BIOTECHNOLOGY & BIOSCIENCES

PRINCIPLES OF DOWNSTREAM TECHNIQUES IN BIOPROCESS

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IIT Madras

TYPE OF COURSE : Rerun | Elective | UG/PG
PRE-REQUISITES : Basics of physics/chemistry /Maths, Mass and heat balance, and thermodynamics
INTENDED AUDIENCE : BE (Biotechonology), BSc/MSc
COURSE DURATION : 4 weeks (28 Jan'19 - 22 Feb'19)
EXAM DATE : 31 Mar 2019

COURSE OUTLINE :

A product that is manufactured in a bioreactor or a fermentor, is recovered and purified in several subsequent unit operations. The economy of a manufacturing process is determined by the cost effectiveness of these downstream operations. This course discusses these operations and the basic underlying principles with worked out problems.

ABOUT INSTRUCTOR :

Prof. Mukesh Doble is a Professor at the Department of Biotechnology at IIT Madras. He has previously worked in Imperial chemical Industries (ICI) and General Electric (GE) for 20 years. Areas of research are Biomaterials, Biopolymers, and Drug design. He has Published 250 papers and 8 books and filed 6 patents.

COURSE PLAN

Week 1 : Introduction, Mass balance, Heat Balance, flow sheet Costing,Cell Breakage

Week 2 : Solid Liquid Separation, Pre-treatment and Filters/centrifuge, Liquid-Liquid Extraction

Week 3 : Adsorption,Reversed micellar and aqueous two phase extraction, Membranes.

Week 4 : Precipitation and crystallization,Product stabilization, drying, Lyophilisation,Electrophoresis / SDS PAGE, Chromatography, Future trends, Other downstream operations/Summary of the course