DEKA Dynamics is a provider of focused professional assistance to the international mining community, ensuring clients benefit from their expertise, in-depth knowledge and problem solving abilities, throughout the project life cycle from early stage exploration, through mine development and operations to eventual mine closure.

Our company has joined with industry leading professionals and subject matter experts (SME) to provide education and training seminars and courses to organisations involved in mining, be they mining companies, their employees, shareholders or owners, or those that support or are involved in them. Their seminars and courses are presented worldwide, with the objective of educating and teaching people relevant subject matter and best practice, transferring new techniques and concepts to mining professionals, and expanding the knowledge of the industry in general, all of which help improve mine operations, personal knowledge, mine profitability and investment opportunities.

DEKA Dynamics provides tried and tested education and training courses on-site, at regional centres or client specified locations. The training covers:

- Theoretical – Providing a solid understanding of underlying principles of the subject matter,
- Practical – Providing software agnostic training,

With a substantive range (40+) of technical courses for all types of mining that also covers non-technical people.

Our education and training sessions:
- Have been created by Industry experts
- Are run by accredited Subject Matter Experts,
- Provide fully customised training (focus on work practices & client data) and on-the-job training,
- Can form an integral part of any Employee Improvement Programme, and
- Enhance the skills, knowledge and capability of the individual for Critical Employee Selection
- May count towards CPD programmes

**Course Schedule**

The courses will be given in 2-13 July 2018 between 09.00 am – 05.00 pm in Ankara. The Venue Place will be given later. Please follow us on [www.mjd.org.tr](http://www.mjd.org.tr) for further details.

Tea and coffee breaks, 10am and 3pm, and lunch 12.30-1.30 pm.

**Course Language**

English (Simultaneous translation will not be available)
Course Level
The course is suitable for all levels of experience.

Course Fee
Each Course costs “daily prices per person”. Daily Price is 3,000 TL/day/person. 5 day course will be 15,000 TL/person, 2 days course is 6,000 TL/person.

Final Registration will be completed after transferring your Course Fee to MJD Accounts. Please let us know about your transfer by sending the receipt to iletisim@mjd.org.tr.

Application Deadline is 25.06.2018. MJD will declare/announce the final situation and availability of each course on 26.06.2018 to registered members. There will be full refund by MJD to members if the courses will be cancelled.

Bank Details

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<th>Banking Details</th>
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<tbody>
<tr>
<td><strong>Account Name:</strong> MADEN JEEOGLARI DERNE`GI IKTISADI ISLET</td>
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<tr>
<td><strong>Account No:</strong> 53467835 TL Account</td>
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<td><strong>Bank Name:</strong> Yap\ı Kredi AS</td>
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<td><strong>Branch:</strong> 290 - KU\ÇULU PARK \ŞUBESİ</td>
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<td><strong>IBAN:</strong> TR82 0006 7010 0000 0053 4678 35</td>
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Course Capacity
Course capacity is limited to 10 participants in each course. The courses will only be available when there is 10 people registered into each course.

MJD have the rights to change/cancel the training program in accordance with DEKA Dynamics.

Registration, Information and Contact
Please contact with MJD-Office for registration and details.

Nihal Atmaca (MJD Secretary)
iletisim@mjd.org.tr
Tel: 0312.428-7654
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- Can form an integral part of any Employee Improvement Programme, and
- Enhance the skills, knowledge and capability of the individual for Critical Employee Selection
- May count towards CPD programmes

DEKA Dynamics Contact Details

Lvl 25/108 St Georges Terrace,
Perth, Australia, 6000
Phone: +61 8 6454 0217
Mobile: +61 448 020 831

Coordinator: Hettie van Wyk
Email: training@dekadynamics.com.au
# Professional Development Programme

**ANKARA    JULY 2-13**

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<td>ADVANCED MINERAL RESOURCE ESTIMATION</td>
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<td>MINING GEOLOGY AND MINING PRACTICES 101</td>
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<td>RESOURCE MODELLING AND ESTIMATION FOR COAL</td>
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<td>GRADE CONTROL AND RECONCILIATION</td>
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## MINE SAMPLING AND ASSAY DATA QUALITY (QAQC) MANAGEMENT – 3 DAYS

Access to sampling and assay data of the highest integrity is key to evaluating and exploiting mineral resources and reserves. The resource and reserve define the asset and companies rely on the quality and accuracy of the data used in processes, such as, resource and reserve estimates, classification of ore and waste, reconciliation of production to plan and mineral beneficiation. Poorly defined procedures and actions have tremendous consequences.

