



# SRIT R19

## COURSE STRUCTURE & SYLLABUS

M. Tech Regular Two Year Master's Degree Program  
(Applied for the Batches admitted from 2019-2020)



## **SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY**

[AUTONOMOUS]

Affiliated to JNTUA & Approved by AICTE

Accredited by NAAC with 'A' Grade & Accredited by NBA (CSE, ECE & EEE)

Rotarypuram Village, B K Samudram Mandal,

Ananthapuramu - 515701

# **COURSE STRUCTURE AND SYLLABI SRIT-R19**

Master of Technology  
In  
Computer Science

**M. Tech (Regular- Full time)**

(Effective for the students admitted into I Year from the  
Academic year **2019- 2020**)



**SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY  
(Autonomous)**

Affiliated to JNTUA & Approved by AICTE Accredited by NAAC  
with 'A' Grade & NBA (CSE, ECE & EEE)  
Rotarypuram Village, B K Samudram Mandal,  
Ananthapuramu - 515701.

## M. Tech Course Structure

### Semester 1 (Computer Science)

#### I Semester: I M.Tech I Semester (5 Theory + 3 Labs)

Course Code	Course Name	Subject Area	Periods per week			Credits	Scheme of Examination (Max. Marks)		
			L	T	P		CIA	SEE	Total
194GD58101	Advanced Data Structures and Algorithms	PCC	4	0	0	4	40	60	100
194GD58102	Fundamentals of Data Science	PCC	4	0	0	4	40	60	100
194GD58103	Software Patterns	PCC	4	0	0	4	40	60	100
<b>Program Elective -I</b>									
194GD58104	Software Project Management	PEC	4	0	0	4	40	60	100
194GD58105	Information Security	PEC	4	0	0	4	40	60	100
194GD58106	Distributed Databases	PEC	4	0	0	4	40	60	100
<b>Program Elective- II</b>									
194GD58107	Professional Aspects in Software Engineering	PEC	4	0	0	4	40	60	100
194GD58108	Artificial Intelligence	PEC	4	0	0	4	40	60	100
194GD58109	Internals of Operating Systems	PEC	4	0	0	4	40	60	100
194GD58110	Advanced Data Structures and Algorithms Lab	PCC	0	0	4	2	40	60	100
194GD58111	R & Analytics Lab	PCC	0	0	4	2	40	60	100
194GD58112	Software Patterns Lab	PCC	0	0	4	2	40	60	100
<b>Total</b>						<b>26</b>	<b>320</b>	<b>480</b>	<b>800</b>

#### II Semester: I M.Tech II Semester (5Theory + 3 Lab)

Course Code	Course Name	Subject Area	Periods per week			Credits	Scheme of Examination (Max. Marks)		
			L	T	P		CIA	SEE	Total
194GD58201	Advances in Software Testing	PCC	4	0	0	4	40	60	100
194GD58202	Big Data Analytics	PCC	4	0	0	4	40	60	100
194GD58203	Mobile Application Development	PCC	4	0	0	4	40	60	100
<b>Program Elective - III</b>									
194GD58204	Internet of Things	PEC	4	0	0	4	40	60	100
194GD58205	Distributed Computing	PEC	4	0	0	4	40	60	100
194GD58206	Network Security & Cryptography	PEC	4	0	0	4	40	60	100
<b>Program Elective - IV</b>									
194GD58207	Machine Learning	PEC	4	0	0	4	40	60	100
194GD58208	Cloud Computing	PEC	4	0	0	4	40	60	100
194GD58209	Natural Language Processing	PEC	4	0	0	4	40	60	100
194GD58210	Advances in Software Testing Lab	PCC	0	0	4	2	40	60	100
194GD58211	Map Reduce Programming Lab	PCC	0	0	4	2	40	60	100
194GD58212	Mobile Application Development Lab	PCC	0	0	4	2	40	60	100
<b>Total</b>						<b>26</b>	<b>320</b>	<b>480</b>	<b>800</b>

**III Semester: II M.Tech I Semester (1 Theory +1 MOOC+1 CV+1 Seminar+1TA+ 1 Proj Stage-I)**

Course Code	Course Name	Subject Area	Periods per week			Credits	Scheme of Examination (Max. Marks)		
			L	T	P		CIA	SEE	Total
<b>Elective-V (Open Elective)</b>									
194GD20301	Research Methodology	OEC	4	0	0	4	40	60	100
194GD20302	Human Values & Professional Ethics	OEC	4	0	0	4	40	60	100
194GD20303	Intellectual Property Rights	OEC	4	0	0	4	40	60	100
194GD58301	Elective-VI (MOOCs)	MCC	0	0	0	0	-	-	-
194GD58302	Comprehensive Viva-Voice		0	0	0	2	100	-	100
194GD58303	Seminar		0	0	0	2	100	-	100
194GD58304	Teaching Assignment		0	0	0	2	100	-	100
194GD58305	Project Work Phase – I	PROJ	0	0	0	4	100	-	100
<b>Total</b>						<b>14</b>	<b>440</b>	<b>60</b>	<b>500</b>

**IV Semester: II M. Tech II Semester (1 DP)**

Course Code	Course Name	Subject Area	Periods per week			Credits	Scheme of Examination (Max. Marks)		
			L	T	P		CIA	SEE	Total
23DCS401	Dissertation Phase – II	PR	0	0	32	16	-	100	100
Total						16	-	100	100

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Advanced Data Structures and Algorithms (Computer Science)

I M.Tech - I Semester						SRIT R19		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD58101	PCC	4	0	0	4	40	60	100
<b>Unit I: Overview of Data Structures</b>								
Arrays, Stacks, Queues, linked lists, linked stacks and Linked queues, Applications. <b>Algorithm Analysis</b> - Efficiency of algorithms, Asymptotic Notations, Time complexity of an algorithm using O notation, Polynomial Vs Exponential Algorithms, Average, Best, and Worst-Case Complexities, Analyzing Recursive Programs.								
<b>Unit II: Trees and Graphs</b>								
Basics of trees and binary trees, Representation of trees and Binary trees, Binary tree Traversals, threaded binary trees, Graphs, representation and traversals. <b>Binary Search Trees, AVL Trees and B Trees</b> - Binary Search Trees: Definition, Operations and applications. AVL Trees: Definition, Operations and applications. B Trees: Definition, Operations and applications.								
<b>Unit III: Red – Black Trees, Splay Trees and Hash Tables</b>								
Red–Black Trees, Splay Trees and their applications, Hash Tables, Hash Functions and various applications, File Organizations.								
<b>Unit IV: Divide – and – Conquer &amp; Greedy Method</b>								
General Method, Binary Search, Finding Maximum and Minimum, Quick Sort, Merge sort, Strassen’s Matrix Multiplication, Greedy Method- General Method, Minimum Cost Spanning Trees, Single Source Shortest Path. <b>Back Tracking and Branch – and – Bound</b> - General Method, 8 – Queen’s Problem, Graph Coloring. Branch – and – Bound: The Method, LC Search, Control Abstraction, Bounding, 0/1 Knapsack Problem.								
<b>Unit V: Dynamic Programming</b>								
General Method, All Pairs Shortest Path, Single Source Shortest Path, 0 /1 Knapsack problem, Reliability Design, Traveling Sales Person’s Problem.								

### Text books:

1	Fundamentals of Computer Algorithms by Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, 2nd edition, University Press.
2	T.H. Cormen, C.E. Leiserson, R.L. Rivest, Introduction to Algorithms, Third Edition PrenticeHall,2009

### Reference Books:

1	T.H. Cormen, C.E. Leiserson, R.L. Rivest, Introduction to Algorithms, Third Edition Prentice Hall,2009.
2	“Advanced Data Structures” by Peter Brass
3	“Data Structures and Algorithms Made Easy: Data Structures and Algorithmic Puzzles” by Narasimha Karumanchi

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Select Appropriate Data Structure for solving a real-world problem.
<b>C02</b>	Select appropriate file organization technique depending on the processing to be done.
<b>C03</b>	Construct Indexes for Databases.
<b>C04</b>	Analyze the Algorithms.
<b>C05</b>	Develop Algorithm for sorting large files of data.
<b>C06</b>	Develop algorithms for searching data and files.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Fundamentals of Data Science (Computer Science)

<b>I M.Tech - I Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD58102	PCC	4	0	0	4	40	60	100
<b>Unit I – Introduction</b>								
Introduction, What Is Statistical Learning? Why Estimate $f$ ?, How Do We Estimate $f$ ?, The Trade-Off Between Prediction Accuracy and Model Interpretability, Supervised Versus Unsupervised Learning, Regression Versus Classification Problems, Assessing Model Accuracy, Measuring the Quality of Fit, The Bias-Variance Trade-of, The Classification Setting, Introduction to R, Basic Commands, Graphics, Indexing Data, Loading Data, Additional Graphical and Numerical Summaries.								
<b>Unit II – Regression Techniques</b>								
Linear Regression, Simple Linear Regression, Multiple Linear Regression, Other Considerations in the Regression Model, Comparison of Linear Regression with K-Nearest Neighbours, Linear Regression.								
<b>Unit III – Classification</b>								
Classification, Logistic Regression, Linear Discriminant Analysis, A Comparison of Classification Methods, Logistic Regression, LDA, QDA, and KNN.								
<b>Unit IV – computational methods</b>								
Programming for basic computational methods such as Eigen values and Eigen vectors, sparse matrices, QR and SVD, Interpolation by divided differences. Data Wrangling: Data Acquisition, Data Formats, Imputation, The split-apply-combine paradigm.								
<b>Unit V – Data Warehouse</b>								
Data Objects and Attribute Types, Basic Statistical Descriptions of Data, Data Visualization, Measuring Data Similarity and Dissimilarity. <b>Data Warehouse:</b> Basic Concepts, Data Warehouse Modeling: Data Cube and OLAP, Data Warehouse Design and Usage, Data Warehouse Implementation, Data Generalization by Attribute-Oriented Induction.								

