SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Manufacturing Engineering Technology Program
Revision Date: August 2025

I. CATALOG DESCRIPTION

Course Number:	MFGT2672
Course Title:	Mechanisms
Prerequisite(s):	MATH1050 or higher, MFGT1351
Catalog Description:	Theory and application of cams and gears, analysis of mechanisms and determination of positions, displacements, velocities, and acceleration of parts. Uses trigonometry for analytical analysis. Use of graphical solutions. Mechanisms such as couplings, universal joints, clutches, drive trains, four bar, slider crank, quick return, toggle, straight line, parallel, and intermittent motion devices.
Credit Hours:	2
Class Hours:	15
Lab Hours:	45
Total Contact Hours:	60

II. COURSE OBJECTIVES: *Course will:*

A. Explain the need for kinematic analysis of mechanisms.
B. Apply the appropriate trigonometry principles to a general triangle.
C. Graphically and analytically, determine the position of all links for an entire cycle of mechanism notion.
D. Using graphical methods design different types of mechanisms.
E. Identify linear, rotational and relative velocities.
F. Define linear, rotational, normal, tangential and relative accelerations.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

A. Student Learning Outcomes: *Student will be able to:*
- **1.** Define terms, make kinematic diagrams of mechanisms and compute number of degrees of freedom of a mechanism.
- **2.** Differentiate between a scalar quantity and a vector.
- **3.** Determine the resultant of two vectors, using both graphical and analytical methods.
- **4.** Define position and displacement of a point and graphically and analytically determine the limiting portion of a mechanism.
- **5.** Calculate the ratios and in balance angles and design bar mechanisms.
- **6.** Use relative velocity method to graphically solve for the velocity of a point on a link.
- **7.** Use the instantaneous center method to graphically and analytically determine the velocity of a point.
- **8.** Use relative acceleration method to analytically or graphically solve for acceleration of a point.

B. General Education Learning Outcomes (GELOs)
- **1.** GELO #5: Analytical, Quantitative, and Scientific Reasoning
  Outcome 4: Manipulate formulas, data sets, graphs, tables, etc. in a way to produce a meaningful outcome.

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

- **A.** Introduction to mechanisms and kinematics
- **B.** Simulating mechanisms using computer software
- **C.** Vectors
- **D.** Position analysis
- **E.** Velocity analysis
- **F.** Acceleration analysis
- **G.** Mechanism design

V. INSTRUCTIONAL MATERIALS

- **A.** Required Text(s): Myszka, David H., *Machines and Mechanisms, Applied Kinematic Analysis* (current edition – see instructor)
- **B.** Other Resources:
  - **1.** Supplemental handouts supplied by instructor
  - **2.** Notebook 8 ½" by 11" (100 pages minimum)
  - **3.** Scientific calculator w/owner's manual (calculator needs to be capable of calculating vector equations, both polar and rectangular) recommended – Sharp 506L or EL-546W or EL-506W

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.
- **C.** Program shop safety rules will be followed. **Please see the course outline for any additional safety rules established by the instructor.**