To assist mine personnel maintain the integrity of the data, a robust QAQC system is a “must have” in any sampling/assaying programme and minimising the errors and faults that may occur throughout the stages of the assay process that eventuate in an assay value is essential.

Developed for geologists, mining engineers and metallurgists involved in maintaining and analysing sampling and quality control systems in mineral projects/operating mines, this part of the course provides participants with an overview of sampling techniques, analytical methods used in the field or laboratory and quality control systems. The intent is to help the participants understand the systems they work with.

The courses addresses:

<table>
<thead>
<tr>
<th>Sampling and Analytical Methods</th>
<th>Quality Control Systems</th>
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<tbody>
<tr>
<td>• Precision, accuracy &amp; bias</td>
<td>• Quality Control Concepts</td>
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<td>• Sampling Errors</td>
<td>• Use of Standard Reference Materials as control points</td>
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<td>• Sample collection</td>
<td>• Duplicates, Replicates and Referee Samples</td>
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<td>• Sample description</td>
<td>• Statistics and Control Charts</td>
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<td>• Sub-sampling &amp; splitting</td>
<td>• Setting up an appropriate Quality Control programme.</td>
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<tr>
<td>• Laboratory Analytical Methods and Limits of Detection</td>
<td>• Reconciliation of assay results with sample descriptions</td>
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<tr>
<td>• Bulk Density determination</td>
<td>• Commercial software vs Excel spreadsheets</td>
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## MINE GRADE CONTROL AND RECONCILIATION – 4 DAYS

The Grade Control part of the course combines participants understanding methodologies to be used, with practical exercises based on best practice in grade control techniques to minimise misclassification of ore and waste. The course covers: sampling for grade control models, a survey of currently used estimation methods, ore definition and ore boundary control and information management options. The course will also look at why the grade control model and resource model are different.

Mine reconciliation is not accounting! The objective of mining reconciliation is not to get two sets of numbers to balance, which is often seen as an end in itself, by those focused on factors, but rather to help identify and understand the discrepancies that occur throughout the reconciliation process in order to assess and improve the processes involved.

This course presents participants with reconciliation as a quality control and oreflow management tool. The course introduces the mining value chain, measurement points along the chain, reconciliation between points in the value chain and between periods in the Life-of-Mine. Exercises provide examples of calculations in the reconciliation process.

The courses addresses:

<table>
<thead>
<tr>
<th>Grade Control Techniques &amp; Modelling</th>
<th>Mine Reconciliation</th>
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<tr>
<td>• The grade control process</td>
<td>• Mining value chain</td>
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<tr>
<td>• Mapping and logging</td>
<td>• Reconciliation as a quality control tool.</td>
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<tr>
<td>• Survey control</td>
<td>• Ore flows, risk assessment, sampling</td>
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<tr>
<td>• Grade control sampling and quality control systems</td>
<td>• Measurement points in the value chain, standard reconciliation nomenclature</td>
</tr>
<tr>
<td>• Trenching, core, RC samples and blasthole samples</td>
<td>• Point to Point Reconciliation, geology, mine, plant, transport - data and calculations</td>
</tr>
<tr>
<td>• Assaying and Bulk density</td>
<td>• Period on Period Reconciliation - data and calculations</td>
</tr>
<tr>
<td>• Grade control modelling</td>
<td>• Reconciliation systems and software tools for data management and analysis.</td>
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<tr>
<td>• Costs and cut-off grades</td>
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<td>• Selectivity and Ore / waste definition</td>
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<td>• Dig plans</td>
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<td>• Mark outs</td>
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<td>• Blast movement</td>
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<td>• Stockpile management</td>
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<td>• Procedures and database management</td>
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MINERAL RESOURCE ESTIMATION – 5 DAYS