### **Text books:**

1	Gareth James Daniela Witten Trevor Hastie, Robert Tibshirani, An Introduction to Statistical Learning with Applications in R, February 11, 2013, web link: <a href="http://www.statlearning.com">www.statlearning.com</a> .
2	Mark Gardener, Beginning R The Statistical Programming Language, Wiley, 2015.

### **Reference Books:**

1	Sinan Ozdemir, Principles of Data Science, Packet Publishing Ltd Dec 2016.
2	Joel Grus, Data Science from Scratch, Oreilly media, 2015.
3	Han , Kamber, and J Pei, Data Mining Concepts and Techniques, 3rd edition, Morgan Kaufman, 2012.



<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Apply the knowledge of mathematics to explain the concept of data science.
<b>C02</b>	Develop a Decision tree based on supervised segmentation and predict the class for a given data set.
<b>C03</b>	Analyze the given data set, and solve a problem by performing Classification.
<b>C04</b>	Develop solutions to group entities in data set.
<b>C05</b>	Analyze the importance of mining text.
<b>C06</b>	Understand manage computer networks while considering performance, reliability, security, and scalability aspects.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Software Patterns (Computer Science)

I M. Tech - I Semester						SRIT R19		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD58103	PCC	4	0	0	4	40	60	100
<b>Unit I – Architecture</b>								
Envisioning Architecture - What is Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views and the Architecture Business Cycle. Creating an Architecture - Quality Attributes, achieving qualities, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.								
<b>Unit II – Architectural Patterns</b>								
Introduction to Patterns - What is a Pattern? What makes a Pattern? Pattern Categories, Relationships between Patterns, Pattern Description, Patterns and Software Architecture. Architectural Patterns Layers, Pipes and Filters, Blackboard, Broker, Microkernel, MVC, PAC, Reflection.								
<b>Unit III – Design Pattern</b>								
What is Design Pattern, organizing catalogs, Role in solving design problems, Selection and Usage, Creational Patterns - Abstract factory, builder, factory method, prototype, singleton.								
<b>Unit IV – Structural Patterns</b>								
Adapter, bridge, composite, decorator, façade, flyweight, Proxy, Decorator, façade, flyweight, Proxy.								
<b>Unit V – Behavioral Patterns</b>								
<b>Behavioral Patterns</b> - Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, and visitor. <b>Case Studies</b> – Designing a Document Editor - Design issues of Lexi Editor in Design Patterns, The World Wide Web - a case study in interoperability								

Text books:	
1	Software Architecture in Practice, second edition, Len Bass, Paul Clements & Rick Kazman, Pearson Education, 2003.
2	Pattern-Oriented Software Architecture”, A System of Patterns, Frank Buschmann Regine Meunier, Hans Rohnert, Peter Sommerlad and Michael Stal, WILEY.
Reference Books:	
1	AntiPatterns: Refactoring Software, Architectures, and Projects in Crisis, by William J. Brown, Raphael C. Malveau, Hays W. "Skip" McCormick, Thomas J. Mowbray (Author) 1st Edition.
2	Software architecture, David M. Dikel, David Kane and James R. Wilson, Prentice Hall PTR, 2001.
3	Design Patterns in Java, Steven John Metsker & William C. Wake, Pearson education, 2006

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Understand Software Architecture Principles.
<b>C02</b>	Analyze and Apply Architectural Patterns.
<b>C03</b>	Implement Creational Design Patterns.
<b>C04</b>	Apply Structural Design Patterns.
<b>C05</b>	Implement Behavioral Design Patterns.
<b>C06</b>	Apply Design Patterns in Real-world Scenarios.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Software Project Management (Computer Science)

<b>I M.Tech - I Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD58104	PEC	4	0	0	4	40	60	100
<b>Unit I- Project Evaluation and Project Planning</b>								
Importance of Software Project Management, Activities Methodologies, Categorization of Software Projects, Setting objectives, Management Principles, Management Control, Project portfolio Management, Cost-benefit evaluation technology, Risk evaluation, Strategic program Management, Stepwise Project Planning.								
<b>Unit II – Project Life Cycle And Effort</b>								
Software process and Process Models, Choice of Process models, mental delivery, Rapid Application development, Agile methods, Extreme Programming, SCRUM, Managing interactive processes, Basics of Software estimation, Effort and Cost estimation techniques, COSMIC Full function points, COCOMO II A Parametric Productivity Model, Staffing Pattern.								
<b>Unit III – Activity Planning And Risk Management</b>								
Objectives of Activity planning, Project schedules, Activities, Sequencing and scheduling, Network Planning models, Forward Pass & Backward Pass techniques, Critical path (CRM) method, Risk identification, Assessment, Monitoring, PERT technique, Monte Carlo simulation, Resource Allocation, Creation of critical patterns, Cost schedules.								
<b>Unit IV – Project Management And Control</b>								
Framework for Management and control, Collection of data Project termination, Visualizing progress, Cost monitoring, Earned Value Analysis- Project tracking, Change control- Software Configuration Management, Managing contracts, Contract Management.								
<b>Unit V – Staffing In Software Projects</b>								
Managing people, Organizational behavior, Best methods of staff selection, Motivation, The Oldham-Hackman job characteristic model, Ethical and Programmed concerns, Working in teams, Decision making, Team structures, Virtual teams, Communications genres, Communication plans.								

### Text books:

1	Bob Hughes, Mike Cotterell and Rajib Mall: Software Project Management – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.
2	“Robert K. Wysocki “Effective Software Project Management” Wiley Publication, 2011.

### Reference Books:

1	Walker Royce: “Software Project Management”- Addison-Wesley, 1998.
2	“Gopalaswamy Ramesh, “Managing Global Software Projects” – McGraw Hill Education (India), Fourteenth Reprint 2013.
3	Software architecture, David M. Dikel, David Kane and James R. Wilson, Prentice Hall PTR, 2001.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Develop the model from the conventional software product to the modern.
<b>C02</b>	Illustrate the need of software life cycle processes.
<b>C03</b>	Exemplify artifacts of the software process.
<b>C04</b>	Develop the model-based software architecture of the project.
<b>C05</b>	Acquire the knowledge of iterative planning process for cost and schedule estimation.
<b>C06</b>	Describe the tools for project automation.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Information Security (Computer Science)

<b>I M.Tech - I Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD58105	PEC	4	0	0	4	40	60	100
<b>Unit I – Computer Security concepts</b>								
The OSI Security Architecture, Security attacks, Security services and Security mechanisms, A model for Network Security Classical encryption techniques- symmetric cipher model, substitution ciphers, transposition ciphers, Steganography. Modern Block Ciphers: Block ciphers principles, Data encryption standard (DES), Strength of DES, linear and differential cryptanalysis, block cipher modes of operations, AES, RC4.								
<b>Unit II – Introduction to Number theory</b>								
Integer Arithmetic, Modular Arithmetic, Matrices, Linear Congruence, Algebraic Structures, GF(2n) Fields, Primes, Primality Testing, Factorization, Chinese remainder Theorem, Quadratic Congruence, Exponentiation and Logarithm. Public-key cryptography - Principles of public-key cryptography, RSA Algorithm, Diffie- Hellman Key Exchange, ELGamal cryptographic system, Elliptic Curve Arithmetic, Elliptic curve cryptography.								
<b>Unit III – Cryptographic Hash functions</b>								
Applications of Cryptographic Hash functions, Requirements and security, Hash functions based on Cipher Block Chaining, Secure Hash Algorithm (SHA) Message Authentication Codes: Message authentication Requirements, Message authentication functions, Requirements for Message authentication codes, security of MACs, HMAC, MACs based on Block Ciphers, Authenticated Encryption, Digital Signatures-RSA with SHA & DSS.								
<b>Unit IV – Key Management and distribution</b>								
Key Management and distribution: Symmetric key distribution using Symmetric Encryption, Symmetric key distribution using Asymmetric, Distribution of Public keys, X.509 Certificates, Public key Infrastructure. User Authentication: Remote user Authentication Principles, Remote user Authentication using Symmetric Encryption, Kerberos, Remote user Authentication using Asymmetric Encryption, Federated Identity Management, Electronic mail security: Pretty Good Privacy (PGP), S/MIME.								
<b>Unit V – Security at the Transport Layer (SSL and TLS)</b>								
Security at the Transport Layer (SSL and TLS): SSL Architecture, Four Protocols, SSL Message Formats, Transport Layer Security, HTTPS, SSH Security at the Network layer (IPSec): Two modes, Two Security Protocols, Security Association, Security Policy, Internet Key Exchange. System Security: Description of the system, users, Trust and Trusted Systems, Buffer Overflow and Malicious Software, Malicious Programs, worms, viruses, Intrusion Detection System (IDS), Firewalls.								

### Text books:

1	"Cryptography and Network Security", Behrouz A. Frouzan and DebdeepMukhopadhyay, McGraw Hill Education, 2nd edition, 2013.
2	"Cryptography and Network Security: Principals and Practice", William Stallings, Pearson Education, Fifth Edition, 2013.

