Table of contents provided by Syndetics

- **Preface** (p. v)
- **Part 1 Overview** (p. 1)
- Chapter 1 Introduction (p. 3)
- 1.1 FAOs about software engineering (p. 5)
- 1.2 Professional and ethical responsibility (p. 14)
- **Key points** (p. 17)
- Further reading (p. 18)
- Exercises (p. 18)
- Chapter 2 Computer-based system engineering (p. 20)
- **2.1** Emergent system properties (p. 22)
- 2.2 Systems and their environment (p. 24)
- **2.3 System modelling** (p. 26)
- **2.4** The system engineering process (p. 29)
- **2.5 System procurement** (p. 37)
- **Key points** (p. 39)
- Further reading (p. 40)
- **Exercises** (p. 40)
- Chapter 3 Software processes (p. 42)
- 3.1 Software process models (p. 44)
- **3.2 Process iteration** (p. 51)
- 3.3 Software specification (p. 55)
- 3.4 Software design and implementation (p. 56)
- **3.5 Software validation** (p. 60)
- 3.6 Software evolution (p. 63)
- **3.7 Automated process support** (p. 63)
- **Key points** (p. 68)
- Further reading (p. 68)
- **Exercises** (p. 69)
- Chapter 4 Project management (p. 71)
- **4.1 Management activities** (p. 73)
- **4.2 Project planning** (p. 75)
- **4.3 Project scheduling** (p. 78)
- **4.4 Risk management** (p. 84)
- **Key points** (p. 90)
- Further reading (p. 91)
- **Exercises** (p. 92)
- Part 2 Requirements (p. 95)
- Chapter 5 Software requirements (p. 97)
- 5.4 The software requirements document (p. 115)
- 5.1 Functional and non-functional requirements (p. 100)
- 5.2 User requirements (p. 106)
- **5.3 System requirements** (p. 109)
- **Key points** (p. 119)
- Further reading (p. 119)

- **Exercises** (p. 120)
- Chapter 6 Requirements engineering processes (p. 121)
- **6.1 Feasibility studies** (p. 123)
- **6.2** Requirements elicitation and analysis (p. 124)
- **6.3 Requirements validation** (p. 137)
- **6.4 Requirements management** (p. 139)
- **Key points** (p. 145)
- Further reading (p. 145)
- **Exercises** (p. 146)
- Chapter 7 System models (p. 148)
- **7.1 Context models** (p. 150)
- **7.2 Behavioural models** (p. 153)
- **7.3 Data models** (p. 158)
- **7.4 Object models** (p. 160)
- **7.5 CASE workbenches** (p. 166)
- **Key points** (p. 168)
- Further reading (p. 169)
- **Exercises** (p. 169)
- Chapter 8 Software prototyping (p. 171)
- **8.1 Prototyping in the software process** (p. 174)
- **8.2 Rapid prototyping techniques** (p. 180)
- **8.3** User interface prototyping (p. 188)
- **Key points** (p. 189)
- Further reading (p. 190)
- **Exercises** (p. 190)
- Chapter 9 Formal specification (p. 192)
- 9.1 Formal specification in the software process (p. 194)
- **9.2 Interface specification** (p. 197)
- **9.3 Behavioural specification** (p. 204)
- **Key points** (p. 209)
- Further reading (p. 210)
- **Exercises** (p. 210)
- **Part 3 Design** (p. 213)
- Chapter 10 Architectural design (p. 215)
- **10.1 System structuring** (p. 219)
- **10.2 Control models** (p. 224)
- **10.3 Modular decomposition** (p. 229)
- **10.4 Domain-specific architectures** (p. 233)
- **Key points** (p. 236)
- Further reading (p. 237)
- **Exercises** (p. 237)
- Chapter 11 Distributed systems architectures (p. 239)
- 11.1 Multiprocessor architectures (p. 243)
- 11.2 Client-server architectures (p. 244)
- 11.3 Distributed object architectures (p. 249)
- 11.4 CORBA (p. 252)

- **Key points** (p. 257)
- Further reading (p. 258)
- **Exercises** (p. 258)
- **12.3 Design evolution** (p. 280)
- Chapter 12 Object-oriented design (p. 260)
- 12.1 Objects and object classes (p. 262)
- 12.2 An object-oriented design process (p. 267)
- **Key points** (p. 282)
- Further reading (p. 282)
- **Exercises** (p. 283)
- Chapter 13 Real-time software design (p. 285)
- **13.1 System design** (p. 287)
- **13.2 Real-time executives** (p. 291)
- 13.3 Monitoring and control systems (p. 295)
- 13.4 Data acquisition systems (p. 300)
- **Key points** (p. 303)
- Further reading (p. 303)
- **Exercises** (p. 304)
- Chapter 14 Design with reuse (p. 306)
- 14.1 Component-based development (p. 310)
- **14.2 Application families** (p. 318)
- **14.3 Design patterns** (p. 322)
- **Key points** (p. 325)
- Further reading (p. 325)
- **Exercises** (p. 326)
- Chapter 15 User interface design (p. 327)
- 15.1 User interface design principles (p. 330)
- **15.2** User interaction (p. 332)
- **15.3 Information presentation** (p. 334)
- **15.4** User support (p. 340)
- **15.5 Interface evaluation** (p. 345)
- **Key points** (p. 347)
- Further reading (p. 348)
- **Exercises** (p. 348)
- Part 4 Critical Systems (p. 351)
- Chapter 16 Dependability (p. 353)
- **16.1 Critical systems** (p. 356)
- **16.2** Availability and reliability (p. 359)
- **16.3 Safety** (p. 364)
- **16.4 Security** (p. 367)
- **Key points** (p. 369)
- Further reading (p. 369)
- **Exercises** (p. 370)
- Chapter 17 Critical systems specification (p. 371)
- 17.1 Software reliability specification (p. 373)
- **17.2 Safety specification** (p. 379)

