Hinc patriam sustinet

Instituto Superior de Agronomia
Universidade Técnica de Lisboa

Nome da disciplina: Mass and Energy Transport Phenomena

Coordenador: Helena Pereira

Outros docentes: Suzana Ferreira Dias

Precedências requeridas: Physics

Semestre pretendido (no caso da disciplina não ter semestre atribuído): 3º semestre

Número e tipo de horas lectivas semanais: 6 hours / week; integrated lecture and practical sessions.

Programme	**Duration**	**Professors**
1. Mass balance in industrial processes; yield, conversion degree and productivity concepts; purge and recycling; batch, co-current and counter-current continuous processes.	2 weeks	Helena Pereira; Suzana Ferreira Dias
2. General concept of transfer: basic laws; steady-state mass transfer (by diffusion within a phase; between phases with chemical or biochemical reaction; boundary-layer flow).	2 weeks	Suzana Ferreira Dias
3. Contact equilibrium processes: mass transfer between phases: phase distribution and equilibrium. *S*ingle-stage and multiple equilibrium contact stages operations (co-current and counter-current) in vapour-liquid, liquid-liquid and fluid-solid separation processes; adsorption. Calculation of operating conditions in multi-stages contact-equilibrium processes. Case-studies in the Food Industry.	6 weeks	Suzana Ferreira Dias
4. Energy balances in industrial layouts	1 week	Helena Pereira
5. Heat transfer: principles of heat transfer; steady-state heat transfer (conduction, natural and forced convection, radiation), design of insulation of flat surfaces and tubes; unsteady-state heat transfer in bodies of uniform and non-uniform temperature. Chart calculations applied to finite solids with various shapes (foods).	3 weeks	Helena Pereira; Suzana Ferreira Dias