<b>Reference Books:</b>	
1	"Network Security and Cryptography", Bernard Menezes ,Cengage Learning.
2	"Cryptography and Security", C.K. Shymala, N. Harini and Dr. T.R. Padmanabhan, Wiley-India.
3	"Introduction to Cryptography", Buchmann, Springer.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Describe the layers of the OSI Security Architecture.
<b>C02</b>	Understand the principles of public-key cryptography.
<b>C03</b>	Analyze hash functions based on Cipher Block Chaining.
<b>C04</b>	Implement symmetric key distribution using symmetric and asymmetric encryption.
<b>C05</b>	Analyze SSL message formats and the concept of Transport Layer Security (TLS).
<b>C06</b>	Describe system security, users, trust, and trusted systems.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Distributed Databases (Computer Science)

<b>I M.Tech - I Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	Total
194GD58106	PEC	4	0	0	4	40	60	100
<b>Unit I – Introduction of DDBMS</b>								
Distributed data processing- Data delivery alternatives- challenges of DDBSS-Design issues- Distributed DBMS Architecture-Overview of relational DBMS-review of computer networks- Distributed databases design-Top down design process-Distribution design issues- Fragmentation- Allocation-data directory-database integration- bottom up design methodology-schema matching- schema integration- schema mapping- data cleaning.								
<b>Unit II Data and Access control</b>								
View management-data security-semantic integrity control-overview of query processing- query processing problem-objectives of query processing-complexity of relational Algebra operations- characterization of query processors-layers of query processing-query decomposition and data localization-query decomposition-localization of distributed data.								
<b>Unit III – Optimization of queries and transaction management</b>								
Query optimization-centralized query optimization-join ordering in distributed queries- Distributed query optimization-multi database query processing-issues in multi database query processing- multi database query processing architecture-query rewriting using views- query optimization and execution-query translation and execution-introduction to transaction management- definition of a transaction-properties of transactions-types of transactions- architecture revisited.								
<b>Unit IV – Distributed concurrency control &amp; Replication</b>								
Serializability theory-Taxonomy of concurrency control mechanisms-locking based concurrency control algorithms-timestamp based concurrency control algorithms-optimistic concurrency control algorithms-deadlock management-“Relaxed” concurrency control- Distributed DBMS Reliability- Reliability concepts and measures-failures in Distributed DBMS-local Reliability protocols- Distributed Reliability protocols-Dealing with site failure- network partitioning-architectural considerations-data replication-consistency of replicated databases-update management strategies-replication protocols-group communication- replication and failures-replication mediator service.								
<b>Unit V – Database systems-Various Models</b>								
Parallel database system architectures-parallel data placement-parallel query processing load balancing-database clusters-distributed object database management-fundamental object concepts and object models-object distributed design- architectural issues-object management-distributed object storage-object query processing-transaction management-web data management-web graph management-web search-web querying-distributed XML Processing.								

### Text books:

1	M. Tamer Ozsu, Patrick Valduriez, Principles of Distributed Database Systems, Springer, 2011.
2	Advanced database management system by RiniChkrabarti and Shibhadra Dasgupta, Dreamtech.

### Reference Books:

1	Chhandra Ray, Distributed database systems, Pearson education, India, 2012.
2	Stefano Ceri, Giuseppe Pelagatti, Distributed databases: Principles and systems, Mc Graw



	Hill Education, 2008.
3	V.S. Subramanian, "Principles of Multimedia Database Systems", Harcourt India Pvt Ltd., 2001.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Understand Distributed Data Processing.
<b>C02</b>	Manage Data Access and Security.
<b>C03</b>	Optimize Queries and Manage Transactions.
<b>C04</b>	Evaluate and apply replication strategies.
<b>C05</b>	Understand concurrency control mechanisms.
<b>C06</b>	Apply query processing-transaction to real world problems.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Professional Aspects in Software Engineering (Computer Science)

<b>I M.Tech - I Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD58107	PEC	4	0	0	4	40	60	100
<b>Unit I – Introduction</b>								
Intellectual Property rights Confidential Information, Copyright, Infringement of Copyright, Acts permitted in Relation to Copyright Works, Licensing and Assignment of Copyright, Moral Rights, Designs, Trademarks, the tort of passing off, Domain Names, Patents.								
<b>Unit II – Software Licenses</b>								
Software Licenses, Copyright, Contract, Patent, Free Software and OpenSource Software, MIT License, BSD, License, GNU General Public License, GNU Lesser General Public License, Q Public License, Proprietary License, Sun Community License.								
<b>Unit III – Software Contracts</b>								
Basics of Software Contracts, Extent of liability, Contract for the supply of custom-built software at a fixed price, other types of software service Contract, Liability for defective software								
<b>Unit IV – Software Crime Prevention</b>								
Computing and criminal Activity, Reforms of Criminal Law, Categories of Misuse, Computer Fraud, Obtaining Unauthorized Access to Computer, Unauthorized Alteration or Destruction of Information, Denying Access to an Authorized user, Unauthorized Removal of Information Stored in a Computer.								
<b>Unit V – Data Protection</b>								
Data Protection Regulations, Data Protection and Privacy, The impact of the Internet, Factors Influencing the Regulation of Data Processing, Convergence of Data Protection Practice, Defamation and the protection of Reputation.								

### **Text books:**

1	Andrew M. St. Laurent, "Open Source and Free Software Licensing", O'Reilly, Publications.
2	Bott, Frank, Allison Coleman, and Diane Rowland. Professional issues in software engineering. CRC Press, 2000.

### **Reference Books:**

1	Fairley R, "Software Engineering Concepts", second edition, Tata McGraw Hill, New Delhi, 2003.
2	Jalote P, "An Integrated Approach to Software Engineering", third edition, Narosa Publishers, New Delhi, 2013.
3	Mall, Rajib. Fundamentals of software engineering. PHI Learning Pvt. Ltd., 2018.

**Course Outcomes:** At the end of the course, the student should have acquired the ability to

<b>CO1</b>	Understanding of Intellectual Property rights.
<b>CO2</b>	Analyze Open source and Licensed software properties.
<b>CO3</b>	Analyze software contracts.
<b>CO4</b>	Understand software crime prevention techniques.
<b>CO5</b>	Implement data protection regulations.
<b>CO6</b>	Implement data protection techniques.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Artificial Intelligence (Computer Science)

<b>I M.Tech - I Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD58108	<b>PEC</b>	4	0	0	4	40	60	100
<b>Unit I – Foundations of AI</b>								
<p>What is AI, History of AI, Strong and weak AI, The State of the Art.</p> <p>Intelligent Agents: Agents and Environments, Good Behavior: The Concept of Rationality, The Nature of Environments, The Structure of Agents.</p>								
<b>Unit II – Solving Problems by Searching</b>								
<p>Problem – Solving Agents, Example Problems, Searching for Solutions, uniformed search Strategies, Informed (Heuristic) Search Strategies, Heuristic Functions.</p>								
<b>Unit III – Knowledge Representation</b>								
<p>Ontological Engineering, Categories and Objects, Events, Mental Events and Mental Objects, Reasoning Systems for Categories, Reasoning with Default Information, The Internet Shopping World.</p>								
<b>Unit IV – Learning from Examples</b>								
<p>Forms of Learning, Supervised Learning, Learning Decision Trees, Evaluating and Choosing the Best Hypothesis, The Theory of Learning, Regression and Classification with Learner Models, Nonparametric Models, Support Vector Machines, Ensemble Learning, Practical Machine Learning.</p>								
<b>Unit V – Learning Probabilistic Models</b>								
<p>Statistical Learning, Learning with Complete data, Learning with Hidden variables: The EM Algorithm.</p>								

### **Text books:**

1	"Artificial Intelligence A Modern Approach", Stuart J. Russell & Peter Norvig – Pearson.
2	"Artificial Intelligence", Elaine Rich, Kevin Knight & Shivashankar B Nair – McGraw Hill Education.

### **Reference Books:**

1	Nilsson, Nils J., and Nils Johan Nilsson. Artificial intelligence: a new synthesis. Morgan Kaufmann, 1998.
2	Johnson, Benny G., Fred Phillips, and Linda G. Chase. "An intelligent tutoring system for the accounting cycle: Enhancing textbook homework with artificial intelligence." Journal of Accounting Education 27.1 (2009): 30-39.
3	Stuart J. Russell, Peter Norvig, "Artificial Intelligence A Modern Approach", 3rd Edition, Pearson Education, 2019.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Evaluate the current state of AI and identify cutting-edge advancements.
<b>C02</b>	Discuss the concept of rationality in the behavior of agents.
<b>C03</b>	Implement informed (heuristic) search strategies.
<b>C04</b>	Apply knowledge representation concepts in the real World.
<b>C05</b>	Explore ensemble learning in practical machine learning scenarios.
<b>C06</b>	Implement the Expectation-Maximization (EM) algorithm.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Internals of Operating Systems (Computer Science)

<b>I M.Tech - I Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD58109	<b>PEC</b>	4	0	0	4	40	60	100
<b>Unit I – Buffer Cache and File Sub-System</b>								
Introduction to kernel- Architecture of the UNIX operating system, System Concepts, Data structures. Buffer Cache: Buffer header, Structure of buffer pool, Reading and writing disk blocks. Files INODES, Structure of a regular file, Directories, Super block, Inode assignment.								
<b>Unit II – System Calls and Process Sub-System</b>								
System calls- OPEN, READ, CLOSE, WRITE, CREATE, CHMOD, CHOWN, Pipes, Mounting and Unmounting. Process Layout the system memory, context, process control, process creation, signals, process scheduling, time, clock.								
<b>Unit III – Inter Process Communications</b>								
Inter-process communications- Process tracing, System V IPC, Shared Memory, Semaphores. Network Communications- Socket Programming: Sockets, descriptors, connections, socket elements, Stream and datagram sockets.								
<b>Unit IV – Windows System Components</b>								
Windows Operating System- versions, concepts and tools, Windows internals, System architecture, requirements and design goals, operating system model, architecture overview, key system components. System mechanisms- Trap dispatching, object manager, synchronization, system worker threads, windows global flags, local procedural calls, kernel event tracing.								
<b>Unit V – Registry and Process Management</b>								
Windows management mechanisms- the registry, registry usage, registry data types, local structure, troubleshooting registry problems, registry internals, services, applications, accounts, service control manager, windows management instrumentation, processes, threads and jobs: Process internals, flow of create process, thread internals, examining thread creation, thread scheduling, job objects.								

