

Engineering Design: An Overview

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What is Engineering Design ?

- ❑ Creative Problem Solving
- ❑ Process of planning
 - physical characteristics of a product
 - methods of construction
- ❑ The end product should
 - Meet the design requirements
 - Use efficient construction process
 - Make best use of resources

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STEPS IN ENGINEERING DESIGN

Steps in Engineering Design -I

- Problem Definition
 - Define product's purpose
 - Translate into performance parameters
 - Establish FOM for cost, manufacturability and performance
- Data Collection on
 - Problem limits and requirements
 - existing designs, available technologies and analysis methods
- Create or synthesize one or more design concepts
 - Describe them in words, parameters, diagrams and drawings

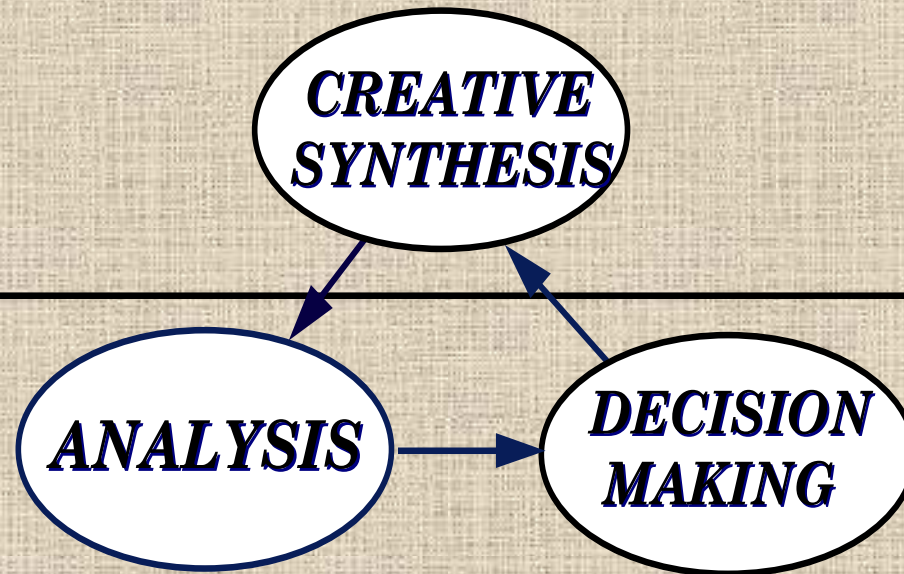
Steps in Engineering Design -II

- Select the type of analyses to be performed
- Perform the analysis, record and communicate results
- Make Decisions
 - Will it work ? Which idea is the best ? Are FOMs OK ?
- Return to Problem Formulation / Data Collection, if required

Mental activity in the design cycle

*Associative Creative
Creative Mind
(Right Brain)*

*Deductive Analytic
Judicial Mind
(Left Brain)*



FEATURES:

- + No rules
- + Uncritical
- + Irrational
- + Illogical
- + Divergent
- + Alternatives

- + Rigid rules
- + Critical thinking
- + Rational
- + Logical
- + Convergent
- + One answer

Source: *Introduction to Aeronautics: A Design Perspective*, Brandt, Stiles, Bertin, Whitford, 2nd ed., AIAA Education Series, 2004