

# 1. Core Programming

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122	Internal and External Views of Testing
123	White-Box Testing
124	Basis Path Testing
125	Control Structure Testing
126	Black-Box Testing
127	Model-Based Testing
128	Testing for Specialized Environments, Architectures, and Applications



129	Patterns for Software Testing
130	Summary
	<b>Testing Object-Oriented Applications</b>
131	Broadening the View of Testing
132	Testing OOA and OOD Models
133	Object-Oriented Testing Strategies
134	Object-Oriented Testing Methods
135	Testing Methods Applicable at the Class Level
136	Interclass Test-Case Design
137	Summary
	<b>Testing Web Applications</b>
138	Testing Concepts for WebApps
139	The Testing Process – An Overview
140	Content Testing
141	User Interface Testing
142	Component-Level Testing
143	Navigation Testing Configuration Testing
144	Security Testing
145	Performance Testing
146	Summary
	<b>Formal Modeling and Verification</b>
147	The Cleanroom Strategy
148	Functional Specification
149	Cleanroom Design
150	Cleanroom Testing
151	Formal Methods Concepts
152	Applying Mathematical Notation for Formal Specification
153	Formal Specification Languages
154	Summary
	<b>Software Configuration Management</b>
155	Software Configuration Management
156	The SCM Repository
157	The SCM Process
158	Configuration management for WebApps
159	Summary
	<b>Product Metrics</b>
160	A Framework for Product Metrics
161	Metrics for the Requirements Model
162	Metrics for the Design Model
163	Design Metrics for WebApps
164	Metrics for Source Code
165	Metrics for Testing
166	Metrics for Maintenance
167	Summary
	<b>Part-4: Managing Software Projects</b>
	<b>Project Management Concepts</b>
168	The Management Spectrum
169	People
170	The Product
171	The Process
172	The Project

173	The W5HH Principle
174	Critical Practices
175	Summary
	<b>Process and Project Metrics</b>
176	Metrics in the Process and Project Domains
177	Software Measurement
178	Metrics for Software Quality
179	Integrating Metrics within the Software Process
180	Metrics for Small Organizations
181	Establishing a Software Metrics Program
182	Summary
	<b>Estimation for Software Projects</b>
183	Observations on Estimation
184	The Project Planning Process
185	Software Scope and Feasibility
186	Resources
187	Software Project Estimation
188	Decomposition Techniques
189	Empirical Estimation Models
190	Estimation for Object-Oriented Projects
191	Specialized Estimation Techniques
192	The Make/Buy Decision
193	Summary
	<b>Project Scheduling</b>
194	Basic Concepts
195	Project Scheduling
196	Defining a Task Set for the Software Project
197	Defining a Task Network
198	Scheduling
199	Earned Value Analysis
200	Summary
	<b>Risk Management</b>
201	Reactive versus Proactive Risk Strategies
202	Software Risks
203	Risk Identification
204	Risk Projection
205	Risk Refinement
206	Risk Mitigation, Monitoring, and Management
207	The RMMM Plan
208	Summary
	<b>Maintenance and Reengineering</b>
209	Software Maintenance
210	Software Supportability
211	Reengineering
212	Business Process Reengineering
213	Software Reengineering
214	Reverse Engineering
215	Restructuring
216	Forward Engineering
217	The Economics of Reengineering
218	Summary

	<b>Part-5: Advanced Topics</b>
	<b>Software Process Improvement</b>
219	What is SPI
220	The SPI Process
221	The CMMI
222	The People CMM
223	Other SPI Frameworks
224	SPI Return on Investment
225	SPI Trends
226	Summary
	<b>Emerging Trends in Software Engineering</b>
227	Technology Evolution
228	Observing Software Engineering Trends
229	Identifying 'Soft Trends'
230	Technology Directions
231	Tools-Related Trends
232	Summary
	<b>Concluding Comments</b>
233	The Importance of Software – Revisited
234	People and The Way They Build Systems
235	New Modes for Representing Information
236	The Long View
237	The Software Engineer's Responsibility
238	A Final Comment
	<b>Part-6: Appendix</b>
239	An Introduction to UML
240	Object Oriented Concepts
	<b>SOFTWARE MAINTANANCE</b>

