STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

Institutional Learning Outcomes

Stella Maris College, an autonomous Catholic institution of higher education, is committed to the highest standards of academic excellence based on sound values and principles, where students are strengthened with whole person education to lead purposeful lives in service to the community and the nation.

The Institutional Learning Outcomes (ILOs) of Stella Maris College (SMC) reflect the broader mission and purpose of the institution. They are the overarching set of learning outcomes that all students, regardless of discipline, must achieve at graduation. All programme and course learning outcomes are mapped to the institutional outcomes, thus reflecting an overall alignment of values, knowledge and skills expected at programme completion. ILOs are designed to help guide individual departments and disciplines in the development of their programme learning outcomes.

The ILOs of SMC are formed by two components:

1. **Core commitments**: Knowledge and scholarship, values and principles, responsible citizenship, service to community
2. **Institutional values**: Quest for truth, spirit of selfless service, empowerment

Upon graduation, students of Stella Maris College will

- Display mastery of knowledge and skills in their core discipline (**Knowledge and Scholarship)**
- Exhibit in all actions and attitudes a commitment to truth and integrity in all contexts, both personal and professional (**Values and Principles)**
- Demonstrate knowledge about their role in society at local and global levels, and actively work for social and environmental justice (**Responsible Citizenship)**
- Engage in the process of self-discovery through a life-long process of learning (**Quest for truth**)
- Demonstrate readiness to serve those who are in need (**Spirit of selfless service**)
- Be able to function effectively and with confidence in personal and professional contexts **Empowerment)**

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Programme Learning Outcomes/Intended Programme Learning Outcomes

Graduates of a Bachelor's Degree will have a broad and coherent body of knowledge in their disciplines, with a deep understanding of the underlying principles and concepts in one or more disciplines as a basis for independent lifelong learning.

At the end of an undergraduate programme students will be able to

- Describe and define critical concepts in their discipline
- Explain and discuss concepts and ideas pertaining to their discipline
- Demonstrate a broad understanding of their discipline
- Demonstrate communication skills to present a clear, coherent and independent exposition of knowledge and ideas
- Demonstrate understanding of the interconnections of knowledge within and across disciplines
- Apply knowledge, theories, methods, and practices in their chosen field of study to address real-world challenges and opportunities
- Demonstrate proficiency in experimental techniques and methods of analysis appropriate for their area of specialisation
- Generate and analyse data using appropriate quantitative tools
- Construct and test hypotheses
- Demonstrate cognitive and technical skills to synthesise knowledge in interrelated disciplines
- Demonstrate critical thinking and judgement in identifying and solving problems with intellectual independence
- Demonstrate the skills needed to be able to function successfully in their field
- Show responsibility and understanding of local and global issues
- Demonstrate through their actions and speech that they are agents of social justice and change
- Practice the discipline's code of ethics in their academic, professional and personal lives
- Practice the values of democracy and principles of human rights
- Show self-awareness and emotional maturity
- Demonstrate career and leadership readiness
- Demonstrate intercultural, interracial, interclass, inter-caste, and ethical competency
- Exhibit the ability to work in teams
- Exhibit a strong sense of professionalism in a range of contexts
- Demonstrate sensitivity and readiness to share their knowledge, experience, and capabilities with the marginalised and oppressed in their communities

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

DEPARTMENT OF COMPUTER SCIENCE

PROGRAMME DESCRIPTION

The Bachelor of Computer Applications offers knowledge on the underlying concepts of computer technology, use of different programming languages as a tool for solving problems in different domains and the technology trends. This degree not only helps the students to pursue career in IT industry or master's programme in the discipline but also opens up their avenues in different domains of their interest as Computer technology plays a vital role in almost all disciplines.

This programme is structured to face the unique challenge of laying down a strong foundation of basics and fundamentals and keeping up with the rapid changes and advancements of computer technology. The programme introduces to the student various programming tools and techniques and the design and development of solutions and enables them to apply the knowledge appropriately to solve different problems. Students are given an understanding on mathematical concepts and entrepreneurship.This programme not only emphasises gaining knowledge in computer technology but also focusses on value education and ethics. It seeks to motivate the students to share their knowledge with the underprivileged and the oppressed.