### **Text books:**

1	Maurice J. Bach, The design of the UNIX operating system, Prentice Hall of India, 1991
2	Mark E. Russinovich and David A. Solomon, Microsoft Windows Internals, Microsoft Press, 2004.

### **Reference Books:**

1	William Stallings, "Operating Systems: Internals and Design Principles", 5th Edition, Prentice Hall, 2005.
2	Russinovich, Mark E., David A. Solomon, and Alex Ionescu. Windows internals, part 2. Pearson Education, 2012.
3	Bovet, Daniel P., and Marco Cesati. Understanding the Linux Kernel: from I/O ports to process management. " O'Reilly Media, Inc.", 2005.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Understand the architecture of the UNIX operating system.
<b>C02</b>	Understand file systems.
<b>C03</b>	Implement System Calls and Process Sub-System.
<b>C04</b>	Implement inter process communication in real time scenarios.
<b>C05</b>	Understand internals of operating systems.
<b>C06</b>	Demonstrate Windows management mechanisms.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Advanced Data Structures and Algorithms Lab

(Computer Science)

I M. Tech – I Semester						SRIT R19		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
194GD58110	PCC	L	T	P	C	CIA	SEE	Total
		0	0	4	2	40	60	100
List of Experiments								
S. No.	Title of the Experiment							
1	Write C++ programs to implement the following using an array. a) Stack ADT b) Queue ADT							
2	Write C++ programs to implement the following using a singly linked list. a) Stack ADT b) Queue ADT							
3	Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.							
4	Write a C++ program to perform the following operations: a) Insert an element into a binary search tree. b) Delete an element from a binary search tree. c) Search for a key element in a binary search tree.							
5	Write C++ programs that use recursive functions to traverse the given binary tree in a) Preorder b) inorder and c) postorder.							
6	Write C++ programs that use non-recursive functions to traverse the given binary tree in b) Preorder b) inorder and c) postorder.							
7	Write C++ programs for the implementation of bfs and dfs for a given graph.							
8	Write C++ programs for implementing the following sorting methods: a) Merge sort b) Heap sort.							
9	Write a C++ program to perform the following operation a) Insertion into an AVL-tree							
10	Write a C++ program for implementing Knuth-Morris- Pratt pattern matching algorithm.							

Reference Books/Lab Manuals:	
1	Data Structures and Algorithms Using C++ by Ananda Rao Akepogu and Radhika Raju Palagiri, Pearson Education, 2010.
2	Data Structures and Algorithms by G.A.V. Pai, 2009, TMH.
3	Fundamentals of Computer Algorithms by Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, 2nd edition, University Press.
4	Design and Analysis of Algorithms by E. Horowitz, S. Sahani, 3rd Edition, Galgotia.

Course Outcomes: At the end of the course, the student should have acquire the ability to	
<b>C01</b>	Implement divide and conquer techniques to solve a given problem.
<b>C02</b>	Implement hashing techniques like linear probing, quadratic probing, random probing and double hashing/rehashing.
<b>C03</b>	Perform Stack operations to convert in fix expression in to postfix expression and evaluate the postfix expression.
<b>C04</b>	Differentiate graph traversal techniques.
<b>C05</b>	Understand how advanced data structures and algorithms are applied to solve real-world

	problems in various domains.
<b>CO6</b>	Analyze problems, devise efficient solutions, and critically evaluate their own algorithms and data structures.



# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## R & Analytics Lab (Computer Science)

<b>I M. Tech – I Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
194GD58111	PCC	L	T	P	C	CIA	SEE	Total
		0	0	4	2	40	60	100
<b>List of Experiments</b>								
S. No.	Title of the Experiment							
1	Installing R in windows, R Console (R window to edit and execute R Commands), Commands and Syntax (R commands and R syntax), Packages and Libraries (Install and load a package in R), Help In R, Workspace in R.							
2	Implement the data structures using R Programming Introduction to Data Types (Why Data Structures? Types of Data Structures in R), Vectors, Matrices, Arrays, Lists, Factors, Data Frames, Importing and Exporting Data.							
3	Implement the Graphical Analysis using R Creating a simple graph (Using plot() command), Modifying the points and lines of a graph (Using type, pch, font, cex, lty, lwd, col arguments in plot() command), Modifying Title and Subtitle of graph (Using main, sub, col.main, col.sub, cex.main, cex.sub, font.main, font.sub arguments in plot() command), Modifying Axes of a Graph (Using xlab, ylab, col.lab, cex.lab, font.lab, xlim, ylim, col.axis, cex.axis, font.axis arguments and axis() command), Adding Additional Elements to a Graph (Using points(), text(), abline(), curve() commands), Adding Legend on a Graph (Using legend() command), Special Graphs (Using pie(), barplot(), hist() commands), Multiple Plots (Using mfrow or mfcpl arguments in par() command and layout command).							
4	Implement the Descriptive Statistics using R. Measure of Central Tendency (Mean, Median and Mode), Measure of Positions (Quartiles, Deciles, Percentiles and Quantiles), Measure of Dispersion (Range, Median, Absolute deviation about median, Variance and Standard deviation), Measure of Distribution (Skewness and Kurtosis), Box and Whisker Plot (Box Plot and its parts, Using Box Plots to compare distribution).							
5	In memory Data Analytics: Window and text functions in SQL; Advanced SQL functions.							
6	MongoDB: Installation of MongoDB, Features of MongoDB: CRUD operations; import and export functions, indexes, aggregate functions, dealing with Nulls, count, limit, skip and sort functions and cursors							
7	Experiments on Hive and Pig Data Wrangling using R Open refine tool for handling messy data							

<b>Reference Books/Lab Manuals:</b>	
1	Grolemund, Garrett, and Hadley Wickham. "R for data science." (2018).
2	Chang, Winston. R graphics cookbook: practical recipes for visualizing data. O'Reilly Media, 2018.
3	Grolemund, Garrett. Hands-on programming with R: Write your own functions and simulations. " O'Reilly Media, Inc.", 2014.
4	Boehmke, Bradley C. Data wrangling with R. New York: Springer, 2016.

<b>Course Outcomes:</b> At the end of the course, the student should have acquire the ability to	
<b>C01</b>	Install and configure R for data analysis purposes.
<b>C02</b>	Implement various data structures in R for efficient data handling.
<b>C03</b>	Create, customize, and interpret graphical representations of data using R.
<b>C04</b>	Utilize MongoDB for data storage and retrieval, applying CRUD operations.
<b>C05</b>	Utilize MongoDB for data storage and retrieval, applying CRUD operations.
<b>C06</b>	Conduct experiments on Hive and Pig for big data processing.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Software Patterns Lab (Computer Science)

I M. Tech – I Semester						SRIT R19		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
194GD58112	PCC	L	T	P	C	CIA	SEE	Total
		0	0	4	2	40	60	100
List of Experiments								
S. No.	Title of the Experiment							
1	Identify the application where you can use single pattern and implement it.							
2	Using UML design one of the architectural patterns.							
3	Using UML design one of the creational patterns.							
4	Using UML design one of the structural patterns.							
5	Using UML design one of the behavioral patterns.							
6	User gives a print command from a word document. Design to represent this chain of responsibility design pattern.							
7	User gives a print command from a word document. Design to represent this Singleton design pattern.							
8	Identify the application where you can use multiple structural patterns and implement it.							
9	Identify the application where you can use multiple behavioral patterns and implement it							
10	Identify the application where you can use architectural patterns and implement it.							

Reference Books/Lab Manuals:	
1	AntiPatterns: Refactoring Software, Architectures, and Projects in Crisis, by William J. Brown, Raphael C. Malveau, Hays W. "Skip" McCormick , Thomas J. Mowbray (Author) 1st Edition.
2	Head First Design patterns, Eric Freeman & Elisabeth Freeman, O'REILLY, 2007.
3	Design Patterns in Java, Steven John Metsker & William C. Wake, Pearson education, 2006.
4	Software architecture, David M. Dikel, David Kane and James R. Wilson, Prentice Hall PTR,2001.

<b>Course Outcomes:</b> At the end of the course, the student should have acquire the ability to	
<b>C01</b>	Identify a suitable application for a single design pattern.
<b>C02</b>	Implement the chosen structural pattern in a practical scenario.
<b>C03</b>	Use UML design to represent a creational design pattern.
<b>C04</b>	Design a system using the Singleton pattern to manage print commands from a Word document.
<b>C05</b>	Implement and demonstrate the integration of multiple behavioral patterns in a practical scenario.
<b>C06</b>	Implement and showcase the application of architectural patterns in a practical scenario.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Advances in Software Testing (Computer Science)

<b>I M.Tech - I Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD58201	<b>MCC</b>	4	0	0	4	40	60	100
<b>Unit I – Control flow graph and Tests generation</b>								
Basic blocks, flow graphs, paths, basic paths, path conditions and domains, Dominators and post-dominators; Program dependence graph – data dependence, control dependence, call graph, Tests generation - Test selection Problem, equivalence partitioning, Equivalence class partitioning, boundary value analysis and category partitioning method.								
<b>Unit II – Finite state machines (FSM)</b>								
Properties of FSM, Conformance testing, test generation, test optimization, Fault detection. Combinatorial designs – combinatorial test design process. Pairwise design: Binary factors and multi-valued factors. Orthogonal arrays and multi level orthogonal arrays..								
<b>Unit III – Test Adequacy</b>								
Basics, measurement of test adequacy, infeasibility and test adequacy. Adequacy criteria-based control – statement, block, conditions and decisions coverage techniques. Basics of Junit tool for Java. Metrics Importance of Metrics in Testing - Effectiveness of Testing – Defect Density – Defect Leakage Ratio – Residual Defect Density – Test Team Efficiency – Test Case Efficiency.								
<b>Unit IV – Regression Testing</b>								
What is Regression Testing? Regression test process. Regression test selection techniques: Test all, Random selection, modification traversing tests, using execution trace. Test minimization and prioritization.								
<b>Unit V – Non-functional testing</b>								
Load testing, performance testing, GUI testing, Security testing techniques and tools. Automation: Case studies functional test automation using Selenium.								

