II B. Tech – II Semester

(20ME4756) CHASIS DESIGN AND PACKAGING

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	-	4

Pre-Requisites: Basics of automobile engineering

UNIT-I: Automatic Feeding and Orienting Devices:
Vibrator feeders, Mechanics of vibratory conveying, load sensitivity, solutions to load sensitivity, spiral elevators, balanced feeders. Types of oriental systems, effect of active orienting devices on feed rate, natural resting aspects of parts for automatic handing, out-of-bowl tooling, Reciprocating - tube hopper feeder

UNIT-II: Automatic Assembly Transfer Systems:
Assembly machines classification, Continuous transfer, intermittent transfer, indexing mechanisms, and operator - paced free – transfer machine, choice of assemble method, advantages and disadvantages of automation

UNIT-III: Product design for High speed Automatic Assembly and Robot Assembly:
Introduction, design of parts for: high speed, feeding and orienting, example, additional feeding difficulties, high speed automatic insertion, example, analysis of an assembly, general rules for product design for automation, product design for robot assembly

UNIT-IV: Design for Manual Assembly:
General design guidelines for manual assembly, development of the systematic DFA methodology, assembly efficiency, classification system for manual handling, classification system for manual insertion and fastening, effect of part symmetry on handling time, effect of part thickness and size on handling time, effect of weight on handling time, parts requiring two hands for manipulation, effect of symmetry effect of chamfer design on insertion operations, estimation of insertion time, reducing disk assembly problems

UNIT-V: Performance and Economics of Assembly Systems:
Indexing machines-effects of parts quality on down time and production time, free transfer machines-performance of free transfer machine, comparison of indexing and free - transfer machines

Course Outcomes:

A student who successfully fulfills this course requirement will be able to:

S. No	Course Outcome	BTL
1.	Outline automatic feeding and orienting devices.	L2
2.	Illustrate automatic assembly transfer systems.	L2
3.	Describe product design for high speed automatic assembly and robot assembly.	L2
4.	Summarize design for manual assembly.	L2
5.	Explain performance and economics of assembly systems.	L2

Correlation of Cos with POs & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	1	3	3	1	1	1	1	1	2	2
CO2	3	3	2	2	1	2	1	0	3	2	1	1	3	3
CO3	3	3	2	3	1	1	3	1	2	1	0	1	3	2
CO4	3	3	3	3	1	3	1	1	2	3	2	0	3	2
CO5	3	3	2	2	2	3	2	0	3	1	1	1	3	2

Text Books

1. Geoffrey Boothroyd, “Assembly Automation and Product Design", Marcel Dekker Inc., NY, 1992.
2. Geoffrey Boothroyd, Peter Dewhurst, Winston Knight, “Product design for Manufacture and assembly”, 2e, CRC Press R16 B.TECH AUTOMOBILE ENGG.

References:

1. A.K. Chitale, RC Gupta, “Product design and Manufacturing”, PHI
2. Geoffrey Boothroyd, "Hand Book of Product Design" Marcel and Dekken, N.Y. 1990.
3. A Delbainbre "Computer Aided Assembly London, 1992.