

CONTENTS

1. Introduction to process and plant design	1
2. Site selection	21
3. The scope	61
4. Process design and safety	80
5. Equipment list	110
6. Layout	147
7. Process control and instrumentation	163
8. Energy and utility balances and personnel needs	182
9. Cost estimation	262
10. Economics – part I: cash flow	317
11. Economics – part II: discounted cash flow methods	359
12. Detailed engineering, construction, and start – up	417
13. Planning tools: cpm and pert	434
14. Optimization techniques	450
15. Digital computers and process engineering	470
16. Pollution and its abatement	481
17. Index	559