Las Positas College
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Course Outline for DSNT 76

GRAPHICAL KINEMATICS

Effective: Fall 2002

I. CATALOG DESCRIPTION:
DSNT 76 — GRAPHICAL KINEMATICS — 2.00 units

A study of elementary mechanisms with emphasis on the fundamentals of displacement, velocity and acceleration, and on the application of these to the analysis and design of mechanisms such as linkages, slides, cams, cranks, gears, and gear-trains.

1.00 Units Lecture 1.00 Units Lab

Strongly Recommended
-
or

DSNT 52 - Technical Graphics
and

-
or

MATH 38 - Trigonometry with Geometry

Grading Methods:
Letter Grade

Discipline:

	MIN
Lecture Hours:	18.00
Lab Hours:	54.00
Total Hours:	72.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT:

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering this course, it is strongly recommended that the student should be able to:

A. DSNT52
1. describe engineering design process and concurrent engineering design approach;
2. understand the importance of sketching and how it integrates into the design process;
3. develop visualization skills to clearly represent and control mental images;
4. use fundamental descriptive and spacial geometry methods to analyze graphic models;
5. develop a basic understanding of fastening devices, manufacturing tools, production processes, and their effects on the finished product;
6. describe how working drawings provide data to make part or assembly of final design;

B. MATH38

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. understand various types of machine components and their specific motion;
B. understand that complex machines are composed of many individual sub-systems and their interaction;
C. analysis the displacement, velocity and acceleration of mechanism motion;
D. solve mechanism problems by the use of vectors and graphical methods;

V. CONTENT:
A. Principles of displacement, velocity and acceleration
B. Vector and graphical methods of problem solving
C. Analysis and design of mechanisms
D. Analysis of gears and gear trains

E. Design of cams
F. Engineering technology
G. Problem solving in graphical and mathematical methods

VI. METHODS OF INSTRUCTION:
A. **Demonstration** - Lecture and lab demonstration
B. **Discussion** - Problem discussion and solution
C. Practical examples

VII. TYPICAL ASSIGNMENTS:
A. Reading: 1. Read Chapter 2 on Vectors and vector equations in preparation to do problem 2-1 on determining graphically the sum of vectors A and B. 2. Read Chapter 6 on the Velocity in Mechanisms, studying the parallel line method of solving velocities. B. Problem-solving: 1. Use Coriolis's Law, specifically the Acceleration Component, to solve the problem on page 186. 2. Explain the function of an Idler Gear in a train? Show a speed ratio (train value) which reflects this function.

VIII. EVALUATION:
A. **Methods**

B. **Frequency**

1. Frequency:
   a. Weekly problem assignments
   b. 1 Midterm, 1 Final examination
   c. Quizzes as needed

IX. TYPICAL TEXTS:
1. Kepler, Harold B. *Basic Graphical Kinematics.*, Glencoe Division, MacMillan/ McGraw-Hill, 1991.

X. OTHER MATERIALS REQUIRED OF STUDENTS:
A. Drawing equipment and instruments
B. Engineering computation paper