CHEN20009 Transport Processes

Credit Points:	12.50
Level:	2 (Undergraduate)
Dates & Locations:	2010, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 hours of lectures, 12 hours of tutorials and 4 hours of laboratory work Total Time Commitment: Estimated 120 hours
Prerequisites:	# 620-155 Calculus 2 or equivalent # 800-001 Engineering Systems Design 1
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry.The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability
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Subject Overview:	This subject covers fundamental concepts of diffusion and conservation within momentum, heat and mass transport. Within momentum transport specific topics include Newton's law of viscosity, viscosity of gases and liquids, conservation of momentum, velocity distributions in simple laminar flows, boundary layer concepts and turbulence and the Reynolds number. Within heat transport specific topics include Fourier's law of conduction, thermal conductivities of gases, liquids and solids, conservation of thermal energy, steady-state temperature distributions in simple geometries, heat transfer resistance, thermal boundary layer concepts, the Nusselt and Prandtl numbers and definition and use of heat transfer coefficients. Within mass transport specific topics include Fick's first law of diffusion, diffusivities of gases, liquids and solids, binary mixture diffusion and conservation of mass, concentration distributions in simple binary systems including identifying appropriate boundary conditions, concentration boundary layer concepts, Schmidt and Sherwood numbers, definition and use of mass transfer coefficients
Objectives:	On completion of this subject students should be able to # Describe the fundamental concepts of momentum, heat and mass transfer # Apply these principles to the solution of problems in process engineering. # Continue study in the area of heat and mass transport with a solid foundation

Assessment:	A mid-semester test worth 15% held in or about Week 6. 6 assignments throughout semester worth a total of 15%An end of semester examination worth 70%
Prescribed Texts:	None
Recommended Texts:	Bird, R.B., Stewart, W.E., and Lightfoot, E.N., Transport Phenomena, second edition, Wiley, 2002 and onwards Coulson, J.M., and Richardson, J.F., Chemical Engineering,Volume 1, sixth edition, Butterworth-Heinemann, 1999
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	None
Notes:	This subject is available for science credit to students enrolled in the BSc (new degree only).
Related Course(s):	Bachelor of Engineering Bachelor of Science
Related Majors/Minors/ Specialisations:	Master of Engineering (Biomolecular) Master of Engineering (Chemical)