

**The University of the Witwatersrand
presents**

**SHORT COURSES
in**

**COAL MINING, EXTRACTION AND
EXPLOITATION
IN SOUTH AFRICA**

**Five-day course
or
Daily attendance**

4-8 May 2009

Module in the
Postgraduate Programme for Industrial Personnel

LEADERSHIP IN FUEL & ENERGY TECHNOLOGY

**Hosted by
School of Mining Engineering,
University of the Witwatersrand.**

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**Venue:
Sports Administration Building, Sturrock Park Campus,
University of the Witwatersrand**

OBJECTIVES OF THE COURSE

The objectives of this course are to present

- An introduction to coal mining and extraction methods

- The impact of geological factors on mine planning, mine design and the selection of mining equipment
- The fundamentals of opencast and underground mining
- A review of small scale and subsistence mining and their issues
- Financial modelling in mine planning
- Environmental issues and rehabilitation
- Long term logistics, exports and production

OUTLINE OF THE COURSE

Topics include the following:

- Principles of coal extraction and exploitation including mining, storage, handling and dispatch
- Underground mining methods
- Opencast mining methods
- Mine planning and design
- Impact of geological features
- Resource and reserve assessment
- Legal and practical issues related to Mining rights
- Planning for closure
- Safety, health and environmental issues
- Methods of handling and transport –conveyors, pipeline, truck, train ocean-going vessels
- Storage mechanisms – long and short-term stockpiling, slurry ponds, discard materials including fines and duff
- Environmental impacts of storage - acid mine drainage, self heating, particulate emissions and their impact on health impact; weathering mechanisms and impact on coal quality
- Techno-economic impact of Southern Africa’s current and future coal reserves and methods for their future extraction and exploitation.

The course includes a visit to a mine with exposure to all aspects of mine management.

MOTIVATION

With the increasing **demand for high quality coal products** for export purposes, the currently prevailing **severe economic climate** and **increasing environmental pressures**, it has become necessary to expand the knowledge and awareness of the coal reserves and resources in South Africa and to improve mining efficiencies and extraction potential.

In so doing it is also necessary to provide an overview of recent government legislation and accreditation requirements currently required to assess the distributions, qualities, resources and reserves of coal more accurately than has been the case in the past, and the environmental impacts that the exploitation and utilisation of such commodities would have before, during and after mining.

The development of modern financial models is also required to significantly improve mine planning, production, extraction and beneficiation and to assess the future marketability and utilisation of the ultimate products. For these reasons the course seeks

- *To outline production geology and geological issues related to mine planning, coal extraction and beneficiation.*
- *To present advances in extraction technologies as used in the underground and opencast mining of coal*
- *To present issues related to surface structures, logistics and transportation, coal handling and stockpile management*
- *To review environmental, social and legal issues*
- *To review economic and financial considerations, investment criteria the influence of the current economic situation in the world.*

WHO SHOULD ATTEND THIS COURSE

- Geologists
- Mining engineers and mine planners
- Mineral (coal) resource managers
- Coal processing engineers
- Marketing and trading personnel
- Industrial users of coal
- Engineering manufacturers
- Financial funding agencies
- Government and company policy planners
- Researchers and lecturers in academia.

COURSE PROGRAMME

DAY 1 – Monday 4 MAY 2009

EXPLORATION AND EXPLOITATION:

Production geology and geological issues related to mine planning, coal extraction and beneficiation; the role of the geologist and mining engineer in estimating reserves and resources; Modifying factors, how they are used and derived, and the associated pitfalls; interaction between geologist and surface plant; main characteristics of coal as they pertain in the mining environment and the constraints put on mining by washability factors.

08:30 – 09:00 – Registration

09:00-10:00 –Overview of geological factors to be considered during exploration, reserve resource analysis, exploitation, role of the geologist in mine planning and surface plant;

10:00 – 10:30 – Tea

10:30-13:00 – Evaluation of geological factors pertaining to underground and opencast mining and mine planning; selection of mining equipment planning.

13:00 – 14:00 – Lunch

14:00 – 15:30 – Economic and financial considerations; investment decision criteria; block ranking and activity hosting, full financial evaluation, inputs, outputs, sensitivity analysis. Influence of current economic situation.

15:30 – 15:45 – Tea

15:45-16:30 - Evaluation of coal quality characteristics and their affect on beneficiation and utilisation potential.

DAY 2 – Tuesday 5 May 2009

COAL MINING – OPENCAST

Fundamentals of opencast mining, method selection, equipment selection, rehabilitation planning.

08:30 – 09:00 - Registration

09:00 – 10:00 – Fundamentals of opencast planning (Stripping Ratio; block ranking, boxcut criteria, Constraints

10:00 – 10:30 - Tea

10:30 – 11:00 - Market and Product selection. Method Selection (methods, criteria, examples)

11:30 – 12:15 – Equipment Selection.

12:15 – 13:00 - Activity Scheduling.

13:00 – 14:00 – Lunch

14:00 – 15:30 - Financial modelling.

15:30 – 15:45 - Tea

15:45 – 16:30 – Rehabilitation planning.

