



SNS COLLEGE OF TECHNOLOGY



# *New Product Development*

## *Unit 3*

### **Concept Embodiment And Modeling Of Product Metric**

**Topic: Modelling of Product Metric**

Text book

Kevin Otto and Kristin Wood ,” **Techniques in Reverse  
Engineering and New Product Development**”



# Modelling of product metrics

- ∞ A model of a product metric is simply a representation, simplification, or estimation of a **products realization** to aid in making product decisions.
- ∞ Models based on
  - ∞ **Applied mathematics and sciences**
  - ∞ **Physical prototypes.**



# Model selection by performance specifications

- Customer needs lists
- Activity diagrams
- Business cases
- Functional models
- S-curve data for forecasted improvements
- Product architecture layouts
- Chosen product concepts.



# Model preparation and selection

- Creation of **simplified versions** of the product for testing and measuring the product.
- Map or **relate the customer need** weights to the product functions.
- Identify the **functions that relate most strongly** to the customer needs.
- Choose the metrics** that may be used to quantify the material, energy or signal flows of the function.
- Identify the target values for these metrics** based on benchmarking results.



# Product models



## ❧ Informal models

- ❧ Informal models simply have **some lack of precision**.
- ❧ Some relationships may not be stated as equations, or "expert judgment" will modify the result of the model.

## ❧ Formal models

- ❧ A *formal model* is a **precise statement of components** to be used and the relationships among them.
- ❧ Formal models are **usually stated via mathematics**, often equations.
- ❧ Formal models can be precisely communicated because they are well-defined. Formal models give replicable results. This is the simple meaning of "mathematical proof".



# Constructing product model

## Basic approach



- ❧ Identify the flow for the informal effect.
- ❧ Identify a balance relationship for the flow.
- ❧ Identify a boundary for the balance relationship.
- ❧ Formulate an equation for the balance relationship in the system.
- ❧ Use the resulting model to explore design configuration options.



# Constructing product model

## Advanced method

- ❧ Identify the effect
- ❧ Identify the flow
- ❧ Identify the physical mechanisms
- ❧ Target the precision
- ❧ Construct the model
- ❧ Apply dimensional analysis, similitude and group variables.
- ❧ embody the model computationally.
- ❧ Interrogate the model.
- ❧ Display and use the model.



Thank u