

# **Sri Kaliswari College (Autonomous), Sivakasi**

(Affiliated to Madurai Kamaraj University)

Re-Accredited with 'A' grade (CGPA 3.30) by NAAC)



## **Programme Scheme, Scheme of Examination and Syllabi**

(For those who join from June 2018 and afterwards)

## **Curriculum Design and Development Cell**

**UG Programme – B.Sc., Computer Science**

**Sri Kaliswari College (Autonomous), Sivakasi**

**Department of Computer Science (UG & PG)**

**B.Sc.,(CS) (Semester) – (2018-2021)**

**Objectives, Outcomes, Regulation**

**Programme Objectives:**

- To teach enhance the knowledge in the field of computer science.
- To improve the skill set needed for global demands.
- To improve the software development programming skill.
- To update knowledge in current trends in IT.
- To produce employable gradates.
- To impart moral and value based education for character modeling.

**Programme Outcomes:**

**Knowledge**

1. Well grounded knowledge in chosen subjects.
2. Updated knowledge related to the subjects.

**Skills**

1. Acquisition of cognitive skills
2. Acquisition of Life Skills for Employment.

**Attitude**

1. Holistic Personality Development through Self-directed and lifelong learning.
2. Eco Sensitivity, inclusive culture, moral uprightless and social commitment.

**Programme Specific Outcomes:**

By the completion of Computer Science program the student will have following Program specific outcomes.

**1. Foundation of Computer System:**

Ability to understand the principles and working of computer systems. Students can assess the hardware And software aspects of computer systems.

**2. Foundation of mathematical concepts:**

Ability to apply mathematical Methodologies to solve computation task, model real world problem using appropriate data structure and suitable algorithm.

**3. Foundations of Software development:**

Ability to understand the structure and development methodologies of software systems. Possess professional skills and knowledge of software design process. Familiarity and practical competence with a broad range of programming language and open source platforms.

4. **Skill to Satisfy Local Needs:**

Possess the skill in designing and animation along with Desktop Publishing

5. **Expertisation in Web Development:**

Skill in developing own Web site. Ability to analyze and design the requirements for Web site. Possess the skill in developing website using different technologies.

6. **Development of Employability skill:**

Development in personality skill which makes them Employable.

7. **Applications of Computing and Research Ability:**

Ability to use knowledge in various domains to identify research gaps and hence to provide solution to new ideas and innovations

**Sri Kaliswari College (Autonomous)-Sivakasi**  
**Department of Computer Science (UG & PG)**  
**Choice Base Credit System- Curriculum Pattern**  
**UG Programme – B.Sc. [Computer Science]**  
**2018-2021**

Sem	Part	Course Code	Title	Hours	Credits
<b>I</b>	I	18UTAL11	Tamil/Hindi/French – I	6	3
	II	18UENL11	General English – I	6	3
	III	18UCSC11	<b>Core Course – I:</b> Programming in C	5	5
		18UCSC1P	<b>Core Course – II:</b> Programming in C Lab	5	4
		18UCSA11	<b>Allied Course – I:</b> Mathematical Foundations	4	4
	IV	18UCSE11	<b>Enrichment Course – I:</b> Introduction to Microprocessor & Computer Organization	2	1
		18UCSN11	<b>Non Major Elective Course–I:</b> Introduction to Computer Science	2	1
			<b>TOTAL</b>	<b>30</b>	<b>21</b>
<b>II</b>	I	18UTAL21	Tamil/Hindi/French – II	6	3
	II	18UENL21	General English – II	6	3
	III	18UCSC21	<b>Core Course – III:</b> OOPs with C++ and Data Structure	5	5
		18UCSC2P	<b>Core Course – IV:</b> C++ and Data Structure Lab	5	4
		18UCSA21	<b>Allied Course – II:</b> Operations Research	4	4
	IV	18UCSE2P	<b>Enrichment Course – II:</b> DTP and Multimedia Lab	2	1
		18UCSN21	<b>Non Major Elective Course – II:</b> Introduction to Internet	2	1
			<b>TOTAL</b>	<b>30</b>	<b>21</b>
<b>III</b>	I	18UTAL31	Tamil/Hindi/French – III	6	3
	II	18UENL31	General English – III	6	3
	III	18UCSC31	<b>Core Course – V:</b> Java Programming	5	5
		18UCSC3P	<b>Core Course – VI:</b> Java Programming Lab	5	4
		18UCSA31	<b>Allied Course – III:</b> Numerical Methods and its Applications	4	4
	IV	18UCSS3P	<b>Skill Based Course – I:</b> UML Lab	2	2
		18UCSV3P	<b>Value Based Course – I:</b> Web Designing Lab	2	1
			<b>TOTAL</b>	<b>30</b>	<b>22</b>

IV	I	18UTAL41	Tamil/Hindi/French – IV	6	3
	II	18UENL41	General English – IV	6	3
	III	18UCSC41	<b>Core Course – VII:</b> Relational Database Management System	5	5
		18UCSC4P	<b>Core Course – VIII:</b> RDBMS and Visual Programming Lab	5	4
		18UCSA41	<b>Allied Course–IV:</b> Numerical Ability	4	4
			<b>Major Elective Course – I:</b>	4	3
		18UCSO41	1. Web Programming		
		18UCSO42	2. Computer Algorithm		
		18UCSO43	3. Consumer Affairs		
	V	-	Extension	-	1
		<b>TOTAL</b>	<b>30</b>	<b>23</b>	
V	III	18UCSC51	<b>Core Course – IX:</b> Software Engineering	5	5
		18UCSC52	<b>Core Course – X:</b> System Software and Operating System	5	5
		18UCSC5P	<b>Core Course – XI:</b> PHP Lab	5	4
		18UCSC5Q	<b>Core Course – XII:</b> Web Programming Lab	5	4
			<b>Major Elective Course – II:</b>	4	4
		18UCSO51	1. Python Programming		
		18UCSO52	2. Computer Graphics and Multimedia		
		18UCSO53	3. Embedded Systems		
	IV	18UCSS5P	<b>Skill Based Course – II:</b> Python Lab	2	1
		18UCSS5Q	<b>Skill Based Course – III:</b> Soft Skill Training	2	1
		18UDMG51	Disaster Management	1	1
		18UVED51	Value Education	1	1
		18UCSJ51	On Job Training	-	1
			<b>TOTAL</b>	<b>30</b>	<b>27</b>
	VI	III	18UCSC61	<b>Core Course – XIII:</b> Computer Networks	5
18UCSC62			<b>Core Course – XIV:</b> Data Warehouse and Data Mining	5	5
18UCSC6P			<b>Core Course – XV:</b> Mobile Application Development Lab	5	4
18UCSJ61			<b>Core Course – XVI:</b> Project & Viva-Voce	5	4
			<b>Major Elective Course – III:</b>	4	4
18UCSO61			1. Artificial Intelligence and Expert Systems		
18UCSO62			2. IoT and its Applications		
18UCSO63			3. Software Testing		

IV	18UCSS61	<b>Skill Based Course –IV:</b> Bio-Informatics	2	2
	18UCSV6P	<b>Value Based Course – II:</b> R Programming Lab	2	1
	18UESR61	Environmental Studies	2	1
		<b>TOTAL</b>	<b>30</b>	<b>26</b>

Semester	I	II	III	IV	V	VI	Total
Credits	21	21	22	23	27	26	140

**Certificate Course in Computer Application (Non Semester)**

S. No.	Course Code	Title	Duration (Hrs)
1.	18CCA0P	Office Automation Lab	60
2.	18CCA0Q	DTP and Multimedia Lab	

**Certificate Course in Data Analytics (Non Semester)**

S. No.	Course Code	Title	Duration (Hrs)
1.	18CDA0P	Introduction to R Programming Lab	60
2.	18CDA0Q	Analysis and Visualization Lab	

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**Department of Computer Science (UG & PG)**  
**UG Programme – B.Sc.,**  
**Semester I**  
**(2018 – 2021)**

**Core Course – I : Programming in C (18UCSC11)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 5</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To pursue the art of programming with C.
- To help the students to solve simple and complex problems.
- To gain the knowledge of Arrays, Structures and Functions.
- To enhance the knowledge in Pointers and Files.

**Course Outcomes:**

1. Develop their art of programming in c.
2. Identify situations where computational methods and computers would be useful.
3. Given a computational problem, identify and abstract the programming task involved.
4. Gain knowledge to use branching, looping, arrays, structures and pointers.
5. Choose the right data representation formats based on the requirements of the problem.
6. Use the comparisons and limitations of the various programming constructs.
7. Implement file operations for given applications.

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**UNIT I**

**(15 Hrs)**

**Getting Started:** What is C – Getting Started with C – The First C Program – Compilation and Execution – Receiving Input – C Instructions – Control Instructions in C.  
**The Decision Control Structure:** Decisions! Decisions! – The if Statement – The if-else Statement – Use of Logical Operators – The Conditional Operators. **Operations on Bits:** Bitwise Operators – The showbits( ) Function.

**UNIT II**

**(15 Hrs)**

**The Loop Control Structure:** Loops – The while Loop – The for Loop – The Odd Loop – The Break Statement – The Continue Statement – The do-while Loop. **The Case Control Structure:** Decisions using switch – switch versus if-else Ladder –The goto Keyword. **Functions:** What is a Function – Passing Values between Functions – Scope Rule of Functions – Calling Convention – One Dicey Issue – Advanced Features of Functions – Return Type of Function – Call by Value and Call by Reference – Recursion.

**UNIT III****(15 Hrs)**

**Data Types Revisited:** Integers, long and short – Integers, signed and unsigned – Chars, signed and unsigned – Floats and Doubles – A few more issues – Storage Classes in C. **Arrays:** What are Arrays – More on Arrays – Two Dimensional Arrays – Initializing a 2-Dimensional Array – Memory Map of a 2-Dimensional Array – Passing 2-D array to a Function – Three Dimensional Arrays. **Puppetting on Strings:** What are Strings – More about Strings – Standard Library String Functions – Two Dimensional Array of Characters.

**UNIT IV****(15 Hrs)**

**Structures:** Why Use Structures – Array of Structures – Additional Feature of Structures – Uses of Structures. **Introduction to Pointers:** The & and \* Operators – Pointer expressions – The Jargon Pointers – Char, int, and float Pointers – Passing Addresses to Functions – Function Returning Pointers. **Pointers and Arrays:** Passing Entire array to a Function – Pointers and 2-D Array to a Function – Pointer to an Array.

**UNIT V****(15 Hrs)**

**Console Input/Output:** Types of I/O – Console I/O Functions – Formatted Console I/O Functions – printf() and scanf() Functions – Unformatted Console I/O Functions. **File Input/Output:** Data Organization – File Operations – Opening a File – Reading from a File – Closing the File – A File-Copy Program – File Opening Modes – Record I/O in Files – Text Files and Binary Files.

**Textbooks**

1. Yashavant P. Kanetkar, "Let Us C", BPB Publications, 2007, 8<sup>th</sup> Edition
2. Yashavant P. Kanetkar, "Understanding Pointers In C", BPB Publications, 2002, 3<sup>rd</sup> edition

Unit	Textbook No.	Chapters	Page No.
I	1	1	1 – 37
	1	2	49 - 73, 76 – 77
	1	14	489 – 508
II	1	3	97 – 123
	1	4	135 – 148
	1	5	155 - 175, 186 – 190
III	1	6	211 – 234
	1	8	277 – 286, 297 - 299, 305 - 307, 310, 311
	1	9	335 - 341, 344 – 355
IV	1	10	371 – 391
	2	1	1 – 16
	2	2	37 – 61
V	1	11	401 – 416
	1	12	423 - 427, 430, 432 - 434, 438 – 444



### **Reference Books**

1. Herbert Schildt “C: The Complete Reference”, TMH Publishing Company, 2000, 4<sup>th</sup> Edition
2. Kernighan, B.W and Ritchie, D.M, “The C Programming Language”, Person Education, 2006, 2<sup>nd</sup> Edition

### **Webliography**

1. [https://www.tutorialspoint.com/cprogramming/c\\_data\\_types.htm](https://www.tutorialspoint.com/cprogramming/c_data_types.htm)
2. [https://www.tutorialspoint.com/cprogramming/c\\_operators.htm](https://www.tutorialspoint.com/cprogramming/c_operators.htm)
3. [https://www.tutorialspoint.com/cprogramming/c\\_pointers.htm](https://www.tutorialspoint.com/cprogramming/c_pointers.htm)
4. [https://www.tutorialspoint.com/cprogramming/c\\_file\\_io](https://www.tutorialspoint.com/cprogramming/c_file_io)

**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science (UG & PG)**  
**UG Programme – B.Sc.,**  
**Semester I**  
**(2018 – 2021)**

**Core Course – II: Programming in C Lab (18UCSC1P)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To learn problem solving techniques using c.
- Practice the use of conditional and looping statements.
- Implement the arrays, functions and pointers.
- Gain skills to handle strings and files.

**Course Outcomes:**

1. Familiarization of language environment.
2. To implement various concepts related to language.
3. Select and model data using primitive and structured types.
4. Apply C features including arrays, structures and pointers.
5. Employ good software engineering practices such as incremental development.
6. Gain the knowledge in File Operation & file functions.
7. To read, understand and trace the execution of programs written in C language.

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1. Program using I/O statements
  2. Program using operators & expressions
  3. Program using variables & data types
  4. Program using decision making & branching
  5. Program using decision making & looping
  6. Program using array & strings
  7. Program using user defined functions
  8. Program using nesting of function
  9. Program using recursive function
  10. Program using passing an Array to a Function
  11. Program using Passing Address to a Function
  12. Program using array of pointers
  13. Program using Pointer as Return Type
  14. Program using pointers & strings
  15. Program using pointers & structures
  16. Program using file functions

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**Enrichment Course – I: Introduction to Microprocessor & Computer Organization**  
**(18UCSE11)**

(For those who join from June 2018 and afterwards)

<b>Credits</b>	<b>: 1</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 2 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 30 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To enable the students to learn about 8086 Microprocessor and Assembly language programming.
- Study the Architecture of 8085 microprocessor.
- Study the organization of memory and types of interrupt.

**Course Outcomes:**

1. Be familiar with the functions units of the processor such as registers, arithmetic logic unit.
2. Be familiar with the representation of data, addressing modes, instruction set.
3. Understand the 8085 microprocessor kit, knowledge of 8085 instruction set and utilize it in applications.
4. Understand the real mode Memory addressing and interface in various devices to the microprocessor.
5. Gain knowledge about architecture and programming and various applications in advanced microprocessor

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**UNIT I** **(6 Hrs)**

**Introduction to microprocessors:** Evolution of microprocessors-Basic functional blocks of a microprocessor-Microprocessor based system-Concept of multiplexing in microprocessor.

**UNIT II** **(6 Hrs)**

**INTEL 8085-INTEL 8086-Microprocessors and microcontrollers:** Processor cycles-machine cycle of 8085- Addressing modes-instruction set.

**UNIT III** **(6 Hrs)**

**CPU:** General Register Organization – Stack Organization – Instruction Formats – Program Control.

**UNIT IV****(6 Hrs)**

**Input/output:** I/O Interface – Asynchronous Data Transfer – Modes of I/O Transfer – Priority Interrupt- Direct Memory Access.

