



DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	M. Tech, Industrial Safety Engineering		
Course Title	Occupational Health and Hygiene		
Course Code	ME 655	No. of Credits	3
Course Code of Pre-requisite subject(s)			
Session	July 2020	Section (if, applicable)	
Name of Faculty	Dr. S.P. Sivapirakasam	Department	Mechanical
Official Email	spshivam@nitt.edu	Telephone No.	0431 2503408
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>PHYSICAL HAZARDS Noise, compensation aspects, noise exposure regulation, properties of sound, occupational damage, risk factors, sound measuring instruments, octave band analyzer, noise networks, noise surveys, noise control program, industrial audiometry, hearing conservation programs vibration types, effects, instruments, surveying procedure, permissible exposure limit. Ionizing radiation, types, effects, monitoring instruments, control programs, OSHA standard non-ionizing radiations, effects, types, radar hazards, microwaves and radio-waves, lasers, TLV- cold environments, hypothermia, wind chill index, control measures- hot environments, thermal comfort, heat stress indices, acclimatization, estimation and control</p> <p>CHEMICAL HAZARDS Recognition of chemical hazards-dust, fumes, mist, vapour, fog, gases, types, concentration, Exposure vs. dose, TLV - Methods of Evaluation, process or operation description, Field Survey, Sampling methodology, Industrial Hygiene calculations, Comparison with OSHAS Standard. Air Sampling instruments, Types, Measurement Procedures, Instruments Procedures, Gas and Vapour monitors, dust sample collection devices, personal sampling Methods of Control - Engineering Control, Design maintenance considerations, design specifications - General Control Methods - training and education</p> <p>BIOLOGICAL HAZARDS Classification of Biohazardous agents –bacterial agents, rickettsial and chlamydial agents, viral agents, fungal, parasitic agents, infectious diseases - Biohazard control program, employee health program-laboratory safety program-animal care and handling-biological safety cabinets - building design.</p>			



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OCCUPATIONAL HEALTH AND TOXICOLOGY

Concept and spectrum of health - functional units and activities of occupational health services, pre-employment and post-employment medical examinations - occupational related diseases, levels of prevention of diseases, notifiable occupational diseases such as silicosis, asbestosis, pneumoconiosis, siderosis, anthracosis, aluminosis and anthrax, lead-nickel, chromium and manganese toxicity, gas poisoning (such as CO, ammonia, coal and dust etc.) their effects and prevention - cardio pulmonary resuscitation, audiometric tests, eye tests, vital function tests. Industrial toxicology, local, systemic and chronic effects, temporary and cumulative effects, carcinogens entry into human systems

OCCUPATIONAL PHYSIOLOGY

Man as a system component - allocation of functions - efficiency - occupational work capacity - aerobic and anaerobic work - evaluation of physiological requirements of jobs - parameters of measurements - categorization of job heaviness - work organization - stress - strain - fatigue - rest pauses - shift work - personal hygiene.

COURSE OBJECTIVES

1. To imbibe knowledge on workplace hazards and control strategies to control the hazards
2. To imbibe knowledge on promotion of occupational health and prevention of occupational diseases.

MAPPING OF COs with Pos

Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1. Identify different types of physical, chemical and biological hazards in the workplaces, and analyze work environment.	1, 2,3
2. Employ risk analysis process on health hazards and recommend control measures for different types of physical, chemical and biological hazards in the workplaces, and be able to choose between different control strategies.	1,2,3,4
3. Select appropriate protective devices based on hazard characterization	1,2,3
4. Formulate plans for promotion of occupational health and prevention of occupational diseases.	1,2,3,4
5. Analyse workplaces, equipment and work postures to recognize ergonomics deficiencies and suggest solutions.	1,2,3,4

COURSE PLAN - PART II

COURSE OVERVIEW

The course focuses on understanding work-related environmental hazards and selection of appropriate methods and devices for monitoring the hazards. The course further helps in recommending different prevention strategies and control measures to promote occupational health and prevent the occupational diseases.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1st week	Chemical Hazards: Recognition of chemical hazards- concentration, Exposure vs. dose, TLV - Methods of Evaluation	Online (MS Teams)



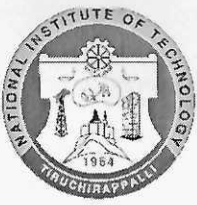
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2	2 nd week	Field Survey, Sampling methodology, Industrial Hygiene calculations, Comparison with OSHAS Standard, Air Sampling instruments and Measurement Procedures	Online (MS Teams)
3	3 rd week	Methods of Control - Engineering Control, Design maintenance considerations, design specifications - training and education	Online (MS Teams)
4	4 th week	Occupational Health & Toxicology: Concept and spectrum of health - functional units and activities of occupational health services, pre-employment and post-employment medical examinations - occupational related diseases	Online (MS Teams)
5	5 th week	Cardio pulmonary resuscitation, audiometric tests, eye tests, vital function tests. Industrial toxicology	Online (MS Teams)
6	6 th week	Physical Hazards: Noise, occupational damage, sound measuring instruments, octave band analyzer, noise control program,	Online (MS Teams)
7	7 th week	Industrial audiometry, hearing conservation programs, vibration types, effects, instruments, surveying procedure, permissible exposure limit	Online (MS Teams)
8	8 th week	Ionizing and Non Ionizing radiation, OSHA standards, TLV, Hypothermia, Windchill index, heat stress indices	Online (MS Teams)
9	9 th week	Biological Hazards: Classification of Biohazardous agents, Biohazard control program, employee health program-laboratory safety program-animal care and handling-biological safety cabinets - building design.	Online (MS Teams)
10	10 th week	Occupational Physiology: Man as a system component – allocation of functions – efficiency – occupational work capacity – aerobic and anaerobic work – evaluation of physiological requirements of jobs	Online (MS Teams)
11	11 th week	parameters of measurements – categorization of job heaviness – work organization – stress – strain – fatigue – rest pauses – shift work – personal hygiene.	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 hour	30
CPA	Compensation Assessment*	As per the academic schedule		30
6	Final Assessment *			30

***mandatory; refer to guidelines on page 4**



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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: spshivam@nitt.edu, Mobile: 9944547215

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



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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.