C.U.SHAH UNIVERSITY – Wadhwan City

FACULTY OF: - Technology andEngineering (Diploma Engineering)
DEPARTMENT OF: -Mechanical Engineering
SEMESTER: -_V_ **CODE**: - 2TE05CDM1
NAME OF SUBJECT: -Computer Aided Design and Computer Aided Manufacturing

Teaching & Evaluation Scheme:-

Subject Code	Name of the Subject	Teaching Scheme				Credits	Evaluation Scheme							
							Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
		Th	Tu	Pr	Total		Marks	Hours	Marks	Hours	Pr/Viva	TW	Pr	
2TE05CDM1	Computer Aided Design and Computer Aided Manufacturing	04	00	02	06	5	30	1.5	70	03	----	20	30	150

Objective: -

The students of mechanical engineering programme are mainly involved in modelling, designing, manufacturing, inspection and planning activities (such as preparing design and production drawing, process plans, preparing bill of materials, etc.) in industries. The industrial practices of modelling and designing are also important for the students to make them aware of modelling and designing practices, symbols, codes, norms and standards generally used in industries. This course has been introduced at Diploma level in order to develop the skills in student so that they can generate various modelling and digital production drawings as required by industry using appropriate CAD software.The use of conventional machines is decreasing day by day. Evolution of information technology, variety of manufacturing concepts with zero lead time demand and quality consciousness has supported fast adaption of Computer Aided Manufacturing. In this course an attempt has been made to focus exclusively on constructional features of CNC machines, their programming and tooling, so that students may learn to use the CNC machines efficiently for manufacturing desired products.

Prerequisites: -

Basic knowledge of design of machine elements and engineering drawing.

Course outline:-

Sr. No.	Course Contents	No. of Hours
1	**Introduction of CAD/CAM:** History of CADCAM, Definition of CADCAM, Importance of CADCAM in industries, Typical product cycle, Industrial look at CADCAM	03
2	**CADCAM Hardware and Software:** **Hardware:** Introduction, CAD workstation, System required for CAD workstation, Input – Output Devices, **Software:** Graphics Packages –List of CADCAM Software like pro-E Catia, Inventor etc. 2D-3D Geometric transformation,	06
3	**Geometric Modelling:** Difference between 2D and 3D models, concept, features and application of geometric modelling, constructive solid geometry, pure primitives and boundary representation, feature base modelling with example, parametric and non-parametric modelling.	08

4	**CNC Machine:** Difference between NC, DNC and CNC, Advantages and limitation of CNC machine, Classification of CNC machine DXE,IGES,STLConstructional features of CNC machine, CAD/CAM interfacing standard, CNC tooling, Working of ATC and APC, Introduction to common CNC controller.	**10**
5	**CNC Part Programming:** Axis nomenclature, Various positions like machine zero, home position, work piece zero, programme zero, G and M code, Structure of part programme, Macros cycle, fixed cycle, canned cycle, subroutines, Simple examples of turning and milling. List of CAM software.	**13**
6	**Recent Trends in CADCAM:** Importance of CADCAM in FMS, CIM, Rapid Prototyping. Advance measuring technique – CMM, Video measuring, 3D scanner, Robotics	**10**
7	**Finite Element Analysis:** Introduction, types of error, derivation, equitation finite element procedure, stress – deflection, stiffness matrix, global matrix, conductivity table, elimination approach, penalty approach, effect of temperature, principle of min. potential energy.	**06**

List of Experiment:-

- To study about interfacing of CAD/CAM
- To study about constructional features of CNC machine.
- Practice on any CAD software.(take out prints of 2D model. 3Dmodel, wire model, and assembly)
- Prepare at least 5 programmes of turning job.
- Prepare at least 5 programmes of milling jog.

Reference Books

- CAD/CAM, P.N. Rao, THM
- CAD/CAM Theory and practice, Ibrahim Zeid, McGraw Hill.
- CAD/CAM/, M.P. Groover, PHI Publication
- CAD/CAM/CIM, P, Radha Krishna & S. subranarayan, New Age International.
- CNC machines, B.S.Pabala, New Age International.
- An introduction to Finite Element Methods, J. N. Reddy, McGraw Hill
- An introduction to Finite Element engg., Tirupathi R. Chandrupatla, PHI
- Mechatronics, HMT, Mc. Graw Hill
- CAD/CAM Theory and concept, kuldeepsareen, S. Chand