Students completing Bachelor of Computer Applications will be equipped in computer technology ready to learn and innovate and skilled in choosing their career or higher studies clubbed with responsibility and righteousness.

PROGRAMME SPEICIFIC LEARNING OUTCOMES

On successful completion of this programme, it is expected that students will be able to

- Describe and define concepts in Computer Science and its related areas
- Interpret concepts in the discipline and apply them to new areas
- Understand and analyse problems in different domains and develop solutions or strategies to solve those problems
- Apply standard Software Engineering practices and strategies in software project development using appropriate programming language to deliver a quality product for business/research needs
- Demonstrate cognitive and creative skills to exercise critical thinking and judgement in identifying and solving problems with intellectual independence
- Understand issues and emerging trends in technological development
- Perform professionally with social, cultural and ethical responsibility as an individual as well as in teams with positive attitude
- Communicate effectively in both oral and written individually and in team
- Demonstrate the ability and the attitude to continuously improve and innovate
- Cultivate skills for successful career, entrepreneurship and higher studies
- Show responsibility towards local and global issues and perceive themselves as agents of change
- Show self-awareness and emotional intelligence
- Share their knowledge and capabilities with the marginalised and oppressed
- Show their readiness to stand up for social justice and work for social change

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI 600 086

B.C.A. DEGREE:COMPUTER APPLICATIONS

COURSES OF STUDY

(Effective from the academic year 2019-2020)

CHOICE BASED CREDIT SYSTEM

C-Credit, **L**-Lecture Hours, **T**-Tutorial Hours, **P**- Practical Hours, **Ex**-Exam Hours,
CA- Continous Assessment Marks, **ES**-End Semester Marks, **M**-Maximum Marks

Subject Code	Title of Course	C	L	T	P	Ex	CA	ES	M
SEMESTER-I									
19CS/MC/FC13	Fundamentals of Computing	3	2	1	2	3	50	50	100
19CS/MC/DL13	Digital Logic Fundamentals	3	3	1	0	3	50	50	100
19CS/SS/HC13	Life Skills:Health, Energy and Computer Basics	3	3	0	0	-	50	-	100
CD / ET / SC	Value Education	2	2	0	0	-	50	-	100
	Life Skills:Personality Development (EL)	3	3	0	0	-	50	-	100
SEMESTER-II									
19CS/MC/PO24	Procedure Oriented Programming	4	2	0	4	3	50	50	100
19CS/MC/AD23	Algorithms and Data Structures	3	3	1	0	3	50	50	100
19CS/GC/ES12	Environmental Studies	2	2	0	0	-	50	-	100
19CS/SS/PS13	Life Skills:Personal and Social	3	3	0	0	-	50	-	100
	Basic Tamil I / General Elective I	2	2	0	0	-	50	-	100
SEMESTER-III									
19CS/MC/WD33	Creative Web Designing	3	3	1	0	3	50	50	100
19CS/MC/OP33	Essentials of Object Oriented Programming	3	3	1	0	3	50	50	100
19CS/MC/TE35	Software Engineering and Testing	5	4	0	2	3	50	50	100
19CS/MC/P132	Creative Web Designing Practical	2	0	0	3	3	50	50	100
19CS/MC/P232	Object Oriented Programming Practical	2	0	0	4	3	50	50	100
CD / ET / SC	Value Education	2	2	0	0	-	50	-	100
	Basic Tamil II / General Elective II	2	2	0	0	-	50	-	100
SEMESTER-IV									
19CS/MC/OS45	Operating Systems	5	5	0	0	3	50	50	100
19CS/MC/FD45	Fundamentals of Database Management Systems	5	5	0	0	3	50	50	100
19CS/MC/P342	Operating System Concepts Implementation	2	0	0	4	3	50	50	100
19CS/MC/P442	Database Management Systems Practical	2	0	0	4	3	50	50	100
	Major Elective I								
SEMESTER-V									
19CS/MC/CN55	Computer Networks	5	5	0	0	3	50	50	100
19CS/MC/DS54	Data Science	4	4	1	0	3	50	50	100
19CS/MC/FW54	Functional Web Development	4	3	0	2	3	50	50	100
19CS/MC/P552	Data Science Practical	2	0	0	3	3	50	50	100
19CS/MC/CA51	Critical Analysis on an Advanced Technology	1	0	0	2	-	50	50	100
Inter Disciplinary Core Courses (CS and PY) to students of Computer Science									
19ID/IC/HC55	Human Computer Interaction	5	5	1	0	3	50	50	100
	General Elective III	2	2	0	0	-	50	-	100
	SAP / SL	2	2	0	0	-	50	-	100