As a typical resource estimation involves the construction of a geological and resource model with data from various sources, this course consists of a theoretical component, explaining basic mathematical concepts behind mineral resource estimation methods, coupled with a substantial practical component. The practical portion will take the participants through the steps necessary to produce a simple mineral resource estimate.

This course has been designed for geologists and mining engineers involved with or are interested in becoming involved with mineral resource estimation for prospect evaluation, grade control or long-term planning. The course requires a knowledge of geology and/or mine planning but does not require prior knowledge of geostatistics. Participants should have computer skills associated with geology modelling, grade control or mine planning software.

The course requires the use of Microsoft Excel and geostatistical modelling software to complete the practical portion. Participants can bring their own commercial software or use GSLIB which will be provided for practical exercises.

The course addresses:

• Introduction to modelling and its purpose.
• Role and responsibilities of the mineral resource modeller.
• Exploratory Data Analysis - Data Quality, Geology and Descriptive Statistics
• Modifying Data-Domaining, Top cutting and Compositing
• Spatial Relationships and Variography
• Estimation Methodologies (Nearest Neighbour, Inverse Distance and Linear Regression-Kriging)
• Choosing Estimation Parameters-block sizes and search neighbourhoods
• Estimation
• Validation
• Classification
• Documentation
• Workflows for various commercial software or GSLIB

ADVANCED MINERAL RESOURCE ESTIMATION – 5 DAYS

Although this course follows on from our Mineral Resource Estimation course, providing delegates with the opportunity to enhance their estimation techniques, delegates who are already competent in Resource Estimation can attend this next level course in to the use of geostatistics and apply them to their own data sets under the guidance of our Subject Matter Expert.

This course involves both theory and practical aspects, with a revision of the processes involved. This practical-based course requires delegates to bring their own laptops and, at the delegates discretion, data set which can be used during the course. Delegates will be familiar with GSLIB software, which will be used for the practical work.

The course addresses:

• Review of the geostatistics processes
• What and when is a process necessary
• Application of:
  • Multiple Indicator Kriging (MIK),
  • Sequential Gaussian Simulation (SGS) and
  • Sequential Indicator Simulation (SIS)
• Conditional Simulation
• Min/Max Autocorrelation Function (MAF)
• Scenario testing through Conditional Simulation
• What’s new?
PUBLIC REPORTING OF MINERAL RESOURCES AND MINERAL RESERVES – 5 DAYS

Public Reporting of Mineral Resource and Mineral Reserves is a requirement for most mining companies either as part of a listing on a stock exchange, reporting to governments and other stakeholders or for raising of funding. To allow for transparent reporting and comparison between companies, stock exchanges, regulatory agencies and financial institutions require technical information to be presented in a specific format. This course is intended to help the technical specialists involved in Public Reporting, meet the formatting requirements for these reports. The course offers guidelines on appropriate reporting to the level of project/company development and how to comment on the quality of technical information and risk factors.

This course provides a short history of and context to the regulations (JORC, 43-101, SAMREC) along with the primary reference materials used in the reporting of Mineral Resources and Mineral Reserves. It includes exercises in reviewing reports and press releases, writing portions of a report, filling out Table 1 (JORC or SAMREC) and guidelines on personal responsibility and professional ethics.

