Lesson Plan

**Name of the Faculty : DR.SANJAY GUPTA**

**Discipline : Automobile Engg.**

**Semester : IVth**

**Subject : CNC Machines and Advanced Manufacturing Processes**

**LessonPlan Duration : 45 lectures**

**Work Load Lecture per week (in hours):** 03 HOURS (theory)

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| **Week** | **Theory** | |  |  |
| **Lecture day** | **Topic (including assignment/ test)** |  |  |
| **1st** | **1** | **UNIT-1**:Introduction to Computer Numerical Control |  |  |
| **2** | Introduction - NC, CNC, DNC; Advantages and Application of CNC. |  |  |
| **3** | Working principle of CNC machine, Basic components of CNC machines |  |  |
| **2nd** | **4** | Types of CNC machines |  |  |
| **5** | Motion control system - point to point, straight line, Continuous path (Contouring) |  |  |
| **6** | The coordinate system in CNC – cartesian and polar, |  |  |
| **3rd** | **7** | Coordinate data input – absolute and incremental,Axis identification |  |  |
| **8** | REVISION |  |  |
| **9** | **UNIT-2**: Introduction to Part programming, |  |  |
| **4th** | **10** | Basic concepts of part programming, NC words |  |  |
| **11** | Part programming formats, |  |  |
| **12** | Linear and circular interpolation, |  |  |
| **5th** | **13** | Simple programs for drilling and turning, |  |  |
| **14** | Tool off sets, cutter radius compensation, |  |  |
| **15** | Tool wear compensation. |  |  |
| **6th** | **16** | REVISION |  |  |
| **17** | **1st Sessional Test** |  |  |
| **18** | **UNIT-3:**CNC Milling: Working principle of CNC Lathe machine |  |  |
| **7th** | **19** | Working principle of CNC milling machine |  |  |
| **20** | Constructional details of CNC Lathe machine |  |  |
| **21** | Constructional details of CNC milling machine |  |  |
| **8th** | **22** | Simple Part programs for CNC Lathe and milling machine |  |  |
| **23** | Simple Part programs for CNC Lathe and milling machine |  |  |
| **24** | REVISION |  |  |
| **9th** | **25** | **UNIT-4:** Advanced Machining Processes |  |  |
| **26** | Mechanical Process - Ultrasonic machining (USM): Introduction, principle,  process, |  |  |
| **27** | Advantages and limitations, applications of USM. |  |  |
| **10th** | **28** | Electro Chemical Processes(ECM)-Fundamental principle, process, applications |  |  |
| **29** | Electrical Discharge Machining (EDM) - Introduction, basic EDM circuit,  Principle |  |  |
| **30** | Metal removing rate, dielectric fluid, applications |  |  |
| **11th** | **31** | Laser beam machining (LBM) – Introduction, machining |  |  |
| **32** | process and applications of LBM |  |  |
| **33** | Electron beam machining (EBM)- Introduction, principle, |  |  |
| **12th** | **34** | process and applications of EBM |  |  |
| **35** | REVISION |  |  |
| **36** | **2nd Sessional Test** |  |  |
| **13th** | **37** | Industrial Robotics :Definition |  |  |
| **38** | Laws of Robotics |  |  |
| **39** | Robot configurations |  |  |
| **14th** | **40** | Basic robot motions |  |  |
| **41** | Robotic sensors |  |  |
| **42** | Industrial applications |  |  |
| **15th** | **43** | REVISION |  |  |
| **44** | **3rd Sessional Test** |  |  |
| **45** | Extra class for doubts |  |  |