Airplane design (Aerodynamic) - Web course

COURSE OUTLINE

1. Introduction: Various stages in airplane design. Steps in preliminary design.
2. Data collection and preliminary three-view drawing.
3. Revised weight estimation.
5. Selection of wing parameters.
6. Selection of fuselage parameters and internal layout.
8. Estimation of weights of various components. Calculation of c.g. and its shift.
9. Control surface design.
11. Example of the preliminary design of a jet airplane.

COURSE DETAIL

A Web course shall contain 40 or more 1 hour lecture equivalents.

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<thead>
<tr>
<th>S.No</th>
<th>Topics</th>
<th>No.of Hours</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction.</td>
<td>3</td>
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<tr>
<td>2</td>
<td>Data collection and Preliminary three-view.</td>
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<td>3</td>
<td>Weight estimation.</td>
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<td>4</td>
<td>Optimization of wing loading and thrust loading and Engine selection.</td>
<td>6</td>
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<td>5</td>
<td>Choice of wing parameters.</td>
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<td>6</td>
<td>Choice of fuselage parameters.</td>
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Pre-requisites:

1. It is expected that the student has undergone course on Airplane performance.
2. The student should have undergone or concurrently undergoing course on stability and control.

Additional Reading:


Coordinators:

Prof. E.G. Tulapurkara
Department of Aerospace EngineeringIIT Madras
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<tr>
<th></th>
<th>Special consideration for configuration lay-out.</th>
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<tr>
<td>8</td>
<td>Weights and centre of gravity.</td>
<td>2</td>
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<tr>
<td>9</td>
<td>Control surface design.</td>
<td>3</td>
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<tr>
<td>10</td>
<td>Miscellaneous topics.</td>
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<tr>
<td>11</td>
<td>An example of airplane preliminary design procedure- jet transport.</td>
<td>3</td>
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References:

2. Nicolai L "Fundamentals of aircraft design" Univ. of Dayton Ohio, 1975