MINE VENTILATION, HEALTH AND SAFETY SYSTEMS

Code	Credit Hours
MinE-802	3-0

Course Description.

Introduction to ventilation, Friction factor, Airflow in airways and ventilation networks, Ventilation system components, Mine ventilation analysis, ventilation assessment, Auxiliary ventilation and Fan characteristic, Laws and Regulations, Computer Simulation

Textbook:

1. Du Plessis. J.J.L (ed.) (2014) Ventilation and Occupational Environmental Engineering in mines, Mine Ventilation Society of South Africa, Johannesburg, ISBN- 978-0-620-61172-5
2. McPherson, M.J. “Subsurface Ventilation and Environmental Engineering”. Champan & Hall, New York, ISBN-978-94-011-1550-6

References Book:

1. Le Roux, W.L “Mine Ventilation Notes for Beginners” Available from MVSSA.
2. Meriky, H.M., " An Introduction to mine Ventilation for Beginner" 1st Ed. 2010

Pre-Requisites:

Nil

ASSESSMENT SYSTEM FOR THEORY

Quizzes	15%
Assignment	5%
Mid Terms	30%
ESE	50%

Teaching Plan

Week No	Topics	Learning Outcomes
1	Introduction	CourseOutline,objectives,teachingplan,assessmentmethod, conceptsreview. Ventilation and the thermodynamics and fluid mechanics (Bernoulli equation) approach to ventilation. Introduction to mine ventilation
2	Airflow and ventilation networks	Overview of mine ventilation system, the components and design of the ventilations network. Types of ventilations

3	Friction factor	Atkinson's equation and friction factors
4-5	Ventilation system components	An introduction of various mine gases, sources of the gases, and associated dangers. An introduction of various mine gases, sources of the gases, and associated dangers. An introduction of various mine dusts and its sources in mine. Ventilation system components (including regulators, booster fans, fans, cooling towers, spray chambers and their characteristics)
6-8	Mine ventilation analysis	Ventilation network analysis, design and analysis of networks of airway and ducts. Analysis of ventilation networks, analogue and digital methods.
9	**MID TERM EXAM**	
10-13	Ventilation Assessment	Ventilation survey equipment, psychrometry, and health and safety hazards (dust, methane, noise), their monitoring and effect on health and safety. Air Quality Control: Calculation of the required air quantity
14	Auxiliary ventilation and Fan characteristic	Need for auxiliary ventilation, Components of Fan characteristic curve and selection criteria
15	Regulations	Mine ventilation health and safety regulations
16-17	Computer Simulation	Mine ventilation design using software applications
18	**END SEMESTER EXAM**	