Transport Phenomena in Food Processes

Master Degree in Food Engineering

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Prof. Ing. Francesco Marra

Course code
0622800020

Academic Year 2012/2013

Transport Phenomena in Food Processes
Prof. Ing. Gaetano Lamberti – Prof. Ing. Francesco Marra

Course Introduction

Teachers

Prof. Ing. Gaetano Lamberti

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Prof. Ing. Francesco Marra

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Timetable

	Monday	Tuesday	Wednesday	Thursday	Friday
8:30-9:30					
9:30-10:30	Room 119				
10:30-11:30	Room 119		Room 119		
11:30-12:30	Room 119		Room 119	Room 129	
12:30-13:30			Room 119	Room 129	
13:30-14:30					
14:30-15:30					
15:30-16:30					
16:30-17:30					
17:30-18:30					

University of Salerno
Department of Industrial Engineering

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Transport
Phenomena
Processes
Fenomeni di Trasporto & Processi

Textbook: main

Transport Phenomena

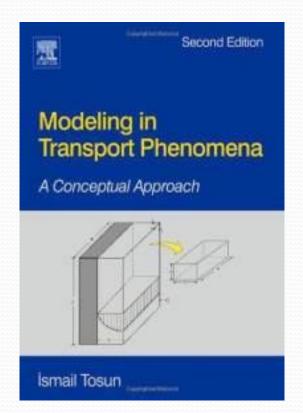**Second Edition**

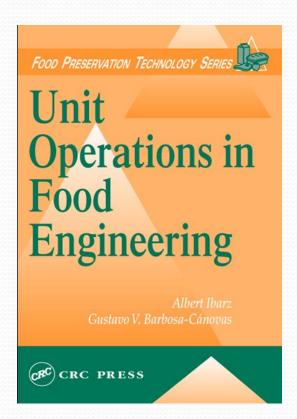R. Byron Bird · Warren E. Stewart
Edwin N. Lightfoot
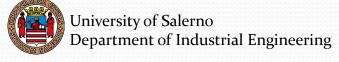
Textbooks: ancillary
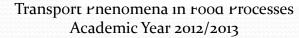
Course outline

First level course
«Principi di Ingegneria Chimica»

This course
«Transport Phenomena in Food Processes»

Table 0.2-1 Organization of the Topics in This Book

Type of transport	Momentum	Energy	Mass
Transport by molecular motion	1 Viscosity and the stress (momentum flux) tensor	9 Thermal conductivity and the heat-flux vector	17 Diffusivity and the mass-flux vectors
Transport in one dimension (shell-balance methods)	2 Shell momentum balances and velocity distributions	10 Shell energy balances and temperature distributions	18 Shell mass balances and concentration distributions
Transport in arbitrary continua (use of general transport equations)	3 Equations of change and their use [isothermal]	11 Equations of change and their use [nonisothermal]	19 Equations of change and their use [mixtures]
Transport with two independent variables (special methods)	4 Momentum transport with two independent variables	12 Energy transport with two independent variables	20 Mass transport with two independent variables
Transport in turbulent flow, and eddy transport properties	5 Turbulent momentum transport; eddy viscosity	13 Turbulent energy transport; eddy thermal conductivity	21 Turbulent mass transport; eddy diffusivity
Transport across phase boundaries	6 Friction factors; use of empirical correlations	14 Heat-transfer coefficients; use of empirical correlations	22 Mass-transfer coefficients; use of empirical correlations
Transport in large systems, such as pieces of equipment or parts thereof	7 Macroscopic balances [isothermal]	15 Macroscopic balances [nonisothermal]	23 Macroscopic balances [mixtures]
Transport by other mechanisms	8 Momentum transport in polymeric liquids	16 Energy transport by radiation	24 Mass transport in multi-component systems; cross effects

End of the lesson