



DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	M. Tech, Industrial Safety Engineering		
Course Title	INDUSTRIAL HYGIENE AND ERGONOMICS LABORATORY		
Course Code	ME 661	No. of Credits	2
Course Code of Pre-requisite subject(s)	NIL		
Session	July 2021	Section (if, applicable)	
Name of Faculty	Dr. Sreejith Mohan Dr. Nivish George	Department	Mechanical
Official Email	sreejith@nitt.edu nivish@nitt.edu	Telephone No.	6238050110 9526086317
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	
Syllabus (approved in BoS)			
<p>1. NOISE LEVEL MEASUREMENT AND ANALYSIS Measurement of noise level for various sources – Impact, continuous and intermittent. Frequency and spectrum analysis of noise: Instrument – precision type of Noise level meter with frequency and spectrum analyzer.</p> <p>2. MEASUREMENT OF HEAT STRESS INDEX Determination of heat stress index using WBGT instrument in indoor and outdoor environments.</p> <p>3. MEASUREMENT OF ULTRAVIOLET RADIATION Determination of ultraviolet radiation during welding operation and outdoor environment</p> <p>4. MEASUREMENT OF ILLUMINATION LEVEL Determination of level of illumination in various labs in the department.</p> <p>5. EXHAUST GAS MEASUREMENT AND ANALYSIS Measurement of Exhaust gas measurement of IC engines: Instrument – Gas analyzer</p> <p>6. BREATHING ZONE CONCENTRATION Measurement of breathing zone concentration of dust and fumes: Instrument – personal air sampler, Measurement of particulate matters (PM2.5, PM1, PM0.5 and PM 0.25) in the Breathing zone</p> <p>7. AMBIENT AIR MONITORING Measurement of respirable and non-respirable dust in the ambient air: Instrument – High volume sampler</p> <p>8. FUME FORMATION RATE(FFR) Measurement of fume formation rate in welding operation using Total fume chamber as per ISO 15011-1</p>			



9. DETERMINATION OF GAS AND VAPOUR Determination of gas and vapour by using air sampling instruments.

10. VIBRATION MEASUREMENT AND ANALYSIS Measurement of whole body vibration for various acceleration: Instrument – vibration simulator and vibration analyzer

11. DIGITAL HUMAN MODELING SOFTWARE FOR VIRTUAL ERGONOMICS EVALUATION

12. BIOMECHANICAL ANALYSIS (COGNITIVE WORKLOAD AND FATIGUE) WITH EMG INSTRUMENT

COURSE OBJECTIVES

1. To imbibe knowledge on Measurement of parameters relevant to health, safety and environment
2. To imbibe knowledge on Evaluation of occupational health hazards and control strategies to control the hazards

MAPPING OF COs with POs

Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
3. Compute noise and vibration level in work environment and apply suitable countermeasures	1, 2
4. Demonstrate exhaust gas measurement and analyze the implications	1,2,3
5. Compute dust and fume level in breathing air and conduct ambient air analysis	2,3
6. Demonstrate fatigue level and analyze the implications on work activity	2,3
7. Compute the heat stress and UV radiation from the various environments	1,2,3
8. Demonstrate illumination level and analyze the implications.	1,2,3

COURSE PLAN – PART II

COURSE OVERVIEW

The course offers an overview of the different ways in which data needed for a safe working environment in an industry is measured. The recorded data can be compared with the exposure limit values for each case, forecasting the likelihood of exposure-related occupational hazards.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1st week	VIBRATION MEASUREMENT AND ANALYSIS Measurement of whole body vibration for various acceleration: Instrument – vibration simulator and vibration analyzer.	Online (MS Teams)



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2	2 nd week	NOISE LEVEL MEASUREMENT AND ANALYSIS Measurement of noise level for various sources-Impact, continuous and intermitted. Frequency and spectrum analysis of noise: Instrument – precision type of Noise level meter with frequency and spectrum analyzer.	Online (MS Teams)
3	3 rd week	MESUREMENT OF HEAT STRESS INDEX Determination of heat stress index using WBGT instrument in indoor and outdoor environments.	Online (MS Teams)
4	4 th week	MESUREMENT OF ULTRAVIOLET RADIATION Determination of ultraviolet radiation during welding operation and outdoor environment	Online (MS Teams)
5	5 th week	EXHAUST GAS MEASUREMENT AND ANALYSIS Measurement of Exhaust gas measurement of IC engines: Instrument – Gas analyzer	Online (MS Teams)
6	6 th week	BREATHING ZONE CONCENTRATION Measurement of breathing zone concentration of dust and fumes: Instrument – personal air sampler, Measurement of particulate matters (PM2.5, PM1, PM0.5 and PM 0.25) in the Breathing zone.	Online (MS Teams)
7	7 th week	AMBIENT AIR MONITORING Measurement of respirable and non-respirable dust in the ambient air: Instrument – High volume sampler	Online (MS Teams)
8	8 th week	FUME FORMATION RATE (FFR) Measurement of fume formation rate in welding operation using Total fume chamber as per ISO 15011-1	Online (MS Teams)

COURSE ASSESSMENT METHODS (shall range from 4 to 6)				
S.No.	Mode of Assessment	Week	Duration	% Weightage
1	Assessment 1	6 th	10 mins	10
2	Assessment 2	7 th	10 mins	10
3	Assessment 3	8 ^h	10 mins	10
4	Assessment 4	9 th	NA	40
6	Final Assessment *	As per academic schedule		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: 6238050110

Email: nivish@nitt.edu, Mobile: 9526086317

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


Dr. Sreejith Mohan


Dr. Nivish George

Course Faculty _____

CC- Chairperson _____


21/09/2021

HOD _____
22/09/2021



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.