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B.C.A. DEGREE:COMPUTER APPLICATIONS

COURSES OF STUDY

(Effective from the academic year 2019-2020)

CHOICE BASED CREDIT SYSTEM

C-Credit, **L**-Lecture Hours, **T**-Tutorial Hours, **P**- Practical Hours, **Ex**-Exam Hours,
CA- Continous Assessment Marks, **ES**-End Semester Marks, **M**-Maximum Marks

Subject Code	Title of Course	C	L	T	P	Ex	CA	ES	M
SEMESTER-VI									
19CS/MC/SC65	Security Concepts	5	5	0	0	3	50	50	100
19CS/MC/CC65	Cloud Computing	5	5	1	0	3	50	50	100
19CS/MC/PR64	Project	4	0	0	8	-	50	50	100
19VE/SS/HL63	Life Skills:An Appraoch to a Holistic Way of Life	3	3	0	0	-	50	-	100
	Major Elective II								
	General Elective IV	2	2	0	0	-	50	-	100
Major Elective Courses									
19CS/ME/AJ45	Advanced Java Programming	5	3	0	3	1.5	50	50	100
19CS/ME/VP45	Visual Programming	5	3	0	3	1.5	50	50	100
19CS/ME/GP45	Game Programming	5	3	0	3	-	50	50	100
19CS/ME/IS45	Intelligent Systems	5	5	1	0	3	50	50	100
19CS/ME/IT45	Internet of Things	5	5	1	0	3	50	50	100
19CS/ME/AD45	Algorithm Design Techniques	5	5	1	0	3	50	50	100
19CS/ME/MA45	Mobile App Development for Android	5	3	0	3	1.5	50	50	100
General Elective Courses									
19CS/GE/CF22	Computer Fundamentals	2	2	0	0	-	50	-	100
19CS/GE/IA22	Image Editing and Animation	2	1	0	1	-	50	-	100
19CS/GE/CS22	Cyber Security	2	2	0	0	-	50	-	100
19CS/GE/DP22	Documentation and Presentation	2	1	0	1	-	50	-	100
19CS/GE/DA22	Introduction to Data Analysis	2	1	0	1	-	50	-	100
Independent Elective Courses									
19CS/UI/CG23	Computer Graphics	3	0	0	0	3	-	100	100
19CS/UI/CV23	Computer Vision	3	0	0	0	3	-	100	100

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

(Effective from the academic year 2019–2020)

FUNDAMENTALS OF COMPUTING

CODE:19CS/MC/FC13 **CREDITS:3**

L T P:2 1 2

TOTAL TEACHING HOURS:65

OBJECTIVES OF THE COURSE

- To enable the students to understand how to solve problems
- To understand the concepts of logging-in, files and directories, file paths, file/directory permissions
- To understand the difference between executables and data files
- To use simple GUI based applications and text editor
- To enable the students to write simple C programs, debug the program
- To understand the process involved in execution of the program
- Ability to understand modular program development

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Apply problem solving strategies
- Work in UNIX/LINUX environment as a user
- Develop, Debug, Compile and Execute a simple C program
- Represent a problem pictorially using flowcharts and to build programs using branching, looping and arrays
- Write modular programs