The course addresses:

- Competent Person’s and Lead Competent Person’s Responsibilities.
- Structure of the most commonly used reporting codes (JORC, 43-101, SAMREC or other CRIRSCO aligned codes).
- Technical Reports, Press Releases, Websites and other forms of Public Reporting.
- Reporting of Exploration Results.
- Reporting of Mineral Resources without Mineral Reserves.
- Reporting of Mineral Resources and Mineral Reserves.
- Updates of technical reports/press releases and follow-on (additional Studies) reports.
- Formatting of Figures.
- Table 1 (JORC/SAMREC)
- Writing Styles and Terminology,
- Competent Person’s Statements and Certificates

FUNDAMENTALS OF PIT OPTIMISATION & MINE PLANNING, & MANAGEMENT OF MINE CONTRACTS – 5 DAYS

Using practical exercises, this course presents basic open pit planning and contracts management considerations,

Mine planners ensure value maximisation through decisions on mine design, scheduling alternatives, ore definition, ore access, equipment selection, and ore and waste removal sequences and continually apply forward-looking exercises based on the updated geological model and modifying factors.

This course is designed to assist mine managers, planners, production engineers and other mineral industry professionals to have a better understanding of open pit mine planning and design processes. The course covers the key elements of mine planning premised on mineral resource to mineral reserve conversion process.

Following the above, the optimisation section of the course is designed to inform and inspire business leaders, mine managers, mine planners and mineral asset advisers about the use of the latest optimization concepts and strategies. Optimisation techniques can be used to enhance the value of the business by maximizing value associated with the flow of ore through the different elements of the value chain.

Optimisation commences with the identification of key value drivers and risks based on the available project or operations data such as geological data, geotechnical data, metallurgical test-work data, drill and blast requirements to meet process requirements, logistics and potential constraints. The key challenge is to simultaneously optimise elements of the value chain rather than to optimise component parts in isolation from the remainder of the elements. Mine to mill optimisation is therefore based on building an integrated geological, mining and processing model that allows optimization of variables along the value chain.

The two-day Mine-to-Mill Optimisation course focuses on the optimisation levers available to mine planners and operations management to enhance the base plan. The workshop will also assist management and shareholders who are not mining and mineral processing technical experts to be able to assess if optimal mineral asset shareholder value has been considered.

The last part of this course provides delegates with the fundamentals behind compiling and managing mining contracts, with focus on; different contract types and their structure; the tendering process; the principles of contract negotiation; management and dispute resolution.
WORKING WITH COAL QUALITY DATA – 5 DAYS

This course covers the numerical evaluation of coal quality data, beginning with the assessment of the raw data derived from the individual sampled ‘plies’ in each unique borehole intersection, and the compounding of these results into full seam composites. The evaluation is then extended to the elementary statistical analysis of project data sets comprising the full complement of available borehole intersections.

The statistical analysis includes simple data validation techniques designed to highlight data errors and anomalous results in both the physical and the quality attributes of the coal deposit. It also provides valid average values and ranges for these physical and quality data. The numerical work utilises standard Microsoft Excel software.

The statistical analysis is facilitated by the generation of a project-specific database which is also designed to be compatible with ‘user-friendly’ modelling packages such as ‘Surfer or MINEX’, which can then be utilised to produce both physical and quality models of the coal deposit.

The preliminary investigation of the washability characteristics of the coal are also covered in this course.

The course addresses:
- Derivation of Seam Quality Composites from Raw Assay Data
- Database Layout
- Data Validation
- Estimation of Average Physical and Quality Parameters
- Coal Quality Reporting

COAL PRODUCTION GEOLOGY – 5 DAYS

The course provides delegates with guidelines to effectively close the production loop from exploration through mining, metallurgy and ultimately coal sales.

As the custodian of the resource, the geologist is ideally placed to reconcile the resource depletion and to qualify many of the loss factors along the coal beneficiation path. This part of the course covers ‘on-mine’ grade control, loss factors inherent in all phases of the mining operation, and the technical aspects of coal beneficiation.

The on-site course allows for demonstration of face and stockpile sampling.

