

1. Record Nr.	UNINA9910553069003321
Autore	Chakrabarti Sampa
Titolo	Project engineering primer for chemical engineers // Sampa Chakrabarti
Pubbl/distr/stampa	Singapore : , : Springer, , [2022] ©2022
ISBN	9789811906602 9789811906596
Descrizione fisica	1 online resource (246 pages)
Disciplina	660.015118
Soggetti	Chemical engineering - Mathematical models Project management
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- Acknowledgements -- Contents -- About the Author -- List of Figures -- List of Tables -- 1 Introduction -- 1.1 Preamble -- 1.2 Engineering, Science and Chemical Engineering -- 1.3 Project and Project Engineering -- 1.3.1 Characteristics of a Project -- 1.4 Different Parties Involved in a Chemical Engineering Project -- 1.5 Categories and Phases of a Chemical Engineering Project -- 1.6 Life Cycle of a Chemical Engineering Project -- 1.6.1 Pre-project Work -- 1.6.2 Starting the Project -- 1.6.3 Starting and Carrying Out Engineering Work -- 1.7 Project Engineering and Process Engineering -- 1.8 Duties and Responsibilities of Project Engineer-Variou Perspectives -- 1.9 Engineering and Environmental Ethics in Project Engineering -- 1.10 Risk and Reliability Analysis -- References -- 2 Pre-project Work -- 2.1 Preamble -- 2.2 Feasibility Study-A Brief Overview -- 2.3 Preparation of Bid Documents-A Guideline -- 2.4 Codes and Standards -- 2.5 Site Selection -- 2.5.1 Availability of Raw Materials -- 2.5.2 Location Concerning the Market -- 2.5.3 Transportation Facilities -- 2.5.4 Availability of Workforce and Labours -- 2.5.5 Availability of Utilities-Water, Fuel and Power -- 2.5.6 Climatic Conditions -- 2.5.7 Environmental Impacts Including Waste Disposal Facilities -- 2.5.8 Site Characteristics Concerning Potential Hazards -- 2.5.9 Taxation and Legal Aspects -- 2.5.10 The Political Situation

and Local Community Consideration -- 2.6 Environmental Impact Assessment (EIA) -- 2.7 Optimization in Design -- 2.7.1 Trade-Offs -- 2.7.2 Objective Function and Constraints -- 2.7.3 Degree of Freedom -- 2.7.4 Mathematical Programming Techniques for Optimization -- 2.7.5 Optimization of a Single-Variable Problem-Problem Statement -- 2.7.6 Application of Optimization in Process Design -- 2.8 Scaling Up and Scaling Down -- 2.8.1 Scaling Factors.

2.9 Safety and Hazard Issues -- 2.9.1 Toxicity -- 2.9.2 Flammability, Fire and Explosion -- 2.9.3 Ionizing Radiation -- 2.9.4 High Pressure and Vacuum -- 2.9.5 Temperature Deviation -- 2.9.6 Noise --

References -- 3 Basic Engineering -- 3.1 Preamble -- 3.2 Process Drawings -- 3.2.1 Block Flow Diagram (BFD) -- 3.2.2 Process Flow Diagram (PFD) -- 3.2.3 Piping and Instrumentation Diagram (P&ID) -- 3.2.4 Plot Plans or Layouts -- 3.3 Design and Selection of Equipment -- 3.4 Safety, Hazard and Environmental Considerations in Design -- 3.5 HAZOP Analysis -- References -- 4 Detailed Engineering -- 4.1 Preamble -- 4.2 Drawing and Documents for a Project -- 4.3 Specification or Data Sheets for Equipment -- 4.3.1 Specification for an Atmospheric Storage Tank -- 4.3.2 Specification for a Shell and Tube Heat Exchanger -- 4.3.3 Specification for a Centrifugal Pump -- 4.4 Worked Out Examples on Pump Heads -- 4.4.1 Pressure Drop Calculation Sheet for Pumps -- 4.5 Specification of the Instruments and Control Valves -- 4.6 Line and Valve List or Schedule -- 4.7 Equipment List -- 4.8 Engineering Change Notice -- 4.9 Evaluation of Quotations from Vendors-Procurement Assistance -- 4.10 Plant Commissioning and Start-up -- 4.11 Operation and Maintenance Manual -- References -- 5 Financial Aspects of Project Engineering -- 5.1 Preamble -- 5.2 Cash Flow -- 5.2.1 Capital Investment -- 5.2.2 ISBL Plant Cost -- 5.2.3 Offsite Cost or OSBL Investment -- 5.2.4 Depreciation Charges and Other Investment Incentives -- 5.3 Estimation of Capital Investment -- 5.3.1 Cost Indexes -- 5.3.2 Cost Components of Capital Investment -- 5.3.3 Estimation of Purchased Equipment Cost -- 5.3.4 Methods of Estimating Capital Investment -- 5.4 Methods for Calculation of Depreciation Charges -- 5.5 Economic Analysis and Profitability Study -- 5.5.1 Methods for Calculating Profitability.

5.6 Alternative Investments -- 5.7 Replacement -- 5.8 Worked Out Examples -- References -- 6 Management Aspects of Project Engineering -- 6.1 Preamble -- 6.2 Project Planning -- 6.3 Project Scheduling -- 6.4 Project Scheduling and Progress Control -- 6.4.1 Bar Chart -- 6.4.2 Gantt Chart -- 6.4.3 Network Analysis -- 6.5 Project Crashing and Cost-Time Trade-Off -- 6.6 Risk Management -- References -- Appendix A Case Study-Developing PFD and P&ID -- A.1 Preamble -- A.2 Example-I -- A.2.1 Preliminary Process Flow Diagram (PFD) -- A.2.2 Preliminary Piping and Instrumentation Diagram (P&ID) -- A.3 Example-II -- A.3.1 Preliminary Process Flow Diagram (PFD) -- A.3.2 Preliminary Piping and Instrumentation Diagram (P&ID) -- Annexure I Multiple Choice Questions with Answers -- Annexure II Project Engineering and Similar Courses-Syllabi (Collected from Open Sourced Websites of the Respective Institutions) -- Index.