Unit 1 (10 Hours)

1.1 Strategies for Problem Solving

What is Problem Solving? - Problem: How to Cross the River? – Problem: The Sliding Eight - General Problem-Solving Techniques

1.2 Introduction to Unix/Linux

What is Unix/Linux? – Various Distributions – User Types (Root, User) – File System Structure

1.3 Files and directories, Editing text

Login - Files and Directories - File Paths* - File/Directory Permissions –chmod command - Directory Navigation -cd, pwd, ls commands - Creating and Manipulating Files and Directories using a Terminal -mkdir, cp, mv, rm commands - Binary and Data Files -file command- Basic Commands - cat, grep, more command - man pages - GUI based File Explorer – Difference between CLI and GUI - Command Window Based Text Editor - Creating/Opening/Closing a file - Making Changes and Saving - Copy/Cut and Paste operation - Find and Replace operation - Undo and Redo operation - File Navigation - Using a GUI Application - GUI based Text Editor

Unit 2 **(15 Hours)**

2.1 Basic elements of C Programming

Basic Structure of a C program - #include, main function, blocks, statements – Compilation- Machine Language & High Level Language, Compiler, Executable Variables - Integer Data Types - int, short, long - Unsigned Counterparts - Supported Range - sizeof operator - printf - Special Characters - new line, horizontal tab - scanf - Arithmetic Expression - Arithmetic Operators - Operator Precedence - Overflow and Underflow - Floating Point Data Types -float, double - Precision - Compound Assignment Operators - Increment and Decrement operators - Boolean Expression - Relational Operators - Logical Operators – Character Data Type - char – getchar – putchar - literals - C Tokens - Variable Naming Rules - Single and Multi-line Comments - Type Conversions - Bitwise Operators

Unit 3 **(9 Hours)**

3.1 Debugging

What is gdb? - Adding Debugging Symbols to the Executable - Breakpoints - Starting Debugging Session - next command - Viewing Source - Inspecting Variables and its Type - continue command- Ending session - gdb command abbreviations.

Unit 4 **(15 Hours)**

4.1 Branching and Looping, Arrays, Flowcharting

Statements and Blocks - If – Else - Else If - Switch -case, break, default – Loops – For, Infinite Loop, While – Do-while - Break and Continue - Conditional Expressions - Goto and Labels - Array – Single and Two Dimensional Arrays - Flow Charts – Symbols - Start/Stop - Process - Decision Making - Input/Output - Connector)

Unit 5 **(16 Hours)**

5.1 Functions

Function Prototype - Function Definition - Function call - Passing Arguments - Returning Values - Passing Arrays - Call Stack - Gdb commands - Backtrace - Frame - Step - Difference between Next and Step – Finish - Recursion - Variable scope - Automatic Variables, External Variables, Static Variables - Constants - Const Keyword, Symbolic Constants - Enums - Built-in Functions - math.h: sqrt, pow, stdlib.h: rand, exit, abs

BOOKS FOR STUDY

Kernighan, Brian, and Dennis M. Ritchie. *The C programming language.* Prentice hall, 2017. (Units 2,4,5)

Sobell, Mark G., and Matthew Helmke. *A practical guide to Linux commands, editors, and shell programming*. 4 ed., Prentice Hall Professional Technical Reference, 2018. (Unit 1.2 – 1.3)

V. Anton Spraul. *Think like a programmer: An introduction to creative problem solving*. No Starch Press, 2012. (Unit 1.1)

BOOK FOR REFERENCE

Balagurusamy, E. *programming in ANSI C.* 7 ed., Tata McGraw-Hill Education, 2017

WEB RESOURCES

GNU GDB - https://www.gnu.org/software/gdb/documentation/

Using GNU's GDB Debugger By Peter Jay Salzman - http://www.dirac.org/linux/gdb/ (Unit 3)

https://www.tutorialspoint.com/cprogramming/

https://www.javatpoint.com/c-programming-language-tutorial

https://www.programiz.com/c-programming

PATTERN OF ASSESSMENT:

