

DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	TRANSPORT PHENOMENA		
Course Code	MTPC17	No. of Credits	3
Course Code of Pre-requisite subject(s)	NIL		
Session	Jan.	Section (if, applicable)	A / B
Name of Faculty	RAJAVIGNESH S	Department	MME
Email	rajas@nitt.edu	Telephone No.	9626856333
Name of Course Coordinator(s) (if, applicable)	Mr RAJAVIGNESH S		
E-mail	-	Telephone No.	-
Course Type	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	
Syllabus (approved in BoS)			
<p>Fluid Flow - Viscosity – differential mass and momentum balances –overall momentum balance – mechanical energy balance – applications</p> <p>Heat Transfer – heat conduction equation – applications – convective heat transfer – concept of heat transfer coefficient – radiative heat transfer</p> <p>Mass Transfer - Diffusion: Diffusivity in gases, liquids, solids – convective mass transfer –concept of mass transfer coefficient</p> <p>Dimensionless analysis – Rayleigh’s method, Buckingham method – use of differential equations – similarity criteria – applications in physical modeling</p> <p>Reaction Kinetics - Basic definitions & concepts – reaction mechanisms – reaction rate theories – slag–metal reaction</p>			
COURSE OBJECTIVES			
<p>To understand basic concepts related to heat flow, fluid flow, mass transfer, in the context of metallurgical processes; to become familiar with the mathematical treatment and equations related to above transport phenomena; to comprehend the science behind process modelling</p>			

COURSE OUTCOMES (CO)	
Course Outcomes	Aligned Programme Outcomes (PO)
At the end of the course student will be able to	
1. Understand the scientific aspects related to heat flow, fluid flow and mass transfer	[1,2]
2. Learn about related equations, in the above context	[1,2,8,10]
3. Understand how transport concepts and equations are used in the modelling of metallurgical processes	[1,2,11]
4. Obtain the ability to convert actual (descriptive) processes into appropriate equations and then attempt to solve the same complex process calculations	[1,5,8,9,10,11]
5. Obtain the basic skills essential for process modeling	[1,11]

COURSE PLAN – PART II			
COURSE OVERVIEW			
At the end of the course student will be able to Understand the scientific aspects related to heat flow, fluid flow and mass transfer to become familiar with the mathematical treatment and equations related to above transport phenomena and to comprehend the science behind process modelling.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week (1-4)	Fluid Flow - Viscosity – differential mass and momentum balances – overall momentum balance – mechanical energy balance – applications	Chalk,talk
2	Week (5-8)	Heat Transfer – heat conduction equation – applications – convective heat transfer –concept of heat transfer coefficient – radiative heat transfer Mass Transfer - Diffusion: Diffusivity in gases, liquids, solids – convective mass transfer –concept of mass transfer coefficient	Chalk, talk, PPT
3	Week (9-12)	Dimensionless analysis – Rayleigh's method, Buckingham method – use of differential equations – similarity criteria – applications in physical modeling	Chalk, talk, PPT

3	Week (9-12)	Reaction kinetics – Basic concept – Reaction mechanism – Reaction rate – Slag – metal Reaction	Chalk, talk, PPT
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S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Continous Assessment -1	(1- 4) th week	1 hour	20
2	Continous Assessment - 2	(5- 10) th week	1 hour	20
3	Assignment	(6) th week	1 hour	10
CPA	Compensation Assessment*	(10- 11) th week	1 hour	20
5	Final Assessment *	(12) th week	3 hour	50

*mandatory; refer to guidelines on page 4

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

An exit survey will be taken from the student at the end of the semester through a questionnaire on coverage of syllabus, usefulness of course-plan, teaching efficiency, etc

COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)

MODE OF CORRESPONDENCE (email/ phone etc)

Students can make a call or email to meet the faculty at any stage of the course duration in case he/she find difficulty in understanding the concepts

ATTENDANCE

The minimum attendance required for result declaration is 75%

COMPENSATION ASSESSMENT

Students who miss assessment 1 or assessment 2 or both will be allowed for compensation assessment only once. This will be conducted after assessment 2 and before the final assessment and the weightage will be 20%

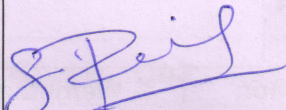
ACADEMIC HONESTY & PLAGIARISM

Students are expected to use fair means in all assessments and plagiarism will not be tolerated

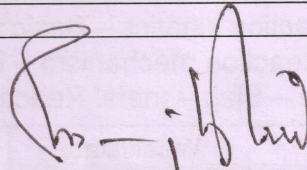
ADDITIONAL INFORMATION

Students are advised to check their webmail and contact their class representatives for details regarding the course and schedule

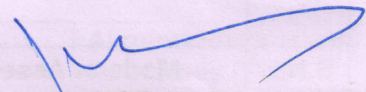
FOR APPROVAL



Course Faculty
Mr Rajavignesh S



CC-Chairperson
Dr S Kumaran



HOD
Dr SP Kumaresh Babu