

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE  
(AUTONOMOUS) COIMBATORE – 641 020**

**For candidates admitted from academic year 2017 - 2018 onwards under New CBCS.**

**Programme:** Computer Science

**SubjectCode:** 13UCS/USC1C01

**Course Title:** CORE: PROGRAMMING IN C

**Year: I**

**Semester: I**

**4 Hours / week**

**Credits: 4**

### **Unit I**

Overview of C – Introduction-Character set –C Tokens Keywords & identifiers - Constant –Variables - Data types- Declaration of Variables- Assigning values to variables- Defining Symbolic Constants. Operators and Expressions:-Arithmetic, Relational Logical, Assignment, Conditional Bitwise, Special, Increment and Decrement operators-Arithmetic Expressions-Evaluation of expression-Precedence of arithmetic operators-Type conversion in expression- operator precedence & associative – mathematical functions. Managing Input and Output Operations: -Reading & writing a character – formatted input and output.

### **Unit II**

Decision making and Branching: – Decision making with IF Statement-simple IF Statement- The IF ELSE statement-Nesting of IF—ELSE statement-Else if Ladder-Switch Statement--Conditional operator. Decision Making and Looping:- The WHILE statement- Do Statement-FOR Statement.

Arrays: The One Dimensional Array-Declarations – Initialization-Two Dimensional Array-Initialization- Multidimensional arrays. Character Arrays and strings: Declaring and initializing string variables- Reading strings from terminals-writing strings to screen - Arithmetic operation on character-putting strings together-comparison of two strings- string handling functions- table of Strings

### **Unit III**

User defined functions: –need for user Defined functions- A multifunction program – Elements of User defined functions-Definition of functions--Return values and their types- Calling a function-Function declaration- Category of functions-No Arguments and no Return values- Arguments but no return values-Arguments with return values-No Arguments but Return the value- Functions that return multiple values- nesting of functions- Recursion- Passing arrays to functions- Passing strings to functions- The scope,visibilityand lifetime of variables

### **Unit IV**

Structure and Union: Defining a structure-Declaring the structure variables– Accessing structure members-Structures initialization- Copying and comparing structure variables- Arrays of Structures - Arrays with in Structures- Structures within structures – Structures and functions- unions- Size of structures. Pointers:- Understanding pointers-Accessing the Address of a Variable – Declaring and initializing pointers- Accessing a variable through its pointers- pointers expressions pointer increments and scale factor-pointers and arrays – pointers and character strings- pointers as functions arguments.

## **Unit V**

File management in C:- Defining and opening a file- closing file-I/O operations on files- Error handling during I/O operations-Random Access to files- Command line arguments – The Preprocessor: Macro substitution- File inclusion- Compiler control directives.

### **TEXT BOOK:**

1. Balagurusamy.E, Programming in ANSI C, McGraw Hill, 6<sup>th</sup> Edition, 2012.

### **REFERENCE BOOKS:**

1. Yashavant Kanetkar, Let us C, Tata McGraw Hill, 2<sup>nd</sup> Edition, ---
2. Mullesh Cooper, Spirit of C, Tata McGraw Hill, 4<sup>th</sup> Edition, ---
3. <http://spoken-tutorial.org/>

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**CORE : OBJECT ORIENTED PROGRAMMING WITH C++**

**Year : I  
Hours / Week : 4**

**Semester : II  
Subject Code: 17UCS/USC2C02  
Credits : 4**

**UNIT I**

Object Oriented Programming Paradigm: Basic concepts — Benefits — Application — Structure of C++ program — Basic data types — User Defined Data types — Derived data types — Manipulators — Type cast operator — Conversions — Control structures

**UNIT II**

Functions: Function Prototyping — Call by reference — return by reference — Inline function — Default arguments.

Class & Objects: Specifying a class — Define member function — Arrays within a class - Memory allocation — Arrays of Object — Objects as function Arguments — Constructors Parameterized constructor — Copy Constructor — Dynamic constructor — Destructors.

**UNIT III**

Function Overloading( Type 1 & Type 2) -- Operator Overloading & type conversion: Define Operators Overloading — Overloading unary operators — Binary operators — Type conversion.

