

		statistics for a distribution, Inference: Finding statistics for a parameter, Drawing a distribution, Non-parametric testing	
References:			
1. Modeling with Data: Tools and Techniques for Scientific Computing Ben Klemens, Princeton University Press.			
2. Computational Statistics, James E. Gentle, Springer			
3. Computational Statistics, Second Edition, Geof H. Givens and Jennifer A. Hoeting, Wiley Publications			

Course Code: PSIT1P3

1. Some SQL queries based on the 1st Unit.
2. Implementing GSL matrix and vectors
3. Graph Plotting
4. Implement the statistical distributions
5. Implement regression and goodness of fit
6. Implement testing with likelihood
7. Generate random numbers using Monte Carlo method
8. Implementing Non-Parametric testing
9. Drawing an Inference
10. Implement Non-parametric Testing

Course 4: Software Testing

PSIT104

Course Code	Unit	Description	Credits
PSIT104	I	<p>Test Basics: Introduction, Testing in the Software Lifecycle, Specific Systems, Metrics and Measurement, Ethics</p> <p>Testing Processes: Introduction, Test Process Models, Test Planning and Control, Test Analysis and Design, Non-functional Test Objectives, Identifying and Documenting Test Conditions, Test Oracles, Standards, Static Tests, Metrics, Test Implementation and Execution, Test Procedure Readiness, Test Environment Readiness, Blended Test Strategies, Starting Test Execution, Running a Single Test Procedure, Logging Test Results, Use of Amateur Testers, Standards, Metrics, Evaluating Exit Criteria and Reporting, Test Suite, Defect Breakdown, Confirmation Test Failure Rate, System Test Exit Review, Standards, Evaluating Exit Criteria and Reporting Exercise, System Test Exit Review, Test Closure Activities</p>	4
	II	<p>Test Management: Introduction, Test Management Documentation, Test Plan Documentation Templates, Test Estimation, Scheduling and Test Planning, Test Progress Monitoring and Control, Business Value of Testing, Distributed, Outsourced, and Insourced Testing, Risk-Based Testing, Risk Management, Risk Identification, Risk Analysis or Risk Assessment, Risk Mitigation or Risk Control, Risk Identification and Assessment Results, Risk-Based Testing throughout the Lifecycle, Risk-Aware Testing Standards, Risk-</p>	

		Based Testing Exercise, Project Risk By-Products, Requirements Defect By-Products, Test Case Sequencing Guidelines, Failure Mode and Effects Analysis, Test Management Issues
	III	<p>Test Techniques</p> <p>Introduction, Specification-Based, Equivalence Partitioning, Avoiding Equivalence Partitioning Errors, Composing Test Cases with Equivalence Partitioning, Equivalence Partitioning Exercise, Boundary Value Analysis, Examples of Equivalence Partitioning and Boundary Values, Non-functional Boundaries, Functional Boundaries, Integers, Floating Point Numbers, Testing Floating Point Numbers, Number of Boundaries, Boundary Value Exercise, Decision Tables, Collapsing Columns in the, Combining Decision Table Testing with Other Techniques, Nonexclusive Rules in Decision Tables, 4 Decision Table Exercise, Decision Table Exercise Debrief, State-Based Testing and State Transition Diagrams, Superstates and Substates, State Transition Tables, Switch Coverage, State Testing with Other Techniques, State Testing Exercise, State Testing Exercise Debrief, Requirements-Based Testing Exercise, Requirements-Based Testing Exercise Debrief, Structure-Based, Control-Flow Testing, Building Control-Flow Graphs, Statement Coverage, Decision Coverage, Loop Coverage, Hexadecimal Converter Exercise, Hexadecimal Converter Exercise Debrief, Condition Coverage, Decision/Condition Coverage, Modified Condition/Decision Coverage(MC/DC), Multiple Condition Coverage, Control-Flow Exercise, Control-Flow Exercise Debrief, Path Testing, LCSAJ, Basis Path/Cyclomatic Complexity Testing, Cyclomatic Complexity Exercise, Cyclomatic Complexity Exercise Debrief, Final Word on Structural Testing, Structure-Based Testing Exercise, Structure-Based Testing Exercise Debrief, Defect- and Experience-Based, Defect Taxonomies, Error Guessing, Checklist Testing, Exploratory Testing, Test Charters, Exploratory Testing Exercise, Software Attacks, An Example of Effective Attacks, Other Attacks, Software Attack Exercise, Software Attack Exercise Debrief, Specification-, Defect-, and Experience-Based Exercise, Specification-, Defect-,and Experience-Based Exercise Debrief, Common Themes, Static Analysis, Complexity Analysis, Code Parsing Tools, Standards and Guidelines, Data-Flow Analysis, Set-Use Pairs, Set-Use Pair Example, Data-Flow Exercise, Data-Flow Exercise Debrief, Data-Flow Strategies, Static Analysis for Integration Testing, Call-Graph Based Integration Testing, McCabe Design Predicate Approach to Integration Testing, Hex Converter Example, McCabe Design Predicate Exercise, McCabe Design Predicate Exercise Debrief, Dynamic Analysis, Memory Leak Detection, Wild Pointer Detection, API Misuse Detection.</p>
	IV	<p>Tests of Software Characteristics</p> <p>Introduction, Quality Attributes for Domain Testing, Accuracy, Suitability, Interoperability, Usability, Usability Test Exercise, Usability Test Exercise Debrief, Quality Attributes for Technical Testing, Technical Security, Security Issues, Timely Information, Reliability, Efficiency, Multiple Flavours of Efficiency Testing, Modelling the System, Efficiency Measurements, Examples of</p>

