**Course Syllabus**

Academic year: 2018-2019

|  |  |
| --- | --- |
| Institution | University of Petroşani |
| Faculty | of Mines |
| Field of study | Civil Engineering |
| Level | Bachelor |
| Program of study | Mining Constructions |

|  |  |
| --- | --- |
| Course | **Occupational Health and Safety** |
| Code | CVCMS0704 |
| Year of study (semester) | IV (VII) |
| Number of hours | 70 |
| Number of credits | 6 |
| Professor | Prof., Ph.D. MORARU Roland |

|  |  |
| --- | --- |
| **No.** | **Topic** |
|  | Composition of mine atmosphere: Mine gases; generation, properties and effects; sampling and analysis of mine air; flame safety lamp; monitoring of different gases; inflammability of fire damp; fire damp explosions. |
|  | Heat and humidity: Sources of heat in mines; geothermal gradient; heat flow in deep mines; effects of heat and humidity; psychometrics; computation of thermodynamic properties of mine air; basic modes of heat transfer in mines; methods of calculation of heat flow and temperature rise in mine airways; heat and moisture transfer in stopes. |
|  | Air flow in mines: Laws of air flow; resistance of airways; resistance and splitting problems; equivalent orifice; flow control devices; permissible air velocities. |
|  | Natural ventilation: Seasonal variations; calculation of natural ventilation pressure;  thermodynamic principles and other short-cut methods |
|  | Mechanical ventilation: Theory of different fans; characteristics and suitability of fan; selection, testing and output control; fans in series and parallel; reversal of air flow; fan drift, diffuser and evasee; booster and auxiliary fans; ventilation of headings and sinking shafts; standards of ventilation; ventilation calculations. |
|  | Ventilation planning: Ventilation layout; determination of size of shafts and airways; estimation of air quantity requirements; ventilation network analysis; Hardy Cross method of iterative analysis and application of linear theory; thermodynamic network analysis and computer application; application of numerical modeling; estimation of pressure requirement; ventilation survey; ventilation plans. |
|  | Structure of the law system and the main normative acts regarding the occupational safety and health |
|  | Occupational accidents and diseases. Definition, classification, communication, research, recording. Signaling and declaring the occupational diseases |
|  | Basic principles and concepts regarding the industrial risks analysis. Threat, risk, acceptable risk, Farmer diagram |
|  | Techniques and methods for assessing the occupational accident and disease risks in mining industry. Systems and techniques for instrumental measurement of the microclimate parameters and comfort degree |
|  | Gaseous explosive environments. Methane. Explosive mixtures with more components. Classification of mines from the point of view of the gas emanations. Monitoring the underground methane concentration. Placing the detection heads of the telemetry station in various categories of mining works |
|  | Underground fires and endogenous fires as major risk phenomena. The mechanism of the coal self ignition process, detection during the incipient phase, techniques and means for prevention and control. Early detection of the endogenous fires. Fire indices calculus (Indices: breathing, Graham. Trickett-Jones) |
|  | Airborne dust: Generation, dispersion, measurement and control; suppression and treatment of mine dust; sampling and analysis of mine dust. Powdery explosive environments. Explosive coal powder, sources, factors and parameters that influence the explosion capacity, the mechanism of the explosion process. |
|  | Prevention against industrial pneumoconiosis causing powders. Prevention of silicosis causing powder generated by the mining operations. |
|  | Technical, organizational and hygienic-sanitary methods and means for prevention against the occupational accident and disease risks in underground mining |
|  | Electrical safety |
|  | Minimal safety and health requirements for temporary and mobile work sites |
|  | Occupational safety and health requirements for mining underground constructions. Rescuing, self-rescuing systems and personal protective equipment |