Inheritance: Defining derived class — Single inheritance — Multi level inheritance — Multiple inheritance — Hierarchical inheritance — Hybrid inheritance — Constructors in derived class.

**UNIT IV**

Pointers, Virtual functions and polymorphism: Pointer to Objects — this pointer — virtual functions — Pure Virtual Functions – Friend functions.

Files: Opening and Closing a File — Detecting end of file — File pointers and their manipulations — Command — line arguments.

**UNIT V**

Templates: Class templates — Function templates — Overloading of template function — Member function templates.

Exception Handling: Basics — Exception handling mechanism — Throwing mechanism — Catching mechanism — Specify Exceptions.

**TEXT BOOK:**

1. E. Balagurusamy, Object Oriented Programming with C++,Tata McGraw Hill Education Private Limited, N.Delhi, 5<sup>th</sup> Edition, 2012.

**REFERENCE BOOKS:**

1. Robert Lafore, Object oriented programming in C++, Pearson Education, 4th Edition, 2013.
2. Yashavant Kanetkar, \_\_\_\_\_

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**CORE: DATABASE MANAGEMENT SYSTEM**

**Year : II  
Hours / Week : 4**

**Semester : III  
Subject Code : 17UCS/USC3C03**

**Credits : 4**

**UNIT I:**

Introduction to Database Systems: – Database System Applications, Database Systems Versus File Systems – View of Data – Data Models – Database Languages – Database Users and Administrators, Transaction Management, Database System Structure, Application Architectures, History of Database Systems. Entity-Relationship Model: - Basic Concepts – s – Keys – Entity Relationship Diagram.

**UNIT II:**

Relational Database Design: - First Normal Form – Pitfalls in Relational Database Design – Normalization Using Functional Dependencies - Decomposition – Normalization Using Multivalued Dependencies – Normalization Using Join Dependencies.

**UNIT III :**

Oracle9i: Oracle9i an introduction - SQL \*Plus Environment - SQL \*Plus - Oracle Tables: Naming Rules and conversion – Data Types – constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types - Working with Tables : Data Management and Retrieval : DML – Adding a new Row/ Record – customized Prompt .

**UNIT IV :**

PL/SQL : A Programming Language : History – Fundamentals - Block Structure – Comments - Data Types - Other Data Types – Declaration = Assignment operation - Bind variables - Substitution Variables – Printing - Arithmetic Operators . Control Structure and Embedded Cursors and Attributes - Cursor FORloops - SELECT...FOR UPDATE - WHERECURRENT OF clause - Cursor with Parameters - Cursor Variables – Exceptions - Types of Exceptions.

**UNIT V :**

PL/SQL Composite Data Types : Records - Tables arrays . Named Blocks : Procedures – Functions – Packages – Triggers - Data Dictionary Views .

**TEXT BOOKS:**

1. A.Silberschatz, H.Korth and S.Sudarsan, Database System Concepts, TATA McGraw Hill Inc., Fourth Edition, 2002.
2. Nilesh Shah ,Database Systems using Oracle, PHI ,2<sup>nd</sup> edition,---

**REFERENCE BOOKS:**

1. Bipin.C.Desai, An Introduction to Database System,West Publishing Company, 2004.
2. C.J.Date, An Introduction to Database Systems, Addition – Wesley, eighth edition, 2007.
3. Majumdar & Bhattacharya, Database Management System, TMH, 2007.
4. Gerald v.Post, Database Management System, TMH, 3<sup>rd</sup> edition, **YEAR.**

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**CORE: DATA STRUCTURES AND ALGORITHMS**

**Year : II  
Hours / Week : 5**

**Semester : III  
Subject Code : 17UCS/USC3C04  
Credits : 5**

**UNIT I**

Introduction: Over view — Creation and analyses of programs — Arrays: Basics — Representation of arrays — Sparse Matrices — Stacks: Basics — Functions — Evaluation of expressions— Multiple Stacks — Queues: Basics — Functions — Circular Queues — Multiple Queues.

**UNIT II**

Linked Lists: Single Linked Lists — Linked Stacks and Queues — Storage Pool — Applications — Polynomial Addition — Equivalence Relations — Double Linked Lists: Dynamic Storage Management —. Garbage collection and Compaction.

