

Course Type	Course Code	Name of the Course	L	T	P	Credits
DP	NMNC520	Safety, Health And Ergonomics Lab	0	0	3	1.5

Course Objective

- The practical course on Safety, Health, and Ergonomics is fundamentally designed to understand and evaluate the safety and health concerns of mine workers.
- By integrating ergonomics into the design of mining equipment and the work environment, the course aims to identify the techniques that significantly reduce the risk of occupational hazards and improve the overall well-being of miners.
- Furthermore, the course serves to educate students about the critical role of ergonomics in preventing musculoskeletal disorders and other occupational injuries. Through this practical, future mining professionals can become advocates for health and safety, recognizing the impact of well-designed workspaces on miner's health which is the need of the hour.

Learning Outcomes

- The students will learn the technical usage of various health, safety, and ergonomical equipment and can also evaluate the various occupational hazards especially mining related hazards. By which, the students will understand essence of risk assessment and practical implications of it. Therefore, in future they can advocate the safety principles adoption in the mines.

Units	Course Content	Contact hours	Learning Outcomes
Unit 1	Study of Experimental setup and analysis of Adiabatic R70 of Coal	03	Students will know the constructional features of Adiabatic R70 of Coal Experimental setup and method of determination of susceptibility of coal combustion of coal using the same.
Unit 2	Assessment of explosibility of mine atmosphere using explosibility diagram	03	The students will learn about the mechanism of formation of explosive atmosphere and how to assess it towards the mitigation of risk associated with such formation of hazards.
Unit 3	Determination of the heat risk at workplace using Wet Bulb Globe Temperature (WBGT)	03	Students will know the constructional features of WBGT apparatus and method of determination of heat stress using it.
Unit 4	Determination of dust exposure level using continuous personal dust sampler	03	Students will know the constructional features of personal dust sampler apparatus and method of determination of dust exposure in mines using it.
Unit 5	Evaluation of the noise levels exposed by mine employees at	03	Students will know the constructional features of noise dosimeter apparatus

	the workplace using noise dosimeter		and method of determination of noise exposure in mines using it.
Unit 6	Study and sketch of Anthropometric Set for the human body measurement	03	Students will know the constructional features of Anthropometric kit and its essence in practical application in mines.
Unit 7	Measurement techniques of Whole-Body Vibration (WBV) and Hand Arm Vibration (HAV) exposure of the mine operators at the workplace	03	Students will know the working principle of WBV meter & HAV meter. They will learn the respective method of determination of WBV & HAV exposure in mines using this apparatus.
Unit 8	Estimation of hearing sensitivity of the mine employees using pure tone air condition audiometry at the workplace.	03	Students will know the constructional features of audiometer and method of determination of loss in hearing sensitivity in mines using it.
Unit 9	The analysis of physical workload of the mine workers by Heart Rate and Activity Monitor using cardio-vascular load method	03	Students will know the working principle of Heart Rate and Activity Monitor and method of determination of workload in mines using it.
Unit 10	Study of the lung's Health and functional capacity (Lung Function Test) of Coal Mine Workers using Spirometry method	03	Students will know the constructional features of spirometer and method of determination of respirable diseases among miners using it.
Unit 11	Determination of grip strength of mine workers using Hand Dynamometer	03	Students will know the constructional features of Hand Dynamometer and method of determination of grip strength of miners using it.
Unit 12	Physical Fitness Test for Mine workers using Cardio-Coach VO2-Max, Metabolic Analyzer	03	Students will know the constructional features of Cardio-Coach VO2-Max, Metabolic Analyzer and method of determination of physical fitness of mine workers.
Unit 13	Doubt clearance (if any) of all practical	06	
Total		42	

Reference: Lab manual