

NEWPORT-MESA UNIFIED SCHOOL DISTRICT Course Description

MANUFACTURING TECHNOLOGY 1AB, 2AB

Overview:

Manufacturing technology introduces manufacturing systems, manufacturing processes, machine tool processes, and manufacturing enterprise. The curriculum will prepare the student with entry level skill for employment or advanced training in a variety of related fields. In addition, manufacturing technology will be a powerful and positive link with all other disciplines providing, enhancing, and reinforcing the student to be a productive citizen in our modern society.

Core Course of Study Objectives:

1. SAFETY, BASIC MACHINES, AND HAND TOOLS

The student will understand safe and appropriate use of tools and machines. Students will demonstrate the correct operation of tools and machines to form, separate, combine, and condition materials.

2. PLANNING AND LAYOUT PROCESSES

The student will understand the planning and layout process including design, print reading, measuring and others as used in manufacturing. The students will read prints and use the information to plan, estimate, layout, and produce a part or product.

3. MATERIALS PROCESSING, ASSEMBLY AND FINISHING

The student will understand how materials are processed using tools and machines. They will perform the processes of cutting, forming, combining, shaping, etc., of materials to manufacture a part or product. In addition, the student will understand various assembly and finishing processes, including mechanical fastening, joining, fusion bonding, adhesive bonding finishing materials, material preparation, and application of finishes, as used in manufacturing. They will select and apply the appropriate processes to the design and production of a part or product.

4. CONVENTIONAL MANUFACTURING SYSTEMS

The student will understand and explain a variety of manufacturing systems which require standard hand and machine tools. They will select and use appropriate conventional tools, machines, and inspection devices to manufacture a part or product.

5. NEW and EMERGING TECHNOLOGY SYSTEMS

The student will understand the ongoing developments of emerging manufacturing technology systems. They will explain how emerging systems can integrate into current manufacturing processes.

6. WELDING, MACHINE TOOL, AND INDUSTRIAL FORMING PROCESSES

The student will understand a variety of welding machines (gas cutting and welding, brazing, arc welding), the operation and function of machine tool operation in production and prototype work, and industrial forming and their applications to specific materials. They will perform these processes necessary to complete an assembly, or repair a product, or effectively produce or manufacture a part or product.

7. QUALITY CONTROL

The student will understand inspection and quality control within the manufacturing process. They will perform continuous inspections to ensure that parts or products meet the design specifications.

Additional Course of Study Objectives Applicable to Manufacturing Technology 2AB:**8. AUTOMATED MANUFACTURING SYSTEMS**

The student will understand and explain a variety of automated manufacturing systems such as tool design, design of manufacturing, flexible manufacturing, and material planning. They will use computer to design and produce a product, and/or control a robot or machines.

9. MANUFACTURING ENTERPRISE ORGANIZATION

The students will understand how a manufacturing company is organized. They will develop a structure which includes financing, management, and marketing.

10. PRODUCTION TECHNOLOGY AND MANAGEMENT

The student will understand the elements of production management. They will establish a management system which includes the planning, engineering organizing, actuating and controlling of resources and manufacturing.

11. PRODUCTION DEVELOPMENT AND DOCUMENTATION

The student will understand basic elements of proper product or project development and documentation (including estimating, code and specifications, sketching, materials and process selection, and print reading) used in manufacturing.

Student Activities:

- A. Use appropriate tools and equipment, read textual materials, watch videos and teacher demonstrations, utilize computer hardware, software and peripherals, complete paper and pencil exercises.
- B. Plan, organize, research, design, execute, construct and complete well crafted teacher assigned sketches, drawings, projects and models.
- C. Work both independently and in cooperative groups.
- D. Work toward an acceptable entry level industry standard in the quality of their work.
- E. Practice the scientific method of problem solving as related to final project development.
- F. Practice self and peer evaluation of class work.
- G. Develop, organize and maintain a portfolio of student work.

Teacher Activities:

- A. Conduct lectures, discussions, and demonstrations.
- B. Facilitate collaborative learning.
- C. Assign projects, monitor progress, advise, mentor, and evaluate completed work.
- D. Provide positive feedback and give appropriate credit for student work.
- E. Discuss portfolio content, advise, and evaluate student portfolios.
- F. Establish and maintain effective working relationships with business partners in related fields.

Suggested Instructional Materials:

Supplemental texts and reference materials as appropriate for project development.

Library collection and reference materials including multi-media and on-line sources as deemed appropriate by instructor.

Vendor materials, kits and modules.

Suggested vendors for use as reference:

Modern Schools Supplies, Pitsco, Hearlihy & Co., Paxton-Patterson, Kelvin, Brodhead & Garrett, Southwest