**UNIT III**

Trees: Basic Terminology — Binary Trees — Representation and Traversals — Threaded Binary trees — In order traversal — Binary tree representation of Trees — Sets — Union, Find algorithms — Graphs: Transitive Closure — Warshall 's Algorithm — Shortest path problem: Djikstra's algorithm — Minimum Spanning Trees: Prim's algorithm.

**UNIT IV**

Searching Techniques: Binary, Sequential and Fibonacci searches — Sorting Techniques: Internal sorting sorting with tapes and disks — balanced merge sort — Polyphase merge sort.

**UNIT V**

Symbol Tables: Static tree and dynamic tree implementations — Hash tables. File Organizations — Sequential, ISAM, Random - Linked File organizations: Multilists — Inverted Files — Cellular Partitions.

**TEXT BOOKS:**

1. Ellis Horowitz and SartajSahni ,Fundamentals of Data Structures, Computer Science Press, 2002 (UNITS — I, II, III First Paragraph, IV, V).
2. Tanenbaum A. M. and Augestein M. J, Data Structures Using Pascal,., Prentice Hall, 2nd edition, 1996 (UNIT — III Second Paragraph).

**REFERENCE BOOKS:**

1. Yashwant Kanetkar, Data Structures through C, BPB publications, 2003.
2. SartajSahni, Data Structures — Algorithms & Applications in C++, McGraw-Hill, 1998.
3. Mark Allen Weiss ,Data Structures & Algorithm Analysis in C, Addison Wesley, 1999.

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**CORE: JAVA PROGRAMMING**

<b>Year</b>	<b>: II</b>	<b>Semester</b>	<b>: III</b>
<b>Hours / Week</b>	<b>: 5</b>	<b>Subject Code</b>	<b>: 17UCS/USC3C05</b>
		<b>Credits</b>	<b>: 4</b>

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Unit I

Introduction to java- Introduction to Classes- Inheritance Concepts- Packages and Interfaces: Packages – Access protection Importing packages – interfaces. Exception Handling: Fundamentals – Exception types – Using Try and Catch – nested Try – statements – throw, throws, finally.

Unit II

**Multithreaded programming:** Thread model – Creating a thread, creating multiple threads – Using Alive ( ) and join ( ) – synchronization – Inter threaded communication. String Handling: String constructors – string operations – character extraction – string comparison – searching – modification.

Unit III

**Input/ Output:** File – Stream classes – Byte streams – character streams – **The Applet Class** : Applet Basics - Applet Architecture - Applet Skeleton-Applet Initialization and Termination-Applet Display Methods-The HTML APPLLET Tag-Passing Parameters to Applets.

Unit IV

**Introduction the AWT:** AWT Classes-Window Fundamentals- Creating Frame Window in an Applet- Handling Events in a Frame Window- Working with Graphics-Working with Color-Working with Fonts-**Using AWT Controls:** Control Fundamentals. **AWT Menus:** Menu Bars and Menus -Dialog Boxes **Image Fundamentals:** Creating, Loading, and Displaying.

Unit V

**J2EE Overview:** Distributed Multitiered Applications-J2EE Containers -Packaging - Development Roles. **EJB:** Enterprise Bean-Session Bean- Entity Bean- Message Driven Bean-The Life Cycles of Enterprise Beans. **Servlet:** Servlet Life Cycle-Sharing Information-Initializing a Servlet-Writing Service Methods

**TEXT BOOKS:**

1. Herbert Schildt, The Complete Reference -java 2, TATAMcGraw Hill, Fifth Edition, 2002. (Units I,II,III,IV)
2. Harley Haim, The internet computer reference, TATAMcGraw Hill, Second Edition, 1998, ( Unit-V)

**REFERENCE BOOKS:**

1. E.Balagurusamy , Programming with Java, , TATAMcGraw Hill, Third Edition
2. Patrick Naughton, The JAVA Hand Book, TATAMcGraw Hill, 1997

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CORE: .NET TECHNOLOGY (C#)

**Year : III**  
**Hours / Week : 6**

**Semester : IV**  
**Subject Code : 17UCS/USC4C06**  
**Credits : 5**

**UNIT I**

Evaluation of .Net- Overview of .Net Framework- Exploring Visual studio IDE- Basic IDE operations.

