

ENGINEERING DESIGN

HANDOUTS

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## 10 STEP DESIGN STRATEGY

1. Identify need
2. Define problem
3. Search
4. Constraints
5. Criteria
6. Alternatives
7. Analysis
8. Decision
9. Specifications
10. Communication

from *Introduction to Engineering Design*

# **DESIGN EXERCISE ACTIVITY TIME SCHEDULE (ASSIGNMENT ONE)**

## **PROBLEM**

Develop a "sample" activity time schedule

## **EXERCISE**

Work with team to develop a schedule

How would you attack this problem ?

Limits must be placed on the time for each step

Prepare one transparency with your schedule

Be prepared to present to class at next meeting

# DESIGN EXERCISE

## "SAMPLE" ACTIVITY TIME SCHEDULE

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Design steps	Percentage of total time									
	10	20	30	40	50	60	70	80	90	100
1. Identify need	x									
2. Define problem	xx									
3. Search	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx									
4. Constraints		xxxx								
5. Criteria			xxxx							
6. Alternatives				xxxxxxxx						
7. Analysis					xxxx					
8. Decision						xxx				
9. Specifications							xxxxxxxx			
10. Communication								xxxxx		

*from Introduction to Engineering Design*

## **ENGINEERING DESIGN EXERCISE DESIGN PROJECT (ASSIGNMENT TWO)**

- Select project from the list
- Or make one up with approval of instructor
- Prepare an activity time schedule
- Complete first two steps of design process
  - Identify need
  - Define problem
- Prepare one transparency with
  - activity time schedule
  - "need"
  - problem definition
- Be prepared to present to class at next meeting

## PROJECTS

- Mechanical pencil
- Safety razors from three vendors; include one disposable razor
- Flashlight
- Battery-powered slide viewer
- Battery-powered fabric shaver
- Headlights that follow the wheels' direction
- A protective "garage" that can be stored in the car's trunk
- A device to prevent theft of helmets left on motorcycles
- A conversion kit for winter operation of motorcycles
- An improved rack for carrying packages or books on a motorcycle or bicycle
- A child's seat for a motorcycle or bicycle
- A tray for eating, writing, and playing games in the back seat of a car
- A system for improving traction on ice without studs or chains
- An inexpensive built-in jack for raising a car
- An auto-engine warmer
- A better way of informing motorists of speed limits, road conditions, hazards, etc.
- Theft- and vibration-proof wheel covers
- A better way to check the engine oil level
- A device to permit easier draining of the oil pan by weekend mechanics
- A heated steering wheel for cold weather
- A less expensive replacement for auto air-cleaner elements
- An overdrive system for a trail bike
- A sun shield for an automobile
- A well-engineered, efficient automobile instrument panel
- An SOS sign for cars stalled on freeways
- A remote car-starting system for warm-up
- A car-door positioner for windy days
- A bicycle trailer
- Automatic rate-sensitive windshield wipers
- A corn detasseler
- An improved wall outlet
- A beverage holder for a card table
- A car wash for pickups

- A better rural mailbox
- A home safe
- An Improved bicycle for recreation
- A transit system for campus
- Improved pedestrian crossing at busy intersections
- Improved campus parking facilities
- A simple but effective device for cleaning clogged drains
- A device to attach to a paint can for pouring
- An improved soap dispenser
- better method of locking weights to a barbell shaft
- A shoestring fastener to replace the knot
- A better jar opener

#### SOURCE MATERIAL

Eide, A. R., Jenison, R. D., Mashaw, L. H., Northup, L. L.,  
Introduction to Engineering Design ,McGraw-Hill, Boston, MA, 1998.