## 5. Basic Mathematics

	Pure Mathematics (A-Level)
	<b>P1: Algebra</b>
01	Background Algebra
02	Linear Equations
03	Changing the Subject of a Formula
04	Quadratic Equations
05	Solving Quadratic Equations
06	Equations that cannot be Factorized
07	The Graphs of Quadratic Function
08	The Quadratic Formula
09	Inequalities
	<b>P2: Algebra</b>
10	Operations with Polynomials
11	Solution of Polynomial Equations
12	The Modulus Function
	<b>P3: Further Algebra</b>
13	The General Binomial Expansion
14	Review of Algebraic Functions
15	Partial Functions
16	Using Partial Functions with The Binomial Expansion
	<b>P1: Co-Ordinate Geometry</b>
17	Co-Ordinates
18	Plotting, Sketching and Drawing
19	The Gradient of a Line
20	The Distance Between Two Points
21	The Mid-Point of a Line Joining Two Points
22	The Equation of a Straight Line
23	Finding the Equation of a Line
24	The Intersection of Two Line
25	Drawing Curves
26	The Intersection of A Line and A Curve
	<b>P1: Sequences and Series</b>
27	Definitions and Notation
28	Arithmetic Progressions
29	Geometric Progressions
30	Binomial Expansions
	<b>P1: Functions</b>
31	The Language of Functions
32	Composite Functions
33	Inverse Functions
	<b>P1: Differentiation</b>
34	The gradient of a Curve
35	Finding the Gradient of a Curve
36	Finding the Gradient from First Principles
37	Differentiating by Using Standard Results
38	Using Differentiation
39	Tangents and Normals
40	Maximum and Minimum Points

41	Increasing and Decreasing Functions
42	Points of Inflection
43	The Second Derivative
44	Applications
45	The Chain Rule
	<b>P2: Differentiation</b>
46	The Product Rule
47	The Quotient Rule
48	Differentiating Natural Logarithms and Exponentials
49	Differentiating Trigonometrical Functions
50	Differentiating Functions Defined Implicitly
51	Parametric Equations
52	Parametric Differentiation
	<b>P3: Differential Equations</b>
53	Forming Differential Equations from Rates of Change
54	Solving Differential Equations
	<b>P1: Integration</b>
55	Reversing Differentiation
56	Finding the Area Under A Curve
57	Area as The Limit of A Sum
58	Areas Below the X Axis
59	The Area Between Two Curves
60	The Area Between A Curve and the Y Axis
61	The Reverse Chain Rule
62	Improper Integrals
63	Finding Volumes by Integration
	<b>P2: Integration</b>
64	Integrals Involving The Exponential Function
65	Integrals Involving The Natural Logarithm Function
66	Integrals Involving Trigonometrical Functions
67	Numerical Integration
	<b>P3: Further Integration</b>
68	Integration by Substitution
69	Integrals Involving Exponentials and Natural Logarithms
70	Integrals Involving Trigonometrical Function
71	The Use of Partial Fractions in Integration
72	Integration by Parts
73	General Integration
	<b>P1: Trigonometry</b>
74	Trigonometry Background
75	Trigonometrical Functions
76	Trigonometrical Functions for Angles of any Size
77	The sine and cosine Graphs
78	The tangent graph
79	Solving Equations using Graphs of Trigonometrical Functions
80	Circular Measure
81	The Length of An ARC of A Circle
82	The Area of A Sector of A Circle
83	Other Trigonometrical Functions
	<b>P2: Trigonometry</b>
84	Reciprocal Trigonometrical Functions

85	Compound-Angle Formulae
86	Double-Angle Formulae
87	The Forms $r\cos$ , $r\sin$
88	The General Solutions of Trigonometrical Equations
	<b>P1: Vectors</b>
89	Vectors in Two Dimensions
90	Vectors in Three Dimensions
91	Vectors Calculations
92	The Angle Between Two Vectors
	<b>P3: Vectors</b>
93	The Vector Equation of a Line
94	The Intersection of Two Lines
95	The Angle Between Two Lines
96	The Perpendicular Distance from A Point to a Line
97	The Vector Equation of a Plane
98	The Intersection of A Line and A Plane
99	The Distance of A Point from A Plane
100	The Angle Between A Line and A Plane
101	The Intersection of Two Planes
	<b>P2: Logarithms and Exponentials</b>
102	Logarithms
103	Exponential Functions
104	Modelling Curves
105	The Natural Logarithm Functions
106	The Exponential Function
	<b>P2: Numerical Solution of Equations</b>
107	Interval Estimation – Change-of-Sign Methods
108	Fixed-Point Iteration
	<b>P3: Complex Numbers</b>
109	The Growth of the Number System
110	Working with Complex Numbers
111	Representing Complex Numbers Geometrically
112	Sets of Points in An Argand Diagram
113	The Modulus-Argument form of Complex Numbers
114	Sets of Points Using The Polar Form
115	Working with Complex Numbers in Polar Form
116	Complex Exponents
117	Complex Numbers and Equations

Each Day: 5 Subjects x 3 Topics = 15 Topics		
01	Programming in C	104
	Object-Oriented Programming with C++	172
02	Fundamental of Database System	190
03	Data Structure and Algorithm	92
04	Software Engineering and Maintenance	241
05	Basic Mathematics	118