



DEPARTMENT OF CIVIL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	M. Tech, Environmental Engineering		
Course Title	AIR POLLUTION AND CONTROL ENGINEERING		
Course Code	CE706	No. of Credits	3
Course Code of Pre-requisite subject(s)			
Session	January	Section (if, applicable)	NA
Name of Faculty	Dr. Aneesh Mathew	Department	Civil Engineering
Official Email	aneesh@nitt.edu	Telephone No.	8502932688
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		Telephone No.	
Course Type (please tick appropriately)	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	
<b>Syllabus (approved in BoS)</b>			
<p>Air pollutants - Sources - classification of pollutants - effect on human health vegetation and property - Reactions of pollutants and their effects - Smoke, smog and ozone layer disturbance - Greenhouse effect - Ambient and stack sampling - pollution measurement methods - Criteria pollutants - Ambient air quality and emission standards - Air pollution indices - Air Act - Industrial sources of air pollution - Behaviour of pollutants in atmosphere - Emission factors - regulations - control strategies and policies - Choosing appropriate air pollution control technology - Particulate Pollutant Control - Settling chambers - Filtration - Electrostatic precipitation - Cyclone separation - Wet collectors - Design of various particle control devices - Gaseous Pollutant Control - Gas absorption in tray and packed towers - Absorption with/without chemical reaction - Adsorption in fixed beds - Breakthrough - Wet scrubbers - Design of various pollutant control devices - Control technologies for removal of SO<sub>2</sub>, NO<sub>x</sub>, VOC - Control technologies for motor vehicles - Biological air pollution control technologies - bioscrubers - biofilters - Integrated air pollution control systems.</p> <p><b>References</b></p> <ol style="list-style-type: none"> <li>1. Wark Kenneth and Warner C.F, Air pollution its origin and control. Harper and Row Publishers, New York, 1997.</li> <li>2. Rao C.S., Environmental pollution control Engineering, New age international Ltd, New Delhi, 2007.</li> <li>3. Peavy, H.S., Rowe, D.R., Tchobanoglous, G. Environmental Engineering, McGraw Hills, New York 1985.</li> <li>4. De Nevers, N., Air Pollution Control Engineering, McGraw Hill, New Delhi, 1995</li> </ol>			



<b>COURSE OBJECTIVES</b>	
1. To provide general understanding of air quality and its impact on the environment and human health 2. To study the fate and transport of air pollutants and its measurement techniques 3. To discuss the different control methods and design principles for gaseous and particulate pollutant 4. To explain the principles of biological air pollution control technologies and its limitations	
<b>MAPPING OF COs with POs</b>	
<b>Course Outcomes</b>	<b>Programme Outcomes (PO) (Enter Numbers only)</b>
1. To classify the types and sources of air pollutants and to understand their effects on human health and the broader environment	<b>1, 4, 6, 10</b>
2. To differentiate and design various air pollution control technologies for particulates and gaseous pollutants	<b>1, 2, 4, 6, 9</b>
3. To choose appropriate technologies for removal of selective pollutants	<b>1, 2, 3, 4, 5</b>
4. To establish and implement air quality management components	<b>1, 2, 3, 6, 7, 9, 10, 11</b>

<b>COURSE PLAN – PART II</b>			
<b>COURSE OVERVIEW</b>			
This course primarily focusses on various air pollutants, their sources and effects. Various sampling and air pollution measurement methods, and different air pollution control technologies will also be explained in the course in detail.			
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b>			
<b>S.No.</b>	<b>Week/Contact Hours</b>	<b>Topic</b>	<b>Mode of Delivery</b>
1	Week 1	Introduction to the course-Air pollutants - Sources - classification of pollutants	PPT/ Digital Writing Pad
2	Week 2	Air pollution effect on human health vegetation and property - Reactions of pollutants and their effects - Smoke, smog and ozone layer disturbance - Greenhouse effect	PPT/ Digital Writing Pad
3	Week 3	Ambient and stack sampling - Pollution measurement methods	PPT/ Digital Writing Pad
4	Week 4	Criteria pollutants - Ambient air quality and emission standards - Air pollution indices	PPT/ Digital Writing Pad



5	Week 5	Air Act - Industrial sources of air pollution - Behaviour of pollutants in atmosphere	PPT/ Digital Writing Pad
6	Week 6	Emission factors - regulations - control strategies and policies - Choosing appropriate air pollution control technology	PPT/ Digital Writing Pad
7	Week 7	Particulate Pollutant Control - Settling chambers - Filtration - Electrostatic precipitation - Cyclone separation - Wet collectors	PPT/ Digital Writing Pad
8	Week 8		
9	Week 9	Design of various particle control devices	PPT/Digital Writing Pad
10	Week 10	Gaseous Pollutant Control - Gas absorption in tray and packed towers - Absorption with/without chemical reaction - Adsorption in fixed beds - Breakthrough - Wet scrubbers	PPT/ Digital Writing Pad
11	Week 11		
12	Week 12	Design of various pollutant control devices	PPT/Digital Writing Pad
13	Week 13	Control technologies for removal of SO <sub>2</sub> , NO <sub>x</sub> , VOC - Control technologies for motor vehicles	PPT/ Digital Writing Pad
14	Week 14	Biological air pollution control technologies - bioscrubbers - biofilters - Integrated air pollution control systems	PPT/ Digital Writing Pad
15	Week 15		
16	Week 16	Revision of Topics	PPT/ Digital Writing Pad



<b>COURSE ASSESSMENT METHODS</b> (shall range from 4 to 6)				
<b>S.No.</b>	<b>Mode of Assessment</b>	<b>Week/Date</b>	<b>Duration</b>	<b>% Weightage</b>
1	Assessment 1	Week 6	1 Hour	20
2	Assessment 2	Week 12	1 Hour	20
3	Assignments, Quizes, Seminars	As per deadlines	Assignments are to be submitted with in 1-week duration	30
CPA	Compensation Assessment*	Week 15	1 Hour	20
4	Final Assessment *	Week 17/18	2 Hour	30
<b>*mandatory; refer to guidelines on page 4</b>				
<b>COURSE EXIT SURVEY</b> (mention the ways in which the feedback about the course shall be assessed)				
It is proposed to take feedback from the students, at the end of the semester to evaluate the execution of the course.				
<b>COURSE POLICY</b> (including compensation assessment to be specified)				
<p><b>Mode of Correspondence:</b></p> <p>Mode of correspondence would be through phone/ E-mail to the class representative and vice versa.</p> <p><b>Compensation Assessment Policy:</b></p> <p>Retest will conduct to those students who have missed Cycle Test on genuine grounds. The portions of the retest will include the portions covered till the date.</p>				
<b>ATTENDANCE POLICY</b> (A uniform attendance policy as specified below shall be followed)				
<ul style="list-style-type: none"> <li>➤ At least 75% attendance in each course is mandatory.</li> <li>➤ A maximum of 10% shall be allowed under On Duty (OD) category.</li> <li>➤ Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.</li> </ul>				
<b>ACADEMIC DISHONESTY &amp; PLAGIARISM</b>				



## NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

- 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

For any queries or doubt clarification, students are free to contact through E-mail [aneesh@nitt.edu](mailto:aneesh@nitt.edu) or Via Phone.

### FOR APPROVAL

**Dr. Aneesh Mathew**  
Course Faculty

**Dr. R. Manjula**  
CC- Chairperson

**Dr. G. Swaminathan**  
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.