SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Manufacturing Engineering Technology Program
Revision Date: August 23, 2021

I. CATALOG DESCRIPTION

Course Number:	MFGT2635
Course Title:	Plastics: Design & Engineering
Prerequisite(s):	None
Catalog Description:	Study of the physical, chemical, and mechanical properties of plastics. Study of molding techniques and processes. Product design considerations and guidelines.
Credit Hours:	2
Class Hours:	15
Lab Hours:	45
Total Contact Hours:	60

II. COURSE OBJECTIVES: *Course will:*

A. Introduce the various types of plastics and the proper type of plastic for the design.
B. Review elementary polymer chemistry.
C. Review the physical characteristics of plastics.
D. Introduce ingredients and additives to polymers.
E. Provide an understanding of the use of molds and mold making techniques.
F. Review commercial considerations.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

A. Student Learning Outcomes: *Student will be able to:*
- **1.** Distinguish the various types of plastics and what is the proper type of plastic for the design.
- **2.** Identify the effects of mechanical and non-mechanical properties of plastics.
- **3.** Design a plastic piece part.
- **4.** Examine how chemical structures determine the unique characteristics of polymers.
- **5.** Show how ingredients are used to alter or improve selected properties of plastics.
- **6.** Know the three main areas of molding: injection, compression and transfer molding techniques for liquid resins.
- **7.** Identify material selection, processing techniques, production rates, and cost estimating.
- **8.** Calculate the strength and safety of polymers.

B. General Education Learning Outcomes (GELOs)
- **1.** GELO #3: Critical Thinking & Problem Solving
  Outcome 1: Collect, identify, interpret and analyze data.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information)*

A. Introduction to plastics
B. Plastics industry
C. Polymer chemistry
D. Elementary statistics
E. Properties of polymers
F. Plastics ingredients
G. Polymer selection

H. Injection molding process
I. Polymer processing
J. Designing mechanical components in plastic
K. Moldmaking
L. Commercial considerations

V. INSTRUCTIONAL MATERIALS

A. Required Text(s): Lokensgard, Erik, *Industrial Plastics: Theory and Application,* (current edition – see instructor)
B. Other Resources: Supplemental handouts supplied by instructor, Three-ring binder, Notebook 8 ½" by 11" (100 pages minimum)

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:
1. Lecture
2. Small and large group discussion
3. Video presentation
4. Demonstrations
5. Project boards
6. Flip charts
7. Handouts
8. Observations
9. Assigned lab projects
10. Field trips

VII. METHODS OF EVALUATION (*course outline will provide more detailed information)*

A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
1. Notebook (if required)
2. Quizzes
3. Tests
4. Lab grades
5. Attendance/class conduct

VIII. SPECIFIC COURSE REQUIREMENTS:

A. Completion of all tests, projects, assignments, and notebook (if required).
B. Must earn a final grade of 60% (1.0) or higher.