



**CIVIL
ENGINEERING**

Momentum Transfer in Process Engineering

Type of Course	: New
Course Snapshot	: Elective / UG, PG
Course Duration	: 30 hours /12 weeks
Industry Support	: Any Processing Industry such as Hindustan Lever, ITC, Britannia etc.

COURSE OUTLINE:

This course will cover basics of momentum transfer required in any processing industries. The basic knowledge of momentum transfer is intermingled with most of the unit operations at some or other stage of processing. Since, this basic aspect of transfer process is not taught in most of the engineering institutions elaborately, a comprehension of the this aspect of transfer process will enrich the knowledge base of the students in general.

INSTRUCTOR:

Prof. Tridib Kumar Goswami
Department of Agriculture and Food Engineering
IIT Kharagpur



ABOUT INSTRUCTOR:

Prof. Tridib Kumar Goswami, a NAAS, ISAE, IE, AABS Fellow, did his B.Sc. in Chemistry (Hons) from University of Calcutta, B.Tech. in Food Technology and Biochemical Engineering from Jadavpur University, Ph.D. from IIT Kharagpur. After serving Kwality Ice Cream, Bombay for 1½ years, he joined IIT Kharagpur in 1989 and is still continuing as a Professor.

COURSE PLAN:

- Week 1 : Compressible and incompressible fluid, Equation of continuity
- Week 2 : Equation of motion in Cartesian and Cylindrical coordinates
- Week 3 : Flow through circular tubes, average velocity, Hagen Poiseuille equation
- Week 4 : Fanning friction factor, Moody's chart
- Week 5 : Flow of liquid film through a vertical / horizontal surface, average velocity of the film, Reynold's number of the film
- Week 6 : Flow through parallel plates, Flow through annulus, average velocity
- Week 7 : Flow through a slit, average velocity and Reynold's number
- Week 8 : Compressible gas flow
- Week 9 : Flow through nozzle, sonic velocity, variable fluid flow
- Week 10 : Non Newtonian fluid flow, flow through slit
- Week 11 : Flow through packed bed or porous medium, Sphericity, hydraulic radius, Ergun's equation
- Week 12 : Flow through fluidized bed