<b>Text books:</b>	
1	Aditya P Mathur, Foundations of software testing, 2nd edition, Pearson, 2013.
2	Boris Beizer, "Software Testing Techniques", 2nd Edition, Dream tech press, 2003.
<b>Reference Books:</b>	
1	M G Limaye, "Software Testing – Principles, Techniques and Tools", Tata McGraw Hill, 2009.
2	Edward Kit, "Software Testing in the Real World - Improving the Process", Pearson Education, 2004.
3	William E. Perry, "Effective methods for software testing", 2nd Edition, John Wiley, 2000.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Understanding Control Flow Graph.
<b>C02</b>	Apply equivalence partitioning for test case generation.
<b>C03</b>	Apply conformance testing and test generation techniques for FSMs.
<b>C04</b>	Apply statement, block, conditions, and decisions coverage techniques.
<b>C05</b>	Implement test minimization and prioritization techniques in the context of regression testing.
<b>C06</b>	Apply automation techniques to improve efficiency in testing processes.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Big Data Analytics (Computer Science)

I M.Tech - II Semester					SRIT R19			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
194GD58202	PCC	L	T	P	C	CIA	SEE	Total
		4	0	0	4	40	60	100
<b>Unit I – Introduction to Big Data</b>								
Introduction to Big Data Platform – Challenges of Conventional System – Intelligent data analysis – Nature of Data – Analytic Processes and Tool – Analysis vs Reporting – Modern Data Analytic Tool – Statistical Concepts: Sampling Distributions – Re-Sampling – Statistical Inference – Prediction Error.								
<b>Unit II – Mining Data Streams</b>								
Introduction To Stream Concepts – Stream Data Model and Architecture - Stream Computing – Sampling Data in a Stream – Filtering Stream – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window – Real time Analytics Platform(RTAP) Applications – Case Studies – Real Time Sentiment Analysis, Stock Market Predictions.								
<b>Unit III – Hadoop</b>								
History of Hadoop- The Hadoop Distributed File System – Components of Hadoop – Analyzing the Data with Hadoop – Scaling Out – Hadoop Streaming – Design of HDFS- Java interfaces to HDFSBasics- Developing a Map Reduce Application – How Map Reduce Works – Anatomy of a Map Reduce Job run – Failures – Job Scheduling – Shuffle and Sort – Task Execution – Map Reduce Types and Formats – Map Reduce Features.								
<b>Unit IV – Hadoop Environment</b>								
Setting up a Hadoop Cluster – Cluster specification – Cluster Setup and Installation –Hadoop Configuration – Security in Hadoop – Administering Hadoop – HDFS – Monitoring – Maintenance – Hadoop Benchmarks – Hadoop in the Cloud.								
<b>Unit V – Frameworks</b>								
Applications on Big Data Using Pig and Hive – Data Processing operators in Pig – Hive Services – HiveQL – Querying Data in Hive – fundamentals of HBase and Zookeeper – IBM Info Sphere Big Insights and Streams. Visualization - Visual data analysis techniques, interaction techniques; Systems and applications.								

### Text books:

- |   |   |
|---|---|
| 1 | Michael Berthold, David J.Hand, Intelligent Data Analysis, Spingers, 2007.  |
| 2 | Tom White, Hadoop: The Definitive Guide Third Edition, O’reilly Media, 2012 |

### Reference Books:

- |   |   |
|---|---|
| 1 | Bill Franks, Taming the big Data tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics, John Wiley & sons, 2012. |
| 2 | Glenn J. Myatt, Making Sense of Data , John Wiley & Sons, 2007 Pete Warden, Big Data Glossary, O’Reilly, 2011.                            |
| 3 | Jiawei Han, MichelineKamber, Data Mining Concepts and Techniques, Second Edition  |

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>CO1</b>	Understanding the Concepts in Big Data Fundamentals.
<b>CO2</b>	Analysis to evaluate moderate data analytics tools.
<b>CO3</b>	Demonstrate Hadoop and Map-reduce programming architectures.
<b>CO4</b>	Evaluate the cloud deployment of Hadoop cluster setup and administration.
<b>CO5</b>	Apply Pig and Hive for processing big data and understand data processing operators in Pig.
<b>CO6</b>	Apply visual data analysis and interaction techniques.



# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Mobile Application Development (Computer Science)

<b>I M.Tech - II Semester</b>					<b>SRIT R19</b>			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
194GD58203	<b>PCC</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		4	0	0	4	40	60	100
<b>Unit I – Basics of Mobile Applications Development</b>								
Tools: Eclipse ADT, Android Studio. Understanding the Role of Android Application Components, Understanding the Utility of Android API, Overview of the Android Project Files, Understanding Activities, Role of the Android Manifest File, Creating the User Interface, Commonly Used Layouts and Controls, Event Handling, Displaying Messages Through Toast, Creating and Starting an Activity, Using the Edit Text Control, Choosing Options with Checkbox, Choosing Mutually Exclusive Items Using Radio Buttons.								
<b>Unit II- Building Blocks for Android Application Design</b>								
Introduction to Layouts, Linear Layout, Relative Layout, Absolute Layout, Using Image View, Frame Layout, Table Layout, Grid Layout, Adapting to Screen orientation. Utilizing Resources and Media Resources, Creating Values Resources, Using Drawable Resources, Switching States with Toggle Buttons, Creating an Images Switcher Application, Scrolling Through Scroll View, playing Audio, Playing Video, Displaying Progress with Progress Bar, Using Assets.								
<b>Unit III – Using Selection widgets and Debugging</b>								
Using List View, Using the Spinner control, Using the GridView Control, Creating an Image Gallery Using the ViewPager Control, Using the Debugging Tool: Dalvik Debug Monitor Service(DDMS), Debugging Application, Using the Debug Perspective. Displaying And Fetching Information Using Dialogs and Fragments: What Are Dialogs, Selecting the Date and Time in One Application, Fragments, Creating Fragments with java Code, Creating Special Fragments								
<b>Unit IV – Building Menus</b>								
Creating Interface Menus and Action Bars, Menus and Their Types, Creating Menus Through XML, Creating Menus Through Coding, Applying a Context Menu to a List View, Using the Action Bar, Replacing a Menu with the Action Bar, Creating a Tabbed Action Bar, Creating a Drop-Down List Action Bar.								
<b>Unit V – Storing Data &amp; Communicating with SMS and Emails</b>								
Using the SQLiteOpenHelperclass, Accessing Databases with the ADB, Creating a Data Entry Form. Understanding Broadcast Receivers, Using the Notification System, Sending SMS Messages with Java Code, Receiving SMS Messages, Sending Email, Working With Telephony Manager.								

### Text books:

- 1 | Android Programming by B.M Harwani, Pearson Education, 2013.
- 2 | Android application Development for Java Programmers, James C Sheusi, Cengage Learning.

### Reference Books:

- 1 | Professional Android 4 applications development, Reto Meier, Wiley India, 2012.
- 2 | Beginning Android 4 applications development, Wei- Meng Lee, Wiley India, 2013
- 3 | PawPrints Learning Technologies, Beginning Android Development: Create Your Own Android Apps Today, 2014.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Explain the basics of mobile android application development.
<b>C02</b>	Understanding the role of Android Application components.
<b>C03</b>	Create the Building Blocks for Android Application Design.
<b>C04</b>	Creating an Image Gallery using selection widgets and Debugging.
<b>C05</b>	Creating Interface Menus and Drop-Down List Action Bar.
<b>C06</b>	Understanding storing Data and broad cast Receivers.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Internet of Things (Computer Science)

<b>I M.Tech - II Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD58204	PEC	4	0	0	4	40	60	100
<b>Unit I – Introduction</b>								
Internet of Things – Design Principles for Connected Devices – Web Thinking for Connected Devices – Internet Principles – IP – TCP – IP Protocol Suite – UDP – IP Address – MAC Address – TCP and UDP Ports – Application Layer Protocols.								
<b>Unit II – Prototyping</b>								
Prototypes and Production – Cloud – Open Source vs Closed Source – Tapping into the Community – Prototyping Embedded Devices – Electronics – Embedded Computing Basics – Arduino – Raspberry Pi – Beagle Bone Black – Electronic Imp.								
<b>Unit III – Prototyping the Physical Design</b>								
Laser Cutting – 3D Printing – CNC Milling – Repurposing and Recycling – Prototyping Online Components – New API – Real Time Reactions – Other Protocols.								
<b>Unit IV – Techniques for writing Embedded Code</b>								
Memory Management – Performance and Battery life – Libraries – Debugging – Business Models – Models – Funding an Internet of Things Startup.								
<b>Unit V – Moving to Manufacture</b>								
Designing Kits – Designing Printed Circuit Boards – Manufacturing Printed Circuit Boards – Mass Producing the case and other Fixtures – Scaling up Software – Ethics – Characterizing the Internet of Things – Control – Environment – Solutions.								

