**ECONOMIC EVALUATION AUGUST 2019 COURSE DETAILS**

**Day 1: Background and Basics**

**Overall industry context:**

The Minerals Industry today.

Macroeconomic trends affecting mineral consumption; greening of the planet and how it is affecting minerals consumption.

**Case study: electric vehicles**

**The project pipeline:**

Stages in minerals project development; quantifying the full mineral inventory; key deliverables from each stage; trends in capital expenditure; breakdown into greenfields, brownfields and sustaining capital; benchmarking.

**Case study 1: patterns in capital expenditure by the majors.**

**Case study 2: valuing exploration properties**

**Valuation Codes:**

The key global valuation codes; the associated stock exchange listings rules; valuation approaches and methods; difference between minerals properties and real estate.

**Case study: gold ounce equivalent approach**

**Investment Fundamentals:**

The Investment Process; The Time Value of Money; Real vs Nominal (inflation); Discount Rates; the Weighted average cost of capital (WACC) approach; Country Risk;  Financial Metrics – Net Present Value, Internal Rate of Return, Capital Efficiency Ratio and Payback Period

**Principles of Financial Modelling:**

How to design a financial spreadsheet; basic spreadsheet principles; financial metrics in Excel; The four cash streams - Production/Revenue, Capital expenditure, Operating Costs, Taxes.

**Case study: Glossary of financial terms**

**Company Annual Financial Statements**:

Commonly terms used in the AFS; how to read and interpret terms like headline earnings, free cash flow, etc; how to interpret a balance sheet and cash flow statement; company stock performance and the key drivers; how to value a mining share.

**Case study: Tharisa Minerals share price drivers**

**The Inputs:**

Production/Revenue: Deep dive into geological, mining and metallurgical parameters affecting the revenue line for gold, PGMs, copper (porphyry and SXEW), iron ore (direct shipped ore and pelletizing); coal (metallurgical & thermal)

**Metal Prices:**

What price to use? Using forward curves; industry consensus; Value in Use (VIU) calculations; Treatment & Refining Charges (TCRC’s).

**Case Study: VIU in Iron Ore**

**Finale:**

Build your own financial model using the input parameters provided. Calculate the NPV and IRR. Determine what needs to be done to increase value.

**Day 2: Into the Deep End**

Recap on Day 1 and review of the financial model

**Valuing thermal coal in South Africa:**

The global coal market; trends in production and consumption; coal mining and processing; products and recoveries; coal pricing (domestic & export); taxes and royalties; building a coal financial model (a template will be provided).

**Case Study: Klipspruit Life Extension**

**Decision Analysis for Mining Investments:**

Historical performance in decision making; reasons why decisions go wrong; cognitive biases and their role in the decision making process; how to counter cognitive bias; and approach to effective decision making.

**Case Study: Grape Expectations**

**The effect of ramp-up:**

McNulty curves, technological impacts:

**Case Study: Las Bambas (porphyry) and Minas Rio (Iron Ore)**

**Valuing a Gold Operation:**

Trends in gold production; the South African gold industry; productivity trends in South Africa; All-in-Sustaining Cost.

**Case Study: Sibanye Gold (one mine will be selected for detailed NPV analysis)**

**\*There will be an overnight assignment**

**Day 3: Further Analyses**

**Operating Costs:**

C1, C2 and C3  costs, All-in-Sustaining Costs; fixed costs and variable costs; metal equivalents.

**Capital Costs:**

Developing a capital estimate; direct and indirect capital costs; work breakdown structure; escalation and contingency.

**Case Study – base metals project**

**Mining Productivity:**

Principles of Continuous Improvement in Mining; Lean Six Sixma; The key productivity areas of Equipment, People, Supply, Capital & Marketing. How do measure productivity in these areas, and to improve productivity, and its impact on value

**Platinum Group Metals/Chrome:**

The market; prill splits; deep dive into the effect of electric vehicles; building the model.

**Case Study: Tharisa Minerals.- Historical analysis (original NPV), value going forward; analysis of options for future development and their value**

**Risk and Uncertainty:**

Traditional methods; Monte Carlo analysis; Risk-based Investment Metrics