Continuous Assessment Test: Total Marks: 50 (Theory-25, Practical -25)

Duration: 90 minutes

Section A - 10 × 1 = 10 marks (Answer all the questions)

(5 Multiple choice questions and 5 Fill in the Blanks)

Section B - 3 × 5 =15 marks (3 out of 4)

Other Components: Total Marks:50

Quiz/Open book tests/Case study/Assignments/Debugging/Coding

End-Semester Examination: Total Marks:100 Duration:3 hours

Theory - 50 marks Duration – 1 ½ hours

Practical - 50 marks Duration – 1 ½ hours

Section A-10 x 1 = 10 (Answer all the Questions)

(5 Multiple choice questions and 5 Fill-in the Blanks)

Section B - 5 × 2 = 10 (Answer all the Questions)

(Atleast 1 question from each unit)

Section C - 6 ×5 = 30 (6 out of 8)

(Atleast 1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS) – CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

DIGITAL LOGIC FUNDAMENTALS

CODE:19CS/MC/DL13 **CREDITS:3**
L T P:3 1 0
TOTAL TEACHING HOURS:52

OBJECTIVES OF THE COURSE

- To learn about the number representation and its conversion
- To understand the basic logic gates and its simplification
- To analyse logical operations using combinational logic circuits.
- To understand concepts of sequential logic and to learn about basic flip-flops and registers.
- To learn about the characteristics of memory and their classification

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Know different number systems and its conversion
- Recognise and use the concepts of different logic gates and simplify them
- Analyse and Design combinational and sequential logic circuits.
- Design Programmable Logic Devices
- Recognise the applications of registers and counters

Unit 1 (12 Hours)

1.1 Digital System and Binary Numbers

Digital Computer and Digital System – Number Systems -Decimal Numbers , Binary Numbers : Counting in Binary, The Weighted Structure of Binary Numbers, Octal Numbers, Hexadecimal Numbers and their Mutual Conversions - Compliments - 1‘s and 2‘s Complement, Signed Numbers, Arithmetic Operations: Addition, Subtraction with Signed Numbers, 9‘s and 10‘s Complement, BCD Numbers, BCD Addition, BCD Subtraction, Gray Code: Binary to Gray Code Conversion, Gray to Binary Conversion, Weighted Code : 8421 Code and Non Weighted Codes : ASCII and EBCDIC – Binary Storage and Registers – Binary Logic

Unit 2 (12 Hours)

2.1 Binary Logic and Logic Gates

Boolean Algebra – Basic definitions – Axiomatic Definition of Boolean Algebra – Basic Theorem and Properties of Boolean Algebra - Boolean Functions – Canonical and Standard Forms – Digital Logic Gates

2.2 Gate-Level Minimization

The Map Method – Four-variable K-Map – Product - of- Sums simplification – Don’t –Care Conditions – NAND and NOR Implementation – Exclusive-OR Function

Unit 3 **(10 Hours)**

3.1 Combinational Logic

Introduction – Combinational Circuits – Binary Adder-Subtractor – Decimal Adder – Binary Multiplier – Decoders – Encoders – Multiplexers

Unit 4 **(10 Hours)**

4.1 Synchronous Sequential Logic

Introduction – Sequential circuits – Storage Elements: Latches, Flip-flops - RS, JK, D Flip flops, Master slave JK flip-flop

4.2 Registers and Counters

Registers – Shift Registers – Ripple counters – Synchronous Counters – Other Counters

Unit 5 **(8 Hours)**

5.1 Memory and Programmable Logic

RAM and ROM – Memory Decoding – Error Detection and Correction – Programmable Logic Array – Programmable Array Logic – Sequential Programmable Devices.

5.2 Inside the Computer

The Von Neumann Architecture – CPU Subunits and Data Path – CPU and Main Memory – Stored Program Computer – Role of Input/output Devices – Machine vs Assembly Languages.

