



# MECHANICAL UNIT OPERATIONS

## **PROF. NANDA KISHORE**

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IIT Guwahati

**INTENDED AUDIENCE :** Chemical Engineering, Biotechnology and Food Engineering

### **COURSE OUTLINE :**

Chemical engineering consists of several unit operations and unit processes. Before the reaction step, the raw materials should be processed through various unit operations and similarly after the reaction step as well the products are passed through various unit operations either for product separation or for purity. Thus unit operations are very essentially part of the chemical engineering; and hence, basic knowledge about the principles and equipment of solid-solid unit operations and solid-liquid unit operations is mandatory for any professional chemical engineer.

### **ABOUT INSTRUCTOR :**

Prof. Nanda Kishore completed PhD from Indian Institute of Technology (IIT) Kanpur in 2008 and presently is a full professor in the Department of Chemical Engineering of IIT Guwahati, India. He was Brunel Research Fellow from Dec. 21, 2009 to March 31, 2011 at School of Engineering Sciences, University of Southampton, UK. He was a visiting researcher of Department of Chemical and Processing Engineering, University of Surrey, Guildford, United Kingdom from June 2016 to July 2016. He received Young Scientist Research Award in 2016 from DAE-BRNS; IEI Young Engineers Award for the year 2015; Young Scientist Research Grant from Science and Engineering Research Board of Department of Science and Technology, Government of India, 2013.

### **COURSE PLAN :**

**Week 1:** Introduction of Particulate Sizes and Shapes

**Week 2:** Screening

**Week 3:** Size Reduction

**Week 4:** Storage and Conveying of Bulk Solids

**Week 5:** Size Enlargement

**Week 6:** Flow past Bluff Bodies

**Week 7:** Flow Through Packed and Fluidized Beds

**Week 8:** Filtration

**Week 9:** Cross Flow Filtration and Membrane Separations

**Week 10:** Gravity Sedimentation

**Week 11:** Centrifugal Separations

**Week 12:** Flootation