**UNIT V****(6 Hrs)**

**Memory Organization:** Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory.

**Textbooks**

1. A.Nagoor Kani, “Microprocessors and Microcontrollers”, McGraw Hill Edition, 2000, 2<sup>nd</sup> Edition.
2. M. M. Mano, “Computer System Architecture”, Prentice Hall of Indias, 2008, 3<sup>rd</sup> Edition.

Unit	Textbook No	Chapters	Section	Page No.
I	1	1	1.2,1.3,1.4,1.5,1.6,1.9,1.10	
II	1	3	3.1,3.2,3.3,3.4,3.5	
III	2	8	8.2,8.3,8.4,8.7	241-259,273-281
IV	2	11	11.2-11.6	385-418
V	2	12	12.1-12.6	445-475

**Reference Books**

1. W. Stallings, “Computer Organization and Architecture-Designing for Performance”, Pearson Education/PHI, Inc., 2008, 7<sup>th</sup> Edition
2. J.P. Hayes, “Computer Architecture and Organization”, Tata McGraw-Hill, 2012, 3<sup>rd</sup> Edition
3. S. Tanenbaum, “Structured Computer Organization”, 2006, Pearson Education, Inc., 2006, 5<sup>th</sup> Edition

**Webliography**

1. [https://www.tutorialspoint.com/microprocessor/microprocessor\\_8085\\_architecture.htm](https://www.tutorialspoint.com/microprocessor/microprocessor_8085_architecture.htm)
2. [http://www.nptel.ac.in/courses/Webcourse-contents/IISc-BANG/Microprocessors%20and%20Microcontrollers/pdf/Lecture\\_Notes/LNm1.pdf](http://www.nptel.ac.in/courses/Webcourse-contents/IISc-BANG/Microprocessors%20and%20Microcontrollers/pdf/Lecture_Notes/LNm1.pdf)
3. <http://www.cs.uwm.edu/classes/cs458/Lecture/HTML/ch12.html>
4. <https://unacademy.com/lesson/central-processing-unit-stack-organization/E66VWMJU>
5. <http://scanftree.com/microprocessor/Pin-Diagram-of-8086-and-Pin-description-of-8086>
6. <http://www.cpu-world.com/CPU/8086/>

**Sri Kaliswari College (Autonomous), Sivakasi**  
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**UG Programme – B.Sc.,**  
**Semester I**  
**(2018 – 2021)**

**Non Major Elective Course – I: Introduction to Computer Science (18UCSN11)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 1</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 2 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 30 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To enrich the knowledge in computer science.
- To know about the basic functions of computer.
- To enhance the knowledge about word processing.
- To understand the need and working of electronic spreadsheet.

**Course Outcomes:**

1. Understand the basics of computer.
2. Gain the knowledge about the functioning of computer.
3. Able to work with documents.
4. Gain the knowledge about electronic spreadsheet.

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**UNIT I**

**(6 Hrs)**

**Introduction to Computers:** Introduction – Characteristics of Computers: Word Length – Speed – Storage – Accuracy – Versatility – Automation – Diligence. **Five Generations of Modern Computers:** First Generation – Second Generation – Third Generation – Fourth Generation – Fifth Generation. **Classification of Digital Computer Systems:** Microcomputers - PCs – Workstations – Portable Computers – Minicomputers – Mainframes – Supercomputers – Network computers.

**UNIT II**

**(6 Hrs)**

**Anatomy of a Digital Computer:** Functions and Components of a computer – CPU - Control Unit - Arithmetic-Logic Unit – Memory – Registers – Addresses – Working of CPU and memory. **Memory Units:** Introduction – RAM – ROM – PROM – EPROM – EEPROM - Flash Memory.

**UNIT III**

**(6 Hrs)**

**Input Devices:** Introduction – Keyboard – Mouse – Trackball – Joystick – Digitizing Tablet – Scanners – Digital Camera – MICR – OCR – OMR – Bar Code Reader – Speech Input Devices – Touch Screen – Touch Pad – Light Pen. **Output Devices :** Introduction – Monitor – Classification of Monitors: Based on Colour – Classification of Monitors : Based

on Signals – Printer: Daisy-wheel Printer – Dot-Matrix Printer – Ink-Jet Printer – Laser Printer – LCD & LED Printers – Line Printer – Thermal Printer – Plotter – Sound Cards and Speakers – 3D Audio.

**UNIT IV (6 Hrs)**

**Computer Networks:** Introduction – Types of Networks: Local Area Network, Wide Area Network – Network Topologies: Star Network – Ring Network – Bus Network. **Computer Software:** Introduction – Operating Systems – Utilities – Word Processors – Spreadsheets – Presentation Graphics – Paint Programs.

**UNIT V (6 Hrs)**

**Word Processing:** Introduction – Creating Documents – Toolbars – Saving Documents – Opening a document – Printing a document. **Introduction to Electronic Spreadsheets:** Introduction – Characteristics of a spreadsheet – Table Format – Data Forms – Recalculations – Storage and retrieval – Presentation.

**Textbook**

1. Alexis Leon, Mathews Leon, “Fundamentals of Computer Science and Communication Engineering”, Leon TECHWorld, Chennai.

Unit	Chapter	Section	Page No.
I	2	2.1 – 2.3	2.1 – 2.3
	3	3.1 – 3.6	3.1 – 3.6
	4	4.1 – 4.4	4.1 – 4.4
II	6	6.1 – 6.4	6.1 – 6.4
	7	7.1 – 7.3	7.1 – 7.3
III	8	8.1 – 8.7	8.1 – 8.7
	9	9.1 – 9.2, 9.6 – 9.10	9.1 – 9.2, 9.6 – 9.10
IV	16	16.1, 16.6 – 16.10	16.1, 16.6 – 16.10
	12	12.1 – 12.4	12.1 – 12.4
V	21	21.1 – 21.4	21.1 – 21.4
	22	22.2 – 22.11	22.2 – 22.11
	26	26.1 – 26.5	26.1 – 26.5

**Reference Books**

1. Young Kai Seng, “Using the Internet”, Minerva Publications, 2003.
2. Deepak Bharihoke “Fundamentals of Information Technology”, Pentagon Press, 2000.

**Webliography**

1. [https://www.tutorialspoint.com/computer\\_fundamentals/index.htm](https://www.tutorialspoint.com/computer_fundamentals/index.htm)
2. <http://www.lsp4you.com/electronics/Generation%20of%20Computers.pdf>
3. [https://www.tutorialspoint.com/computer\\_fundamentals/computer\\_software.htm](https://www.tutorialspoint.com/computer_fundamentals/computer_software.htm)

**Sri Kaliswari College (Autonomous), Sivakasi**  
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**UG Programme – B.Sc.,**  
**Semester II**  
**(2018 – 2021)**

**Core Course – III: OOPs with C++ and Data Structure (18UCSC21)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 5</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To develop Basic Concepts in C++.
- To learn the characteristics of an object-oriented programming language.
- To design and implement efficient algorithms and program development.
- To build the working knowledge in many application by using various techniques.

**Course Outcomes:**

1. Understand the difference between object oriented programming and procedural oriented languages and data types in C and C++.
2. Be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism.
3. Understand the basic concepts of data structures and algorithms.
4. Identify appropriate data structure as applied to specified problem definition.
5. Acquire skill to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
6. Gain knowledge to describe and simulate various linear data structures like stacks, queues, linked lists using static and dynamic allocation and use them in solving problems.
7. Acquire knowledge to simulate nonlinear data structures like binary search tree and use them in designing applications like sorting, expression trees.

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**UNIT I**

**(15 Hrs)**

**Introduction to C++:** Key Concepts of Object Oriented Programming – Advantages of OOP – Usage of OOP. **C++ Declarations:** Dynamic Initialization – Data Types in C++ – Basic Data Type – Derived Data Type – User Defined Data Type – Type Casting – Constants. **Control Structures. Functions in C++:** Parts of Functions – Passing arguments – Inline Functions – Function Overloading.

**UNIT II**

**(15 Hrs)**

**Classes and Objects. Constructors and Destructors:** Constructors – Overloading Constructors – Copy Constructors – Destructors – Calling Constructor and Destructor –

**Operator Overloading and Type Conversion:** Overloading Unary Operators –Overloading Binary Operators. **Inheritance:** Types of Inheritances: Single Inheritance, Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance –Hybrid Inheritance.

**UNIT III (15 Hrs)**

**Arrays:** Representation of Arrays. **Stacks and Queues:** The Stack Abstract Data Type – The Queue Abstract Data Type – Evaluation of Expressions, Postfix Notation, Infix to Postfix. **Linked Lists:** Singly Linked Lists and Chains – Representing Chains in C++ – Circular Lists – Doubly Linked Lists.

**UNIT IV (15 Hrs)**

**Trees:** Introduction – Binary Trees – Binary Tree Traversal and Tree Iterators – Binary Search Trees

**UNIT V (15 Hrs)**

**Graphs:** The Graph Abstract Data Type – Elementary Graph Operations – Minimum Cost Spanning Trees. **Sorting:** Insertion Sort – Quick Sort – Merge Sort – Heap Sort.

**Textbooks**

1. Ashok N.Kamthane, “Object Oriented Programming with ANSI & Turbo C++”, Pearson Education, 2006, 1<sup>st</sup> Edition.
2. Ellis Horowitz, SartajSahni, Dinesh Mehta, “Fundamentals of Data Structures in C++”, Universities Press, 2008, 2<sup>nd</sup> Edition.

Unit	Textbook No.	Chapters	Section	Page No.
I	1	1,3,4	1.7 – 1.8, 1.10, 3.6 – 3.10, 3.14 – 3.15, 4.1 – 4.15	7 – 15, 17, 84 – 96, 99 – 105, 125 – 149
	1	5	5.3 – 5.4, 5.11–5.12	154 – 163, 171–176
II	1	67	6.1 – 6.29, 7.2 –7.3, 7.6, 7.8, 7.10–7.11	190 – 255, 259–260, 266-273, 274-280
	1	8,9	8.3, 8.6, 9.5–9.9	307 – 310, 313–318, 354–365
III	2	2,3	2.5, 3.2, 3.3, 3.6	108 – 112, 134 – 147, 157 – 165
	2	4	4.1 – 4.2, 4.4, 4.10	170 – 183, 194 – 196, 224 – 225
IV	2	5	5.1 – 5.3, 5.7	243 – 269, 287 – 296
V	2	6, 7	6.1 – 6.3, 7.2 – 7.3, 7.5 – 7.6	324 – 359, 399 – 405, 407 – 417

**Reference Books**

1. E.Balagurusamy, "Object Oriented Programming in C++", TMH Publishing Company 2002.



2. Herbert Schildt, "C++: The Complete Reference", TMH Publishing 2001.
3. Seymour Lipschutz, "Data Structures", Tata McGrawHill, 2006, 4th Edition, New Delhi.
4. A.Chitra, P.T. Rajan, "Data Structures", Vijay Nicole Imprints Private Limited, Chennai, 2006.

### **Webliography**

1. [https://www.tutorialspoint.com/cplusplus/cpp\\_inheritance.htm](https://www.tutorialspoint.com/cplusplus/cpp_inheritance.htm)
2. <https://www.studytonight.com/data-structures/introduction-to-linked-list>
3. <http://www.i-programmer.info/babbages-bag/477-trees.html>
4. <https://www.w3schools.in/data-structures-tutorial/sorting-techniques/merge-sort-algorithm/>
5. <https://www.w3schools.in/data-structures-tutorial/sorting-techniques/insertion-sort-algorithm/>

**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science (UG & PG)**  
**UG Programme – B.Sc.,**  
**Semester II**  
**(2018 – 2021)**

**Core Course – IV: C++ and Data Structure Lab (18UCSC2P)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To understand the basic concepts of class and objects.
- To learn the concepts of inheritance and function overloading.
- To develop application using data structures.
- Gain knowledge of Stack, Queue and Linked list concept.

**Course Outcomes:**

1. Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.
2. Be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism.
3. Making the students to be able to use linear and non-linear data structures like stacks, queues.
4. Understanding simple sorting algorithms.
5. Student will be able to choose appropriate data structure as applied to specified problem definition.
6. Understanding various linked list concepts.
7. Students will be able to use linear and non-linear data structures like stacks, queues, linked lists.

- 
1. Program to implement Class and Object.
  2. Program to implement Constructor and Destructor
  3. Program to implement Function Overloading
  4. Program to implement Overloading Unary and Binary Operator
  5. Program to implement Multilevel Inheritance
  6. Program to implement Multiple Inheritance
  7. Program to implement Hierarchical Inheritance
  8. Program to implement Stack
  9. Program to implement Queue
  10. Program to implement Single Linked List
  11. Program to implement Double Linked List

12. Program to implement Insertion Sort
13. Program to implement Merge Sort
14. Program to implement Quick Sort
15. Program to implement Evaluation of Expression

**Sri Kaliswari College (Autonomous), Sivakasi**

**Department of English (UG & PG)**

**UG Programme – B.Sc.,**

**Semester II**

**(2018 – 2021)**

**Enrichment Course – II : DTP and Multimedia Lab (18UCSE2P)**

**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 1</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 2 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 30 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To design an image using various image editor tools.
- To create banner / logo / invitation / visiting cards.
- To make the student learn animation effects.
- Practice the use of Moving and animation styles.

**Course Outcomes:**

1. Acquire skills to work with various designing tools.
2. Acquire Creativity in banner / logo / invitation / visiting card designing.
3. Develop various effects on images.
4. Apply various animations on images.
5. Familiarization of animation environment.

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**Vector Image Editor Tool (Inkscape)**

1. Design a Postage Stamp
2. Design a Brochure
3. Design a Newspaper Advertisement
4. Design a Logo
5. Design a Certificate
6. Design a Visiting / Greeting Card / CD Cover
7. Design a Wedding Invitation / Book Cover
8. Design a dart / Multiple Swirl Circle / floral leaf

**GUI prototyping tool (Pencil)**

1. A Simple walk cycle animation
2. Create a family Album
3. Make a Rainfall occurrence
4. Bow and arrow to hit the target
5. Make a flipbook

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**Semester II**  
**(2018 – 2021)**

**Non Major Elective Course – II: Introduction to Internet (18UCSN21)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 1</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 2 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 30 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To enrich the knowledge about origin of internet.
- To know about the internet connection and addresses.
- To enhance the knowledge about using mail.
- To gain the idea of building webpages.

**Course Outcomes:**

1. Understand the basics of internet.
2. Gain the knowledge about internet connection and addresses.
3. Able to send email with necessary attached materials.
4. Able to create and work with webpages.

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**UNIT I** **(6 Hrs)**

**Understanding the Internet:** History of the Internet – TCP/IP makes the internet work. **An Overview of the Internet:** Mail – The Web – The Parts of the Web – FTP and Downloading – Talk Facilities (including IRC) – Telnet.

**UNIT II** **(6 Hrs)**

**Everything you need to connect to the net:** Operating Systems (Windows) – Modems. **Internet Addresses:** Two types of top level domains – Domains – IP Addresses – Mail addresses – URLs – Filenames and Extensions. **The Web:** The basic ideas – Options and Preferences – Entering a URL.

**UNIT III** **(6 Hrs)**

**Finding Stuff on the Internet:** Search Engines – Techniques for using the search engine. **Downloading and Installing Software:** Overview of the download process – Downloading Program – Anonymous FTP – Installing a program – installing a program automatically – uninstalling a program. **Safety, Security and Privacy:** Computer Viruses

**UNIT IV** **(6 Hrs)**

**Mail:** The basic ideas – The body of a message – Attachments – Signatures – Mail is Stored (Folders) – Address Lines within the Header (To, Cc, Bcc) – Using an address book –

Replying – Forwarding – Understanding Mail Error messages. **Using Mail Well:** Smileys and other communication conventions – Use RichText – Putting URLs in Messages – Using the windows clipboard – Sending Mails to a group of people.

