BLACKBIRD FOR TRAINING

Project Analysis: Tools & Techniques for Managing Risk & Uncertainty

28 June – 2 July 2027
Geneva (Switzerland)

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Project Analysis: Tools & Techniques for Managing Risk & Uncertainty

Ref: 3254147_301424 **Date:** 28 June – 2 July 2027 **Location:** Geneva (Switzerland) **Fees:** 5200 GBP

Introduction

Large, capital-intensive projects require significant financial commitments and involve multiple layers of uncertainty throughout their lifecycle. From the early stages of exploration and concept evaluation to execution, operation, and long-term asset management, organizations must rely on structured analysis and sound decision-making to determine whether these investments are viable and sustainable. Without a clear analytical framework, projects face a greater risk of budget overruns, delays, weak returns, and strategic misalignment.

This course is designed to provide participants with a practical understanding of project analysis and decision-making techniques used in large-scale capital investment environments. It focuses on how to assess project feasibility, model financial performance, evaluate uncertainty, and analyze risks under changing conditions. By combining financial analysis, probability-based decision tools, and project risk evaluation methods, the program equips participants with the ability to make more informed, data-driven decisions that support stronger project outcomes and improved return on investment.

Course Objectives

By the end of this course, participants will be able to:

- Understand the full project analysis process and its role in major investment decisions.
- Apply project analysis methods to evaluate feasibility, profitability, and risk exposure.
- Develop and interpret project cash-flow models that reflect CAPEX, OPEX, and lifecycle value.
- Use uncertainty analysis and risk modelling techniques to forecast project outcomes more accurately.
- Assess project success factors and identify practical ways to maximize investment returns.
- Apply financial indicators and decision tools to support project approval and prioritization.
- Integrate risk and financial planning into broader project management and capital strategy decisions.



Course Outlines

Day 1: Fundamentals of Decision Analysis and Project Profitability

- Understand the concept of project decision analysis and its importance in capital-intensive environments.
- Explore the role of project analysis in building a strong business case for investment decisions.
- Examine the relationship between uncertainty, risk, and strategic project choices.
- Review key project analysis methods, including option analysis and identification of major decision factors.
- Learn the fundamentals of engineering economics, with emphasis on time value of money and discounted cash flow principles.

Day 2: Cash-Flow Modelling and Project Decision Analysis

- Learn the key techniques used in financial modelling for project evaluation and decision support.
- Develop an in-depth understanding of Internal Rate of Return IRR and its role in project analysis.
- Explore how project-specific conditions influence evaluation outcomes and investment decisions.
- Understand how scope of work and stakeholder analysis support the overall project analysis process.
- Build practical awareness of how to structure cash-flow models for large capital projects.

Day 3: Cost of Capital and Risk Modelling

- Understand how to estimate the cost of capital and why it matters in project evaluation.
- Examine the relationship between capital expenditure, operational expenditure, and long-term value.
- Learn how to calculate Benefit-Cost Ratio BCR and assess associated financial trade-offs.
- Apply risk modelling techniques to evaluate risk exposure, opportunities, sunk costs, and salvage value.
- Explore how financial assumptions and risk variables influence project viability and strategic outcomes.

Day 4: Expected Value Concept and Sensitivity Analysis

- Understand the expected value concept and its role in decision-making under uncertainty.
- Review basic probability theories used in project uncertainty and risk analysis.
- Conduct quantitative project risk analysis using structured analytical techniques.
- Explore semi-quantitative approaches such as the bow-tie method for identifying and managing risk pathways.
- Use sensitivity analysis tools, including tornado diagrams and PERT-based techniques, to assess critical variables.



Day 5: Decision Trees, Risk Responses, and ROI Analysis

- Learn how decision tree analysis supports project evaluation and alternative scenario assessment.
- Develop and interpret decision trees to compare possible project outcomes and options.
- Explore effective risk response strategies and how to assess their relevance and impact.
- Understand how to apply ROI analysis techniques to evaluate investment performance.
- Practice presenting project analysis findings in a way that supports decision-making and stakeholder communication.

Why Attend This Course: Wins & Losses!

- Stronger Project Analysis Skills: Build the ability to evaluate major projects using structured and practical analysis methods.
- Better Financial Decision-Making: Learn how to assess profitability, cash flow, and investment value with greater confidence.
- Improved Risk Awareness: Strengthen your understanding of uncertainty, probability, and risk modelling in project environments.
- Practical Use of Decision Tools: Gain hands-on familiarity with tools such as IRR, BCR, decision trees, and sensitivity analysis.
- Greater Strategic Value: Improve your ability to support sound capital investment decisions and better long-term project outcomes.

Conclusion

This course offers a structured and practical approach to analyzing large capital-intensive projects and making informed investment decisions in uncertain environments. It equips participants with the essential tools to evaluate project feasibility, model financial performance, assess risks, and support stronger decisions throughout the project lifecycle.

By the end of the program, participants will have a clearer understanding of what project analysis involves, why it matters, and how to apply the right analytical techniques to support successful outcomes. Whether working in infrastructure, energy, construction, or other investment-driven sectors, participants will leave the course with stronger capability to improve planning, reduce uncertainty, and maximize value from major projects.

