ECONOMIC & TECHNICAL EVALUATIONS IN ENGINEERING & MAINTENANCE PROJECTS



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GENTEX Training Center LLC | Orlando - FL, USA
Info@gentextraining.com

Introduction

Economic & Technical Evaluations in Engineering & Maintenance Projects Training Course builds the appraisal capability that engineers, maintenance planners, and project economists need to justify technical work with financial evidence. Engineering and maintenance proposals compete for the same limited capital, yet many are approved on technical merit alone. Proper evaluation compares alternatives on cost, reliability, energy use, and lifecycle value before commitment. Weak appraisal produces over-maintained assets, under-funded critical work, and investment that never pays back. This course develops the analytical discipline that prevents those outcomes. It covers evaluation methods, cost estimation, and technical assessment. Furthermore, it applies lifecycle costing, reliability analysis, and replacement decisions. In addition, it develops risk, prioritisation, and reporting. As a result, participants evaluate engineering and maintenance projects with confidence.

Economic & Technical Evaluations in Engineering & Maintenance Projects Course Objectives

- Explain evaluation principles for engineering and maintenance projects.
- Apply time value of money to capital and maintenance decisions.
- Calculate NPV, IRR, payback, and benefit-cost ratios.
- Estimate capital, operating, and maintenance costs accurately.
- Apply lifecycle costing and total cost of ownership analysis.
- Assess technical feasibility, reliability, and availability factors.
- Apply RAM analysis and failure mode assessment methods.
- Evaluate repair, refurbish, or replace alternatives.
- Apply risk analysis and sensitivity testing to evaluations.
- Prepare evaluation reports, prioritisation lists, and justifications.

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Course Methodology

- Interactive lectures with real engineering and maintenance cases.
- Cost estimation and lifecycle costing workshops.
- Economic evaluation and replacement analysis exercises.
- Reliability, risk, and prioritisation practice.
- Structured peer review with facilitator feedback on evaluation reports.

Who Should Take This Course

- Maintenance and reliability engineers.
- Project engineers and engineering managers.
- Maintenance planners and asset managers.
- Cost estimators and project controls staff.
- Finance analysts supporting capital projects.
- Consultants advising on asset and maintenance strategy.

Economic & Technical Evaluations in Engineering & Maintenance Projects Course Outlines

Day 1: Evaluation Fundamentals and Project Framing

- Evaluation principles for engineering and maintenance work.
- Problem definition, scope, and option identification.
- Technical versus economic evaluation criteria.
- Capital versus operating expenditure classification.
- Base case definition and incremental analysis.

- Data sources and estimation accuracy levels.
- Case study: framing an evaluation for a maintenance investment.

Day 2: Cost Estimation and Lifecycle Costing

- Capital cost estimation methods and accuracy ranges.
- Operating, maintenance, and energy cost estimation.
- Total cost of ownership and lifecycle costing models.
- Discounting, inflation, and escalation treatment.
- Salvage value, disposal, and decommissioning costs.
- Cost escalation indices and benchmarking techniques.
- Workshop: building a lifecycle cost model for an asset.

Day 3: Economic Evaluation Techniques

- Time value of money and discount rate selection.
- Net Present Value and internal rate of return.
- Payback and discounted payback analysis.
- Benefit-cost ratio and equivalent annual cost.
- Mutually exclusive and independent project ranking.
- Budget constraints and capital rationing decisions.
- Workshop: comparing maintenance and capital alternatives.

Day 4: Technical and Reliability Assessment

- Technical feasibility and design adequacy review.
- Reliability, availability, and maintainability analysis.
- Failure mode and effects analysis (FMEA).

- Mean time between failures and downtime cost.
- Condition monitoring and predictive maintenance data.
- Repair, refurbish, or replace decision frameworks.
- Workshop: evaluating reliability and replacement alternatives.

Day 5: Risk, Prioritisation, and Reporting

- Risk identification and probability-impact assessment.
- Sensitivity analysis and scenario testing.
- Risk-adjusted evaluation and contingency setting.
- Maintenance prioritisation and criticality ranking.
- Evaluation report structure and recommendation writing.
- Justification packs and approval submissions.
- Course review, assessment, and action planning.

Conclusion

By successfully completing Economic & Technical Evaluations in Engineering & Maintenance Projects, participants will gain a thorough understanding of evaluation fundamentals and project framing, cost estimation and lifecycle costing, economic evaluation techniques, technical and reliability assessment, and risk, prioritisation and reporting. They will also acquire practical skills in engineering and maintenance project framing and evaluation, cost estimation and lifecycle costing, economic evaluation and investment ranking, and technical, reliability and risk assessment. In addition, the course prepares them to justify engineering and maintenance decisions with transparent financial and technical evidence. Gentex Training Center delivers this programme with a strong focus on applied appraisal practice and decision-ready justification packs.

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FAQs for Economic & Technical Evaluations in Engineering & Maintenance Projects course

Q1 What is the "Economic & Technical Evaluations in Engineering & Maintenance Projects" course about?

It is a five-day programme on appraising engineering and maintenance proposals. It covers evaluation fundamentals and framing, cost estimation and lifecycle costing, economic evaluation techniques, technical and reliability assessment, and risk, prioritisation and reporting.

Q2 What are the key benefits of the "Economic & Technical Evaluations in Engineering & Maintenance Projects" course?

Participants justify engineering and maintenance work with stronger evidence. The course improves option framing and incremental analysis, sharpens cost estimation and lifecycle costing, strengthens NPV and benefit-cost comparison, improves reliability and replacement decisions, and raises prioritisation and justification reporting quality.

Q3 What skills will I gain from the "Economic & Technical Evaluations in Engineering & Maintenance Projects" course?

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Participants gain engineering and maintenance project framing and evaluation, cost estimation and lifecycle costing, economic evaluation and investment ranking, and technical, reliability and risk assessment. These four skills cover the practical core of this work.

Q4 What tools, methods, or standards are covered in the "Economic & Technical Evaluations in Engineering & Maintenance Projects" course?

The course covers option identification and base case definition, capital and operating expenditure classification, incremental analysis, cost estimation methods and accuracy ranges, operating, maintenance and energy cost estimation, total cost of ownership and lifecycle costing models, discounting, inflation and escalation treatment, salvage value and decommissioning cost analysis, cost escalation indices and benchmarking, time value of money and discount rate selection, Net Present Value, internal rate of return, payback and discounted payback, benefit-cost ratio, equivalent annual cost, mutually exclusive and independent project ranking, capital rationing decisions, technical feasibility and design adequacy review, reliability, availability and maintainability analysis, failure mode and effects analysis, mean time between failures and downtime costing, condition monitoring and predictive maintenance data, repair-refurbish-replace decision frameworks, risk identification and probability-impact assessment, sensitivity analysis and scenario testing, risk-adjusted evaluation and contingency setting, maintenance prioritisation and criticality ranking, evaluation report structure, and justification pack preparation.

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Q5 How is the "Economic & Technical Evaluations in Engineering & Maintenance Projects" course applied in real-world practice?

Participants apply the methods to real and simulated engineering and maintenance proposals. They frame evaluation problems and options, estimate capital, operating and maintenance costs, build lifecycle cost models, calculate NPV, IRR and benefit-cost ratios, rank competing projects under budget limits, assess technical feasibility and reliability, run FMEA and downtime costing, evaluate repair or replace alternatives, test sensitivity to key variables, rank maintenance work by criticality, and prepare evaluation reports and justification packs for approval. Many leave with a lifecycle cost model template, an economic evaluation worksheet, and a justification pack structure ready to use.