



DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN – PART I

Name of the programme and specialization	M. Tech, Industrial Safety Engineering		
Course Title	Environmental Pollution Control		
Course Code	ME 671	No. of Credits	3
Course Code of Pre-requisite subject(s)			
Session	July 2020	Section (if, applicable)	
Name of Faculty	Dr. Sreejith Mohan	Department	Mechanical
Official Email	sreejith@nitt.edu	Telephone No.	
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		Telephone No.	
Course Type (please tick appropriately)	<input type="checkbox"/> Core course	<input checked="" type="checkbox"/> Elective course	

Syllabus (approved in BoS)

AIR POLLUTION

Classification and properties of air pollutants – Pollution sources – Effects of air pollutants on human beings, Animals, Plants and Materials - automobile pollution hazards of air pollution concept of clean coal combustion technology - ultra violet radiation, infrared radiation, radiation from sun-hazards due to depletion of ozone - deforestation-ozone holes-automobile exhausts-chemical factory stack emissions- Chloro Fluoro Carbon(CFC).

WATER POLLUTION

Classification of water pollutants-health hazards-sampling and analysis of water-water treatment - different industrial effluents and their treatment and disposal –advanced wastewater treatment - effluent quality standards and laws- chemical industries, tannery, textile effluents, common treatment.

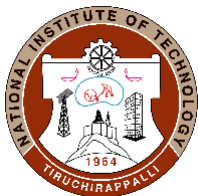
HAZARDOUS WASTE MANAGEMENT

Hazardous waste management in India-waste identification, characterization and classification-technological options for collection, treatment and disposal of hazardous waste selection charts for the treatment of different hazardous wastes-methods of collection and disposal of solid wastes-health hazards-toxic and radioactive wastes incineration and vitrification - hazards due to bio-process-dilution-standards and restrictions – recycling and reuse.

ENVIRONMENTAL MEASUREMENT AND CONTROL

Sampling and analysis – dust monitor – gas analyzer, particle size analyzer – pH meter – gas chromatograph – atomic absorption spectrometer. Gravitational settling chambers-cyclone separators-scrubbers-electrostatic precipitator - bag filter – maintenance - control of gaseous emission by adsorption, absorption and combustion methods- Pollution Control Board-laws.

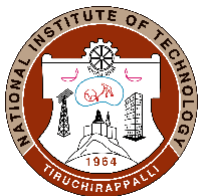
POLLUTION CONTROL IN PROCESS INDUSTRIES



Pollution control in process industries like cement, paper, petroleum- petroleum products, textile-tanneries-thermal power plants – dyeing and pigment industries - eco-friendly energy.	
COURSE OBJECTIVES	
<ol style="list-style-type: none"> 1. To imbibe knowledge on principles of environmental pollution control 2. To imbibe knowledge on control of various pollutants within the permissible limits. 	
MAPPING OF COs with POs	
Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1. Classify air and water pollutants and hazardous wastes.	1,2,3
2. Apply scientific knowledge to propose control strategies for different pollutions and process industries.	1,2,3,4
3. Use relevant information about environmental impacts of air, water pollutants and hazardous wastes to discuss environmental pollution in a given case.	1,2,3,4
4. Recognize and select appropriate environmental pollutant sampling and measurement techniques.	1,2,3,4
5. Apply relevant statutory and regulatory requirements concerned with environmental pollution.	1,2,3,4
6. State the principle and requirements of ISO 14001 standard based environmental management system.	1,2

COURSE PLAN – PART II

COURSE OVERVIEW			
The course deals with the identification, classification and characterization of air pollutant, water pollutant and hazardous waste from industries which impact the environment. This course exhibits quality standard and statutory requirements to control environmental pollution by recognizing and selecting appropriate sampling and measurement techniques.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1st week	Air Pollution: Classification and properties of air pollutants –Effects of air pollutants - ozone holes-automobile exhausts-chemical factory stack emissions- Chloro Fluoro Carbon (CFC).	Online (MS Teams)
2	2 nd week	Automobile pollution hazards of air pollution, concept of clean coal combustion technology - ultra violet radiation, infrared radiation - deforestation-.	Online (MS Teams)
3	3 rd week	Environmental Measurement and Control: Sampling and analysis – dust monitor – gas analyzer, particle size analyzer – pH meter – gas chromatograph – atomic absorption spectrometer.	Online (MS Teams)



4	4 th week	Gravitational settling chambers-cyclone separators-scrubbers-electrostatic precipitator - bag filter – maintenance - control of gaseous emission by adsorption, absorption and combustion methods-Pollution Control Board-laws.	Online (MS Teams)
5	5 th week	Water Pollution: Classification of water pollutants-health hazards-sampling and analysis of water-water treatment - different industrial effluents and their treatment and disposal	Online (MS Teams)
6	6 th week	Advanced wastewater treatment - effluent quality standards and laws- chemical industries, tannery, textile effluents - common treatment.	Online (MS Teams)
7	7 th week	Hazardous Waste Management: Hazardous waste management in India-waste identification, characterization and classification-technological options for collection	Online (MS Teams)
8	8 th week	Treatment and disposal of hazardous waste - selection charts for the treatment of different hazardous wastes -methods of collection and disposal of solid wastes-health hazards	Online (MS Teams)
9	9 th week	Toxic and radioactive wastes incineration and vitrification - hazards due to bio-process-dilution-standards and restrictions – recycling and reuse	Online (MS Teams)
10	10 th week	Pollution Control in Process Industries: cement, paper, petroleum	Online (MS Teams)
11	11 th week	Petroleum products-textile-tanneries-thermal power plants – dyeing and pigment industries - eco-friendly energy.	Online (MS Teams)

COURSE ASSESSMENT METHODS (shall range from 4 to 6)				
S.No.	Mode of Assessment	Week	Duration	% Weightage
1	CT1	6 th	1 hr	30
2	Assignment	-		10
3	CT2	10 th	1 hr	30
CPA	Compensation Assessment*	As per the academic schedule		30
6	Final Assessment *			30
*mandatory; refer to guidelines on page 4				



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

Feedback about the course shall be collected from the students during the last week of the period

COURSE POLICY (including compensation assessment to be specified)

MODE OF CORRESPONDENCE

Email: sreejith@nitt.edu, Mobile: 9605749947

COMPENSATION ASSESSMENT POLICY

One compensation assessment in the form of viva voce shall be conducted for the students failed in appearing for assessment I, II or both I & II.

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

FOR APPROVAL

Course Faculty

CC- Chairperson

22.10.2020

HOD

23/10/2020



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.