ME554: Machine Tool Design

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<th>Teaching Scheme</th>
<th>Credits</th>
<th>Marks Distribution</th>
<th>Total Marks</th>
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<td>L   T   P   C</td>
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<td>Theory Marks</td>
<td>Practical Marks</td>
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<td>3   0   2   5</td>
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<td>70      30</td>
<td>30      20</td>
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Course Content:

1. **Introduction to Machine Tool Drives:**

2. **Regulation of Speed and Feed Rates:**

3. **Design of Machine Tool Structures:**
   Functions of Machine Tool Structures and Their Requirements, Design criteria for Machine Tool Structures, Materials of Machine Tool Structures, Static and Dynamic Stiffness, Profiles of Machine Tool Structures, Basic Design

   Procedure of Machine Tool Structures, Design of Beds, Columns, saddles, carriages, Bases and Tables.

4. **Design of Guideways and Power Screws:**
5 **Design of Spindles and Spindle Supports:**

Functions of Spindles and Requirements, Effect of Machine Tool Compliance on Machining Accuracy, Design of Spindles, Antifriction Bearings.

6 **Dynamics of Machine Tools:**


7 **Control Systems in Machine Tools:**

Machine tool control systems, Control Systems for Speed and Feed Changing, Adaptive Control Systems,

8 Ergonomics and aesthetic design of machine tool, Recent trends of machine tool.

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**Reference Books:**