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|------------------------------|--------------------------------------|
| <b>Branch Name:</b>          | Mechanical Engineering (CAD-CAM)     |
| <b>Program Code:</b>         | ET201                                |
| <b>Course Name:</b>          | Computer Aided Production Management |
| <b>Course Code:</b>          | 2ET2010105T                          |
| <b>Pre-requisite Course:</b> | Zeal to learn subject                |

### Course Objectives:

1. The aim of this course is to develop an understanding of the knowledge in Computer Aided Production management.
2. With the help of this course students study how to maintain information about manufacturing resources, enhance production capabilities, develop new facilities and systems and share Information through a common database.

### Teaching and Examination Scheme:

| Credit | Teaching Scheme<br>Hours per week |   |   |       | Evaluation Scheme (Marks) |      |      |      |                   |      |      |      |                  |
|--------|-----------------------------------|---|---|-------|---------------------------|------|------|------|-------------------|------|------|------|------------------|
|        |                                   |   |   |       | Theory (Marks)            |      |      |      | Practical (Marks) |      |      |      | Total<br>(Marks) |
|        | L                                 | T | P | Total | SEE                       |      | CCA  |      | SEE               |      | CCA  |      |                  |
|        |                                   |   |   |       | Min.                      | Max. | Min. | Max. | Min.              | Max. | Min. | Max. |                  |
| 4      | 3                                 | 1 | - | 4     | 24                        | 60   | 16   | 40   | -                 | -    | -    | -    | 100              |

### Subject Contents:

| Sr. No | Topic                                                                                                                                                                                                                                                                                                                                                  | Total Hours | Weight (%) |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| 01     | <b>Introduction:</b><br>Objective, Function of Computer Aided Production Management, How Computer useful in current industrial environment,                                                                                                                                                                                                            | 02          | 8          |
| 02     | <b>Computer Aided Forecasting:</b><br>Nature and use of forecast, sources of data, demand patterns, forecasting models, Forecasting Techniques, selection of forecasting technique, measurement of forecast Accuracy, Adoptive methods.                                                                                                                | 03          | 12         |
| 03     | <b>Computer Aided Production Planning:</b><br>Use of computer for Automation of following task Sales forecasting, Master production schedule, Rough cut planning, Capability analysis, MRP, Job Sequencings, Optimized scheduling, Assignment, Manufacturing planning, Support service design, Production implementation,                              | 05          | 20         |
| 04     | <b>MRP and ERP:</b><br>MRP: Introduction, Objective, Input, Computational procedure, information provided by the system. Detailed capacity planning, manufacturing resources planning II. ERP: Introduction, main features, generic model of ERP system, selection of ERP, proof of concept approach, analytic hierarchy approach, ERP implementation. | 02          | 08         |
| 05     | <b>Computer Aided Inspection:</b><br>Computer Aided Testing, Contact type, non contact type inspection.                                                                                                                                                                                                                                                | 02          | 08         |
| 06     | <b>Just in time management (JIT):</b><br>Introduction, Philosophy of JIT, just in time procurement, just in time shop floor corner, Arguments against JIT                                                                                                                                                                                              | 03          | 12         |

|    |                                                                                                                                                                                                                                                                                                                                                               |    |    |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| 07 | <b>Inventory Control:</b><br>Introduction, Parameter, Cost associated, Deterministic inventory Models, Simple EOQ Model, Model for finite production rate, Model for Instantaneous production with finite shortage cost, etc, Stochastic Inventory Model, Buffer stock, Distribution of demand during the lead time, Inventory control systems, ABC analysis. | 04 | 16 |
| 08 | <b>Group Technology:</b> - Introduction, objectives part families, algorithms and models, Rank order clustering, Bond energy, mathematical model for machine – component cell formation. Design and manufacturing attributes. Parts classification and coding, concept of composite job machine group, cell group tooling, GT benefits.                       | 04 | 16 |

**Review Presentation:** The student is expected to spend minimum 2 hours per week (as mentioned in the teaching and evaluation scheme) to refer at least two peer reviewed journal papers related to this domain/subject. The student is expected to identify issues/challenges and emerging trends in the domain/subject. Student is supposed to explore various video lectures (E.g. NPTEL) available in the domain/subject. Student is required to make a review-presentation on the work carried out for the same. Recommended sites for journal papers are (1) asmedigitalcollection.asme.org (2) springer.com (3) sciencedirect.com (5) ieeexplore.ieee.org (6) scholar.google.co.in or others of similar repute.

**Course Outcome:**

1. Knowledge about roll of computers in PPC.
2. Knowledge about integrating production functions through a common database.

**List of References:**

1. An introduction to Automated Process Planning – Tien – Chien Chang and Richard A wysk/Prentice hall
2. Automation production systems and computer aided mfg.- M.P. Groover
3. Computer aided manufacturing P.N.Rao, N.K.Tewari, T.K. Kundra
4. G.T. in the engineering industry Bur bridge
5. MRP – by Orlikey
6. Computer Aided production management – P.B.Mahapatra
7. CAD / CAM M.P. Groover & Zimmers.

**Tutorials:** Tutorials will be base on above mentioned subject contents. The sample list is given below.

1. Tutorial on Forecasting methods and c program of any one.
2. Tutorial on Computerized plant layout design.
3. Tutorial on Material requirement planning.
4. Tutorial on Group technology.
5. Tutorial on Computer aided process planning.
6. Tutorial on Computer aided quality control.
7. Tutorial on Enterprise resource planning.
8. Tutorial on Simulation.

**Course Learning Outcomes (CLO):** On completion of this course, the students will be able to:

| CLO  | Description                                                       | Bloom's Taxonomy Level           |
|------|-------------------------------------------------------------------|----------------------------------|
| CLO1 | Discuss about roll of computers in PPC.                           | 1 Remembering<br>2 Understanding |
| CLO2 | Apply integrating production functions through a common database. | 3 Applying                       |

|      |                                                                                                                                                         |                            |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| CLO3 | Understand relevance and importance of the Different Production and operations management techniques and their applications.                            | 3 Applying                 |
| CLO4 | Capable to design, analyses and assess production planning and control systems, including those operating within distributed manufacturing environment. | 4 Analyze                  |
| CLO5 | Develop simulation of machine shop.                                                                                                                     | 5 Evaluating<br>6 Creating |
| CLO6 | Gain an overall understanding of computer aided production management.                                                                                  | 2 Understanding            |

### Mapping of CLOs with POs & PSOs:

| Course Learning Outcomes | Program Outcomes (POs) |     |     |     |     |     |     |     |     |      |      |      | Program Specific Outcomes(PSOs) |      |
|--------------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|---------------------------------|------|
|                          | PO1                    | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1                            | PSO2 |
| CLO1                     | L                      | M   |     |     | H   |     |     |     |     |      |      |      | M                               |      |
| CLO2                     |                        |     | H   | M   |     |     |     |     | M   |      |      |      |                                 | L    |
| CLO3                     | L                      |     |     |     |     | M   |     |     | L   |      | M    |      | H                               |      |
| CLO4                     | M                      | L   | H   | M   |     |     |     |     | L   |      |      |      |                                 | M    |
| CLO5                     |                        |     | M   | M   | H   |     |     |     |     |      | M    |      |                                 | M    |
| CLO6                     |                        | M   |     |     | M   |     |     |     |     |      | M    |      | M                               |      |

**H: High, M: Medium, L: Low**