe the Steel Production processes:	3.1 Describe the production flow through an integrated steel plant from incoming raw materials to shipped product. 3.2 Describe the various steel production processes work. 3.3 Explain how the various processes work. 3.4 Where alternate processes are available, explain the technical and economic advantages and disadvantages of each alternate i. Cokemaking ii. Ironmaking iii. Steelmaking iv. Casting v. Hot Rolling vi. Pickling



	vii. Cold Rolling viii. Annealing 3.5 Shipping
<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>
4. Upon successful completion of this course, the student will be able to describe the Steel Manufacturing processes	<p>4.1 Recognize and describe various manufacturing processes used for the production of goods made from steel.</p> <p>4.2 Describe the demands made on the material in each of the various processes covered.</p> <p>4.3 Explain in technical and economic terms why one process may be used as opposed to a possible alternate process</p> <p>i. Cutting:</p> <p>a. Shearing</p> <p>b. Flame cutting</p> <p>c. Plasma Cutting</p> <p>d. Laser cutting</p> <p>ii. Metal forming:</p> <p>a. Punching</p> <p>b. Blanking</p> <p>c. Bending</p> <p>d. Press forming</p> <p>e. Roll forming</p> <p>f. Drawing</p> <p>g. Hydroforming</p> <p>iii. Joining:</p> <p>a. Bolting b. Riveting</p> <p>c. Arc welding</p> <p>d. Resistant spot welding</p> <p>e. Seam welding</p> <p>f. Friction Welding</p> <p>g. Laser welding</p> <p>h. Brazing</p> <p>i. Soldiering</p> <p>iv. Machining:</p> <p>a. Milling and Drilling</p> <p>b. Turning</p> <p>c. Grinding</p> <p>v. Casting:</p> <p>a. Sand casting</p> <p>b. Permanent mould casting</p> <p>c. Lost wax casting</p>

<b>Evaluation Process and Grading System:</b>	<b>Evaluation Type</b>	<b>Evaluation Weight</b>
	Assignments/Reports	40%
	Tests	60%

**Date:** June 21, 2022

**Addendum:** Please refer to the course outline addendum on the Learning Management System for further information.