C# Fundamentals: Identifiers, Keywords, Variables, and constants, Expressions and operators- Selection statements: if, Switch-loops: While, do While, For,foreach-Jump Statement: Goto, Break, Continue.

**UNIT II**

Exception handling: Try.. Catch.. Finally and throw statements, Checking and Unchecking, Exploring name spaces, Classes and objects, Structs.

OOPS: Encapsulation, Inheritance, Polymorphism, Abstraction and Interfaces. Using Pointers, Delegates and Events.

Dynamic Data type and Dynamic Language Runtime.

**UNIT III**

Windows Forms: Creating and Customizing

WPF: Controls – Properties and Events

Multithreading: Creating and Scheduling a thread – Synchronizing Threads – Thread Pooling.

File Handling: Working with files – File Compression.

**UNIT IV**

**ADO.Net: Understanding SQL and ADO.Net Entity framework – Data binding in windows forms – Data binding in ASP.Net Applications.**

**UNIT V**

**ASP.Net: Web services: Architecture – Properties – ASP.Net AJAX – Security.**

**Windows services: Various class and installation. Deploying windows and web applications.**

**TEXT BOOK:**

1.C#.Net Programming Black book, Dreamtech Press, 2011.

**REFERENCE BOOK:**

1. E.Balagurusamy, Programming in C#:A Primer, 3<sup>rd</sup> Edition, TATA McGrew Hill Education Pvt Limited, New Delhi, 2012.

2. Kevin Hoffman. Microsoft Visual C#, Pearson Education, 2006.

3.V.K.Jain, The Complete Guide to C# Programming, Dreamtech Press, 2001.

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CORE: COMPUTER ORGANIZATION AND ARCHITECTURE

**Year : II**

**Semester : IV**

**Hours / Week : 6**

**Subject Code : 16UCS/USC4C07**

**Credits : 4**

**UNIT I**

Central Processor Organization: ALU — Stack organization Instruction formats — Addressing Modes - Data transfer and manipulation — program control program interrupt — parallel processing — pipeline — memory interleaving.

**UNIT II**

Input/output Organization: peripheral devices — I/O Bus and interface modules — micro processor interface isolated and memory mapped I/O — asynchronous data transfer — handshaking Direct memory access.

**UNIT III**

Priority interrupts — parallel priority interrupt - I/O processor CPU — IOP communication INTEL 8089 I/O processor — multiprocessor system Organization.

**UNIT IV**

Arithmetic processor design — comparison and subtraction of unsigned binary numbers — Addition and subtraction algorithm — Multiplication algorithm — Division algorithm — Processor configuration — Design of control — Micro programmed calculator.

**UNIT V**

Memory Organization — Microcomputer memory — Associative memory — Virtual memory Cache memory — Memory management hardware.

**TEXT BOOK:**

1. Computer System Architecture, Morris Mano, Eighth Printing (Second Edition), October 1990.

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**CORE: OBJECT ORIENTED MODELING AND DESIGN WITH UML AND SOAD**

**Year : II  
Hours / Week : 5**

**Semester : IV  
Subject Code : 17UCS/USC4C08  
Credits : 3**

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**UNIT I REQUIREMENTS MODELING:**

Introduction- Overview of object oriented system development – Object basics- The unified Process- Modelling concepts- Modelling as a design technique- Analysis and modelling- UML diagrams- Use case modelling- Class modelling – State modelling- Interaction modelling

Object constraint language- Inception- Evolutionary Requirements – Domain models- System sequence diagrams –Operation contracts

**UNIT II DESIGN AND PRINCIPLE OF DESIGN**

Requirements to design – Design patterns- Logical architecture- Package diagram- Design patterns- Model, View, Control pattern- Detailed design- Object design with GRASP pattern – Detailed class diagram with visibility

**UNIT III MAPPING TO CODE**

Mapping design to code- Test driven development and refactoring- UML tools and UML as blueprint.

**UNIT IV MORE PATTERNS**

More patterns- Analysis update- Objects with responsibilities- applying design patterns- Architectural Analysis- Logical Architecture refinement – Package design- Persistence framework with patterns

**UNIT V SOAD:**

Key Components of SOA – Service Oriented Enterprise Applications: Consideration, Patterns – Service -Oriented Analysis & Design (SOAD): Principles, design of Services: Activity, Data, Client, business process, CLOUD – Technologies for SOA: REST, SOAP.