## UNIT V

(6 Hrs)

**Building Websites:** HTML tags – Text Formatting – Multimedia in websites – Inserting tables in web pages – Adding frames in web pages – Style sheets in HTML documents – Use of meta tags in web pages – structure of web files – creating web files using MS Word – Web Publishing.

### Textbooks

1. Harley Hahn, “The Internet”, Prentice Hall of India Private Limited, 2001, 2<sup>nd</sup> Edition.
2. K.L. James, “The Internet – A User’s Guide”, Prentice Hall of India private limited, New Delhi, 2003, Eastern Economy Edition.

Unit	Textbook No.	Chapter	Section	Page No.
I	1	1	1	2 – 3, 6 – 8
		2	2	19 – 23, 30 – 31, 33 – 34
II	1	3	3	42, 52
		4	4	70, 74 – 77, 80 – 86
		7	7	145 – 149, 151 – 152
III	1	9	9	202 – 206
		11	11	234 – 241
		8	8	192 – 194
IV	1	5	5	96 – 97, 108 – 110, 111 – 120
		6	6	125 – 127, 129 – 134
V	2	10	10	133 – 145, 146 – 154, 155 – 162, 164 – 166

### Reference Books

1. Young Kai Seng, “Using the Internet”, Minerva Publications, 2003.
2. Wendy Willed “HTML A Beginners guide” Tata Mc Graw-Hill Publishing Company Limited, 3<sup>rd</sup> Edition.
3. Jerry Honeycutt, “Using the Internet”, Prentice Hall of India, 4<sup>th</sup> Edition.

### Webliography

1. <https://www.internetsociety.org/internet/history-internet/brief-history-internet/>
2. <http://wifinotes.com/computer-networks/internet-network-architecture.html>
3. [https://www.w3schools.com/html/html\\_elements.asp](https://www.w3schools.com/html/html_elements.asp)

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**UG Programme – B.Sc.,**  
**Semester III**  
**(2018 – 2021)**

**Core Course – V: Java Programming (18UCSC31)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 5</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To develop practical skills in an object oriented programming language.
- To enable students to create, compile and debug computer programs.
- It will enable them define and implement classes to produce reliable, robust and reusable code.
- To implement object oriented designs using encapsulation, inheritance, polymorphism, exception handling and JDBC Connection.

**Course Outcomes:**

1. Knowledge of the structure and model of the Java programming language.
2. Use the programming language for various programming technologies.
3. Able to provide practical Evidence of programming concepts to solve problems using object oriented programming language.
4. Provide practical evidence using programming constructs and explanation to express the understanding of the outcomes.
5. Demonstrated by successful completion of the individual report that includes analysis, design and production of object oriented programs and explanations of concept and logic.
6. Evaluate user requirements for software functionality required to decide whether the Java programming language to solve the given synthesis.

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**UNIT I**

**(15 Hrs)**

**Introduction:** Java's Magic– Java Buzz Words – The Evolution of Java – **An Overview of Java:** Object Oriented Programming – A First Simple Program – Using Blocks of Code – Lexical Issues – Java Class Libraries – Data Types – Variables – Arrays – Operators - **Control Statements:** Java's Selection Statements – Iteration Statements – Jump Statements.

**UNIT II**

**(15 Hrs)**

**Introducing Classes:** Class Fundamentals – Declaring Objects – Accessing Object Reference Variables – Introducing Methods – Constructors – this Keyword – Garbage

Collection – finalize() Method – Stack Class – Overriding Methods – Overloading Constructor – Using Objects as Parameters – Argument Passing – Returning Objects – Recursion – Access Control – Static – final – Nested and Inner Classes – Command Line Arguments - Varargs. **Inheritance:** Basics – Using Super – Creating Multilevel Hierarchy – Method Overriding – Dynamic Method Dispatch – Using Abstract Classes – Using final with Inheritance – The Object Class.

### **UNIT III** **(15 Hrs)**

**Packages:** Defining Packages – Access Protection – Importing Packages. **Interfaces:** Defining an Interface – Implementing an Interfaces – Nested Interfaces – Applying Interfaces – Variables in Interface – Interface can be extended – Default and Static Methods in an Interface. **Exception Handling:** Exception-Handling Fundamentals – Exception Types – Uncaught Exception – Using try and catch – Multi catch Clauses - Nested try Statements - throw – throws – finally – Java’s Built-in Exceptions – Creating Your Own Exception – Chained Exceptions.

### **UNIT IV** **(15 Hrs)**

**Multithreaded Programming:** The Java Thread Model – The Main Thread – Creating a Thread – Creating Multiple Threads – Using isAlive() and join() – Thread Priorities – Synchronization – Inter Thread Communication – Suspending, Resuming and Stopping Threads – Obtaining Thread’s State. **String Handling:** The String Class – String Buffer. **The Input Output Classes and Interfaces:** File – I/O Exceptions - The Stream Classes – Byte Streams: Input Stream – File Input Stream – File Output Stream – Byte Array Input Stream – Byte Array Output Stream - Character Streams: Reader – Writer – FileReader – FileWriter – Character Array Reader – Character Array Writer – Buffered Reader – Buffered Writer.

### **UNIT V** **(15 Hrs)**

**Introducing the AWT:** AWT Classes – Window Fundamentals – Working with Frame Windows – Creating a Frame Window in an AWT – Based Applet – Creating Windowed Program – Displaying Information Within a Window – Graphics – Colors – Setting the Paint Method – Working with Fonts – Managing Text Output Using Font Metrics. **AWT Controls:** Labels – Buttons – Check Boxes – Check Box Group – Choice Controls – List – Scroll Bars – Text Field – TextArea – Layout Managers – Menu Bars and Menus – Dialog Boxes – FileDialog. **Java Database Connectivity:** JDBC Drivers – Statements – Caching Database Results – Storing Classes, Images – and Other Large Objects.

#### **Textbooks:**

1. Herbert Schildt, “Java The Complete Reference”, Mc-Graw – Hill Education (India) Private Limited New Delhi, 2014, 9<sup>th</sup> Edition.
2. C.Xavier, “Programming with JAVA 2”, Scitech Publications (INDIA) Pvt. Ltd, Chennai, 2000.



Unit	Textbook No.	Chapters	Page No.
I	1	1, 2	3 – 34
	1	3, 4	35 – 79
II	1	5, 6	81 – 128
	1	7, 8	129 – 186
III	1	9	187 – 212
	1	10	213 – 232
IV	1	11, 16	233 – 261, 413 – 439
	1	20	641 – 659, 670 - 678
V	1	25, 26	797 – 832, 833 – 882
	2	21	588 – 599

### **Reference Books:**

1. Herbert Schildt, “Java A Beginner’s Guide”, Mc-Graw – Hill Education (India) Private Limited, New Delhi, 2014, 6<sup>th</sup> Edition.
2. Joshua Bloch, “Effective Java”, Pearson Education (Inc), Boston, 2008, 2<sup>nd</sup> Edition.

### **Webliography**

1. <http://www.javatpoint.com/java-tutorial>
2. <http://www.javabeginnerstutorial.com/core-java>
3. <http://www.beginnersbook.com/java-tutorial-for-beginners-with-example>
4. <http://www.studytonight.com/java/java-swing.php>

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**Semester III**  
**(2018 – 2021)**

**Core Course – VI: Java Programming Lab (18UCSC3P)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To understand the basic concepts of Java, Class syntax, data types, flow of control, classes, methods, objects, arrays, exception handling, recursion, and graphical user interfaces.
- Be familiar with the main features of the Java language.
- Be able to write a Java program to solve a well specified problem.
- To build software development for real world applications.

**Course Outcomes:**

1. Understand and apply Object Oriented features.
2. Apply the concept of polymorphism, inheritance and threading to solve real world problems.
3. Implement Exception handling and file operations.
4. The skills to apply OOP in Java programming in problem solving.
5. Choose an engineering approach to solve problems by knowledge of programming and the operating system.
6. Develop graphical interactive application development and JDBC for database transactions.

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1. Program to defining a class and instance methods for setting and retrieving values of instance variables and instantiate its object
  2. Program to defining a class, describe its constructor, overload the Constructors and instantiate its object
  3. Program to demonstrate Method Overloading
  4. Program to demonstrate use of Sub Class and Nested Class
  5. Program to explain the concept array of objects
  6. Program to practice using String Class and its Methods
  7. Program to practice using String Buffer class and its Methods
  8. Program to implement Inheritance and demonstrate use of Method Overriding
  9. Program to implement Multilevel Inheritance by applying various access controls to its Data Members and Methods

10. Program to demonstrate use of Implementing Interfaces
11. Program to demonstrate use of Extending Interfaces
12. Program to implement the concept of Creating Packages and importing classes from user defined package
13. Program to implement the concept of Threading by extending Thread Class
14. Program to implement the concept of Threading by implementing Runnable Interface
15. Program to defining the concept of Exception Handling using Predefined Exception
16. Program to illustrate the concept of Exception Handling by creating User-Defined Exceptions
17. Programs to defining a use of Graphics class
18. Program to demonstrate how to display a scrolling message using Applet
19. Program to configuring Applet by Passing Parameters
20. Program to demonstrate any Event in AWT
21. Program to demonstrate database connections using JDBC and does add, deletes, modify and retrieve operations

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**(2018 – 2021)**

**Skill Based Course – I: UML Lab (18UCSS3P)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 2</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 2 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 30 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To make software blueprints thru pictorial language.
- To model software system and non-software system.
- To understand software components, software frame work and software patterns.
- To provide base for code generation.

**Course Outcomes:**

1. Recognize the difference between various object relationships.
2. Construct various UML models using the appropriate notation.
3. Analyse and design complex problems related to project or product.
4. Design case documents that capture requirements for a software system development.

- 
1. Design a Use case diagram for given URS (User Requirement Specification)
  2. Design a Class diagram for given URS
  3. Design a Object diagram for given SRS (System Requirement Specification)
  4. Design Sequence diagrams for given SRS
  5. Design State chart diagrams for given URS.
  6. Design an Activity diagram for given URS
  7. Design Component diagram for given URS
  8. Design Collaboration diagram for given URS
  9. Design Deployment diagram for given URS

**Pre-Document:**

1. Prepare a User Requirement Specification (URS) document and System Requirement Specification document for different domains
2. Lab Cycle must be based on URS or SRS

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**Semester III**

**(2018 – 2021)**

**Value Based Course – I : Web Designing Lab (18UCSV3P)**

**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 1</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 2 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 30 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To gain basic knowledge about web page designing.
- To gain knowledge about different formatting tags.
- To implement tags and elements efficiently for web development.
- To gain knowledge about CSS elements and tags.
- To gain knowledge in JavaScript.

**Course Outcomes:**

- Understanding the basics of web designing.
- Able to work with different formatting tags.
- Able to implement tags and elements efficiently.
- Able to deal with CSS elements and tags.
- Able to use JavaScript.

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**HTML**

1. Design a web page using text formatting tags.
2. Create Web page using ordered and unordered lists.
3. Create your home page with images.
4. Create web page using internal and external links for documents.
5. Create web page using image and text hyperlinks within documents.
6. Create web page using tables.
7. Create a web page using 2 or more framesets.
8. Design a web page using forms.

**CSS**

9. Design a web page using classes and properties of CSS.
10. Design a web page using Layouts of CSS.
11. Design a web page using icons, list and links of CSS.
12. Design a web page using Transitions of CSS.

## **JavaScript**

13. Design a web page using JavaScript Objects.
14. Design a web page using Operators in JavaScript.
15. Design a web page using built-in functions in JavaScript.
16. Design a web page using user-defined functions in JavaScript.
17. Design a web page using loops in JavaScript.

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**(2018 – 2021)**

**Core Course – VII: Relational Database Management System (18UCSC41)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 5</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To gain knowledge about database.
- To gain knowledge over various database models, schemas and SQL statements.
- To gain insight about transaction and recovery system into database.

**Course Outcomes:**

1. Understand the database concepts.
2. Gain adequate knowledge to design various database models, schemas and SQL statements.
3. Understand the insights of security and authorization.
4. Improve database efficiency using normal form.
5. Qualify to write queries using algebraic and calculus notations.
6. Access data from various databases.

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**UNIT I**

**(15 Hrs)**

**Database and database users:** Introduction-example-Characteristics of the database approach -Workers behind the scene-Advantages of using the DBMS Approach- A brief history of database applications. **Database system Concepts and Architecture:** Database languages and Interfaces- The Database system environment-Centralized and Client/Server Architectures for DBMS. **Relational algebra and Relational Calculus:** Unary relational operators: Select and Project -Relational algebra operation from Set Theory- Binary Relational operations: Join and Division- The Tuple Relational Calculus –The Domain Relational Calculus.

**UNIT II**

**(15 Hrs)**

**Data Modeling Using the Entity-Relationship(ER) Model:** Using high level conceptual Data Models for database design-Entity types, Entity sets, Attributes and keys-Relationship types, Relationship Sets, Roles and Structural Constraint - Weak entity types-ER-Diagrams, Naming Conversions, and Design issues. **The Relational Data model and Relational Database Constraint:** Relational model concepts- Relational model constraints

and Relational database schemas-Update operations, Transactions, and dealing with constraints violations.

**UNIT III (15 Hrs)**

**Basic SQL:** SQL Data definition and data types-Specifying constraints in SQL-Basic Retrieval queries in SQL-Insert, Delete and Update statements in SQL-Additional features of SQL. **More SQL: Complex Queries, Triggers, Views, and Schema Modification:** More Complex SQL retrieval queries-Specifying Constraint as Assertions and Actions as Triggers –Views (Virtual table) in SQL-Scheme change statement in SQL.

**UNIT IV (15 Hrs)**

**Basics of Functional Dependencies and Normalization for Relational Databases:** Informal design guidelines for Relation Schemas – Functional Dependencies – Normal Forms Based on Primary keys – General definitions of second and Third Normal forms.- Boyce-Codd Normal Form – Multivalued Dependency and Fourth Normal Forms – Join Dependencies and Fifth Normal Form.

**UNIT V (15 Hrs)**

**Introduction to Transaction Processing Concepts and Theory:** Introduction to Transaction processing – Transaction and System Concepts – Desirable properties of Transaction.**Concurrency Control Technique:** Two Phase Locking Techniques for Concurrency Control-Concurrency Control Based on Timestamp Ordering – Validation (Optimistic) technique and Snapshot Isolation Concurrency Control.

**Textbook**

1. Ramez Elmasri, Shamkant B.Navathe, “Fundamentals of Database Systems”, Pearson India Pvt. Ltd, 2017, 7<sup>th</sup>Edition.

Unit	Chapters	Section	Page No.
I	1,2	1.1,1.3,1.5-1.7,2.3-2.5	4-6, 9-14, 16-23, 36-44
	6	6.1-6.3,6.6-6.7	147-157, 174-183
II	7	7.1,7.3-7.5,7.7	200-201, 203-219, 221-225
	3	3.1,3.3	60-78
III	4,5	4.1-4.5,5.1-5.4	89-110,115-138
IV	15	15.1-15.7	503-534
V	21,22	21.1-21.3,22.1,22.2,22.4	744-755, 778-788, 794-795

**Reference Books**

1. Frad R.McFadden, Jeffrey A.Hofferand Mary. B. Prescott, “Modern Database Management”, Pearson Education Asia, 2015, 12<sup>th</sup> Edition.
2. Abraham Silberschatz, Henry F.Korth and S.Sudarshan, “Database System Concepts”, McGraw Hill, 2011, 6<sup>th</sup> Edition.