### **Text books:**

1	Adrian Mcewen and HakinCassimally, "Designing The Internet of Things" Wiley Publications, 2015.
2	Vijay Madiseti and ArshdeepBahga, "Internet of Things (A Hands-on-Approach)", 1stEdition, VPT, 2014.

### **Reference Books:**

1	Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013 CunoPfister, "Getting Started with the Internet of Things"
2	Kranz, Maciej. Building the Internet of Things: Implement New Business Models, Disrupt Competitors, Transform Your Industry. Wiley, 2016.
3	Bahga, Arshdeep, and Vijay Madiseti. Internet of Things: A Hands-On Approach. VPT, 2014.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Understand the basics of IoT.
<b>C02</b>	Illustrate the functional stack of IoT.
<b>C03</b>	Implement the state of the Architecture of an IoT.
<b>C04</b>	Understand design methodology and hardware platforms involved in IoT.
<b>C05</b>	Understand how to analyze and organize the data.
<b>C06</b>	Compare IOT Applications in Industrial & real world.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Distributed Computing (Computer Science)

<b>I M.Tech - II Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD58205	<b>PEC</b>	3	0	0	3	40	60	100
<b>Unit I – Introduction</b>								
Message-passing systems versus shared memory systems - Primitives for distributed communication - Synchronous versus asynchronous executions - A model of distributed computations - A model of distributed executions - Models of communication networks - Models of communication networks - Models of process communications.								
<b>Unit II – Global state and snapshot recording algorithms</b>								
System model and definitions - Snapshot algorithms for FIFO channels - Variations of the Chandy–Lamport algorithm - Snapshot algorithms for non-FIFO channels - Snapshots in a causal delivery system - Monitoring global state - Terminology and basic algorithms - Topology abstraction and overlays - Classifications and basic concepts - Complexity measures and metrics.								
<b>Unit III – Message ordering and group communication</b>								
Asynchronous execution with synchronous communication - Synchronous program order on an asynchronous system - Group communication - A nomenclature for multicast - Propagation trees for multicast - Classification of application-level multicast algorithms - Termination detection - Termination detection using distributed snapshots - Termination detection by weight throwing - A spanning-tree-based termination detection algorithm.								
<b>Unit IV – Distributed mutual exclusion algorithms</b>								
Lamport’s algorithm - Ricart–Agrawala algorithm - Singhal’s dynamic information-structure algorithm - Lodha and Kshemkalyani’s fair mutual exclusion algorithm - Quorum-based mutual exclusion algorithms - Maekawa’s algorithm - Agarwal–El Abbadi quorum-based algorithm.								
<b>Unit V – Deadlock detection in distributed systems</b>								
Models of deadlocks - Knapp’s classification of distributed deadlock detection algorithms - Mitchell and Merritt’s algorithm for the single resource model - Chandy–Misra–Haas algorithm for the AND model - Chandy–Misra– Haas algorithm for the OR model.								

### Text books:

1	Kshemkalyani, Ajay D., and Mukesh Singhal, "Distributed computing: principles, algorithms, and systems Cambridge University Press, 2011.
2	Sunita Mahajan and Seema Shah, "Distributed Computing", Oxford University Press, Second Edition, 2011.

### Reference Books:

1	Albert Y. Zomaya, "Parallel and Distributed Computing Hand book", Second edition, McGraw-Hill Publications, 2005.
2	Francesco Pierfederici, "Distributed Computing with Python", First Edition, Packt Publishing, 2016.
3	Mahajan, Sunita, and Seema Shah, "Distributed Computing", Oxford University Press, Inc., 2013.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Understanding Distributed Systems.
<b>C02</b>	Examine models of process communications and their significance in distributed systems.
<b>C03</b>	Define the system model and key terms related to distributed systems.
<b>C04</b>	Explore topology abstraction, overlays, and classifications in the context of snapshot recording.
<b>C05</b>	Examine termination detection in distributed systems using distributed snapshots, weight throwing, and spanning-tree-based algorithms.
<b>C06</b>	Evaluate Mitchell and Merritt's algorithm for the single resource model.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Network Security & Cryptography (Computer Science)

I M.Tech - II Semester					SRIT R19			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	Total
<b>194GD58206</b>	<b>PEC</b>	3	0	0	3	40	60	100
<b>Unit I – Computer Security Concepts</b>								
<p>The OSI Security Architecture, Security Attacks, Security Services And Security Mechanisms, Classical Encryption Techniques- Symmetric Cipher Model, Substitution Ciphers, Transposition Ciphers, Steganography, Modern Block Ciphers, Modern Stream Ciphers.</p> <p>Modern Block Ciphers: Block Ciphers Principles, Data Encryption Standard (DES), Linear And Differential Cryptanalysis, Block Cipher Modes Of Operations, AES.</p>								
<b>Unit II – Public-Key Cryptography</b>								
<p>Principles Of Public-Key Cryptography, RSA Algorithm, Diffie-Hellman Key Exchange, Elgamal Cryptographic System, Elliptic Curve Arithmetic, Elliptic Curve Cryptography</p> <p>Cryptographic Hash Functions: Applications Of Cryptographic Hash Functions, Requirements And Security, Hash Functions Based On Cipher Block Chaining, Secure Hash Algorithm (SHA).</p>								
<b>Unit III – Message Authentication Codes</b>								
<p>Message Authentication Requirements, Message Authentication Functions, Requirements For Message Authentication Codes, Security Of Macs, HMAC, Macs Based On Block Ciphers, Authenticated Encryption.</p> <p>Digital Signatures and Authentication Protocols: Digital Signatures, Authentication Protocols.</p>								
<b>Unit IV – Key Management and Distribution</b>								
<p>Symmetric Key Distribution Using Symmetric Encryption, Symmetric Key Distribution Using Asymmetric, Distribution Of Public Keys, X.509 Certificates, Public Key Infrastructure.</p> <p>Electronic Mail Security: Pretty Good Privacy (PGP), S/MIME</p>								
<b>Unit V – Security At The Transport Layer and Network Layer</b>								
<p>SSL Architecture, Four Protocols, SSL Message Formats, Transport Layer Security, HTTPS, SSH</p> <p>Security At The Network Layer (Ipsec): Two Modes, Two Security Protocols, Security Association, Security Policy, Internet Key Exchange.</p> <p>Intruders: Intruders, Intrusion Detection, Password Management, Firewalls, Viruses and Worms.</p>								

<b>Text books:</b>	
1	Cryptography and Network Security: Principals and Practice, William Stallings, Fifth Edition, Pearson Education.
2	Cryptography and Network Security, Behrouz A. Frouzan and Debdeep Mukhopadhyay, 2nd edition, Mc Graw Hill Education.
<b>Reference Books:</b>	
1	Network Security and Cryptography, Bernard Menezes, Cengage Learning.
2	Cryptography and Security, C.K. Shymala, N. Harini and Dr. T.R. Padmanabhan, Wiley-India.
3	Applied Cryptography, Bruce Schneier, 2nd edition, John Wiley & Sons.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Identify and analyze different types of security attacks and the importance of security services and mechanisms.
<b>C02</b>	Examine the principles of modern block ciphers and their applications in data encryption, with a focus on DES and AES.
<b>C03</b>	Evaluate cryptographic hash functions, their applications, and security requirements.
<b>C04</b>	Evaluate key management and distribution strategies, including symmetric and asymmetric key distribution.
<b>C05</b>	Understand the concepts and implementation of IPsec for securing communication at the network layer.
<b>C06</b>	Understand the importance of security measures in protecting computer networks from malware attacks.



# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Machine Learning (Computer Science)

<b>I M.Tech - II Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	Total
<b>194GD58207</b>	<b>PEC</b>	4	0	0	4	40	60	100
<b>Unit I – Learning Problems</b>								
Learning Problems – Perspectives and Issues – Concept Learning – Version Spaces and Candidate Eliminations – Inductive bias – Decision Tree learning – Representation – Algorithm – Heuristic Space Search.								
<b>Unit II – NEURAL NETWORKS AND GENETIC ALGORITHMS</b>								
Neural Network Representation – Problems – Perceptrons – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evaluation and Learning.								
<b>Unit III – Bayes Theorem</b>								
Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probability Learning – Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model.								
<b>Unit IV – Instance Based Learning</b>								
K- Nearest Neighbour Learning – Locally weighted Regression – Radial Bases Functions – Case Based Learning.								
<b>Unit V – Advanced Learning</b>								
Learning Sets of Rules – Sequential Covering Algorithm – Learning Rule Set – First Order Rules – Sets of First Order Rules – Induction on Inverted Deduction – Inverting Resolution – Analytical Learning – Perfect Domain Theories – Explanation Base Learning – FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning.								

### **Text books:**

1	T.M. Mitchell, "Machine Learning", McGraw-Hill, 1997.
2	Muller, Andreas C., and Sarah Guido. Introduction to machine learning with Python. O'Reilly, 2017.