**TEXT BOOKS:**

1. Michael Blaha and James Rumbaugh, Object oriented modeling and design with UML, Pearson, 2<sup>nd</sup> Edition ,2012
2. Craig Larman, Applying UML and patterns- An introduction to object oriented analysis and design and iterative development”, Pearson Education, 3<sup>rd</sup> Edition ,2016
3. Shankar Kambhampaty, ‘SOA for Enterprise & Cloud Applications’, Wiley India, 2<sup>nd</sup> Edition, 2012.

**REFERENCE BOOKS:**

1. ERICH GAMMA, Richard Helm, Ralph Johnson, John Ulissides, Design patterns: “Elements of Reusable object oriented software Engineering, Pearson Education, 2016.  
Alan Shalloway, James R.Trott, Design patterns Explained: A new perspective on object oriented design, Pearson Education, 2010.

**SRI RAMAKRISHNA MISSION VIDYALAYA**  
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**CORE: OPERATING SYSTEM**

**Year : II**  
**Hours / Week : 4**

**Semester : V**  
**Subject Code : 16UCS/USC5C09**  
**Credits : 4**

**Unit I**

**INTRODUCTION: What is an Operating System?-Mainframe Systems-Desktop Systems-Multiprocessor Systems-Distributed Systems-Clustered System-Real-Time Systems-Handheld Systems. Operating-System Structures:-System Components-Operating-System Services-System Calls-System Programs-System Structure-Virtual Machines.(Pages 3-19, 55-80)**

**Unit II**

**PROCESS MANAGEMENT: Process Concept-Process Scheduling-Operations on Processes-Cooperating Processes-Inter process Communication. CPU Scheduling:-Basic Concepts-Scheduling Criteria- Scheduling Algorithms-Multiple-Processor Scheduling-Real-Time Scheduling. Deadlocks:-System Model-Deadlock Characterization-Methods for Handling Deadlocks-Deadlock Prevention- Deadlock Avoidance- Deadlock Detection-Recovery from Deadlock. (Pages 95 – 109, 151-170, 243 - 264)**

**Unit III**

**STORAGE MANAGEMENT: Memory Management:-Background-Swapping-Contiguous Memory Allocation-Paging-Segmentation- Segmentation with Paging. Virtual Memory:-Background-Demand Paging-Process Creation-Page Replacement-Allocation of Frames-Thrashing. (Pages 273-309, 317 – 348)**

**Unit IV**

**File-System Implementation:-File-System Structure- File-System Implementation-Directory Implementation-Allocation Methods-Free-Space Management. Mass-Storage Structure:-Disk Structure-Disk Management-Swap-Space Management-RAID Structure-Disk Attachment-Stable-Storage Implementation-Tertiary-Storage Structure. (Pages 411 – 430, 491 – 516)**

**Unit V - CASE STUDIES:**

**Windows2000: History-DesignPrinciples-SystemComponents-Environmental Subsystems-File System-Networking-Programmer Interface. Windows XP: History-Design Principles-System Components-Environmental Subsystems-File System-Networking-Programmer Interface. (Pages 743-780, 789 – 839)**

**TEXT BOOK :**

1. SILBERSCHATZ, GALVIN, GAGNE, OPERATING SYSTEM CONCEPTS, Wiley India Edition (sixth edition), 2007

**REFERENCE BOOKS:**

1. DeitelDeitelChoffnes, Operating Systems, Pearson Education (third edition), 2003.
2. Stuart E. Madnick, John J.Donovan, Operating Systems, Tata McGraw Hill (third edition),2003

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**CORE: WEB TECHNOLOGY (XML, WEB SERVICES AND PHP)**

**Year : III**

**Hours / Week : 4**

**Semester : V**

**Subject Code : 17UCS/USC5C10**

**Credits : 4**

**XML**

**Unit I**

**XML Document:** Hello XML- Creating, saving, loading XML document- Attributes – Empty Element tags- XSL. Document type definition: DTD files- Internal and External DTDs- Element Declaration.

**Unit II**

**CSS layouts:** CSS units- The Display property- Box properties- Size – Positioning – CSS Text styles: Fonts- Color- Text- Backgrounds.

