DEPARTMENT OF METALLURGICAL and MATERIALS ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	**Mineral Processing and Metallurgical Analysis**		
Course Code	**MTPC 14**	**No. of Credits**	03
Course Code of Pre-requisite subject(s)	NIL		
Session	**July 2018**	**Section (if, applicable)**	NA
Name of Faculty	**Dr. Karthik V**	**Department**	MME
Email	karthikv@nitt.edu	**Telephone No.**	Mobile: 8667647852 Whatsapp: 9788444987
Name of Course Coordinator(s) (if, applicable)	NA		
E-mail	---	**Telephone No.**	----
Course Type	**PC**		

Syllabus (approved in BoS)

Principles of combustion, testing of fuels, - Coal - Manufacture of metallurgical coke and its properties -typical energy consumption in metallurgical processes, overview of different raw materials (including fluxes) in metals processing

Physical properties of minerals, physical and chemical characteristics of industrial minerals such as magnetite, haematite, galena, chalcopyrite, azurite, sphalerite, monazite, cassiterite, chromite, bauxite and ilmenite ; economics of ore processing;

Chemical processing of ores - leaching ,ion-exchange and liquid- solvent extraction; crushing and grinding – types, washing, sorting and hand-picking; laboratory and industrial screening classifiers, mechanical and hydraulic; sedimentation principles

Concentration by jigs, tables, heavy media separation, froth floatation, magnetic and electrostatic separation, thickeners and filters; use of flow sheets (specific examples from metals processing), wet and dry sampling,

Principles of chemical analysis - ores, metals, alloys, non-metallics, details of specific chemical analysis techniques, introduction to common analysis techniques used in metallurgical industries (spectrovac and spot testing)

Reference Books:

1. Gupta, O.P., Elements of Fuels, Furnaces and Refractories, 6th Ed., Khanna Publishers, New Delhi, 2016
2. Wills, B.A. and Napier-Munn, T.J, Will's Mineral Processing Technology, Elsevier Science & Technology Books, 7th Ed., 2006.

COURSE OBJECTIVES

Theoretical aspects of common mineral processing techniques and the associated equipment used in mining and pre-extraction practices

COURSE OUTCOMES (CO)	
Course Outcomes	**Aligned Programme Outcomes (PO)**
• Understand the mineral processing basic principles	1,2
• Describe the physical and chemical properties of various minerals	1,2
• To know and understand the various separation methods of mineral or gangue particles	2
• To know the common analysis techniques used in metallurgical industries	8,11
• Explain the various types of process control in mineral processing	1
• To study about the different ores for different materials	1,11

COURSE PLAN – PART II

COURSE OVERVIEW

The course covers theoretical aspects of common mineral processing techniques and the associated equipment used in mining and pre-extraction practices.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	I-III	Combustion, fuels and their types, properties, testing and manufacturing of metallurgical coke	Class room lecture with both chalk & talk and power point+ animated/real videos
2	IV-VI	Crushing, grinding, screening and classification	
3	VII-IX	Gravity & heavy media separation, Froth flotation, Magnetic & electrostatic separation, Dewatering	
4	X	Different types of minerals and their properties	
5	XI-XII	Chemical processing of ores and chemical analysis of ores	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration (min)	% Weightage
1	Assignment I	III	--	10
2	Cycle Test I	V	60	20
3	Assignment II	X	--	10
4	Cycle Test II	XI	60	20
CPA	Compensation Assessment	XII	60	20
5	End semester Examination	XIII	150	40

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

The exit survey will be assessed based on the questionnaire prepared by the class teacher and expected attainment is 75% on 1-10 scale basis

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

MODE OF CORRESPONDENCE (email/ phone etc)

Email/Mobile/Whatsapp

ATTENDANCE

- **75% attendance is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**
- Students with **less than 65% of attendance** are prevented from writing the final assessment and **shall be awarded 'V' grade.**

COMPENSATION ASSESSMENT

It will be given during XII week for those who are absent on genuine grounds for any one of the Cycle Tests.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

ADDITIONAL INFORMATION

The Course faculty is available for consultation at any time. Students can also contact him at any time through whatsapp or phone call or by mail. The phone number and mail-id will be given to the students at the beginning of the course

FOR APPROVAL

Course Faculty (Dr. V. Karthik)	CC-Chairperson (Dr. S. Raman Sankaranarayanan)	HOD (Prof. V. Muthupandi)