**COURSE FILE**

**AUTOMOBILE SYSTEM (2025503)**

DIPLOMA 5TH SEM.

PRO. MUKESH KUMAR

**DEPARTMENT OF AUTOMOBILE ENGINEERING**

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**GOVERNMENT POLYTECHNIC CHAPRA**

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**Time table**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1st10:00-11:00 | 2nd1:00-12:00 | 3rd12:00-1:00 |  | 4th2:00-3:00 | 5th3:00-4:00 | 6th4:00-5:00 |
| MON |  |  |  | LUNCH |  |  |  |
| TUE |  |  |  |  |  |  |
| WED |  |  |  |  |  |  |
| THU |  |  |  |  |  |  |
| FRI |  |  |  |  |  |  |
| SAT |  |  |  |  |  |  |

Department of Automobile Engineering

**Vision**

To be a centre of excellence in the field of Mechanical Engineering offering value based world class education and research producing well qualified engineers, who can contribute favorably to the technological and socio-economic development of the nation.

**Mission**

1. To ensure sufficient modern technological exposure to the students in order to create skilled professionals.

2. To frequently update the labs keeping in view the requirement of the current industry scenario.

3. To extend counseling and career guidance facility to the students to help them to achieve their goal.

4. To encourage faculties and staffs to pursue higher education and to do the research work.

5. To encourage faculties and staffs to participate in various seminars, conferences and workshops to keep themselves updated of the state-of-the-art technology.

Unit-I 1.1 Fundamentals of CAD/CAM: Automation; Design process; Application of computers for design; Benefits of CAD; Computer configuration for CAD applications; Design workstation; Graphic terminal. 1.2 CAD Software: Definition of system software and application software; CAD database and structure. 1.3 Geometric modelling: 3D-Wire frame modelling; Wire frame entities and their definitions; Interpolation and Approximation of curves; Concept of Parametric and Non-parametric representation of curves; Curve fitting techniques.- 12

 Unit-II 2.1 Surface Modeling: Algebraic and Geometric form; Parametric space of surface; Blending functions; Parametrization of surface patch; Subdividing; Cylindrical surface; Ruled surface; Surface of revolution; Spherical surface; Composite surface; Bezier surface; 2.2 Solid Modelling: Definition of cell composition and spatial occupancy enumeration; Sweep representation; Constructive solid geometry; Boundary representations. 12

Unit-III 3.1 NC Control Production Systems: Numerical control; Elements of NC system; NC part programming; Methods of NC part programming; Manual part programming, Computer assisted part programming; Post processor; Computerized part program. 12

Unit-IV 4.1 Group Technology: Part families; Parts classification and coding; Production analysis; Machine cell design; 4.2 Computer aided process planning: Retrieval type and Generative type; Machinability data systems; MRP and its Benefits. 12

Unit-V 5.1 Flexible manufacturing system: F.M.S equipment; Layouts; Analysis methods and benefits; Computer aided quality control. 5.2 Automated inspection: Off-line, On-line, Contact, Non-contact; Coordinate measuring machines; Machine vision; CIM system and Benefits. 12

**Reference Books:**

**1. CAD/CAM Principles and Applications, P.N.Rao, Tata McGraw-Hill**

**2. Computer Aided Design and Manufacturing, Groover M.P. & Zimmers Jr, Prentice hall of India**

**3. CAD/CAM/CIM, Radha Krishna P. & Subramanyam, Wiley Eastern Ltd**

Lecture plan

|  |  |  |
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| **Unit** | **Name of Topic** | **No. of Lecture** |
| **01** | **Fundamentals of CAD/CAM:** Automation; Design process  | **Lec-1** |
| ; Application of computers for design;  | **Lec-2** |
| Benefits of CAD; Computer configuration for CAD  | **Lec-3** |
| applications; Design workstation; Graphic terminal. | **Lec-4** |
| **CAD Software:**  | **Lec-5** |
| Definition of system software and  | **Lec-6** |
| application software | **Lec-7** |
|  ; CAD database and structure. | **Lec-8** |
| **Geometric modelling:** 3D-Wire frame modelling;  | **Lec-9** |
| Wire frame entities and their definitions; Interpolation and Approximation of curves; | **Lec-10** |
| Concept of Parametric and Non-parametric representation of curves;. | **Lec-11** |
| Curve fitting techniques | **Lec-12** |
| **Class test-01** |  |

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| **Unit** | **Name of Topic** | **No. of Lecture** |
| **02** | **Surface Modeling**  | **Lec-13** |
|  **:** Algebraic and Geometric form | **Lec-14** |
| ; Parametric space of surface; Blending functions; Parametrization of surface patch;  | **Lec-15** |
| Subdividing; Cylindrical surface; Ruled surface; Surface of revolution; | **Lec-16** |
| Spherical surface;; | **Lec-17** |
| Composite surface; Bezier surface | **Lec-18** |
| S**olid Modelling:**  | **Lec-19** |
| Definition of cell composition and  | **Lec-20** |
| spatial occupancy enumeration; | **Lec-21** |
| Sweep representation;  | **Lec-22** |
| Constructive solid geometry | **Lec-23** |
|  ; Boundary representations. | **Lec-24** |
| **Class test-02** |  |