**Web Services: WSDL, XML Schema and SOAP.**

**PHP**

**Unit III**

**Introduction to PHP:** Creating first PHP page – variables- constants-types- Operators and Flow Control: Operators- Conditional Statements- Looping - arrays.

**Unit IV**

**Reading Data in Web Pages:** Handling Text Fields, Text Area, Checkboxes, Radio Buttons, List Boxes, Password Controls, Hidden Controls, Image Maps, File Uploads, Buttons.

**Unit V**

**Working with Databases:** Creating MYSQL Database, New Table, Putting Data into the New Database, Accessing the Database in PHP, Inserting, Deleting, Updating the Data items into a database using PHP.

**TEXT BOOKS:**

1. Ellistte Rusty Harold, XML1.1. Bible, IDG Books Pvt Ltd, 3<sup>rd</sup> Edition, 2007. (Unit I,II)
2. Steven Holzner, The Complete Reference PHP, McGrawHill Education Private Limited, 2010. (Unit III,IV & V)
3. Sandeep Chatterjee, James Webber, Developing Enterprise Web Services, PEARSON, 2008.

**REFERENCE BOOKS:**

1. Heather Williamson, The Complete Reference XML, TATA McGraw Hill, Fifth Edition, 2002.
2. Vikram Vaswani, A Beginner's Guide PHP, Tata McGraw Hill, Fifth Edition, 2011.

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**CORE: ANDROID PROGRAMMING**

**Year : III**

**Hours / Week: 4**

**Semester : V**

**Subject Code : 17UCS/USC5C11**

**Credits : 4**

**UNIT I**

The History of the Android OS-Configuring Your Android App Development System-Updating Eclipse ADT-Configuring EclipseAndroid SDK Manager Repository-Android Virtual Devices- Creating the AVD

**UNIT II**

Android Application Development Platform:How the Android Platform is Structured–Android Runtimes-Creating Your First Android Application- Android Resources- Asset Project Folders-Creating a Custom App Launch Icon:Creating a Launch Icon for Each Screen Density-Creating Transparency-Creating Resolution Density App Launch Icons.

**UNIT III**

Introduction to XML:Defining an Android App, Its Design, and Constants-Android Screen Design: Writing to the Display Using Activity and View- Making Apps Interactive: Intents, Event Handling, and Menus.

**UNIT IV**

Android Animation: Making Your UI Designs Move-Frame Animation Concepts and Techniques-Creating Frame Animation Using XML Markup-Creating Frame Animation in MainActivity-Creating Tween Animation Using XML- MarkupHybrid Animation Using Frames with Tween

**UNIT V**

Digital Video: Streaming Video, MediaPlayer, and MediaController classes-Android Service Class and Threads: Background Processing- Android Content Providers: Providing Data to Applications

**TEXT BOOK:**

1. Wallace Jackson, Android Applications for Absolute Beginners, Apress, 3<sup>rd</sup> Edition, 2014.

**REFERENCE BOOKS:**

1. W. Frank Ableson, RobiSen, Chris King, “Android in Action” , Manning Publications, 2nd Edition, 2011.
2. Shawn Van Every, ‘Pro Android Media: Developing Graphics, Music, Video, and Rich Media Apps for Smartphones and Tablets ‘, Apress Publisher, 2016.

**SRI RAMAKRISHNA MISSION VIDYALAYA  
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**CORE: SOFTWARE ENGINEERING**

**Year : III**  
**Hours / Week: 5**

**Semester : VI**  
**Subject Code : 16UCS/USC6C12**  
**Credits : 5**

**UNIT I**

Introduction — software engineering the software process software process models — the linear sequential model — the proto type model — the RAD model — evolutionary software process models — component based development — the formal methods model — fourth generation techniques.

**UNIT II**

Requirements analysis — requirements elicitation for software — analysis principles -- software prototyping specification — the software requirements — specification — specification review.

**UNIT III**

Software design and software engineering — the design process — design principles — design concepts — effective modular design — design heuristics for effective modularity — the design model — design documentation.

**UNIT IV**

Quality concepts. — the quality movement — software quality assurance — software reviews — formal technical reviews — formal approaches to SQA — statistical software quality assurance — software reliability — mistake proofing for software — the ISO 9000 quality standards — the SQA plan.

