COMPUTER AIDED PROCESS PLANNING
(Elective - II)

Subject Code: 13ME2119

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Prerequisites: Computer Aided Manufacturing

Course Educational Objectives:

To make the student understand

1. fundamentals of computer aided process planning
2. group technology and applications
3. simulation of machining processes
4. importance of design and manufacturing tolerances
5. role of optimal selection of machining parameters

Course Outcomes:

The student will be able to

1. generate the structure of automated process planning system
2. use the principle of generative CAPP system for automation
3. predict the effect of machining parameters on production rate, cost and surface quality
4. solve optimization models of machining processes
5. develop awareness about the concept of concurrent engineering

UNIT – I

Introduction to CAPP: Information requirement for process planning system, role of process planning, advantages of conventional process planning over CAPP, structure of automated process planning system, feature recognition, methods

Generative CAPP system: Importance, principle of generative CAPP system, automation of logical decisions, knowledge based systems, inference engine, implementation, benefits

Retrieval CAPP system: Significance, group technology, structure, relative advantages, implementation, and applications

UNIT-II

Process planning and concurrent engineering: process planning, CAPP, concurrent engineering, design for manufacturing, advanced manufacturing planning

Selection of manufacturing sequence: Significance, alternative-manufacturing processes, reduction of total set-up cost for a particular sequence, quantitative methods for optimal selection, examples

UNIT –III

Determination of machining parameters: reasons for optimal selection of machining parameters, effect of parameters on production rate, cost and surface quality, different approaches, advantages of mathematical approach over conventional approach, solving optimization models of machining processes

Determination of manufacturing tolerances: design tolerances, manufacturing tolerances, methods of tolerance allocation, sequential approach**,** integration of design and manufacturing tolerances, advantages of integrated approach over sequential approach

UNIT –IV

Generation of tool path: Simulation of machining processes, NC tool path generation, graphical implementation, determination of optimal index positions for executing fixed sequence, quantitative methods

UNIT –V

Implementation techniques for CAPP: MIPLAN system, Computer programming languages for CAPP, criteria for selecting a CAPP system and benefits of CAPP, computer integrated planning systems, and capacity planning system

TEXT BOOKS:

1. Mikell P. Groover, "*Automation, Production systems and Computer Integrated Manufacturing*", 8th edition, PHI, New Delhi, 2010.
2. Dr. Sadhu Singh, "Computer Aided Design and manufacturing", Khanna publishers, 2000.

REFERENCES:

1. Change T C and Richard A Wysk, "*An Introduction to automated process planning systems*", Prentice Hall, 1985.
2. H.P. Wang and J.K. Li, "*Computer Aided Process Planning*", Elsevier Science and Technology Publishers, 1st edition,1991.