### **Webliography**

1. <http://iips.icci.edu.iq/images/exam/databases-ramaz.pdf>
2. <https://inspirit.net.in/books/database/Database%20System%20Concepts.pdf>
3. <https://www.scribd.com/document/368844872/Modern-Database-Management-12th-Edition-Hoffer-Solutions-Manual>

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**(2018 – 2021)**

**Core – VIII: RDBMS and Visual Programming Lab (18UCSC4P)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To gain knowledge about database creation.
- To familiar with advance RDBMS Concepts such as Trigger, View, Cursor.
- To know Store, Retrieve and display table data through application front end.

**Course Outcomes:**

1. Create Table with necessary fields.
2. Obtain knowledge to create Table using DDL Commands.
3. Familiarizing in adding constrains in Scheme designing
4. Understand the concept of Triggers, Cursors, and Procedures.
5. Qualify in Database connection with front end application.
6. Familiarizing in storing, retrieving and displaying table data.

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**RDBMS**

(Two or More Exercises including the following concepts must be incorporated)

1. DDL Commands.
2. DML commands.
3. Aggregate functions
4. Date and String functions.
5. Joins.
6. Views
7. Built –in exception
8. User defined exception.
9. Procedure
10. Functions
11. Trigger
12. Cursor

**Visual Programming**

1. Program using Basic Controls-1 (Forms, Text boxes, Label, Button, List Box and Combo Box)

2. Program using Basic Controls-2 (Picture Box, Progress Bar, Date\_Time Picker, Menu Strip and Common Dialog)
3. ADO Code to perform Insert, Delete, Update and Select operations.
4. ADO Code to show records in DataGridView Control.

**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science (UG & PG)**  
**UG Programme – B.Sc.,**  
**Semester IV**  
**(2018 – 2021)**

**Major Elective Course – I: Web Programming (18UCSO41)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 3</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 4 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 60 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To enhance the knowledge about server side web applications.
- To learn basic controls involved in web Programming.
- To learn basic validation controls and Database Connectivity.

**Course Outcomes:**

1. Gain knowledge in server side web applications.
2. Attain skills in working standard controls.
3. Acquire knowledge in validation control types and its usage.
4. Acquire in depth skill to implement login control, various menu control for their website.
5. Gain depth knowledge in database control for their website.
6. Skillfully handle master page and themes.

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**UNIT I**

**(12 Hrs)**

**.Net Framework and VB.NET :** Introduction - Evolution of the .NET Framework - Overview of the .NET Framework - DLL,COM,COM+,DCOM and Assemblies - VB.NET Language- Development of a simple VB.NET Program. **Feature in VS.NET :** Introduction- Start Page- The IDE Main window- Class View window -object Browser- Code window – Intellisense- Compiling the Code- Code Debugging -Developing a Simple VB.NET Console Application Through Visual Studio IDE- Developing a Simple VB.NET Project Through Visual Studio IDE-Developing Another Simple VB.NET Project Through Visual Studio IDE. **Variables, Constants and Expressions :** Introduction- Value Types and Reference Types- Variable Declaration and Initialization - Value Data Types - Reference Data Types - Boxing and Unboxing - Arithmetic Operators - Textbox Control - Label Control - Button Control.

**UNIT II**

**(12 Hrs)**

**Control Statements:** Introduction - If Statement - RadioButton Control - CheckBox Control - GroupBox Control - ListBox Control - CheckedListBox Control - ComboBox Control - Select....Case Control - while Statement - Do Statement - For Statement. **Methods and Arrays:** Introduction - Types of Methods - Arrays One-dimensional Array –

Multidimensional Arrays - Jagged Arrays. **Classes, Properties and Indexers:** Introduction - Definition and Usage of a Class - Constructor Overloading - Copy Constructor - Instance and Shared Class Members - Shared Constructors – Properties - Indexers.

**UNIT III** (12 Hrs)

**Additional windows Controls:** Introduction - Docking Controls - Timer Control - ProgressBar Control - LinkLabel Control - TrackBar Control - Panel Control - TreeView Control - Splitter window - Menu Control - SDI and MDI - Dialog Boxes - ToolBar Control - Status Bar Control. **Database Connectivity:** Introduction - Advantages of ADO.NET - Managed Data Providers - Developing a Simple ADO.NET Based Application - Creation of a Data Table - Retrieving Data From Tables - Table Updating - Disconnected Data Access Through Dataset Object.

**UNIT IV** (12 Hrs)

**Standard Controls in ASP.Net :** Introduction to the control class-The TextBox control- The Button Control- The Label control- The literal control- The Image control- The Imagebutton control- The ImageMap control- The Dropdownlist control- The Checkbox control- The CheckboxList control- The RadioButton control- The RadioButtonList control- The Table control- The Panel control- The Adrotator control- The Calendar control- The Hyperlink control- The Fileupload control- The Hiddenfield control- The Wizard control. **Navigation controls:** The SiteMapPath Controls-The TreeView Control-The Menu controls. **Validation Controls:** The BaseValidator Class- The RequiredField Validator Control – The RangeValidator Control - The RegularExpressionValidator Control - The CompareValidator Control - The CustomValidator Control - The ValidationSummary Control – The ValidationGroup Property.

**UNIT V** (12 Hrs)

**Login Controls:** The User Accounts-The Login controls-The LoginName Control-The Login Status- The LoginView Control – The PasswordRecovery control – The ChangePassword Control- The CreateUser Control. **Database Controls:** Connected Data Access- ADO.net- The SQLDataSource controls- The ObjectDataSource controls- The XMLDataSource controls- The LinqDataSource controls- The AccessDataSource controls- Introduction to Data-Bound controls: The DataList Control-The FormView Control. **Master Pages and Themes:** Describing Master Pages-Exploring Themes-Describing Cascading Style Sheet.

**Textbooks**

1. C.Muthu , “Visual Basic.Net”, McGraw-Hill Education Pvt Ltd, 2008, Second Reprint.
2. Kogent learning solutions inc, "ASP.NET 4.5 IN SIMPLE STEPS", Dreamtech Press Publications, 2013.

Unit	Textbook No.	Chapters	Section	Page No.
I	1	1,2,3	1.1-1.6, 2.1-2.12, 3.1-3.10	1-8, 11-48, 51-81
II	1	4	4.1-4.12	83-118
	1	5	5.1-5.6	119-128
	1	6	6.1-6.8	139-169
III	1	14	14.1-14.14	361-402
	1	15	15.1-15.8	403-431
IV	2	3	-	67-170
		4	-	
		5	-	
V	2	6	-	171-204
		8	-	227-261
		9	-	279-292

### **Reference Books**

1. Bill Eujen , Wiley Publishing Inc “ASP.Net 2.0 Beta Preview”– 2<sup>nd</sup> Edition .
2. Richard Leincker –“Using ASP.Net” – 2005 5th Reprint Edition.

### **Webliography**

1. [www.completecsharp-tutorial.com/](http://www.completecsharp-tutorial.com/)
2. [www.csharp-station.com/tutorial/ADODotNet](http://www.csharp-station.com/tutorial/ADODotNet)
3. [www.sitepoint.com/net - web-services-5steps](http://www.sitepoint.com/net-web-services-5steps)

**Sri Kaliswari College (Autonomous), Sivakasi**  
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**UG Programme – B.Sc.,**  
**Semester IV**  
**(2018 – 2021)**

**Major Elective Course – I : Computer Algorithm (18UCSO42)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 3</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 4 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 60 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To gain knowledge about different data structures.
- To design and implement efficient algorithms and program development.
- To build the working knowledge in many application by using various techniques.
- To gain knowledge about analysis of algorithms.

**Course Outcomes:**

1. Identify appropriate data structure as applied to specified problem definition.
2. Acquire skill to handle operations like searching, insertion, deletion, traversing mechanism etc. on various techniques.
3. Gain knowledge to describe and simulate various linear data structures like stacks, queues
4. Gain knowledge about linked lists using static and dynamic allocation and use them in solving problems.
5. Acquire knowledge to simulate nonlinear data structures like binary search tree and use them in designing applications like sorting, expression trees etc.

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**UNIT I** **(12 Hrs)**

**What is algorithm:** Algorithm specification-introducton-Recursive Algorithms-Performance Analysis: Space complexity-time complexity-Amortized Complexity-Asymptotic Notation-Performance Measurement.

**UNIT II** **(12 Hrs)**

**Elementary data structures:** Stack and Queues-Trees-Terminology-Binary trees-Dictionaries-Binary Search Tree-Priority Queues: Heaps-Heapsort-Graphs: Introduction-Definitions-Graph Representations-Binary Search-Finding the maximum and minimum-Merge Sort-Quick Sort-Performance measurement.

**UNIT III** **(12 Hrs)**

**Greedy method:** The general method- Container loading-Knapsack problem-Minimum cost spanning trees-Single source shortest path.

**UNIT IV****(12 Hrs)**

**Dynamic Programming:** The general method-Multistage Graphs-All pairs shortest path-Optional binary search trees-The travelling sales person problem.

**UNIT V****(12 Hrs)**

**Back Tracking:** The General method-The 8 queen problem- sum of subsets-Graph coloring-Branch and bound: The method- Knapsack problem.

**Textbook**

1. Ellis Hirowitz, Sartaj sahni, Sanguthevar Rajasekaran, “Computer Algorithms/C++” 2010.

<b>Unit</b>	<b>Chapters</b>	<b>Section</b>	<b>Page No.</b>
I	1	1.2,1.3	1-36,45
II	2,3	2.1-2.4,2.6,3.3-3.6	75-105,120-125,145-175
III	4	4.1-4.3,4.6,4.9	210-218,236-240,261
IV	5	5.1,5.2,5.3,5.5,5.9	272-284,289-294,308-315
V	7,8	7.1-7.4,8.1,8.2	359-379,398-416

**Reference Books**

1. Richard Neapolitan, Kumarss Naimipour, “Foundations of Algorithms”, Jones and Bartlett Publishers, 2011, 4<sup>th</sup> Edition,Canada
2. Richard Neapolitan, Kumarss Naimipour, “Foundations of Algorithms using C++ Pseudocode”, 3<sup>rd</sup> Edition.

**Webliography**

1. [http://www.vgloop.com/\\_files/1394454921-126688.pdf](http://www.vgloop.com/_files/1394454921-126688.pdf)
2. [https://www.tutorialspoint.com/design\\_and\\_analysis\\_of\\_algorithms/index.htm](https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm)
3. <http://openclassroom.stanford.edu/MainFolder/CoursePage.phpcourse=IntroToAlgorithms>
4. [https://www.tutorialspoint.com/data\\_structures\\_algorithms/divide\\_and\\_conquer.htm](https://www.tutorialspoint.com/data_structures_algorithms/divide_and_conquer.htm)
5. <https://www.geeksforgeeks.org/greedy-algorithms-set-5-prims-minimum-spanning-tree-mst-2/>



**Sri Kaliswari College (Autonomous), Sivakasi**  
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**(2018 – 2021)**

**Major Elective Course – I: Consumer Affairs (18UCSO42)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 3</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 4 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 60 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Aims and Objectives:**

- To familiarize the students with their rights and responsibilities as a consumer, the social framework of consumer rights and legal framework of protecting consumer rights.
- To provide an understanding of the procedure of redress of consumer complaints, and the role of different agencies in establishing product and service standards.
- To enable the student to comprehend the business firms' interface with consumers and the consumer related regulatory and business environment.

**Course Outcomes:**

1. Know about the need for consumer protection and the areas covered by consumer protection law.
2. Have a clear idea on legislative controls on unconscionable conduct, misleading or deceptive conduct, false or misleading representations and other unfair practices.
3. Know the legal obligations of a supplier of goods or services.
4. Know the obligations of manufacturers and the rights of consumers to compensation.
5. Know the bodies available to protect the rights of the consumer and discuss their operations.
6. Know the obligations of consumer rights and duties.

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**UNIT I**

**(12 Hrs)**

Conceptual Framework - Consumer And Markets – Concept Of Consumer, Nature Of Markets – Liberalization And Globalization Of Markets With Special Reference To Indian Consumer Markets – E-Commerce With Reference To Indian Market – Concept Of Price In Retail And Wholesale – Maximum Retail Price (Mrp), Fair Price, Gst, Labeling And Packaging Along With Relevant Laws, Legal Metrology.

Experiencing and Voicing Dissatisfaction– Consumer Buying Process – Consumer Satisfaction/Dissatisfaction –Grievances – Complaint – Consumer Complaining behavior – Alternatives available to Dissatisfied Consumers – Complaint Handling Process: ISO 10000 suite.

## **UNIT II**

**(12 Hrs)**

The Consumer Protection Law in India - Objectives and Basic Concept – Consumer rights and UN Guidelines on consumer protection - Consumer goods – Defect in goods – spurious goods and services – Service - Deficiency in service - unfair trade practice - restrictive trade practice.

Organizational set-up under the Consumer Protection Act: Advisory Bodies: Consumer Protection Councils at the Central – State and District Levels –Adjudicatory Bodies: District Forums, State Commissions, National Commission – Their Composition – Powers– and Jurisdiction (Pecuniary and Territorial) – Role of Supreme Court under the CPA with important case law.

## **UNIT III**

**(12 Hrs)**

Grievance Redressal Mechanism under the Indian Consumer Protection Law -Who can file a complaint – Grounds of filing a complaint – Limitation period – Procedure for filing and hearing of a complaint – Disposal of cases - Relief/Remedy available- Temporary Injunction – Enforcement of order – Appeal – Frivolous and vexatious complaints – Offences and penalties.

Leading Cases decided under Consumer Protection law by Supreme Court/National Commission: Medical Negligence – Banking – Insurance – Housing & Real Estate – Electricity and Telecom Services – Education – Defective Products – Unfair Trade Practices.

## **UNIT IV**

**(12 Hrs)**

Role of Industry Regulators in Consumer Protection: Banking: RBI and Banking Ombudsman - Insurance: IRDA and Insurance Ombudsman - Telecommunication: TRAI - Food Products: FSSAI - Electricity Supply: Electricity Regulatory Commission - Real Estate Regulatory Authority.

## **UNIT V**

**(12 Hrs)**

Contemporary Issues in Consumer Affairs - Consumer Movement in India–Evolution of Consumer Movement in India- Formation of consumer organizations and their role in consumer protection – Misleading Advertisements and sustainable consumption – National Consumer Helpline – Comparative Product testing – Sustainable consumption and energy ratings.

Quality and Standardization – Voluntary and Mandatory standards – Role of BIS – Indian Standards Mark (ISI) – Ag-mark – Hallmarking, Licensing and Surveillance – Role of International Standards –ISO an Overview.

### **Textbooks:**

1. Khanna, Sri Ram, SavitaHanspal, Sheetal Kapoor, and H.K. Awasthi, “Consumer Affairs” - Universities Press, 2007
2. Choudhary, Ram NareshPrasad , “Consumer Protection Law Provisions and Procedure” - Deep Publications Pvt Ltd, 2005.
3. G. Ganesan and M.Sumat,”Globalisation and Consumerism”, - Regal Publications, 2012.
4. Rajyalaxmi Rao, -“Consumer is King”, - Universal Law Publishing Company, 2012.