**UNIT V**

Software testing fundamentals — test case design - white box testing — basis path testing — control structure testing — black box testing — unit testing — Integration testing — validation testing — system testing.

**TEXT BOOK:**

1. Software Engineering a Practical Approach, Roger S Pressman, McGraw Hill International Edition, Fifth Edition, 2001.

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**Year : III  
Hours / Week : 5**

**Semester : VI  
Subject Code : 17UCS/USC6C13  
Credits : 5**

**CORE: PYTHON AND IOT**

**Unit – I**

Variables – Data Types: String, Numeric, Tuples, Sets, Dictionaries,  
Control Structures: if, while, for, break and continue, lists.

**Unit – II**

Functions: passing parameters, variable number of arguments – scope – passing  
functions – mapping functions in a dictionary – lambda.  
Modules: standard – sys – math – time – dir.  
Error Handling: Exception hierarchy – handling multiple exceptions.

**Unit – III**

File handling: Writing and reading / parsing binary data, text& xml files.  
Object- oriented programming – inheritance, polymorphism, creating classes.  
Processes and threading – delegating work.

**Unit – IV**

Regular expressions – character classes, grouping and capturing, assertions and flags.  
Database Programming: DBM & SQL databases.  
Web Programming: Building CGI applications – Django framework.

**UNIT – V**

IOT – Definition and Overview  
Middleware: platform, communication and software  
Developing IOT: Case study – Weather Monitoring System.

**TEXT BOOKS:**

1. Mark Summerfeld, “Programming in PYTHON 3: A Complete introduction to the Python language, Addison – Wesley, 2009.
2. Arshdeep Bagha, Vijay. K. Madiseti, “Internet of Things: A Hands on approach”, VPT, 1st Edition, 2014.

**REFERENCE BOOKS:**

1. Wesley. J. Chun, “Core Python Applications Programming”, Prentice Hall, 2012.
2. Allen. B. Downey, “Think python”, O’Reilly, 2012.
3. Andrian McEwen, Harm Cassimally, “Designing the IOT”, John Wiley, 1<sup>ST</sup> Edition, 2014.

**SRI RAMAKRISHNAMISSIONVIDYALAYACOLLEGE OF ARTS AND SCIENCE  
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**CORE: COMPUTER NETWORKS AND CYBER-SECURITY**

**Year : III**  
**Hours / Week : 5**

**Semester : VI**  
**Subject Code : 17UCS/USC6C14**  
**Credits : 5**

**UNIT I**

Uses of Computer Networks — Applications of networks —, network structure — network architectures — ISO reference model example networks.

**UNIT II**

Transmission and multiplexing — analog transmission — digital transmission — X.2 1 digital interface — circuit, packet switching — terminal. handling — telephone, wireless and satellite communication systems.

**UNIT III**

Data link layer: Elementary data link protocols — sliding window protocols protocols efficiency and verification. Network layer: Virtual circuits and datagram's — routing algorithms — congestion.

**UNIT IV**

Transport and Session layers: Transport protocol design issues — interconnection of packets switching networks — session layer design issues teammate procedure call.

**UNIT V**

**Introduction to cyber crime and law:** Cyber crimes, Types of Cyber Crime, Hacking, Attack vectors, Cyberspace and Criminal Behavior, Clarification of terms, Traditional problems associated with Computer Crime, Introduction to incident response, Digital forensics, Computer language, Network language, Realms of the cyber world, A brief history of the internet, Recognizing and defining computer crime, Contemporary crimes, Computers as targets, Contaminants and destruction of data, Indian IT ACT 2000.

**TEXT BOOK:**

1. Andrew S. Tanenbaum,"Computer networks" , Prentice Hall of India Pvt. Ltd, Edition 5, 2015.
2. Nina Godbole and Sunit Belpure, Cyber security understanding cyber crimes, Computer forensics and legal perspectives, Publication Wiley India, 2009.

**REFERENCE BOOKS:**

1. Vylless D. Black, Data communication networks and distributed processing.
2. Mike Shema , Anti-Hacker Tool kit, Publication Mc Graw Hill, 4th Edition, 2014.