		<p>Efficiency Bugs, Exercise: Security, Reliability and Efficiency, Exercise: Security, Reliability, and Efficiency Debrief, Maintainability, Subcharacteristics of Maintainability, Portability, Maintainability and Portability Exercise.</p> <p>Reviews Introduction, The Principles of Reviews, Types of Reviews, Introducing Reviews, Success Factors for Reviews, Deutsch’s Design Review Checklist, Marick’s Code Review Checklist, The Open Laszlo Code Review Checklist, Code Review Exercise, Deutsch Checklist Review Exercise.</p> <p>Incident Management Introduction, When Can a Defect Be Detected? Defect Lifecycle, Defect Fields, Metrics and Incident Management, Communicating Incidents, Incident Management Exercise.</p>	
V		<p>Standards and Test Process Improvement Introduction, Standards Considerations, Test Improvement Process, Improving the Test Process, Improving the Test Process with TMM, Improving the Test Process with TPI, Improving the Test Process with CTP, Improving the Test Process with STEP, Capability Maturity Model Integration, CMMI, Test Improvement Process Exercise.</p> <p>Test Techniques Introduction, Test Tool Concepts, The Business Case for Automation, General Test Automation Strategies, An Integrated Test System Example, Test Tool Categories, Test Management Tools, Test Execution Tools, Debugging, Troubleshooting, Fault Seeding, and Injection Tools, Static and Dynamic Analysis Tools, Performance Testing Tools, Monitoring Tools, Web Testing Tools, Simulators and Emulators, Keyword-Driven Test Automation, Capture/Replay Exercise, Capture/Replay Exercise Debrief, Evolving from Capture/Replay, The Simple Framework Architecture, Data-Driven Architecture, Keyword-Driven Architecture, Keyword Exercise, Performance Testing, Performance Testing Exercise.</p> <p>People Skills and Team Composition Introduction, Individual Skills, Test Team Dynamics, Fitting Testing within an Organization, Motivation, Communication.</p>	
<p>Reference Books Advanced Software Testing—Vol. 3 by Rex Black and Jamie L. Mitchell, Rocky Nook Publication, Advanced Software Testing Vol. 2 by Rex Black, Rocky Nook Publication, 2008 W.E. Perry, “Effective Methods for Software Testing”, John Wiley. Kaner C., Nguyen H., Falk J., “Testing Computer Software”, John Wiley. Boris Beizer, “Software Testing Techniques”, Dreamtech Louise Tamres, “Introducing Software Testing”, Pearson Education.</p>			

Course Code: PSIT1P4

1. Evaluating Test Exit Criteria and Reporting
2. Static and Dynamic Analysis
3. Rate Quality Attributes for Domain and Technical Testing
4. Perform Review
5. Incident Management

6. Path Testing and Equivalence Partitioning
7. Performance Testing
8. Using Testing Tool Selenium
9. Using Testing Tool QTP
10. Using Testing Tool WAPT
11. Using Testing Tool VTEST
12. Using Testing Tool AutoIT

SEMESTER II

Course 5: Mobile Computing

PSIT201

Course Code	Unit	Description	Credits
PSIT201	I	Introduction: Applications, A short history of wireless communication Wireless Transmission: Frequency for radio transmission, Signals, Antennas, Signal propagation, Multiplexing, Modulation, Spread spectrum, Cellular systems. Medium Access Control: Motivation for a specialized MAC: Hidden and Exposed terminals. Near and Far terminals; SDMA, FDMA, TDMA: Fixed TDM, Classical Aloha, Slotted Aloha, Carrier sense multiple access, Demand assigned multiple access, PRMA packet reservation multiple access, Reservation TDMA, Multiple access with collision avoidance, Polling, Inhibit sense multiple access; CDMA: Spread Aloha multiple access.	4
	II	Telecommunication Systems: GSM: Mobile services, System architecture, Radio interface, Protocols, Localization And Calling, Handover, Security, New data services; DECT: System architecture, Protocol architecture; TETRA, UMTS and IMT-2000: UMTS Basic architecture, UTRA FDD mode, UTRA TDD mode Satellite Systems: History, Applications, Basics: GEO, LEO, MEO; Routing, Localization, Handover, Examples	
	III	Broadcast Systems: Overview, Cyclic repetition of data, Digital audio broadcasting: Multimedia object transfer protocol; Digital video broadcasting Wireless LAN: Infrared vs. Radio transmission, Infrastructure and Ad hoc Networks, IEEE 802.11: System architecture, Protocol architecture, Physical layer, Medium access control layer, MAC management, Future development; HIPERLAN: Protocol architecture, Physical layer, Channel access control. Sublayer, Medium access control Sublayer, Information bases And Networking; Bluetooth: User scenarios, Physical layer, MAC layer, Networking. Security, Link management.	
	IV	Wireless ATM: Motivation for WATM, Wireless ATM working group, WATM services, Reference model: Example configurations, Generic reference model; Functions: Wireless mobile terminal side, Mobility supporting network side; Radio access layer: Requirements, BRAN; Handover: Handover reference model, Handover requirements, Types of handover, Handover scenarios, Backward handover, Forward handover; Location management: Requirements for location management, Procedures and Entities; Addressing, Mobile quality of service, Access point control protocol. Mobile Network Layer: Mobile IP: Goals, assumptions and requirements, Entities and Terminology, IP packet delivery, Agent advertisement and discovery, Registration, Tunneling and Encapsulation , Optimizations, Reverse tunneling, Ipv6; Dynamic host configuration protocol.	