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**(2018 – 2021)**

**Core Course – IX: Software Engineering (18UCSC51)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 5</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To provide an insight into the processes of software development.
- To understand and practice the various fields such as analysis, design, development, testing of Software Engineering.
- To develop skills to construct software of high quality with high reliability.
- To apply metrics techniques to evaluate the software.

**Course Outcomes:**

1. Able to provide solution for any real time problem.
2. Able to apply different software development process models for any kind of domain.
3. Determine software engineering principles and develop an ability to apply them to software design of real life problems.
4. Understanding towards teamwork and quality management in software project management.
5. Able to create a test plan for the software.
6. Able to analyze and test a software system, when it is evolved to accommodate a set of change requirements such as adding new functionalities, bug fixing.

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**UNIT I**

**(15 Hrs)**

**Introduction:** The Nature of Software-Software Engineering-The Software Process-Software Engineering Practice. **Process Models:** A Generic Process Model-Process Assessment and Improvement-Prescriptive Process Models-Specialized Process Models-The Unified Process: Personal and Team Process Models-Process Technology-Product and Process. **Agile Development:** What is an Agile Process-other Agile Process Models.

**UNIT II**

**(15 Hrs)**

**Requirements Modeling:** Requirements Analysis- Scenario-Based Modeling-UML Models that supplement the Use Case-Data Modeling Concepts-Class Based Modeling. **Requirements Modeling Strategies-**Flow Oriented Modeling-Creating a Behavioral Model-Requirement modeling for web apps.

**UNIT III****(15 Hrs)**

**Design Concepts:** Design within the context of Software Engineering-The Design Process-Design Concepts-The Design Model. **Architectural Design:** Software Architecture-Architectural Genres-Architectural Styles-Architectural Design. **User Interface Design:** The Golden Rules-User Interface Analysis and Design-Interface Analysis-Interface Design Steps. **Web App Design :** Web app Design quality-Design goals-A design pyramid for web apps-web app Interface Design- aesthetic design – Content design- Architecture design- Navigation design-Component level design- OOADM.

**UNIT IV****(15 Hrs)**

**Software Testing Strategies:** A strategic approach to software testing – testing issues- Test strategies for Conventional Software- Test strategies for Object Oriented Software- Test Strategies for web Apps- Validation Testing- System Testing- The art of Debugging. **Testing Conventional Applications:** White Box Testing-Basis path testing-Control structure testing-Black-box testing- Model based testing- Testing for speclized environments, architectures and applications. **Testing Web Applications:** Testing concepts for web apps- Content testing- User interface testing- Component level testing- Navigation testing-Configuration testing- security testing- Performance testing

**UNIT V****(15 Hrs)**

**Software Quality Assurance:** Elements of Software Quality Assurance-SQA Tasks, Goals, and Metrics-Formal Approaches to SQA-Statistical Software Quality Assurance-Software Reliability-The ISO 9000 Quality Standards-The SQA Plan. **Product Metrics:** Metrics for the Requirements Model-Metrics for the Design Model-Metrics for web apps- Metrics for Source code- Metrics for testing.

**Textbook**

1. Roger S. Pressman, “Software Engineering-A Practitioner’s Approach”, McGraw Hill Education, 2014, 7<sup>th</sup> Edition, New Delhi.

Unit	Chapters	Section	Page No.
I	1	1.1,1.3,1.4,1.5	3 -10,12 – 21
	2	2.1,2.2,2.3,2.4,2.5,2.6,2.7,2.8	31- 61
	3	3.3,3.5	68 -72, 80 – 89
II	6	6.1,6.2,6.3,6.4,6.5	149 -182
	7	7.1,7.2,7.3,7.5	186 - 198, 205 – 213
III	8	8.1,8.2,8.3,8.4	216 – 238
	9	9.1,9.2,9.3,9.4	243 – 261
	11	11.1,11.2,11.3,11.4	313 – 334
	13	13.1,13.2,13.3,13.4,13.5,13.6,13.7,13.8,13.9,13.10	374 – 393
IV	17	17.1, 17.2, 17.3, 17.4, 17.5, 17.6, 17.7, 17.8	450 – 478
	18	18.3, 18.4, 18.5, 18.6,18.7,18.8	485 – 508

	20	20.1,20.3,20.4,20.5,20.6,20.7,20.8,20.9	530 - 533,534 – 552
V	16	16.2,16.3,16.4,16.5,16.6,16.7,16.8	434 – 446
	23	23.2,23.3,23.4,23.5,23.6	619 -640

### **Reference Books**

1. Richard Fairley, “Software Engineering Concepts“, 2008, Tata McGraw Hill Edition.
2. K.K.Aggarwal, Yogesh Singh “Software Engineering”, 2005, New age international (p) Ltd. New Delhi.
3. Ronald J.Leach, “Introduction to Software Engineering”, Second Edition, 2016, CRC Press, New York.

### **Webliography**

1. <http://www.thomasalspaugh.org/pub/fnd/softwareProcess.html>
2. [https://www.test-institute.org/Introduction\\_To\\_Software\\_Testing.php](https://www.test-institute.org/Introduction_To_Software_Testing.php)
3. <http://www.sqa.net/softwarequalitymetrics.html>

**Sri Kaliswari College (Autonomous), Sivakasi**  
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**Semester V**  
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**Core Course – X: System Software and Operating System (18UCSC52)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 5</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To know the operations of a computer.
- To know the scheduling done by the operating system for the processes.
- To know the working of each instruction.
- To know the memory and file management.

**Course Outcomes:**

1. Understand system software such as assembler, interpreter, linker, loader and Compilers.
2. Understanding towards design for Intermediate Code Generation in compiler.
3. Understand the principles and working of computer systems.
4. Learn different types of operating systems along with concept of file systems and
5. CPU scheduling algorithms used in operating system
6. Acquire knowledge in memory management and deadlock handling algorithms.

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**UNIT I** **(15 Hrs)**

**Introduction:** System Software and Machine Architecture – The Simplified Instructional Computer. **Assembler:** Basic Assembler Functions – Machine Dependent Assembler features - Machine Independent Assembler Features – Assembler design options.

**UNIT II** **(15 Hrs)**

**Loader and Linkers:** Basic Loader Functions - Machine Dependent Loader Features - Machine Independent loader Features – Loader Design Options. **Compiler:** Basic Compiler Functions - Machine Dependent Compiler Features - Machine Independent Compiler Features – Compiler Design Options.

**UNIT III** **(15 Hrs)**

**Computer System Structure:** Storage Structure - Hardware Protection. **Operating System Structure:** System Components - System Calls – System Structure. **Processes:** Process Concept – Process scheduling – Operations on Processes – Cooperating Processes –

Interprocess communication – Communication in Client – Server Systems. **Threads:** Overview – Multithreading Models – Threading Issues.

**UNIT IV (15 Hrs)**

**CPU Scheduling:** Scheduling Criteria – Scheduling Algorithms – Algorithm Evaluation **Process Synchronization:** Background - The Critical-Section Problem – Semaphores – Classic problems of Synchronization. **Deadlocks:** System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock

**UNIT V (15 Hrs)**

**Memory Management:** Background - Contiguous Memory Allocation – Paging – Segmentation – Segmentation with Paging. **Virtual Memory:** Background – Demand Paging – Page Replacement. **Thrashing File System Interface:** Access Methods – Directory Structure – Protection. **File System Implementation:** Allocation Methods – Free Space Management – Recovery.

**Textbooks**

1. Leland L. Beck, “System Software – An Introduction to Systems Programming”, Pearson Education, 2001, 3<sup>rd</sup> Edition.
2. Silberschatz, Galvin and Gagnes, "Operating System Concepts", Wiley Publications, 1990, 6<sup>th</sup> Edition.

Unit	Textbook No.	Chapters	Section	Page No.
I	1	1,2	1.1-1.3,2.1-2.4	1 to 20, 44 – 102
II	1	3	3.1-3.4	124 – 159
	1	5	5.1-5.4	225 – 305
III	2	2	2.3,2.5	34-37,42-47
	2	3	3.1,3.3,3.5	55-60,63-71,74-79
	2	4	4.1-4.6	95-125
	2	5	5.1-5.3	129-138
IV	2	6	6.2,6.3,6.6	155-168,172-176
	2	7	7.1,7.2,7.4,7.5	189-196,201-210
	2	8	8.1-8.7	243-265
V	2	9	9.1,9.3,9.4,9.5,9.6	273-279, 283-311
	2	10	10.1,10.2,10.4,10.6	317-327,330-343,348-352
	2	11	11.2,11.3,11.6	379-392,402-405
	2	12	12.4,12.5,12.7	421-432,437-438

**Reference Books**

1. William Stallings, "Operating Systems", Prentice Hall of India (p) Ltd, 2000, 4<sup>th</sup> Edition.

2. D.M.Dhamdhere,"System Programming and Operating System", Tata McGraw Hill, 2003.

### **Webliography**

1. <http://www.studytonight.com/operating-system/types-of-os>
2. <http://www.techcuriosity.com/resources/linux/>
3. [http://www.osdever.net/documents/persistent\\_microkernel.pdf](http://www.osdever.net/documents/persistent_microkernel.pdf)



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**Core Course– XI: PHP Lab (18UCSC5P)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To be able to write PHP code to output text on the browser.
- To be able to declare PHP Variables, Functions and Arrays.
- To be able to use control statements and loops and process data on the server.
- To be able to use and configure PhpMyAdmin to manage mySQL databases.

**Course Outcomes:**

1. State and apply syntaxes of PHP.
2. Practice and use web development tools in order to gain web programming skills.
3. Use and set the values of PHP session variables.
4. The skills to apply web development in problem solving.
5. Efficient use of get and post method.
6. Choose an engineering approach to solve problems by knowledge of programming.

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1. Program to design Web Application using HTML Formatting tags
  2. Program to design Web Site using Tables and Frames in HTML and PHP
  3. Program for Form Handling using PHP
  4. Program to Perform Validation in Forms
  5. Program for Build-in Functions in PHP
  6. Program for User Defined Function in PHP
  7. Program to Upload a File to the Web Server
  8. Program to Demonstrate Session
  9. Program to Demonstrate Cookies
  10. Program to perform Manipulation with Database
  11. Program to store and Retrieve image in database

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**Core Course - XII: Web Programming Lab (18UCSC5Q)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To gain knowledge in Website Designing.
- Creating framework based applications using standard controls.
- Connecting to data sources and managing them.

**Course Outcomes:**

1. Able to design web applications.
2. Able to use controls required for web applications.
3. Perform form validation with validation controls.
4. Ability to create web application to read, insert and update data in a database.
5. Building webpages using classes, events, methods, properties.
6. Perform form validation with validation controls.

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1. Simple Application Using Web Controls
  2. Simple Application Using Calendar Control
  3. Simple Application Using Tree View Control
  4. Simple Application Using Validation Controls
  5. Simple Application Using Data link Control
  6. Application to demonstrate Data Binding Using Dropdown List Control
  7. Application to Insert, delete record into a database
  8. Application to demonstrate Data binding Using Data grid
  9. Simple Application Using Data grid Control Hyperlink
  10. Simple Application Using Ad rotator Control
  11. Application implementing Cookies and Session Object

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**Semester V**  
**(2018 – 2021)**

**Major Elective Course – II : Python Programming (18UCSO51)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 4 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 60 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To write simple Python programs.
- To handle Lists and Dictionaries.
- To make the students to use Lists and Dictionaries in Python.
- To handle files in Python.
- To Use Classes and functions in Python.

**Course Outcomes:**

1. Ability to develop algorithmic solutions to simple computational problems in Python.
2. Ability to write and execute simple Python programs..
3. Knowledge to represent compound data using Python lists, tuples, dictionaries..
4. Knowledge to handle input/output with files in Python.
5. Ability to develop python programs with class and functions.
6. Understanding in data handling with Lists and Dictionaries.

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**UNIT I**

**(12 Hrs)**

**The way of the Program:** What is a program – Running Python – The First program – Arithmetic operators – Values and types – Formal and natural languages – **Variables, Expressions and Statements:** Assignment statements – Variable names – Expressions and statements – Script mode – Order of operations – String operations – Comments – **Functions:** Function calls – Math functions – Compositions – Adding new functions – Definitions and uses – Flow of execution – Parameters and arguments – Variables and parameters are local – Stack diagram – Fruitful functions and Void functions – Why functions – **Case study: Interface Design:** The turtle module – Simple repetition – Exercises – Encapsulation – Generalization – Interface Design – Refactoring – A development plan – doc string.

**UNIT II**

**(12 Hrs)**

**Conditionals and Recursion:** Floor division and modulus – Boolean expressions – Logical Operators – Conditional execution – Alternate Execution – Chained conditionals – Nested conditionals – Recursion – Stack diagram for recursive functions – Infinite recursion – Key board input – **Fruitful functions:** Return values – Incremental development –

Composition – Boolean functions – More recursion – Leap of faith – Example – Checking types – **Iteration:** Reassignment – Updating variables – The *while* statement – break – square roots – **Strings:** A string is a sequence – len – Traversal with a *for* loop – String slices – Strings are immutable – Searching – Looping and counting – String methods – the *in* operator – String Comparison – **Case study: Word Play:** Reading word lists – Exercises – Search – Looping with indices.

**UNIT III** **(12 Hrs)**

**Lists:** A list is a sequence – List are mutable – Traversing a List – List operations – List slices – List methods – Map, filter and reduce – Deleting elements – Lists and strings – Objects with values – Aliasing – List arguments – **Dictionaries:** A dictionary is a mapping – Dictionary as a collection of counters – Looping and Dictionaries – Reverse lookup – Dictionaries and Lists – Memo – Global variables – **Tuples:** Tuples are immutable – Tuple assignment – Tuples as return values – Variable length argument tuples – Lists and Tuples – Dictionaries and Tuples – Sequences of Sequences.

**UNIT IV** **(12 Hrs)**

**Files:** Persistence – Reading and writing – Format operator – Filenames and paths – Catching exceptions – Databases – Pickling – Pipes – writing modules – **Classes and Objects:** Programmer defined types – Attributes – Rectangles – Instances and return values – Objects are mutable – Copying – **Classes and Functions:** Time – Pure functions – modifiers – Prototyping versus planning.

**UNIT V** **(12 Hrs)**

**Classes and methods:** Objected oriented features – Printing objects – Examples – init method – The str method – Operator Overloading – Type based dispatch – Polymorphism – **Inheritance:** Card objects – Class attributes – Comparing cards – Decks – Printing the check – Add, remove, shuffle and sort – Inheritance – Class diagrams – **The Goodies:** Conditional expressions – List Comprehensions – Generator functions – *any* and *all* – Sets – Counters – defaultdict – Named tuples – Gathering keyword args.

