

2nd Semester

ID 551 ADVANCED COMPUTER AIDED GRAPHICS

Introduction to application of computer graphics for visualizing concepts, introduction of hardware including operating systems, file management and hardware limitations introduction to the concepts of programming through by per media. Exploration of various packages for illustration, drawing, desk top publishing page composition and animation.

Texts/References:

1. Mars Bell G.R. Computer Graphics In Application Prentice Hall
2. Kerlow L.V. And Rosebush J. Computer Graphics For Designers And Artists.
3. Grieman A. The Fusion Of Technology And Computer Graphic Design – Hybrid Imagery Architecture, Design And Technology Press.

ID 552 GENERAL COMPUTER AIDED DESIGN

Computer Technology, Data Representation , Languages, Operating The Computer System, Introduction To Workstations, Graphic Terminals, Input/Output Devices Graphic Package, Fundamental Of CAD, Design Process , Database Constructing The Geometry, Wire Frame And Solid Model. Autocad Software Package And Its Applications, Use Of autolisp. CAD-CAM Integration . Introduction To Software Packages And Its Applications.

ID 553 STRESS & VIBRATION ANALYSIS

Introduction, Types of Strain Gauges, Selection of Various Compensations, Installation, D.C & A.C. Systems. Steady & Transient Vibration of Single & Multi – Degree Freedom Systems . Systems with Distributed Mass & Elasticity Structural Damping. Dynamics of Rotating & Reciprocating Machinery. Response of Systems to Random Vibrations. Vibration of Multi Rotor System Holzer’s Method , Self Excited Vibration, Criteria Of Stability.

ID ELECTIVE - II

ID 561 CONCURRENT ENGINEERING

Introduction to Concurrent Engineering, Fundamentals of CE, Need and basic principles of CE, Benefits of implementation of CE, Introduction to various integrating mechanisms, forming of CE team.

Teamwork: Interfacing of manufacturing and design, selection of key techniques and methodologies, selection of CE tools.

Quality by design: Quality Function Deployment methodology, Taguchi methods of robust design, Design for manufacturability: Virtual manufacturing, , Introduction to Value Engineering, Value Engineering analysis and techniques, Design for assembly : Introduction to various DFA technologies.

Rapid Prototyping: Need and use of RP, various RP technologies, Design for Reliability: Reliability fundamentals and design for reliability principles, Design for Serviceability: Factors affecting serviceability, serviceability evaluation, Design for Maintainability and Economics.

References: -

- 1.) John. R. Hartley, Susmu Okamoto. “Concurrent Engineering, shortening lead times, raising quality & lowering costs”.
- 2.) Don Clausing, “Total quality development, a step by step guide to world class concurrent engineering”.
- 3.) Thomas A. Salomone, “ Concurrent engineering, what every engineer should know about series”.

ID 562 ACCELERATED PRODUCT DESIGN & DEVELOPMENT

Introduction to rapid prototyping and manufacturing, photo polymerization, cationic photo polymerization, stereo lithography, lasers for rapid prototyping and manufacturing, solid modeling, slice process post processing – part removal, part cleaning, post curing and part finishing, case studies . Concurrent engineering: product design and product manufacturing merger is an intimate way to response competitiveness in design and manufacturing. Model of concurrent engineering correlating manufacturing, sales and distribution, market analysis, product design and production system design. Designing for lifetime use (life cycle engineering). Manufacturing decision and life cycle cost. Careful design decision in the area like material selection, selection of features, ease of assembly, product . Concurrent engineering beyond reducing manufacturing cost. More engineering effort. Rapid product development through concurrent engineering. Venders of suppliers a part of design team. Communication skill

ID 563 ELECTRONICS PACKAGING DESIGN

Electronics packaging introduction -packaging levels, mechanical packaging aspects of electronics packaging connectors, materials for electronics packaging, substrates sealing materials, packaging electronics, pcs, back panel, wire wrap bands cable connectors, wire insulation, electronic enclosures. Thermal management, vibration and shock analysis, noise and control, emi/rfi/esd shielding, reliability & testing, packaging case studies.

ID 564 COMPLEX MECHANISM & GRAPH THEORY

Equivalent planar mechanisms, complex mechanisms of lower and higher degree of complexity and their analysis, basic concepts in graphs. Graph theory

Application to detect isomorphic kinematic chains, graph representation of kinematic chain, adjacency, degree and distance matrices, string method, characteristics polynomial computerized methodology. Application to simple, multiple jointed and sliding pair kinematic chains. Detection of distinct mechanism of a kinematic chain: velocity graph method and other methods, complex mechanics & of graph theory for selection of interactive chains, mechanics, fixed input & out put link location in multi-degree freedom linkages: mechanism selection and link location, application to partial, fractionated and total degree of freedom linkages.

ID 554 DESIGN FOR FATIGUE & FRACTURE

Fatigue effect of size factor, design criteria against fatigue, linear elastic fracture mechanics – energy approach & stress intensity factor approach, general yielding fracture mechanics concept of crack opening displacement & integral fracture criteria evaluation of fracture mechanics parameters, fracture safe designing of structures & mechanical components, service failure analysis.

ID 591 CAD AND CAM LAB.

1. Two Dimensional Drawings.
2. Three Dimensional Model Of Product.
3. Working Drawings of Components and Assembly.
4. Mechanical and Aesthetic Design Of Products.
5. Trying Various Aesthetic Shapes, Shapes, Colours Etc . Of The Product By CAD.
6. Programming On CNC Machine, FMS, Robotics