### **Reference Books:**

1	Stephen Marsland, "Machine Learning -An Algorithmic Perspective", Second
2	Andreas C. Müller and Sarah Guido "Introduction to Machine Learning with Python: A Guide for Data Scientists", Oreilly.
3	Shai Shalev-Shwartz , Shai Ben-David, "Understanding Machine Learning: From Theory to Algorithms" , Cambridge University Press.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Describe the fundamental concepts of learning problems.
<b>C02</b>	Illustrate basics of learning problems with hypothesis and version space.
<b>C03</b>	Explain the concepts of neural networks for learning linear and non-linear activate functions.
<b>C04</b>	Demonstrate Bayesian learning to solve real world problems.
<b>C05</b>	Use instance-based learning to resolve memory complexity and over fitting problems.
<b>C06</b>	Explain the importance of leaning set of rules and reinforcement learning.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Cloud Computing (Computer Science)

<b>I M.Tech - II Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>194GD58208</b>	<b>PEC</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	0	0	3	40	60	100
<b>Unit I – Introduction to cloud computing</b>								
The Evolution of cloud computing – Hardware Evolution- Internet Software Evolution – Server Virtualization – Web Services Deliver from the cloud– Communication-as-a-service– Infrastructure-as-a-service–Monitoring-as-a-service–Platform- as-a-Service - Software-as-a-service – Building Cloud Network.								
<b>Unit II – Federation in the cloud</b>								
Presence in the cloud – Privacy and its Relation to cloud-Based Information Systems– Security in the cloud – Common Standards in the cloud-End-User Access to the cloud Computing.								
<b>Unit III – Advancing towards a Utility Model</b>								
Introduction,Evolving IT infrastructure – Evolving Software Applications – Continuum of Utilities- Standards and Working Groups- Standards Bodies and Working Groups- Service Oriented Architecture- Business Process Execution Language- Interoperability Standards for Data Center Management – Utility Computing Technology- Virtualization – Hyper Threading – Blade Servers- Automated Provisioning- Policy Based Automation- Application Management – Evaluating Utility Management Technology – Virtual Test and development Environment – Data Center Challenges and Solutions – Automating the Data Center.								
<b>Unit IV – Software Utility Application Architecture</b>								
Characteristics of a SaaS – Software Utility Applications – Cost Versus Value – Software Application Services Framework – Common Enablers – Conceptual view to Reality – Business profits – Implementing Database System for Multitenant Architecture.								
<b>Unit V – Design Consideration</b>								
Design of a Web Services Metering Interface – Application Monitoring Implementation – A Design for an update and Notification Policy – Transforming to Software as a Service – Application Transformation Program – Business Model Scenarios-Virtual Services for Organizations – The Future.								

### **Text books:**

1	Guy Bunker and Darren Thomson, Delivering utility Computing, John Wiley & Sons Ltd, 2012.
2	John W. Rittinghouse and Ames F. Ransome, Cloud Computing Implementation, Management and security, CRC press & Francis Group, Boca Raton London New York. 2010.

### **Reference Books:**

1	Alfredo Mendroza, Utility Computing Technologies, Standards, and Strategies Artech House INC, 2007.
2	Bahga, Arshdeep, and Vijay Madiseti. Cloud Computing: A Hands-On Approach. VPT, 2014.
3	Erl, Thomas, Ricardo Puttini, and Zaigham Mahmood. Cloud Computing: Concepts, Technology & Architecture. Prentice Hall, 2013.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Explore the evolution of hardware, internet software, and server virtualization.
<b>C02</b>	Demonstrate the process of building a cloud network.
<b>C03</b>	Examine the relationship between privacy and cloud-based information systems.
<b>C04</b>	Discuss virtualization, hyper-threading, blade servers, automated provisioning, and policy-based automation.
<b>C05</b>	Understand the framework for software application services.
<b>C06</b>	Develop a design for an update and notification policy.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Natural Language Processing (Computer Science)

<b>I M.Tech - II Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
<b>194GD58209</b>	<b>PEC</b>	3	0	0	3	40	60	100
<b>Unit I – Introduction</b>								
Introduction to Natural Language, Applications of NLP, Corpora and Corpus Analysis, Lexicon and Morphology, Syntax and Semantics.								
<b>Unit II – Language Modeling</b>								
Introduction, n-gram models, Smoothing: Interpolation and Backoff.								
<b>Unit III – Introduction to Machine Translation</b>								
History, Rule Based MT, Direct Transfer & INTERLINGUA Approaches, MT Evaluation.								
<b>Unit IV – Statistical MT</b>								
Parallel Corpus and Alignment, Lexical Translation Model, Decoding Algorithms.								
<b>Unit V – Applications</b>								
Automatic Text Categorization, Text Summarization, Information Extraction, Sentiment Analysis.								

### **Text books:**

1	Natural Language Processing: An Information Access Perspective”, Ess Ess Publications, Kavi Narayana Murthy, 2006.
2	“Foundations of Statistical Natural Language Processing”, Christopher Manning, MIT Press, 1999.

### **Reference Books:**

1	James A. Natural language Understanding 2e, Pearson Education, 1994.
2	Bharati A., Sangal R., Chaitanya V. Natural language processing: a Paninian perspective, PHI, 2000
3	Siddiqui T., Tiwary U. S.. Natural language processing and Information retrieval, OUP, 2008.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	Understand the Natural Language Processing fundamentals.
<b>C02</b>	Analyze the Language Modeling.
<b>C03</b>	Explore the Machine Translation.
<b>C04</b>	Understand statistical and Lexical MT.
<b>C05</b>	Demonstrate the Applications of NLP.
<b>C06</b>	Analyze the Text summarization.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Advances in Software Testing Lab (Computer Science)

I M. Tech – II Semester						SRIT R19		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
		194GD58210	PCC	0	0	4	2	40
<b>List of Experiments</b>								
S. No.	Title of the Experiment							
1	Write programs in C Language to demonstrate the working of the following constructs: i) do...while ii) while....do iii) if...else iv) switch v) for							
2	A program written in C language for Matrix Multiplication fails. Introspect the causes for its failure and write down the possible reasons for its failure.							
3	Consider ATM System and Study its system specifications and report the various bugs.							
4	Write the test cases for Banking application.							
5	Create test plan document for Library Management System.							
6	Create test cases for Railway Reservation.							
7	Understand the Automation Testing Approach, Benefits, Workflow, Commands and Perform Testing on one application using the following Tool's. i)Win runner Tool for Testing ii)Load runner Tool for Performance Testing iii) Selenium Tool for Web Testing.							

Reference Books/Lab Manuals:	
1	Modern Operating Systems, Andrew S Tanenbaum, 2nd edition, Pearson/PHI
2	Operating Systems – Internals and Design Principles, William Stallings, Fifth Edition–2005, Pearson Education/PHI
3	Advanced programming in the Unix environment, W.R.Stevens, Pearson education.
4	Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley

Course Outcomes: At the end of the course, the student should have acquire the ability to	
<b>CO1</b>	Know the fundamentals of agile methodologies used in various development environments.
<b>CO2</b>	Differentiate traditional model with agile model for better software development.
<b>CO3</b>	Design and model agile methods in SCRUM.
<b>CO4</b>	Describe the knowledge management cycle for improving performance in an organization.
<b>CO5</b>	Illustrate tools and techniques for improving team collaboration and agile software.
<b>CO6</b>	Implement quality assurance methods in agility environment.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Map Reduce Programming Lab (Computer Science)

I M. Tech – II Semester						SRIT R19						
Course Code	Category	Hours/Week			Credits	Maximum Marks						
194GD58211	PCC	L	T	P	C	CIA	SEE	Total				
		0	0	4	2	40	60	100				
<b>List of Experiments</b>												
S. No.	Title of the Experiment											
1	Install Apache Hadoop.											
2	i)Write a map reduce program to calculate the frequency of a given word in a given file? ii)Write a Map Reduce program to find the grades of student's?											
3	i)Write a map reduce to find the maximum electrical consumption in each year given electrical consumption for each month in each year? ii) Write a map reduce to analyze weather data set and print whether the day is shinny or cool day?											
4	Write a map reduce program to find the number of products sold in each country by considering sales data containing fields like.											
	Transaction_ date	Prod uct	Price	Payment _Type	Nam e	Cit y	Stat e	Countr y	Account_ Created	Last_ Login	Latitu de	Longitude
5	<p>10.XYZ.com is an online music website where users listen to various tracks, the data gets collected like shown below. The data is coming in log files and looks like as shown below.</p> <pre> UserId Skip        TrackId             Shared        Radio   111115        222             0             1        0 111113        225             1             0        0 111117        223             0             1        1 111115        225             1             0        0                     </pre> <p>Write a map reduce program to get the following</p> <ul style="list-style-type: none"> <li>• Number of unique listeners</li> <li>• Number of times the track was shared with others</li> <li>• Number of times the track was listened to on the radio</li> <li>• Number of times the track was listened to in total</li> <li>• Number of times the track was skipped on the radio</li> </ul>											
6	Write a map reduce program to find the frequency of books published each year and find in which year maximum number of books were published using the following data?											
	Title	Author	Published year	Author country	Language	No of pages						
7	Write a map reduce program to analyze Titanic data and to find The average age of the people (both male and female) who died in the tragedy How many persons survived – traveling class wise. The titanic data will be. Column 1: PassengerId died=1) Column 3: Pclass      olumn 2 : Survived Column 4: Name      (survived=0 & Column 5 : Sex Column 6 : Age											



Column 7 : SibSp Column 8 : Parch Column 9 : Ticket Column 10 : Fare Column 11 : Cabin Column 12 : Embarked
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**Reference Books/Lab Manuals:**

1	Srinath Perera and Thilina Gunarathne Hadoop MapReduce Cookbook, Packt publishing, 2003.
2	Bill Franks, Taming the big Data tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics, John Wiley & sons, 2012.
3	Glenn J. Myatt, Making Sense of Data , John Wiley & Sons, 2007 Pete Warden, Big Data Glossary, O'Reilly, 2011.

