GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme: Bachelor of Technology
Branch/Spec.: Mechanical Engineering
Semester: VIII
Version: 2.0.0.0
Effective from Academic Year: 2017-18
Effective from the batch Admitted in: July 2014
Subject code: 2ME802
Subject Name: Production & Operations Management

Teaching scheme: Examinations scheme (Marks)

<table>
<thead>
<tr>
<th>(Per week)</th>
<th>Lecture(DT)</th>
<th>Practical(Lab.)</th>
<th>Total</th>
<th>CE</th>
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<td>Credit</td>
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<td>1</td>
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<td>4</td>
<td>Theory</td>
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<td>Hours</td>
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<td>Practical</td>
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Credit 30 20 10
Hours 30 20 50

Pre-requisites:

Learning Outcome:

After learning this course, student should be able to:

- Identify and develop operational research models from the verbal description of the real system.
- Understand the mathematical tools that are needed to solve optimisation problems.
- Use mathematical software to solve the proposed models.
- Develop a report that describes the model and the solving technique, analyse the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.

Theory syllabus

<table>
<thead>
<tr>
<th>Unit</th>
<th>Content</th>
<th>Hrs</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to Operation Research: History of OR, Approach, Techniques &amp; tools, Typical application of OR, Scope of OR, Limitations of OR.</td>
<td>3</td>
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<td>2</td>
<td>Linear Programming: General L.P. Format, Formulation of production problems, Method of solution: Graphical, Simplex, Modified simplex, Big M and 2 phase methods, Application of L.P. to solve problems of production systems.</td>
<td>6</td>
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<tr>
<td>3</td>
<td>Transportation Model: Formulation, methods of solution: North West Corner, Least cost and Vogel’s approximation methods; Optimality tests: Stepping stone and MODI methods; Degenerate and unbalanced transportation problems, Application to production systems.</td>
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<td>4</td>
<td>Assignment Model: Formulation; Methods of solution: Enumeration, transportation, Hungarian methods; Areas of application in the solution of production problems.</td>
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<td>5</td>
<td>Project Management: CPM and PERT in project management, Concept of slack/float and its significance; Project cost analysis, Crashing, Resource smoothing and leveling, Applications in production systems.</td>
<td>6</td>
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<tr>
<td>6</td>
<td>Inventory Control: Inventory parameters and properties; Deterministic and probabilistic, Inventory models; Concept of zero inventory; Application to production problems.</td>
<td>4</td>
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## Queuing Models:
Concepts relating to Queuing systems, types of queuing system (use of six character code), Basic elements of Queuing Model, Role of Poison & Exponential Distribution, Concepts of Birth and Death process, Steady state measures of performance, M/M/1 model with and without limitation of q-size M/G/1, single channel with Poisson arrival rate and general service time.

## Production Planning and control: Introduction:
Types of Production systems (Mass production, process production, batch production, job production), Characteristics, Function and objective of Production planning control-product design and development including standardization and simplification-sales forecasting:- Concept, Techniques, application,- Process planning and routing, Material control, Loading, scheduling, Dispatching, Progress reporting, Expediting, Preplanning Use of computer in PPC.

## Inspection and Quality Control: Inspection:

## Value Engineering and value Analysis:
What is value engineering, Its types, Approach and analysis, Techniques, Procedures, Advantages and application of value engineering and value control?

## Practical content
The term work shall be based on experimental and analytical work on topics mentioned above.

## Text Books

## Reference Books