The course addresses:
- On-mine Quality Control Basics
- Stockpile Control
- Contamination and Dilution
- Mining Loss Factors
- Plant Loss Factors
- Moisture Factors
- Resource Reconciliation and Depletion

MINING GEOLOGY AND MINING PRACTICES - 2 DAYS

There are many people involved or associated with the mining industry who have not worked on a mine site and do not necessarily understand the mining processes. This two-day course highlights the underlying geology that provides mineral wealth to be exploited and is followed by an insight into the different facets of mining needed to make a viable ore deposit a success.

In the Geology section, delegates will be able to experience collecting samples and identifying sampling errors. Through the visual aids, delegates can experience the mining activity and machinery involved.

The Mining session provides delegates with an overview of the mining cycle for open pit and underground mines, from feasibility studies to mine closure. The iterative planning process is discussed, and delegates will be able to see that a mine continually plans and plans. Audio Visual aids provide visualisation of the mining process, incorporating open-pit and various underground mining operations.

Delegates will leave the course with a better understanding of mining.
## COAL RESOURCE MODELLING AND ESTIMATION – 5 DAYS

Providing theory and practical applications, delegates learn how to generate models and estimate the Resource.

The first part of the course teaches delegates how to utilise a quality coal database to generate 2D and 3D physical coal deposit models and to model trends in the quality attributes of the coal. These models are produced using modelling software. Many modelling algorithms are investigated and the various advantages and disadvantages of each are evaluated during the course.

The second part of the course utilises these models to calculate resource areas and volumes as a prelude to the estimation of resource tonnages and provision of their resource classification.

The course ultimately provides delegates with a basic guide to compiling the Competent Person’s reports (CPR’s), acceptable to JORC, NI 43-101 and SAMREC standards.

The course addresses:
- Deposit Modelling Methods
- Theoretical Geological Losses
- Physical Resource Modelling
- Coal Quality Modelling
- Resource Calculations and Resource Estimation

## COAL RESOURCE AND RESERVE REPORTING – 5 DAYS

The reporting of Coal Resources and Coal Reserves entails the preparation of summary technical reports that comply with various company and regulatory requirements. The principles of reporting are transparency and materiality of the methodologies and information in the reports, and competency of the individuals undertaking the evaluations and reporting. Amongst the regulatory and company requirements is the appointment of Competent Person’s to take professional (and legal) responsibility for the format and content of the reports.

The Competent Person must meet specific levels of technical expertise in coal geology and coal exploration, and ability to make judgements, and to comment on the quality of technical work. The Competent Person must also be able assess at a reasonable level the materiality of any factors likely to the company’s financial performance. Finally, the Competent Person must be able to produce a report in the required formats.

This course is designed to provide the participants with a short history of and context to the regulations relating to coal exploration and coal mining, and to present the primary reference materials used in the reporting of Coal Resources and Coal Reserves. This course helps technical specialists involved in reporting, to meet the formatting requirements for these reports, and offers guidelines on how to comment on the quality of technical information and risk factors.

Learning the requirements for content and formatting of these reports is based on memorizing basic rules, collecting and learning how to use a set of appropriate reference documents and adopting behaviours and attitudes aligned with independent thinking, personal responsibility and professional ethics.

The list of examples used to demonstrate acceptable reporting formats addresses areas of greatest concern, where practice is difficult and/or poorly complied with.

The course addresses:
- Resource Codes (JORC, NI43-101, SAMREC)
- Understanding the Requirements of the SANS 10320 Document
- Project Evaluation and CPR Preparation
# OPTIMAL OPEN PIT BLASTING TECHNIQUES (METAL MINES) - 3 DAYS

There are many people involved or associated with the mining industry who have not worked on a mine site and do not necessarily understand the mining processes. This two-day course highlights the underlying geology that provides mineral wealth to be exploited and is followed by an insight into the different facets of mining needed to make a viable ore deposit a success.

This course introduces mine personnel involved in the blasting process to the latest techniques and methods. The course will focus on Blast Optimisation thereby, ensuring downstream benefits through improved drilling and blasting operations. The course focuses on the generic details of blasting products with no particular emphasis on specific manufacturers and their products, thereby ensuring impartiality.

