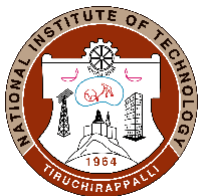




DEPARTMENT OF CHEMICAL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	M.Tech – Chemical Engineering		
Course Title	Air pollution control equipment design (3-0-0)		
Course Code	CL 627	No. of Credits	3
Course Code of Pre-requisite subject(s)	NIL		
Session	July 2020	Section (if, applicable)	---
Name of Faculty	Dr. N.Anantharaman	Department	Chemical Engg
Official Email	naraman@nitt.edu	Telephone No.	0431-2503103
Name of Course Coordinator(s) (if, applicable)	Dr.K.M. Meera Sheriffa Begum		
Official E-mail	meera@nitt.edu	Telephone No.	0431-2503109
Course Type (please tick appropriately)	<input checked="" type="checkbox"/> Elective course		
Syllabus (approved in BoS)			
<p>Air Pollutant Sources, Effects and Clean Air Acts: Pollution of air: Sources and effects of air pollutants on physical environment and living systems, Monitoring air pollution, Air pollution Laws and Minimum national standards.</p> <p>Air Pollutant Formation, Dispersion, Analysis: Formation of pollutants through large-scale combustion of fossil fuels, mineral processing, automobiles in urban areas and at source minimization of release - Meteorological aspects of air pollutant dispersion. Chemical reactions in a contaminated atmosphere, urban air pollution, acid rain Air sampling and measurement, Analysis of air pollutants.</p> <p>Air Pollution Control Methods for Particulates Removal: Control Methods-Source Correction methods - Particulate emission control: Dry techniques industrial dust collectors, cyclone and multiclone separators, bag filters, electrostatic precipitators, relative merits and demerits, choice of equipments, design aspects economics. Wet techniques wet dust collection, wet cyclone, empty scrubber, column (packed) scrubber, ventury scrubber, suitability, merits and demerits, design aspects and economics.</p> <p>Control of Specific Gaseous Pollutants: Cleaning of Gaseous effluents –Control of sulphur dioxide emission by various methods -Control of nitrogen oxides in combustion products -Control of release of carbon monoxide and hydrocarbons to the atmosphere.</p> <p>REFERENCEBOOKS</p> <ol style="list-style-type: none"> 1. Y.B.G. Verma, H. Brauer, Air Pollution Control Equipments, Springer, VerlagBerlin,1981. 2. M.N. Rao and H.V.N. Rao, Air Pollution, Tata McGraw Hill, New Delhi, 1993. 3. Rao C.S., Environmental Pollution Control Engineering, 2nd Edition, New Age International Publishers,2006. 4. A. P. Sincero and G.A. Sincero, Environmental Engineering: A Design Approach, Prentice Hall of India pvt Ltd, N.Delhi.1996. 			



COURSE OBJECTIVES	
To design equipment based on the application of air pollution treatment and various methods of design of air pollution control equipment	
MAPPING OF COs with POs	
Course Outcomes:	Programme Outcomes (PO) (Enter Numbers only)
On completion of the course, the students will be able to	
1. Identify the pollution of air and effects of air pollutants	PO1,PO2,PO9,PO11
2. Acquire sufficient knowledge for control of air pollution at source level and control of specific gaseous pollutants	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO12
3. Design suitable equipment based on the application of air pollution treatment.	PO1,PO2,PO3,PO4, PO5, PO6, PO7, PO8,PO9,PO11
4. Get exposed on causes of air pollution and its control	PO1,PO2,PO6,PO9, PO11

COURSE PLAN – PART II			
COURSE OVERVIEW			
COURSE TEACHING AND LEARNING ACTIVITIES (Add more rows)			
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1 - 4 hrs	Air Pollutant Sources and effects of air pollutants on physical environment and living systems, Monitoring air pollution,	Online mode
2	5-8 hrs	Air Pollutant Formation, Dispersion, Analysis: Formation of pollutants through large-scale combustion of fossil fuels, mineral processing, automobiles in urban areas and at source minimization of release	Online mode
3	9 – 12 hrs	Meteorological aspects of air pollutant dispersion. Chemical reactions in a contaminated atmosphere, urban air pollution, acid rain	Online mode
4	13 - 15 hrs	Air sampling and measurement, Analysis of air pollutants.	Online mode



5	16hrs – 19hrs	Air Pollution Control Methods for Particulates Removal: Control Methods-Source Correction methods -Particulate emission control: Dry techniques industrial dust collectors, cyclone and multiclone separators, bag filters, electrostatic precipitators, relative merits and demerits, choice of equipments, design aspects economics.	Online mode
6	20 hrs – 22 hrs	Wet techniques wet dust collection, wet cyclone, empty scrubber, column (packed) scrubber, ventury scrubber, suitability, merits and demerits, design aspects and economics	Online mode
7	23 hrs- 25 hrs	Control of Specific Gaseous Pollutants: Cleaning of Gaseous effluents –Control of sulphur dioxide emission by various methods -	Online mode
8	26 hrs – 29 hrs	Control of nitrogen oxides in combustion products -Control of release of carbon monoxide and hydrocarbons to the atmosphere	Online mode
9	30 hrs – 32 hrs	Air pollution control acts and regulations. Flame temperature	Online mode

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assignment 1	Oct last week		10%
2	Test 1	November 1 st week	60 min	20%
3	Assignment 2	November 3 rd week		10%
4	Test 2	November last week	60 min	20%
CPA	Compensation Assessment*	December 1 st week	60 min	20%
5	Assignment 3	December 1 st week		10%
6	Final Assessment *	December 2 nd week	120 min	30%

*mandatory; refer to guidelines on page 4



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

- 1) Feed back is planned to be collected twice; once in the mid semester and one at the end of course as soon as classes are over.

COURSE POLICY (including compensation assessment to be specified)

- 1) It is expected that the students will not indulge in any form of malpractice. In the event of any malpractice reported, all those who are involved will forfeit all the marks in that test/examination/assignment. Reappearance /additional assignment will not be given.
- 2) However, if there is a genuine reason for not attending sessions regularly, due credit will be given.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

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

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.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

NIL

FOR APPROVAL

No. An An than am
Course Faculty _____
[Dr. N. Anantharaman]

CC-Chairperson_

HOD_



Guidelines

- a) The number of assessments for any theory course shall range from 4 to 6.
- b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.
- d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.