BOOKS FOR STUDY

David Reed. *A Balanced Introduction to Computer Science,* 3rd ed. Prentice Hall, 2010. [Unit 5.2: Chapter 14]

Mano, M. Morris, Micheal D. Ciletti, *Digital Design with an Introduction to Verilog HDL*, 6th ed. Pearson, 2018. [Unit 2: Chapters 2 &3, Unit 3: Chapter 4, Unit 4.2: Chapter 6, Unit 5.1: Chapter 7]

Mano, M. Morris. *Digital logic and computer design*. Pearson Education India, 2017. [Unit 1:Chapter 1, Unit 4.1: Chapter 6]

BOOKS FOR REFERENCE

Charles H. Roth Jr., Larry L. Kinney, *Fundamentals of Logic Design*, Sixth Edition, Cengage Learning.

Morris Mano, Charles K. Kime, Tom Martin, *Logic and computer design fundamental*, 5th Edition, Pearson.

WEB RESOURCES

https://www.researchgate.net/publication/267334709_Fundamentals_of_Digital_Systems/download

http://info.iet.unipi.it/~luigi/biomedica/sito/cosc205.pdf

https://web2.aabu.edu.jo/tool/course_file/lec_notes/901220_logic%20notes.pdf

PATTERN OF ASSESSMENT:

Continuous Assessment Test: Total Marks: 50 Duration: 90 minutes

Section A - 10×1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)

Section B - 5×2 = 10 marks (Answer all the questions)

Section C - 4×5 = 20 marks (4 out of 5)

Section D - 1×10 = 10 marks (1 out of 2)

Other Components: Total Marks: 50

Quiz/Assignment/Seminar/Problem solving

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20×1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)

Section B - 5×2 = 10 marks (Answer all the questions)

Section C - 8×5 = 40 marks (8 out of 10)

Section D - 3×10 = 30 marks (3 out of 5)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

Soft Skills Course Offered to students of
B.A. / B.Sc. / B.Com. / B.B.A. / B.V.A. / B.S.W. / B.C.A. Degree Programme

SYLLABUS
(Effective from the academic year 2019 – 2020)

LIFE SKILLS – HEALTH, ENERGY AND COMPUTER BASICS

CODE: 19CS/SS/HC13 **CREDITS: 3**
L T P: 3 0 0
TOTAL TEACHING HOURS: 39

OBJECTIVES OF THE COURSE

- To sensitise students to the fact that good health lies in nature
- To create an awareness about energy obtained from different components of food and to plan for a balanced diet
- To enable students to understand the significance of energy conservation and strategies for conserving energy
- To provide a basic knowledge of computer fundamentals and Email configuration

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- identify the importance of a few plants and their health benefits
- recognise the causes and symptoms of common disorders
- calculate food energy values and follow the Recommended Dietary Allowances (RDA) and appreciate the need for them.
- conserve energy and use it responsibly
- understand computer configuration for purchase of personal computer and E mail setting

Unit 1 (13 Hours)

Food and Health

1.1 Traditional food and their health benefits

1.1.1 **Six tastes –** Natural guide map towards proper nutrition

1.1.2 Nutritional value and significance of Navadhanya (Sesame seed, Bengal gram, Horse gram, Green gram, Paddy seeds, White beans, Wheat, black gram and Chick pea) and Greens (Vallarai, Thuthuvalai, Manathakkali, Pulichakeerai, Agathi Keerai, Murungai Keerai, Karuveppilai, Puthina and Kothamalli)

1.2 Causes, symptoms and home remedies for the following ailments

Common cold, Anaemia, Hypothyroidism, Obesity, Diabetes, Mellitus, Polycystic Ovarian Syndrome, Ulcer, Wheezing and Hypertension

Unit 2 **(13 Hours)**

Food and energy balance

2.1 Units of Energy, Components of Total Energy Requirement – Basal Metabolic Rate, energy requirements for (work) physical activity and Thermic effect of food

