THE GUNT LEARNING CONCEPTS OF MECHANICAL PROCESS ENGINEERING

What does mechanical process engineering involve?

Process engineering is the engineering science of material transformation.

Mechanical process engineering involves the changes in material properties (e.g. particle size), and composition (concentration), due to mechanical effects.

The mechanical effects are forces acting on the materials. These forces may include compression forces, friction forces, impulses, or forces triggered by flow resistances.

The material systems with which mechanical process engineering concerns itself are termed dispersed systems. They consist at least of a dispersed phase and a continuous phase. The dispersed phase usually comprises large numbers of individual particles which are finely distributed (dispersed) in the continuous phase. The dispersed phase largely involves solids, however, both phases may also be liquid or gaseous. Examples of dispersed systems are bulk solids such as sand, ore-bearing rock, suspensions, emulsions and dusts.

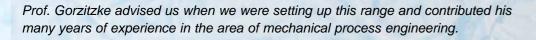
How can the unit operations in mechanical process engineering be classified?

Unit operations in mechanical process engineering INVOLVING CHANGE IN PARTICLE SIZE WITHOUT CHANGE IN PARTICLE SIZE **Separation Methods** Comminution Mixing Storage and Flow Fluidised Beds Agglomeration of Bulk Solids and Pneumatic Transport The processes can essentially be divition of solid, dispersed phases from fluids and the division of solid compounds into ded into two principal categories. In the

comminution and agglomeration (particle size enlargement) processes, the size of solid particles is purposely altered. In the separation, mixing, storage and transport of bulk solids, the particle size usually remains unchanged. The separation methods in many cases involve the separa-

fractions with different particle properties.

In fluidised beds, mixing, separation or agglomeration processes may occur, depending on the application.





Prof. Dr. Wolfgang Gorzitzke (Anhalt University of Applied Sciences), our technical advisor on mechanical process engineering

The	unit operations			
Comminution				
Agglomeration				
	Classifying	* *		
	Sorting	•		
SOC	Separation in a Gravity Field	* * *		
SEPARATION METHODS	Separation in a Centrifugal Force Field	***		
	Filtration	****		

Mixing				
Storage and Flow of Bulk Solids				

Fluidised Beds and Pneumatic Transport



... and the appropriate GUNT unit

CE	245	Ball Mill
~		Danim

CE 255 Rolling Agglomeration

CE 275 Gas Flow Classification

CE 264 Screening Machine

CE 280 Magnetic Separation

CE 115 Fundamentals of Sedimentation HM142 Separation in Sedimentation Tanks CE 587 Dissolved Air Flotation

CE 282 Disc Centrifuge CE 235 Gas Cyclone

CE 225 Hydrocyclone

CE 116 Cake and Depth Filtration

CE 117 Flow through Particle Layers

CE 287 Plate and Frame Filter Press

- CE 283 Drum Cell Filter
- CE 284 Nutsche Vacuum Filter
- CE 286 Nutsche Pressure Filter
- CE 579 Depth Filtration

CE 320 Stirring

CE 210	Flow of Bulk Solids from Silos
CE 200	Flow Properties of Bulk Solids
-	
CE 220	Fluidised Bed Formation
CE 250	Pneumatic Transport