**Textbook**

1. Allen Downey, “Think Python – How to think like a Computer Scientist”, 2<sup>nd</sup> edition, O’Reilly, 2015.

Unit	Chapters	Section	Page No.
I	1	1.1 – 1.6	1 – 6
	2	2.1 – 2.7	9 – 13
	3	3.1 – 3.11	17 – 25
	4	4.1 – 4.9	29 – 35
II	5	5.1 – 5.11	39 – 46
	6	6.1 – 6.8	51 – 59
	7	7.1 – 7.5	63 – 67
	8	8.1 – 8.10	71 – 77
	9	9.1 – 9.4	82 – 87

III	10	10.1 – 10.12	90 – 98
	11	11.1 – 11.7	104 – 111
	12	12.1 – 12.7	116 – 122
IV	14	14.1 – 14.9	137 – 144
	15	15.1 – 15.6	148 – 152
	16	16.1 – 16.4	156 – 159
V	17	17.1 – 17.9	162 – 168
	18	18.1 – 18.8	172 – 178
	19	19.1 – 19.9	184 – 191

### **Reference Books**

1. Timothy A. Budd, “Exploring Python”, TATA McGraw Hill, 2012
2. Guido van Rossum, Fred L. Drake, “Python Tutorial”, Release 3.2.3, Python Software Foundation.
3. Robert Sedgwick, Kevin Wayne, Robert Dondero, “Introduction to Python Programming – An Interdisciplinary Approach”, Addison-Wesley, 2015.

### **Webliography**

1. <https://www.programiz.com/python-programming>
2. <https://www.python.org/about/gettingstrated>
3. <https://www.learnpython.org>

**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science (UG & PG)**  
**UG Programme – B.Sc.,**  
**Semester V**  
**(2018 – 2021)**

**Major Elective Course – II: Computer Graphics and Multimedia (18UCSO52)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 4 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 60 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To know the fields of applications of computer graphics
- To know the algorithm for drawing basic shapes.
- To know about geometric transformation.
- To know the characteristics of digital video.
- To apply their knowledge in computer animation.

**Course Outcomes:**

1. Gain the knowledge about the applications of computer graphics.
2. Able to work with algorithm for drawing basic shapes.
3. Able to deal with output primitives.
4. Able to perform geometric transformations.
5. Able to understand the characteristics of digital video.
6. Able to apply their knowledge in computer animation.

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**UNIT I**

**(12 Hrs)**

**A survey of computer graphics:** Computer Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and training – visualization – Image processing – Graphical user interfaces. **Overview of Graphics systems:** Video Display devices – Refresh CRT – Raster Scan displays – Random scan displays – color CRT Monitors – DVST – Flat Panel Displays – Three Dimensional Viewing Devices – Graphics monitors and workstations – Input Devices – Hard Copy devices – Graphics software.

**UNIT II**

**(12 Hrs)**

**Output Primitives :** Points and Lines – Line drawing algorithms – Loading the frame buffer – Line function – Circle Generating Algorithms – Ellipse generating Algorithms – Other curves – Parallel curve algorithms – curve functions – pixel addressing – Filled area primitives – Fill area functions – cell array – character generation.

**UNIT III**

**(12 Hrs)**

**Attributes of Output Primitives:** Line attributes – Curve attributes – Color and gray scale levels – Area fill attributes – Fill Styles – Pattern fill – Character attributes – Bundled

attributes – Inquiry functions – Antialiasing methods. Supersampling – Area Sampling – Pixel Phasing.

**UNIT IV** **(12 Hrs)**

**Two Dimensional Geometric Transformations:** Basic transformations – Translation – Rotation – Scaling – Matrix representations and Homogeneous coordinates – Composite transformations: General pivot point rotation – General fixed point scaling – other transformations – Reflection and shear.

**UNIT V** **(12 Hrs)**

**Graphics:** Elements of graphics – Pictures and Images – Raster of Bitmap Images – Vector Images – Images and Color: Computer Display Resolution – Computer Generated Colors – Color Palettes and Color Look-up Tables – Color Dithering – Color Flashing. **Digital Audio:** Characteristics of sound and digital audio. Digitizing sound – Digital Audio systems: Digital Audio Software Support – MIDI. **Digital video and animation:** Characteristics of Digital Video – Frame Rate – Frame size – Color Depth or Resolution – Computer Animation. Creating Animation – Object Based Animation.

**Textbooks**

1. Donald Hearn and M.Pauline Baker, “Computer Graphics”, Pearson Education, 2<sup>nd</sup> Edition.
2. David Hillman, “Multimedia Technology and Applications”, Galgotia Publications Pvt Limited, New Delhi.

Unit	Textbook No.	Chapter	Section	Page No.
I	1	1	1	2 – 3, 6 – 8
		2	2	19 – 23, 30 – 31, 33 – 34
II	1	3	3	42, 52
		4	4	70,74 – 77, 80 – 86
		7	7	145 – 149, 151 – 152
III	1	9	9	202 – 206
		11	11	234 – 241
		8	8	192 – 194
IV	1	5	5	96 – 97, 108 – 110, 111 – 120
		6	6	125 – 127, 129 – 134
V	2	10	10	133 – 145, 146 – 154, 155 – 162, 164 – 166

**Reference Books**

1. Ranjan Parakh, “Principles of Multimedia”, Tata McGraw Hill Publishing, New Delhi.
2. Steven Harrington, "Computer Graphics A Programming Approach", Tata McGraw Hill, New Delhi, 2<sup>nd</sup> Edition.

## **Webliography**

1. <http://nptel.ac.in/courses/Webcourse-contents/IIT-Delhi/Computer%20Graphics/csmain.htm>
2. <http://www.bcanotes.com/info%20about%20computer%20graphics.html>
3. [https://www.tutorialspoint.com/computer\\_graphics/computer\\_graphics\\_basics.htm](https://www.tutorialspoint.com/computer_graphics/computer_graphics_basics.htm)



**Sri Kaliswari College (Autonomous), Sivakasi**  
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**UG Programme – B.Sc.,**  
**Semester V**  
**(2018 – 2021)**

**Major Elective Course – II: Embedded Systems (18UCSO53)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 4 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 60 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- Know basic knowledge of embedded system.
- Gain knowledge of Processor and Memory organization.
- Know about Real time operating system.

**Course Outcomes:**

1. Understanding the basics of embedded system, processor architecture.
2. Knowing network devices and communication buses, device drivers, threads and inter process communications.
3. Knowing about applying programming concept to embedded devices using C and C++ and java.
4. Enriching real time operating system and its services, process management.

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**UNIT I** **(12 Hrs)**

**Introduction to Embedded System:** Embedded Systems – Processor Embedded into a System -Embedded Hardware Units and devices in a system– Embedded Software in a System –Examples of Embedded Systems.

**UNIT II** **(12 Hrs)**

**8051 and Advanced Processor Architecture and Memory Organization:** 8051 Architecture-Introduction to advanced Architectures–Processor and Memory organization. **Devices and Communication Buses for Device Networks:** I/O Types and Examples – Timer and Counting Devices – Serial bus Communication and Parallel bus Communication protocols. **Device Drivers and Interrupts Service Mechanism:** ISR concept – Interrupt Servicing (Handling) Mechanism – Context and the periods for context switching, Interrupt Latency and Deadline- Direct Memory Access –Device driver programming.

**UNIT III** **(12 Hrs)**

**Programming Concepts and Embedded Programming in C and C++ and Java:** Software Programming in Assembly Language (ALP) and in High Level Language ‘C’ – Embedded Programming in C++ - Embedded Programming in Java –Inter-Process

Communication and Synchronization of Processes, **Threads and Tasks:** Multiple Processes in an Application - Multiple Threads in an Application– Tasks- Shared Data - Inter Process Communication.

**UNIT IV (12 Hrs)**

**Real Time Operating Systems:** Interrupt Routines in RTOS Environment and Handling of Interrupt Source Calls- - RTOS Task Scheduling Models, Interrupt Latency and Response Time of the Tasks as Performance Metrics - OS Security Issues-**RTOS Programming I:** Basic functions and types of RTOS. **RTOS Programming II:** Linux 2.6.x and RTLinux.

**UNIT V (12 Hrs)**

**Design Examples and Case study:** Case Study of an Embedded System for a Smart Card. **Embedded Software Development Process and Tools:** Introduction to Embedded Software Development Process and Tools –Host and Target Machines- Linking and Locating Software- Getting Embedded Software into the Target System - Issues in Hardware -Software Design and Co -design.

**Textbook**

1. Raj Kamal Embedded Systems, “Architecture, Programming and Design”, Tata McGraw-Hill, 2nd Edition.

Unit	Chapters	Section	Page No.
I	1	1.1,1.2,1.3,1.4,1.5	3-28
II	2 , 3, 4	2.1,2.3,2.4,3.1,3.6,3.10,3.11, 4.2,4.4,4.6,4.8,4.9	62-103,130-133,152-156,160- 169,192-199,203-208,211-216,218- 232
III	5, 7	5.1,5.6,5.7, .1,7.2,7.3,7.8,7.9	235-237,263-271,305,308,326-332
IV	8, 9, 10	8.7,8.10,8.11, 9.1, 10.3	366-370,385-403
V	12, 13	12.4,13.1,13.2,13.3,13.4,13.5	593-604,620-646

**Reference Books**

1. Dreamstech S/w Team, “Programming for Embedded system”, Willey Publication Inc, 2002.
2. David.E.Simon, “An embedded system primer”, Addison Wesley-2001.

**Webliography**

1. [https://www.tutorialspoint.com/embedded\\_systems/es\\_overview.htm](https://www.tutorialspoint.com/embedded_systems/es_overview.htm)
2. <https://electronicsforu.com/resources/embedded-systems-overview>

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**Semester V**  
**(2018 – 2021)**

**Skill Based Course – II : Python Lab (18UCSS5P)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 1</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 2 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 30 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To work with basic constructs of Python.
- To make the students to develop their own Python program using the concepts of Strings, Lists, Tuples.
- To work with the Python program involving the concepts of Dictionary, Sets and File Handling.

**Course Outcome:**

1. Ability to write simple programs.
2. Ability to develop Python programs using Strings, Lists and Tuples.
3. Knowledge to develop programs using the concepts of Dictionary and Sets.
4. Ability to handle file using Python constructs.
5. Ability to write programs using classes and objects in Python.

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1. Simple Python Programs.
  2. Programs on Mathematical Functions.
  3. Programs on Lists.
  4. Programs on Strings.
  5. Programs on Tuples.
  6. Programs on Dictionary.
  7. Programs on Sets.
  8. Programs on Function Recursion.
  9. Programs on File handling.
  10. Programs on Classes and Objects.

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**Semester V**  
**(2018 – 2021)**

**Skill Based Course – III: Soft Skill Training (18UCSS5Q)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 1</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 2 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 30 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To develop effective Communication skills.
- To develop effective Presentation skills.
- To make them ready for the Interviews and Jobs.
- To deal with different situations diligently and responsibly.

**Course Outcomes:**

1. Identify the significance of soft skills in working environment.
2. Learn to connect and work with others to achieve a set of task.
3. Ability to handle emotions and respect for the opinions, personal space.
4. Ability to develop self-motivation, raised aspirations and beliefs in one's own abilities.
5. Excel with focused approach in working environment.
6. Ability to communicate effectively with creativity.

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1. Resume Preparation
  2. Email Etiquettes by sending and replying emails
  3. Peer Session on Self Introduction
  4. New paper reading to improve voice modulation
  5. Storytelling to enhance creativity and presentation skills
  6. Enact on Body Languages by peers
  7. Prepare a Time Management Matrix for daily scheduling
  8. Do Time Management related exercises and activities in the classroom
  9. Do Distress related exercises in the class room
  10. Conduct activities related to enhance leadership qualities
  11. Do activities related to team spirit
  12. Peer Group Discussion on various topics
  13. Peer Telephonic Interview
  14. Peer Mock Stress Interview
  15. Peer Mock HR Interview

**Internal (40 Marks)**

Resume Preparation : 10 Marks

Mock GD : 15 Marks

Mock Interview : 15 Marks

**External (60 Marks)**

Resume Preparation : 10 Marks

Mock GD : 25 Marks

Mock Interview : 25 Marks

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**Department of Computer Science**

**UG Programme**

**Semester V**

**(2018 – 2021)**

**On Job Training (18UCSJ51)**

**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 1</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: -</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 25 Days</b>	<b>Max. Marks</b>	<b>: 100</b>

**Rules Governing Institutional Training**

1. Each Student should undergo 25 days institutional training under a manager during the fourth semester summer vacation.
2. He / She shall undergo the above training in the organization approved by the department.
3. At the end of the training the student has to produce an attendance certificate from the organization to the Head of the Department
4. The student has to submit two copies of the report in not less than 25 pages as per the given format within a month of the re-opening of the college in the fifth semester.
5. The training report must contain the following:
  - a. Introduction
  - b. Company Profile
  - c. Nature of work
  - d. Organizational structure of the concern
  - e. Role in the organization
  - f. Questionnaires and Observations about working of the concern
  - g. Conclusion
  - h. Appendix
6. The training programme shall be evaluated as per the following pattern with HOD and senior faculty members as the External viva voce panel.

**Internal (40 Marks)**

Training Report	: 20 Marks
Overall Performance	: 20 Marks

**External (60 Marks)**

Training Report	: 20 Marks
Viva Voce	: 40 Marks

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**Semester VI**  
**(2018 – 2021)**

**Core Course – XIII : Computer Networks (18UCSC61)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 5</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To enable the students to learn the fundamentals of Computer Network and its concepts.
- To understand every layer functionalities.
- To make the students to understand the various concepts of Computer Network.
- To have better understanding of the network architecture and different layers of network.

**Course Outcomes:**

1. Learn the concepts of Networking.
2. Gain knowledge in the functionalities of every layer in network.
3. Ability to realize and compare different LAN topologies.
4. Implement and Compare the performance of different layer protocols.
5. Differentiate different routing algorithms and their usage.
6. Knowledge in Security issues.

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**UNIT I** **(15 Hrs)**  
Applications – Requirements – Network Architecture – Performance.

**UNIT II** **(15 Hrs)**  
Perspectives on Connecting – Encoding – Framing – Error Detection – Reliable Transmission – Ethernet and Multiple Access Network (802.3) – Wireless.

**UNIT III** **(15 Hrs)**  
Switching and Bridging – Basic Internetworking (IP) – Routing: Distance Vector (RIP) – Link State (OSPF) – The Global Internet – Multicast.

**UNIT IV** **(15 Hrs)**  
Simple Demultiplexer (UDP) – Reliable Byte Stream (TCP) – TCP Congestion Control – Congestion Avoidance Mechanism.

**UNIT V****(15 Hrs)**

Pretty Good Privacy – Secure Shell – Transport Layer Security – IP Security – Wireless security (802.11i) – E-mail (SMTP, MIME, IMAP) – World Wide Web (HTTP) – Web Services.

**Textbook**

1. Larry L. Peterson, Bruce S. Davie, “Computer Networks: a systems approach”, 5<sup>th</sup> Edition, MKP.

<b>Unit</b>	<b>Chapters</b>	<b>Section</b>	<b>Page No.</b>
I	1	1.1 – 1.3	2 – 36
	1	1.5	44 – 55
II	2	2.1 – 2.7	72 – 148
III	3	3.1 – 3.2	170 – 240
	3	3.3.2 – 3.3.3	243 – 262
IV	5	5.1 – 5.2	393 – 428
	6	6.3 – 6.4	499 – 623
V	8	8.4.1 – 8.4.5	665 – 678
	9	9.1.1 – 9.1.3	700 – 718

**Reference Books**

1. Behrouz A. Forouzan, “Data Communication and Networking”, McGraw-Hill, 5<sup>th</sup> Edition.
2. Andrew S. Tanenbaum, David J. Wetherall, “Computer Networks”, Pearson Education, 2013, 5<sup>th</sup> Edition.
3. William Stallings, “Data and Computer Communications”, Pearson, 2013, 10<sup>th</sup> Edition.