**Course Outcomes:** At the end of the course, the student should have acquire the ability to

<b>C01</b>	Implement the Concepts in Big Data Fundamentals.
<b>C02</b>	Analysis to evaluate moderate data analytics tools.
<b>C03</b>	Demonstrate Hadoop and Map-reduce programming architectures.
<b>C04</b>	Evaluate the cloud deployment of Hadoop cluster setup and administration.
<b>C05</b>	Implement Pig and Hive for processing big data and understand data processing operators in Pig.
<b>C06</b>	Implement visual data analysis and interaction techniques.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Mobile Application Development Lab (Computer Science)

I M. Tech – II Semester						SRIT R19		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
194GD58212	PCC	L	T	P	C	CIA	SEE	Total
		0	0	4	2	40	60	100
List of Experiments								
S. No.	Title of the Experiment							
1	Design and develop an Mobile App for smart phones The Easy Unit Converter using Android. This application should have approximately 20 categories to be used in your daily life. It includes following units: Acceleration, Angle, Area, Circle, Capacitor, Cooking, Data Size, Density, Data Transfer rate, Electric Current, Energy, Flow Rate, and Force.							
2	Design and develop an Mobile App for smart phones Currency Converter.This applications should synchronize online as you run it and sends you back the latest and most reliable exchange rates possible.							
3	Design and develop an Mobile App game for smart phones The Tic Tac Toe using Android.							
4	Design and develop an Mobile App for smart phones ,The Health Monitoring System using Android. This App should record Biochemistry Lab Parameters and if abnormal shold send an SMS to doctor for Medications.							
5	Design and develop an Mobile App for smart phones The Expense Manager using Android. This is an application for managing your expenses and incomes: Tracking expenses and incomes by week, month and year as well as by categories, Multiple accounts in multiple currencies, Schedule the payments and recurring payments, Take a picture of receipt, Payment alerts, Budget by day, week, month and year, Search and reports, Import and export account activities in CSV for desktop software, Customize expense categories, payer/payer, payment methods, date format, white or black background, button style etc, Account transfer, Convenient tools such calculator, currency converter, tip calculator, sales and tax calculator and credit card calculator.							

### Reference Books/Lab Manuals:

1	Mobile Computing: (technologies and Applications- N. N. Jani S chand.
2	B.M.Hirwani- Android programming Pearson publications-2013.
3	Stallings, William. "Wireless Communication and Networks, PHI." (2003).

**Course Outcomes:** At the end of the course, the student should have acquire the ability to

<b>CO1</b>	Explain the basics of mobile android application development.
<b>CO2</b>	Understanding the role of Android Application components.
<b>CO3</b>	Create the Building Blocks for Android Application Design.
<b>CO4</b>	Creating an Image Gallery using selection widgets and Debugging.
<b>CO5</b>	Creating Interface Menus and Drop-Down List Action Bar.
<b>CO6</b>	Understanding storing Data and broad cast Receivers.

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Research Methodology (Computer Science)

<b>II M.Tech - III Semester</b>					<b>SRIT R19</b>			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
194GD20301	<b>PEC</b>	L	T	P	C	CIA	SEE	Total
		3	0	0	3	40	60	100
<b>Unit I – Introduction</b>								
Meaning of Research – Objectives of Research – Types of Research – Research Approaches – Guidelines for Selecting and Defining a Research Problem – research Design – Concepts related to Research Design – Basic Principles of Experimental Design.								
<b>Unit II – Sampling Design</b>								
Steps in Sampling Design –Characteristics of a Good Sample Design –Random Sampling Design. Measurement and Scaling Techniques-Errors in Measurement – Tests of Sound Measurement – Scaling and Scale Construction Techniques – Time Series Analysis – Interpolation and Extrapolation. Data Collection Methods – Primary Data – Secondary data – Questionnaire Survey and Interviews.								
<b>Unit III – Correlation and Regression Analysis</b>								
Method of Least Squares – Regression vs Correlation – Correlation vs Determination – Types of Correlations and Their Applications.								
<b>Unit IV – Statistical Inference</b>								
Tests of Hypothesis – Parametric vs Non-parametric Tests –Hypothesis Testing Procedure – Sampling Theory – Sampling Distribution – Chi-square Test – Analysis of variance and Co-variance – Multi-variate Analysis.								
<b>Unit V – Report Writing and Professional Ethics</b>								
Interpretation of Data – Report Writing – Layout of a Research Paper – Techniques of Interpretation- Making Scientific Presentations in Conferences and Seminars – Professional Ethics in Research.								

### **Text books:**

1	Research Methodology: Methods And Techniques – C.R.Kothari, 2nd Edition,New Age International Publishers.
2	Research Methodology: A Step By Step Guide For Beginners- Ranjit Kumar, Sage Publications (Available As Pdf On Internet)

### **Reference Books:**

1	Research Methodology And Statistical Tools – P.Narayana Reddy And G.V.R.K.Acharyulu, 1st Edition,Excel Books,New Delhi.
2	Crafting Your Research Future –Charles X. Ling And Quiang Yang (Available As Pdf On Internet).
3	Scientists Must Write - Robert Barrass (Available As Pdf On Internet).

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	
<b>C02</b>	
<b>C03</b>	
<b>C04</b>	
<b>C05</b>	
<b>C06</b>	

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Human Values and Professional Ethics (Computer Science)

<b>II M.Tech - III Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
194GD20302	<b>PEC</b>	3	0	0	3	40	60	100
<b>Unit I – Human Values</b>								
Morals, Values and Ethics-Integrity-Work Ethic-Service learning –Civic Virtue – Respect for others – Living Peacefully – Caring – Sharing – Honesty -Courage- Co Operation – Commitment – Empathy –Self Confidence Character –Spirituality.								
<b>Unit II – Engineering Ethics</b>								
Senses of Engineering Ethics- Variety of moral issues –Types of inquiry – Moral dilemmas – Moral autonomy –Kohlberg’s theory- Gilligan’s theory- Consensus and controversy – Models of professional roles- Theories about right action- Self interest - Customs and religion –Uses of Ethical theories – Valuing time –Co-operation – Commitment.								
<b>Unit III – Engineering as Social Experimentation</b>								
Engineering As Social Experimentation – Framing the problem – Determining the facts – Codes of Ethics –Clarifying Concepts – Application issues – Common Ground - General Principles –Utilitarian thinking respect for persons.								
<b>Unit IV – Engineers Responsibility for Safety and Risk</b>								
Safety and risk –Assessment of safety and risk – Risk benefit analysis and reducing riskSafety and the Engineer- Designing for the safety- Intellectual Property rights(IPR).								
<b>Unit V – Global Issues</b>								
Globalization – Cross culture issues- Environmental Ethics –Computer Ethics – Computers as the instrument of Unethical behavior – Computers as the object of Unethical acts – Autonomous Computers- Computer codes of Ethics – Weapons Development - Ethics .								

### **Text books:**

1	Engineering Ethics includes Human Values” by M.Govindarajan, S.Natarajan and V.S.SenthilKumar-PHI Learning Pvt. Ltd-2009.
2	“Engineering Ethics” by Harris, Pritchard and Rabins, CENGAGE Learning, India Edition, 2009.

### **Reference Books:**

1	“Ethics in Engineering” by Mike W. Martin and Roland Schinzinger – Tata McGrawHill– 2003.
2	“Professional Ethics and Morals” by Prof.A.R.Aryasri, Dharanikota Suyodhana Maruthi Publications.
3	“Professional Ethics and Human Values” by A.Alavudeen, R.Kalil Rahman and M.Jayakumaran , Laxmi Publications.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	
<b>C02</b>	
<b>C03</b>	
<b>C04</b>	
<b>C05</b>	
<b>C06</b>	

# SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY

## Intellectual Property Rights (Computer Science)

<b>II M.Tech - III Semester</b>						<b>SRIT R19</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	Total
194GD20303	<b>PEC</b>	3	0	0	3	40	60	100
<b>Unit I – Introduction</b>								
Introduction To Intellectual Property: Introduction, Types of Intellectual Property, International Organizations, Agencies And Treaties, Importance Of Intellectual Property Rights.								
<b>Unit II – Trade Marks</b>								
Purpose And Function Of Trade Marks, Acquisition Of Trade Mark Rights, Protectable Matter, Selecting And Evaluating Trade Mark, Trade Mark Registration Processes.								
<b>Unit III – Law Of Copy Rights</b>								
Fundamental Of Copy Right Law, Originality of Material, Rights Of Reproduction, Rights To Perform The Work Publicly, Copy Right Ownership Issues, Copy Right Registration, Notice Of Copy Right, International Copy Right Law. Law Of Patents: Foundation Of Patent Law, Patent Searching Process, Ownership Rights and Transfer								
<b>Unit IV – Trade Secrets</b>								
Trade Secrete Law, Determination Of Trade Secrete Status, Liability For Misappropriations Of Trade Secrets, Protection For Submission, Trade Secrete Litigation. Unfair Competition: Misappropriation Right of Publicity, False Advertising.								
<b>Unit V – New Development of Intellectual Property</b>								
New Developments in Trade Mark Law; Copy Right Law, Patent Law, Intellectual Property Audits. International Overview on Intellectual Property, International – Trade Mark Law, Copy Right Law, International Patent Law, International Development in Trade Secrets Law.								

### **Text books:**

1	Cathy O' Neil and Rachel Schutt. Doing Data Science, Straight Talk from The Frontline. O' Reilly, 2014.
2	Intellectual Property Right – Nileshmy The Knowledge Economy, Prabuddha Ganguli, Tata Mc Graw Hill Publishing Company Ltd.

### **Reference Books:**

1	Intellectual Property Right, Deborah. E. Bouchoux, Cengage Learning.
2	"Intellectual Property: The Law of Trademarks, Copyrights, Patents, and Trade Secrets" by Deborah E. Bouchoux.
3	Vaidhyanathan, Siva. Intellectual Property: A Very Short Introduction. Oxford University Press, 2017.

<b>Course Outcomes:</b> At the end of the course, the student should have acquired the ability to	
<b>C01</b>	
<b>C02</b>	
<b>C03</b>	
<b>C04</b>	
<b>C05</b>	
<b>C06</b>	