- **17.3 Security specification** (p. 387)
- **Key points** (p. 389)
- **Further reading** (p. 389)
- **Exercises** (p. 390)
- Chapter 18 Critical systems development (p. 392)
- **18.1 Fault minimisation** (p. 393)
- **18.2 Fault tolerance** (p. 400)
- **18.3 Fault-tolerant architectures** (p. 410)
- **18.4 Safe system design** (p. 413)
- **Key points** (p. 414)
- Further reading (p. 415)
- **Exercises** (p. 415)
- **19.2 Software inspections** (p. 425)
- Part 5 Verification and Validation (p. 417)
- Chapter 19 Verification and validation (p. 419)
- 19.1 Verification and validation planning (p. 423)
- 19.3 Automated static analysis (p. 431)
- **19.4 Cleanroom software development** (p. 434)
- **Key points** (p. 437)
- Further reading (p. 438)
- **Exercises** (p. 438)
- Chapter 20 Software testing (p. 440)
- **20.1 Defect testing** (p. 442)
- **20.2 Integration testing** (p. 452)
- **20.3 Object-oriented testing** (p. 458)
- **20.4 Testing workbenches** (p. 462)
- **Key points** (p. 464)
- Further reading (p. 465)
- **Exercises** (p. 466)
- Chapter 21 Critical systems validation (p. 467)
- 21.1 Formal methods and critical systems (p. 469)
- 21.2 Reliability validation (p. 470)
- **21.3 Safety assurance** (p. 476)
- **21.4 Security assessment** (p. 483)
- **Key points** (p. 484)
- Further reading (p. 484)
- **Exercises** (p. 485)
- Part 6 Management (p. 487)
- Chapter 22 Managing people (p. 489)
- **22.1 Limits to thinking** (p. 490)
- **22.2 Group working** (p. 497)
- 22.3 Choosing and keeping people (p. 503)
- 22.4 The People Capability Maturity Model (p. 506)
- **Key points** (p. 508)
- Further reading (p. 509)
- **Exercises** (p. 509)

- Chapter 23 Software cost estimation (p. 511)
- **23.1 Productivity** (p. 513)
- 23.2 Estimation techniques (p. 518)
- 23.3 Algorithmic cost modelling (p. 520)
- **23.4 Project duration and staffing** (p. 531)
- **Key points** (p. 533)
- Further reading (p. 533)
- **Exercises** (p. 534)
- Chapter 24 Quality management (p. 535)
- **24.1 Quality assurance and standards** (p. 539)
- **24.2 Quality planning** (p. 544)
- **24.3 Quality control** (p. 546)
- 24.4 Software measurement and metrics (p. 547)
- **Key points** (p. 555)
- Further reading (p. 555)
- **Exercises** (p. 556)
- Chapter 25 Process improvement (p. 557)
- 25.1 Process and product quality (p. 560)
- 25.2 Process analysis and modelling (p. 562)
- 25.3 Process measurement (p. 566)
- **Further reading** (p. 576)
- 25.4 The SEI Process Capability Maturity Model (p. 568)
- **25.5 Process classification** (p. 573)
- **Key points** (p. 576)
- **Exercises** (p. 577)
- **Part 7 Evolution** (p. 579)
- Chapter 26 Legacy systems (p. 581)
- **26.1 Legacy system structures** (p. 583)
- **26.2** Legacy system design (p. 587)
- **26.3** Legacy system assessment (p. 592)
- **Key points** (p. 598)
- Further reading (p. 599)
- **Exercises** (p. 599)
- Chapter 27 Software change (p. 601)
- **27.1 Program evolution dynamics** (p. 603)
- **27.2 Software maintenance** (p. 605)
- **27.3 Architectural evolution** (p. 614)
- **Key points** (p. 620)
- Further reading (p. 620)
- **Exercises** (p. 621)
- Chapter 28 Software re-engineering (p. 622)
- **28.1 Source code translation** (p. 626)
- **28.2 Reverse engineering** (p. 628)
- **28.3 Program structure improvement** (p. 629)
- **28.4 Program modularisation** (p. 632)
- **28.5 Data re-engineering** (p. 634)

- **Key points** (p. 638)
- Further reading (p. 639)
- **Exercises** (p. 639)
- Chapter 29 Configuration management (p. 641)
- **29.1** Configuration management planning (p. 644)
- **29.2** Change management (p. 647)
- 29.3 Version and release management (p. 650)
- **29.4 System building** (p. 655)
- 29.5 CASE tools for configuration management (p. 656)
- **Key points** (p. 660)
- Further reading (p. 661)
- **Exercises** (p. 661)
- **References** (p. 663)
- **Index** (p. 679)