**Webliography**

1. <https://www.dammies.com/programming/networking>
2. <https://www.noction.com/blog/tcp-transmissioncontrol>
3. <https://www.techopedia.com/transport-layer-security-tls>



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**Semester VI**  
**(2018 – 2021)**

**Core Course – XIV: Data Warehouse and Data Mining (18UCSC62)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 5</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To expose the students to the concepts of Data warehousing Architecture and Implementation.
- To Familiarization with the concepts of Classification and Clustering.
- To study the overview Data Mining Trends and Application.

**Course Outcomes:**

1. Understand warehouse architecture.
2. Gain knowledge on various data storage models.
3. Retrieve interesting patterns.
4. Acquire skills to plot data in multidimensional space.
5. Qualify to generate rule from data-set.
6. Gain Familiarity with classification algorithm.

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**UNIT I**

**(15 Hrs)**

**Data Warehousing Components:** Overall Architecture - Data Warehouse Database - Sourcing, Acquisition, Clean Up and Transformation Tools – Metadata - Access Tools - Data marts. **On-Line Analytical Processing (OLAP):** Need for OLAP - Multidimensional Data Model - OLAP Guidelines - Multidimensional Versus Multirelational OLAP - Categorization of OLAP Tools - State of the Market - OLAP Tools and the Internet.

**UNIT II**

**(15 Hrs)**

**Introduction:** What is Data Mining What kind of Data can be mined - What kinds of patters can be mined - Which Technologies are used - Major Issues in Data Mining. **Getting to know your Data:** Data Objects and Attribute Types - Basic Statistical Descriptions of Data - Data Visualization.

**UNIT III**

**(15 Hrs)**

**Data Pre - Processing:** An Overview - Data cleaning - Data Integration - Data Reduction. **Association Rule Mining:** Frequent Item set Mining methods - which patterns are Interesting - Pattern evaluation Methods.

**UNIT IV****(15 Hrs)**

**Classification:** Basic Concepts - Decision Tree Induction - Bayes Classification Methods - Rule Based Classification - Bayesian Belief Networks - Classification by Back propagation - Support Vector Machines - Classification using Frequent patterns.

**UNIT V****(15 Hrs)**

**Cluster Analysis: Basic Concepts and Methods:** Cluster Analysis - Partitoning Methods - Hierarchical Methods: Agglomerative Vs Divisive Hierarchical Clustering. **Data Mining Trends:** Data mining Applications - Data Mining Trends.

**Textbooks**

1. Alex Berson and Stephen J. Smith, “Data Warehousing, Data Mining & OLAP”, Tata McGraw Hill, 2007, Tenth Reprint.
2. Jiawei Han and Micheline Kamber, “Data Mining Concepts and Techniques”, Elsevier 2007, Second Edition.

Unit	Textbook No.	Chapters	Section	Page No.
I	1	6, 13	6.1 - 6.6, 13.1 - 13.7	115 - 126, 247 – 265
II	2	1, 2	1.2 - 1.5, 1.7, 2.1 - 2.3	5 - 33, 40 - 65
III	2	3, 6	3.1 - 3.4, 6.1, 6.2	84 - 111, 243 - 264
IV	2	8, 9	8.1 - 8.4, 9.1 - 9.4	327 - 363, 393 - 422
V	2	10, 13	10.1, 10.2, 10.3.1, 10.3.2, 13.3, 13.5	443 - 462, 607 - 618, 622 - 625

**Reference Books**

1. B.S. Charulatha, and S.Poonkuzhali, ”Data Warehousing & Data Mining” Charulatha Publications 2013 Chennai.
2. K.P. Soman, Shyam Diwakar and V. Ajay, “Insight into Data mining Theory and Practice”, Prentice Hall of India, Easter Economy Edition, 2006.
3. G. K. Gupta, “Introduction to Data Mining with Case Studies”, Prentice Hall of India, Easter Economy Edition, 2006.

**Webliography**

1. [tdan.com/components\\_of\\_a\\_data\\_warehouse/4213](http://tdan.com/components_of_a_data_warehouse/4213)
2. [www.mimuw.edu.pl/~son/datamining/DM/4\\_Preprocess.pdf](http://www.mimuw.edu.pl/~son/datamining/DM/4_Preprocess.pdf)
3. [www.users.cs.umn.edu/~kumar/dmbook/dmslides/chap6\\_basic\\_association\\_analysis.pdf](http://www.users.cs.umn.edu/~kumar/dmbook/dmslides/chap6_basic_association_analysis.pdf)

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**(2018 – 2021)**

**Core Course – XV: Mobile Application Development Lab (18UCSC6P)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To improve the fundamental knowledge of Android programming using the Android SDK.
- To enrich the knowledge about Android programming.
- To develop the idea for effective .apk files.

**Course Outcomes:**

1. Apply general programming knowledge in the field of developing mobile applications.
2. Learn specific requirements, possibilities and challenges in developing for a mobile context.
3. Get understanding work on Android Development Environment.
4. Develop effective .apk files.
5. Understand interaction between user interface and underlying application infrastructure.
6. Develop and design work including developing prototype that can be evaluated with specified user group.
7. Enhance practical skills and knowledge to construct software for a mobile application.

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1. Develop an application that uses GUI components, Font and Colors.
  2. Develop an application that uses Layout Managers and event listeners.
  3. Develop a native calculator application.
  4. Write an application that draws basic graphical primitives on the screen.
  5. Develop an application that makes use of database.
  6. Develop an application that makes use of RSS Feed.
  7. Implement an application that implements Multi threading.
  8. Implement an application that writes data to the SD card.
  9. Implement an application that creates an alert upon receiving a message.
  10. Write a mobile application that creates alarm clock.

**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science (UG & PG)**  
**UG Programme – B.Sc.,**  
**Semester VI**  
**(2018 – 2021)**

**Core Course – XVI : Project & Viva-Voce (18UCSJ61)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 5 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 75 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Rules and Regulations**

1. The combined project shall be undertaken by the students as a team of two.
2. The Title must be confirmed and the synopsis of the project countersigned by the guide need to be submitted to the Project Coordinator for approval on or before second week of the commencement of the semester.
3. The Student should maintain an observation for their project work and give report about this to project guide on every week.
4. The Students should meet the guide before every project lab days.
5. The Students must attend all the reviews without fail and come with the corresponding needs.
6. The following list of parameters is taken into account for the evaluation of project work and viva voce. The student has to produce 3 copies (Individual per student – 1, Department Library – 1) of the document.

**Internal (40 Marks)**

Consolidated Two Review Meetings	: 20 Marks
Project Documentation	: 10 Marks
Overall Performance	: 10 Marks

**External (60 Marks)**

Project Documentation	: 10 Marks
Project Demo	: 20 Marks
Power Point Presentation	: 10 Marks
Viva Voce	: 20 Marks

**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science (UG & PG)**  
**UG Programme – B.Sc.,**  
**Semester VI**  
**(2018 – 2021)**

**Major Elective Course – III : Artificial Intelligence and Expert Systems (18UCSO61)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 4 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 60 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To study basics of Artificial Intelligence.
- To study different Pattern Recognition Task using Artificial Intelligence.
- To study different Visual Image Understanding using Artificial Intelligence.
- To study basics of Expert System Architecture.

**Course Outcomes:**

1. Analyze the elements of formal learning law theorem, and types of learning process and computational process.
2. Identify the basic pattern structure and algorithms for pattern approaches and mapping, clustering a pattern.
3. Apply the fundamental algorithms and techniques in the area of Artificial Intelligence.
4. Learn the Artificial Intelligence direct applications in Natural Language Processing and speech recognition techniques the various types of language processors, and the vowels and verbal communications.
5. Learn the Artificial Intelligence direct applications in visual image understanding.

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**UNIT I**

**(12 Hrs)**

**Knowledge: General Concepts:** Introduction – Definition and Importance of knowledge – Knowledge Based System – Representation of Knowledge – Knowledge Organization – Knowledge Manipulation – Acquisition of Knowledge. **LISP & Other AI Programming Languages:** Introduction to LISP Syntax and Numeric Functions – Basic List Manipulation Function in LISP – Functions, Predicates, and Conditionals – Input, Output and Local Variables – Iteration and Recursion – Property Lists and Arrays – Miscellaneous Topics – PROLOG and Other AI Programming Languages.

**UNIT II**

**(12 Hrs)**

**Formalized Symbolic Logics:** Introduction – Syntax and Semantics for Propositional Logic – Syntax and Semantics for FOPL – Properties of Wffs – Conversion to Clausal Form – Inference Rules – The Resolution Principle – Nondeductive Inference Methods – Representations Using Rules. **Dealing with Inconsistencies and Uncertainties:** Introduction

– Truth Maintenance Systems – Default Reasoning and the Closed World Assumption – Predicate Completion and Circumscription – Model and Temporal Logics – Fuzzy Logic and Natural Language Computations.

**UNIT III (12 Hrs)**

**Search and Control Strategies:** Introduction – Preliminary Concepts – Examples of Search Problems – Uniformed or Blind Search – Informed Search – Searching And-Or Graphs. **Matching Techniques:** Introduction – Structures Used in Matching – Measures for Matching – Matching Like Patterns – Partial Matching – Fuzzy Matching Algorithms – The RETE Matching Algorithm.

**UNIT IV (12 Hrs)**

**Natural Language Processing:** Introduction – Overview of Linguistics – Grammars and Languages – Basic Parsing Techniques – Sematic Analysis and Representation Structures – Natural Language Generation – Natural Language Systems. **Pattern Recognition:** Introduction – The Recognition and Classification Process – Learning Classification Patterns – Recognizing and Understanding Speech.

**UNIT V (12 Hrs)**

**Visual Image Understanding:** Introduction – Image Transformation and Low Level Processing – Intermediate Level Image Processing – Describing and Labeling Objects – High Level Processing – Vision System Architectures. **Expert System Architectures:** Introduction – Rule Based System Architectures – Nonproduction System Architectures – Dealing With Uncertainty – Knowledge Acquisition and Validation – Knowledge System Building Tools.

**Textbook**

1. Dan W. Patterson, “Introduction to Artificial Intelligence and Expert Systems”, Prentice Hall of India Private Limited New Delhi 2003, original U.S Edition.

Unit	Chapters	Section	Page No.
I	2	2.1 - 2.7	9 - 17
	3	3.1 - 3.8	19 - 42
II	4	4.1 - 4.9	47 - 76
	5	5.1 - 5.6	80 - 103
III	9	9.1 - 9.6	167 - 185
	10	10.1 - 10.7	188 - 208
IV	12	12.1 - 12.7	227 - 265
	13	13.1 - 13.4	271 - 281
V	14	14.1 - 14.6	285 - 322
	15	15.1 - 15.6	326 - 353

### **Reference Books**

1. N J Nilson, "Principles of Artificial Intelligence", Tiega Press, Polo Alto, 1980, 2<sup>nd</sup> Edition.
2. Elain Rich and Kevin Knight, "Artificial Intelligence", McGraw Hill, 1991, 3<sup>rd</sup> Edition.

### **Webliography**

1. [https://www.tutorialspoint.com/lisp/lisp\\_overview.htm](https://www.tutorialspoint.com/lisp/lisp_overview.htm)
2. [https://www.tutorialspoint.com/artificial\\_intelligence/artificial\\_intelligence\\_natural\\_language\\_processing.htm](https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_natural_language_processing.htm)
3. [https://www.tutorialspoint.com/artificial\\_intelligence/artificial\\_intelligence\\_expert\\_systems.htm](https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_expert_systems.htm)

**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science (UG & PG)**  
**UG Programme – B.Sc.,**  
**Semester VI**  
**(2018 – 2021)**

**Major Elective Course – III: IoT and its Applications (18UCSO62)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 4 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 60 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To understand the basics of Internet of Things.
- To study the basics of cloud computing and its services.
- To apply the concept of Internet of Things in the real world scenario.

**Course Outcomes:**

1. Understand the fundamentals of Internet of Things.
2. Familiar with the basics of cloud computing.
3. Gain Knowledge in Arduino Platform.
4. Analyze applications of IoT in real time scenario.
5. Capable to work with Cosm as a Cloud Service.

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**UNIT I**

**(12 Hrs)**

**Internet of Things (IoT):** Introduction - The Basic Concepts - Communication Technologies - Current Status and the Near Future. **The Basics of Sensors and Actuators:** How Sensors Work? - Analog Sensors - Digital Sensors - Pull-Up/Down Resistors and Sensors - A Brief introduction to sampling theory - Examples of Sensors and working principles - Actuators - Putting things together.

**UNIT II**

**(12 Hrs)**

**An Introduction to Cloud Computing:** What is Cloud Computing – Basic Services and Architectures – Communicating with the Cloud Using Web services – Cloud Computing and IoT – Most Popular Open Cloud Computing Services for Storage Management. **The Arduino Microcontroller Platform:** Microcontrollers – The Arduino Platform – Writing Arduino Software.

**UNIT III**

**(12 Hrs)**

**Arduino Platform:** Trying Your Code on an Arduino Emulator - Extending Arduino – The Arduino Libraries – Programming Your Arduino for the Internet of Things. **Reading From Sensors:** Sensing the World – Reading from Analog Sensors – Sensors with On/Off States - Using the Serial Protocol.



**UNIT IV****(12 Hrs)**

**Talking to your Android phone with Arduino:** Connecting Arduino with a Mobile Device – The Android Mobile OS – Communicating Using Bluetooth – Communicating Using USB. **Connecting Your Arduino to the Internet:** The Basics of the Internet.

**UNIT V****(12 Hrs)**

**Connecting Your Arduino to the Internet:** Connect your Arduino Using the Ethernet - Connect your Arduino using the Wi-Fi - Connect your Arduino with GSM Network – Send Arduino data to your own Cloud Application. **Introducing Cosm as a Cloud service:** Introduction to basic COSM Concepts. **Case Study:** Use Arduino to upload feed data from environmental sensors.

**Textbook**

1. Charalampos Doukas “Building Internet of Things with the Arduino Volume 1”, Create Space Independent Publishing Platform, 2012.

<b>Unit</b>	<b>Chapters</b>	<b>Section</b>	<b>Page No.</b>
I	1	1 – 4	1 – 24
	2	2 – 8	25 – 41
II	3	1 – 5	42 – 61
	4	1 – 3	63 – 79
III	4	4 – 7	79 – 80
	5	–	103 – 112
IV	6	1 – 4	122 – 155
	7	1	156 - 161
V	7	2 – 7	161 – 212
	8	1, 2	213 – 246

**Reference Books**

1. Gautam Shroff, “Enterprise Cloud Computing Technology, Architecture, Applications”, Cambridge University Press, 2010.
2. Arshdeep Bahga and Vijay Madiseti, “Internet of Things A Hands-On Approach”.

**Webliography**

1. [www.internet-of-things-book.com](http://www.internet-of-things-book.com)
2. [www.mdpi.com/1424-8220/14/4/6998/pdf](http://www.mdpi.com/1424-8220/14/4/6998/pdf)

**Sri Kaliswari College (Autonomous), Sivakasi**  
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**UG Programme – B.Sc.,**  
**Semester VI**  
**(2018 – 2021)**

**Major Elective Course – III : Software Testing (18UCSO63)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 4</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 4 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 60 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To have an understanding of Different Life cycle Models.
- To know about how testing be done, in order to build a defect-free product.
- To understand about Test Planning and Test Metrics.