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| **Unit** | **Name of Topic** | **No. of Lecture** |
| **03** | **NC Control Production Systems:**  | **Lec-25** |
|  Numerical control; Elements of NC system; | **Lec-26** |
| NC part programming; Methods of NC part programming;  | **Lec-27** |
| Manual part programming | **Lec-28** |
|  , Computer assisted  | **Lec-29** |
| part programming;  | **Lec-30** |
| Post processor;  | **Lec-31** |
| Computerized part program. | **Lec-32** |
| **Class test-03** |  |

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| **Unit** | **Name of Topic** | **No. of Lecture** |
| **04** | **Group Technology:**  | **Lec-33-34** |
| Part families; Parts classification and coding;  | **Lec-35-36** |
| Production analysis; Machine cell design; | **Lec-37-38** |
| **Computer aided process planning:** Retrieval type and Generative type;  | **Lec-39-40** |
|  Machinability data systems;  | **Lec-41-42** |
| MRP and its Benefits. | **Lec-43-44** |
| **Class test-04** |  |

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| **Unit** | **Name of Topic** | **No. of Lecture** |
| **05** | **Flexible manufacturing system**  | **Lec-45-46** |
| **:** F.M.S equipment; Layouts | **Lec-47-48** |
| ; Analysis methods and benefits; Computer aided quality control. | **Lec-49-50** |
| **Automated inspection**: Off-line, On-line, Contact,  | **Lec-51-52** |
| Non-contact; Coordinate measuring machines;  | **Lec-53-54** |
|  Machine vision; CIM system and Benefits. | **Lec-55-56** |
| **Class test-05** |  |

**Students list**

|  |  |
| --- | --- |
| **Roll Number** | **Name Of the Student** |
| 311131220001 | PANKAJ KUMAR |
| 311131220002 | TUSHAR |
| 311131220003 | DHIRAJ KUMAR |
| 311131220004 | SHASHIKANT KUMAR |
| 311131220005 | MANISH KUMAR CHAURASIYA |
| 311131220006 | DHRUV KUMAR |
| 311131220007 | ABHISHEK KUMAR SINGH |
| 311131220008 | ANKIT KUMAR |
| 311131220009 | RUPESH KUMAR TIWARI |
| 311131220010 | THAKUR ANISH ADARSH |
| 311131220011 | PAWAN KUMAR |
| 311131220012 | MUKESH KUMAR SAH |
| 311131220014 | ABHIJIEET KUMAR |
| 311131220015 | ARJUN KUMAR RAM |
| 311131220016 | VISHAL KUMAR |
| 311131220019 | SANTOSH KUMAR |
| 311131220020 | ANKESH KUMAR |
| 311131220021 | RAHUL RAY |
| 311131220022 | SONI KUMARI |
| 311131220023 | MUNNA KUMAR SHARMA |
| 311131220024 | ADITYA KUMAR |
| 311131220025 | AKSHAY KUMAR NIRALA |
| 311131220026 | AMIT KUMAR RAM |
| 311131220027 | SUMIT SAURABH |
| 311131220028 | ABHISHEK KUMAR RAM |
| 311131220029 | ANISH KUMAR |
| 311131220030 | MD ALHARISH |
| 311131220031 | SAURABH ANAND |
| 311131220032 | ADARSH BHARDWAJ |
| 311131220033 | VIVEK SAURAV |
| 311131220034 | DEEPAK KUMAR |
| 311131220035 | KAUSHAL KUMAR |
| 311131220036 | UTKARSH KUMAR |
| 311131220037 | AMAR KUMAR |
| 311131220038 | AYUSH RAJ |
| 311131220039 | AYUSH KUMAR |
| 311131220040 | AMAN KUMAR DEV |
| 311131220041 | KRISHNA PANDIT |
| 311131220042 | SHIVAM KUMAR |
| 311131220043 | RAVI KUMAR SAH |
| 311131220044 | SAURABH KUMAR |
| 311131220045 | VISHWAJEET KUMAR |
| 311131220046 | RAJEEV KUMAR CHAUHAN |
| 311131220047 | SHIPRA BHARTI |
| 311131220048 | ADITYA KUMAR |
| **401/A/21** | **SUBHAM KUMAR SINGH** |
| **402/A/21** | **ARUN KUMAR** |
| **403/A/21** | **AVINASH KUMAR** |
| **601/A/21** | **AMARJEET KUMAR** |
| **602/A/21** | **NIHAL KUMAR** |
| **603/A/21** | **SHAHNAWAZ ALAM** |
| **604/A/21** | **MUSKAAN KUMARI** |
| **605/A/21** | **ANUP KUMAR** |
| **606/A/21** | **AARIF PRAWEJ** |
| **607/A/21** | **BISHWASH SINGH** |
| **608/A/21** | **ABHISHEK KUMAR SINGH** |
| **609/A/21** | **SHIVAM KUMAR** |
| **610/A/21** | **ANURAG PRASAD** |
| **611/A/21** | **LALAN KUMAR YADAV** |