16:30 – 17:00 - Discussions on the day's papers

DAY 3 – Wednesday 6 May 2009

COAL MINING – UNDERGROUND

Fundamentals of underground mining, method selection, equipment selection, VOHE and safety.

08:30 - 09:00 Registration

09:00 – 10:30 Mine management for major mining ventures. Principles and practice in underground mines. Mine planning, extraction methods, handling and storage, health and safety and the coordination thereof.

10:30 – 10:45 - Tea

10:45 – 13:00 **Mine management** for major mining ventures. Principles and practice (cont

13:00 – 14:00 – Lunch

14:00 – 15:15 – Junior and subsistence mining in the coal industry. Technical, social and economic factors.

15:15 – 15:30 – Tea

15:30 – 17:00 - Junior and subsistence mining in the coal industry. Technical, social and economic Factors (continued).

DAY 4 – Thursday 7 May 2009

SURFACE INFRASTRUCTURE, LOGISTICS AND TRANSPORTATION.

Surface infrastructure; logistics and transportation; coal handling and stockpile management; environmental, social and legal issues.

08:30 - 09:00 - Registration

09:00 - 10:00 - Surface infrastructure transportation, coal handling; Reducing coal fines when mining and extracting coal in open cast mines in Southern Africa. Blue sky ideas using different explosive combinations and their impact on costs of mining.

10:00 - 10:15 - Tea

10:15 – 12:00 - Environmental impacts of coal mining and storage - acid mine drainage, self heating and spontaneous combustion, particulate emissions and their impact on health impact; weathering mechanisms and impact on coal quality.

12:00-13:00 – Contaminant Transport Modelling.

13:00 – 14:00 – Lunch

14:00 – 15:00 – Underground coal gasification – international experiences and SA potential.

15:00 – 15:15 – Tea

15:15 - 16:30 – Social and legal issues.

16:30-17:00 - Final discussion and Closure. Examination arrangements and project for those taking examinations.

DAY 5 – Friday 8 May 2009

COAL MINE VISIT

08:00–15:00 - Visit to Colliery with illustrated and practical examples of mining and exploitation methods and mine planning with an opencast mining operation visit.

REMAINING COURSE PROGRAMME FOR 2009

- **Coal and Coke in the Metallurgical Industry:** 8-12 June 2009
- **3- Coal Preparation and Beneficiation:** 3-7 August 2009
- **4- Coal Conversion:** 31 August – 4 September 2009
- **5- Coal Combustion, Power Generation and CCT:** 9-13 November 2009

NB: Courses are subject to cancellation or date changes.

*Please check via “Technical enquiries” margaret.blair@wits.ac.za or in relevant Schools in the University)
or via Mrs Lesley Stephenson Cell: 083 679 0697 Email: lstephenson@mweb.co.za*

COAL MINING, EXTRACTION AND EXPLOITATION

REGISTRATION - FIVE-DAY ATTENDANCE:

R6 500-00 + VAT R910.00 = R7 410-00

Email registration to: MRS L STEPHENSON. VAT No: **4270185251**
 Tel/Fax: 011 447 1490 Cell: 083 679 0697 Email: lstephenson@mweb.co.za

NAME:.....TITLE.....

AFFILIATION

COMPANY.....

ADDRESS.....

TEL:.....FAX.....

MOBILE.....EMAIL:.....

ACCOUNTS CONTACT PERSON.....

ACCOUNTS TEL NUMBER.....

ACCOUNTS EMAIL ADDRESS.....

COMPANY VAT NO..... VENDOR NO..... PURCHASE ORDER NO.....

NB: ATTENDANCE IS STRICTLY SUBJECT TO PAYMENT PRIOR TO THE COURSE

BANKING DETAILS: *Please fax a copy of the deposit slip or EFT to (011) 447 6148 or email projects@fossilfuel.co.za.*

Fossil Fuel Foundation of Africa (Education)

Bank: ABSA

Branch Code: 632 005

Account No: 919 978 4837

Ref: **PLEASE USE YOUR INVOICE NUMBER AS A REFERENCE ON THE DEPOSIT SLIP OR EFT.**

CANCELLATION OF THIS REGISTRATION

Cancellation may be made in writing 7 days prior to this course, whereon a 25% cancellation fee will be charged. No refund or credit will be issued within the 7 days of the course. Registrations are transferable. Invoices will be sent once registration forms have been submitted. **KINDLY NOTE: ATTENDANCE IS STRICTLY SUBJECT TO PRIOR PAYMENT**

COAL MINING, EXTRACTION AND EXPLOITATION

REGISTRATION - DAILY ATTENDANCE:

R1 500-00 + VAT R210.00 = R1 710-00 per day

DAY 1..... DAY 2..... DAY 3..... DAY 4..... DAY 5.....

Email registration to: MRS L STEPHENSON. VAT No: **4270185251**
Tel/Fax: 011 447 1490 Cell: 083 679 0697 Email: lstephenson@mweb.co.za

NAME:..... TITLE.....

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ACCOUNTS TEL NUMBER.....

ACCOUNTS EMAIL ADDRESS.....

FFF MEMBERSHIPYes/No..... No.....

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