Opportunities will be given for delegates to introduce the course attendees to their individual technical challenges at their mine site for discussion, with a collective review of their existing blasting techniques and procedures part of the course.

**Who should attend:**

- Experienced Shotfirers and Blasters
- Drill and Blast Supervisors
- Senior Mining Personnel
- Geologists
- Drill and Blast Engineers
- Procurement Personnel
- Geotechnical Engineers
- Mine Superintendents

And anyone seeking more in-depth knowledge of blasting techniques and outcomes

The course will cover the following:

## Understanding the Basics

- Understanding your Current designs
- Major factors influencing blast efficiency
- Rock fragmentation by blasting
- Three keys to improving explosive performance
- Geological effects on blast performance
- Defining blast performance goals and developing designs
- Selecting the best explosive for site conditions
- History of Explosive Initiation Systems
- Initiation Systems
- Selecting the Point of Initiation
- Timing Configuration Refinement
- Advantages of Various Timing Configurations
- Developing timing configurations to match the site conditions
- Slope Protection
- Controlling over-break

## Assessing the Outcomes

- Measuring and Optimising fragmentation
- Implementing field procedures to achieve consistent blast performance
- Quantifying blast performance with key performance indicators
- Defining the downstream effects of blast performance
- Refining the blast designs to achieve the lowest overall cost

## OPTIMAL OPEN PIT BLASTING TECHNIQUES (COAL MINES) - 3 DAYS

In addition to the above points, this course is focused on coal and will include:

- Coal fines reduction
- Hot-hole Blasting
ENERGY MANAGEMENT - 3 DAYS

Providing theory and practical

This three-day introductory course discusses the significance of the Energy Crisis and its relevance to mining and processing activities.

Energy efficiency/optimisation can contribute a significant percentage to solving energy shortages. A traditional energy audit and energy management recommendations, as an undeveloped approach, targets only 10% of the consumption. A comprehensive active energy management system gives visibility and context for targeting known and revealed challenges, and for continuous improvement.

The Energy Management course provides delegates with the essentials regarding:

- conducting an energy audit
- compiling audit reports based on energy codes, standards and protocols
- Energy purchasing, accounting and benchmarking
- the importance of electricity rate structures based on an economic analysis
- life cycle costing of energy supply, demand and consumption.

The basics and lessons learnt in energy recommendations for utilities (power, water, gas), lighting basics and illumination system improvements, electric motors, operational and production scheduling, maintenance programs and project commissioning will be discussed through qualitative and quantitative examples. There is no software involved, but the participant is required to have a working understanding of MS Excel.

CARBON FOOTPRINT ANALYSIS - 2 DAYS

Industries and companies continuously examine their efficiencies in terms of the availability and utilisation of physical resources. This 2-day course teaches the steps to conduct a carbon footprint assessment in accordance with the Greenhouse Gas Protocol and the ISO 14064.

A mining-related example will be compiled by applying the Carbon Accounting Methodology, and the exercise will be continued with an overview to different types of Carbon Markets (mandatory and voluntary) available and Trading Mechanisms (command-and-control and market approaches). Carbon Management and Reporting methods will be discussed with the perspective of social costs.

The latest information on the local (South African, Australasian, European, American, etc.) contribution to carbon emissions and the South African national policies and frameworks for carbon taxation, based on carbon emission targets will be presented. There is no software involved, but the participant is required to have a working understanding of MS Excel.

ENVIRONMENTAL ECONOMICS - 2 DAYS

The aim of the 2-day Environmental Economics introductory course is to explore the quantitative economic principles and management of environmental resources and associated policies, in the context of mineral economic activities.

The fundamental link and quantitative balance of these resource extremes, namely mineral and environmental, is presented based on the circular flow model, and through case studies of market failures and full/social costs of transactions (private costs and external/environmental costs).

The theory and practise of the benefit-cost analysis is presented based on a typical mining project, from demand and willingness-to-pay perspectives, damage and abatement costing, and economic efficiency for mining activity problems.