**Course Outcomes:**

1. Gain knowledge to write test cases and test scripts for different types of testing.
2. Learn Methods to implement test generation from requirement.
3. Implementation of test plan, reporting and its practices in real IT projects.
4. Apply project metrics in Quality Assurance.
5. Acquire skills to work in all kinds of testing methodologies.
6. Capable of applying various test metrics.

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**UNIT I** **(12 Hrs)**

**Software Development Life Cycle models:** Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases – Life Cycle models. **White Box Testing:** Static Testing – Structural Testing – Challenges in White Box Testing.

**UNIT II** **(12 Hrs)**

**Black-Box Testing:** What is Black Box Testing – Why Black Box Testing – When to do Black Box Testing – How to do Black Box Testing. **Integration Testing:** Integration Testing as Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash.

**UNIT III** **(12 Hrs)**

**System and Acceptance Testing:** System Testing Overview – Why System testing is done – Functional versus Non-functional Testing – Functional testing – Non-functional Testing – Acceptance Testing.

**UNIT IV****(12 Hrs)**

**Performance Testing:** Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. **Regression Testing:** What is Regression Testing – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

**UNIT V****(12 Hrs)**

**Test Planning, Management, Execution and Reporting:** Test Planning – Test Management – Test Process – Test Reporting –Best Practices. **Test Metrics and Measurements:** Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.

**Textbook**

1. Srinivasan Desikan, Gopalswamy Ramesh, “Software Testing Principles And Practices”, Pearson Education, New Delhi, 2006.

Unit	Chapters	Section	Page No.
I	2	2.1–2.5	25 – 43
	3	3.1–3.4	47 – 68
II	4	4.1–4.4	73 – 104
	5	5.1–5.5	107 – 125
III	6	6.1–6.6	127 – 162
IV	7	7.1–7.6	169 – 191
	8	8.1–8.5	193 – 208
V	15	15.1–15.6	351 – 381
	17	17.4–17.7	428 – 455

**Reference Books**

1. William E.Perry, “Effective Methods of Software Testing”, Wiley Publications, India, 3<sup>rd</sup> Edition.
2. Renu Rajani, Pradeep Oak, “Software Testing”, TMH Publications, 2007.

**Webliography**

1. [http://www.tutorialspoint.com/software\\_testing/](http://www.tutorialspoint.com/software_testing/)
2. <http://softwaretestingfundamentals.com/software-testing-basics/>
3. [http://www.tutorialspoint.com/software\\_testing/software\\_testing\\_types.html](http://www.tutorialspoint.com/software_testing/software_testing_types.html)

**Sri Kaliswari College (Autonomous), Sivakasi**  
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**Semester VI**  
**(2018 – 2021)**

**Skill Based Course –IV: Bio-Informatics (18UCSS61)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 2</b>	<b>Int. Marks</b>	<b>: 25</b>
<b>Hours / Week</b>	<b>: 2 Hrs</b>	<b>Ext. Marks</b>	<b>: 75</b>
<b>Duration</b>	<b>: 30 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To know Basic concepts of Bioinformatics.
- To know Gene sequence alignments and databases.
- To know the analyzing method using biological dataset.

**Course Outcomes:**

1. Understand the basic principles, concepts and applications of bioinformatics.
2. Be familiar with the basic practical techniques of bioinformatics.
3. Familiar with the use of a wide variety of internet applications, biological database  
And apply these methods to research problems.
4. Gain knowledge on basic techniques of Bioinformatics.

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**UNIT I** **(6 Hrs)**

**Bioinformatics An Overview:** Introduction – Aims – Molecular Biology and Computers – Role of Internet in Bioinformatics - Application of bioinformatics in various fields Commercialization of Bioinformatics.

**UNIT II** **(6 Hrs)**

**Databases:** EMBnet-NCBI-Bioinformatics Programme in India. **Genome information resources:** Introduction-DNA sequence database-Specialized genomic databases.

**UNIT III** **(6 Hrs)**

**Protein information resources:** Introduction-Biological databases-Primary sequence databases-Composite protein sequences database-Secondary database.

**UNIT IV** **(6 Hrs)**

**DNA Sequence Analysis:** Introduction – Why analyze DNA – Gene Structure and DNA sequences – Features of DNA sequence analysis – Issues in the interpretation of EST searches – Two approaches to gene hunting – The expression profile of a cell – cDNA

libraries and ESTs – Different approaches to EST analysis – Effects of EST data on DNA databases.

## UNIT V

(6 Hrs)

**Analysis packages:** Introduction-Commercial database-Commercial software-Comprehensive packages-Packages specializing in DNA analysis-Intranet packages-Internet packages-Laboratory Information Management system (LIMS)

### Textbooks

1. Irfan Ali Khan, Atiya Khanum, “Fundamentals of Bioinformatics”, 2008, Ukaaz Publications, Hyderabad, 3rd Edition.
2. TK Attwood., DJ Parry Smith, “Introduction to Bioinformatics”, 2014, Pearson Education, New Delhi, 9<sup>th</sup> Edition.

Unit	Textbook No.	Chapters	Section	Page No.
I	1	1	1-10	1-12
II	2	2, 4	2.8,2.9,2.10, 4.1,4.2,4.3	29-38, 75-85
III	2	3	3.1, 3.2, 3.3.3.4.3.5	42-68
IV	2	5	5.1,5.2,5.3,5.4,5.5,5.5,5.6,5.7,5.8,5.9,5.10	87-113
V	2	10	10.1,10.2,10.3,10.4,10.5,10.6,10.7,10.8,10.9	192-205

### Reference Books

1. Arthur M.Lesk”Introduction to bio-informatics”, oxford press, New Delhi, 2006, 2<sup>nd</sup> edition.
2. Irfan Ali Khan, Atiya Khanum,”Introductory Bioinformatics”, UKAAZ Publication, Hyderabad.

### Webliography

1. <http://bioinfo.mbb.yale.edu/mbb452a/intro/>
2. <https://digitalworldbiology.com/tutorial/introduction-bioinformatics>

**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science (UG & PG)**  
**UG Programme – B.Sc.,**  
**Semester VI**  
**(2018 – 2021)**

**Value Based Course – II: R Programming Lab (18UCSV6P)**  
**(For those who join from June 2018 and afterwards)**

<b>Credits</b>	<b>: 1</b>	<b>Int. Marks</b>	<b>: 40</b>
<b>Hours / Week</b>	<b>: 2 Hrs</b>	<b>Ext. Marks</b>	<b>: 60</b>
<b>Duration</b>	<b>: 30 Hrs</b>	<b>Max. Marks</b>	<b>: 100</b>

**Course Objectives:**

- To gain knowledge about statistical data analysis.
- To gain knowledge about data mining techniques.
- To apply their knowledge in research.

**Course Outcomes:**

1. Understanding in data types and objects in R.
  2. Understanding in various data mining techniques.
  3. Able to work with image analysis using R.
  4. Able to work with different data formats.
- 

**Statistical Operations using R**

1. Basic computations in R.
2. Data types and objects in R (Vectors, List, Matrices, Data frames)
3. Data visualization using ggplot package in R (Plotting-Line chart, bar chat, Pie chart)

**R Analysis Using Images**

4. Import, Export and Properties of an image  
[Reading an image, writing an image, display the information of an image and properties of an image (color node, storage mode, dimension, total no of frames)]
5. Image Transformation/Geometric transformations.  
[Trim, Cropping, Scaling, rotation, Image Border and Flip & Flop]
6. Contrast Adjustment with Image Analysis  
[Adjusting Brightness and Contrast of an image]  
[Adding watermark, converting file format (JPG to PNG)]
7. Import image and apply image transformations and contrast adjustment using different text effects.
8. Image enhancement [Morphological Operations (Erosion, dilation, Opening and Closing)]
9. Image Effects (Silly Filters) [Charcoal, Oil paint, edge, embossing and Negate]
10. Image Filter [Low Pass Filter, High Pass Filter and Noise]

11. Import image and apply various filter effects to an image with enhancement.
12. Color space conversion [RGB to Grey, RGB to HIS, HIS to RGB]
13. Color channelization [Separate the color channels of an image]
14. Kernel convolution [Blurring]
15. Animation [Morph the sequence of images]
16. Convert Black and White to Color photo to perform animation of an image.

#### **Statistical Analysis using biological Dataset**

17. Import and export the biological (genie) dataset [Trained and test dataset]
18. To perform association rule techniques using bio-conductor package
19. To perform clustering techniques using bio-conductor package.
20. Import the gene sequence data to perform classification technique using bio-conductor Package.

**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science**  
**Certificate Course in Computer Application**  
**Non Semester**  
**Office Automation Lab (18CCA0P)**  
**(For those who join from June 2018 and afterwards)**

**Duration : 60 Hrs**

**Int. Marks : 40**  
**Ext. Marks : 60**  
**Max. Marks : 100**

**Course Objectives:**

- To improve Employability Skills.
- To Gain Knowledge about Computer.
- To learn controls in Word, Excel and PowerPoint.

**Course Outcomes:**

1. Gain Basic knowledge in Office package.
2. Familiar with Invitation design and News Paper Creation.
3. Insertion and Creation of Tables, Symbols and Pictures.
4. Use inbuilt mathematical functions.
5. Apply various Slide Design, Animation and Slide Transition.

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**Word**

1. Creating a document, editing and saving and alignment controls
2. Creating a table, merging of cells, column and row width
3. Usage of Paragraph, Line Spacing, Header and Footer
4. Usage of Bullets and Numbering, Spelling and Grammar
5. Insert an image into the shape (document with page border, content border, add pattern)
6. Wedding Invitation Creation (Both Tamil and English using word art and Google input)
7. News Paper creation (Both Tamil and English with column alignment and Drop cap)
8. Mail Merge

**Excel**

1. Mathematical functions in Excel
2. Creation of Charts and Graphs in Excel
3. Filters in Excel

**PowerPoint**

1. Simple Slide creation
2. Transition and Design
3. Slide creation using custom Animation
4. Photo Album



**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science**  
**Certificate Course in Computer Application**  
**Non Semester**  
**DTP and Multimedia Lab (18CCA0Q)**  
**(For those who join from June 2018 and afterwards)**

	<b>Int. Marks : 40</b>
	<b>Ext. Marks : 60</b>
<b>Duration : 60 Hrs</b>	<b>Max. Marks : 100</b>

**Course Objectives:**

- To design an image using various image editor tools.
- To create banner / logo / invitation / visiting cards.
- To gain knowledge about different animation styles.
- To design and implement text, elements efficiently and animation development.
- To gain knowledge about bouncing elements and moving animation.
- To make the student learn a animation effects.

**Course Outcomes:**

1. Acquire skills to work with various designing tools.
2. Able to provide clarity to an image.
3. Acquire skills to work with various designing tools.
4. Develop various effects on images using pencil.
5. Create graphical designs.
6. Apply various animations on images.

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**Vector Image Editor Tool**

1. Design a Postage Stamp
2. Design a Brochure
3. Design a Newspaper Advertisement
4. Design a Logo
5. Design a Certificate
6. Design a Visiting / Greeting Card / CD Cover
7. Design a Wedding Invitation / Book Cover
8. Design a dart
9. Design a Multiple Swirl Circle
10. Design a floral leaf

**Graphics Editor Tool**

1. Text in Stitches
2. Water Color Effect
3. Colorful glowing text

4. Amazing Advertisement
5. Poster Design
6. Eroded Fashion Portraits
7. Typography Wallpaper

### **API Prototyping Tool (Pencil)**

1. Bouncing Ball Animation
2. Moving Ball in a 3X 3Square
3. Character Blinking
4. Melting Snowman
5. Biting an Apple
6. Teaching Numbers to Children with Objects
7. Teaching Alphabet
8. Sunrise
9. Design an Interactive Quiz Page

### **Webliography**

1. Weld, Trim, Intersect  
<https://www.youtube.com/watch?v=AHKE0yY5X3k>
2. Floral Design  
[http://www.entheosweb.com/tutorials/coreldraw/floral\\_logo\\_design.asp](http://www.entheosweb.com/tutorials/coreldraw/floral_logo_design.asp)
3. Visiting Card  
<https://www.youtube.com/watch?v=FtkMplxQnTo>
4. Dart  
<https://www.youtube.com/watch?v=MtBdpbF8nAM>
5. Scroll saw Patterns  
<https://www.youtube.com/watch?v=z3fOoLB-yIc>
6. Step and Repeat  
<https://www.youtube.com/watch?v=t5qjryCAW2k>
7. Logo  
[http://gtu.ge/Arch/Faculty/Multimedia/Resources/2\\_Corel/Languages/EN/Tutorials/CorelDRAW%20Tutorials/dr\\_2.pdf](http://gtu.ge/Arch/Faculty/Multimedia/Resources/2_Corel/Languages/EN/Tutorials/CorelDRAW%20Tutorials/dr_2.pdf)

**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science (UG & PG)**  
**Certificate Course in Data Analytics**  
**Non Semester**  
**Introduction to R Programming Lab (18CDA0P)**  
**(For those who join from June 2018 and afterwards)**

**Duration : 60 Hrs**

**Int. Marks : 40**  
**Ext. Marks : 60**  
**Max. Marks : 100**

**Course Objectives:**

- To gain knowledge about statistical data analysis.
- To gain knowledge about data mining techniques.
- To gain knowledge about functions in R.
- To gain knowledge in working with matrix data.

**Course Outcomes:**

1. Understanding in data types and objects in R.
2. Understanding in various data mining techniques.
3. Able to work with functions in R.
4. Able to analyse matrix data.

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1. Program using Vectors.
  2. Program using Matrices and Arrays.
  3. Program using List.
  4. Program using Data Frames.
  5. Program using Looping.
  6. Program using Inbuilt Functions.
  7. Program using Data Summary Functions in R.
  8. Working with Date and Time.
  9. Importing and Exporting Files(Text Files, Excel Files and CSV files).
  10. Working with In Built Data Set.
  11. Removing missing values using in-built Functions, Mean, Median and Mode.
  12. Apply any Feature Selection method for in-built Data Set.
  13. Create Confusion Matrix for Any Data.

**Sri Kaliswari College (Autonomous), Sivakasi**  
**Department of Computer Science (UG & PG)**  
**Certificate Course in Data Analytics**  
**Non Semester**  
**Analysis and Visualization Lab(18CDA0Q)**  
**(For those who join from June 2018 and afterwards)**

**Duration : 60 Hrs**

**Int. Marks : 40**  
**Ext. Marks : 60**  
**Max. Marks : 100**

**Course Objectives:**

- To gain knowledge about importing and exporting image.
- To gain knowledge about data mining techniques.
- To gain knowledge about image enhancement.
- To apply their knowledge in visualization.

**Course Outcomes:**

1. Understanding in importing and exporting image.
2. Understanding in various data mining techniques.
3. Able to do image enhancement.
4. Able to do visualization using R.

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1. Import, Export and Properties of an Image.
  2. Image Transformation/ Geometric Transformations.
  3. Contrast Adjustment.
  4. Image Analysis.
  5. Image Enhancement.
  6. Image Filter.
  7. Image Effects.
  8. Color Channelization.
  9. Kernel Convolution.
  10. Animation.
  11. Create Histogram and Equalization.
  12. Create Boxplot, Pie Chart, Bar Chart and Dot Chart.