2.2 Factors affecting Basal Metabolic Rate and Thermic Effect of food

2.3 Recommended Dietary Allowances and Balanced Diet, Food Energy Values-Calculation

Unit 3 **(13 Hours)**

3.1 Energy conservation

3.1.1 Needs for Energy Conservation – Power consumption of domestic appliances – Electrical Energy Audit – Strategies for Energy Conservation - Modern lighting systems– Light emitting diode (LED), Compact fluorescent lamps (CFL), Green indicators and Inverter, Green building - Home lighting using Solar cell - Solar water heaters- Water and waste management - Biogas plant

3.1.2 Safety Practices in using electronic gadgets and electricity at home – Precautions - Shock- Use of testers to identify leakage

3.2 Computer fundamentals

3.2.1 Essentials of Purchasing a Personal Computer - Fundamentals of Networks – Local Area Network, Internet, Networking in real-time scenario- Computer Hacking – Computer Forensics Fundamentals – Cyber Laws - Secure Browsing

3.2.2 **Configuring Email**

Configure Email Settings – Attachments – Compression – Organizing Emails – Manage Folders - Auto Reply - Electronic Business Card - Email Filters- Manage Junk Mail - Calendar - Plan Meetings, Appointments - Scheduling Emails

3.2.3 Emerging Trends in IT - 3D Printing, Cloud Storage, Augmented Reality, Artificial Intelligence, Internet of Things (IoT)

BOOKS FOR REFERENCE

Achaya K. T. *The Illustrated Foods of India*. Oxford Publications, 2009.

Guyton, A.C. *Text Book of Medical Physiology*. (12th ed.). Philadelphia: W.B. Saunders & Co., 2011.

Joe Benton, *Computer Hacking: A Beginner's Guide to Computer Hacking, How to Hack, Internet Skills, Hacking Techniques, and More!,* Createspace Independent Pub, 2015.

John Vacca, *Computer Forensics*: Computer Crime Scene Investigation, Laxmi Publications 2015.

Pradeep Sinha, Priti Sinha, *Computer Fundamentals 6th Edition*, BPB Publications, 2003.

Srilakshmi, B. *Nutrition Science* (4th Revised Edition), New Delhi: New Age International (P) Ltd., 2014.

Suzanne Le Quesne *Nutrition: A Practical Approach*, Cornwall: Thomson, 2003.

Therapeutic Indes – Siddha, 1st edition, SKM Siddha and Ayurveda, 2010.

Trevor Linsley, *Basic electrical installation work.* Newnes rint of Elsevier 2011.

PATTERN OF ASSESSMENT

Continuous Assessment: **Total Marks: 50**

Two to three Task based components
Task based classroom activities
Case studies
Group discussions
Group presentation
Role play

No End Semester Examination

No CA test

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

(Effective from the academic year 2019–2020)

PROCEDURE ORIENTED PROGRAMMING

CODE:19CS/MC/PO24 **CREDITS:4**

L T P:2 0 4

TOTAL TEACHING HOURS:78

OBJECTIVES OF THE COURSE

- To understand and implement Pointers, Strings, Dynamic memory allocation
- To understand and compare Structures and Unions
- To appreciate the role of build tool while developing large programs
- To understand Pre-processing, Command Line arguments and Error Handling
- To understand File I/O

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Develop programs using pointers and strings
- Create applications using dynamic memory allocation
- Apply the concept of structures and unions relevantly
- Build large applications using make utility
- Use preprocessing appropriately
- Handle data using files

Unit 1 (20 Hours)

1.1 Pointers

Pointers variable – Address of and Dereferencing operators – Declaring a pointer – Initializing a pointer - Pointers and Function Arguments – Dynamic memory allocation – malloc, calloc, realloc and free - Pointers and Arrays - Address Arithmetic - Character Pointers and Functions - Pointer Arrays - Pointers to Pointers - Multi-dimensional Arrays - Initialization of Pointer Arrays - Pointers vs. Multi-dimensional Arrays - Pointers to Functions

1.2 String Concepts

String representation – Initialization - Length – Compare – Copy – Concatenate – Substring - Search – Replace – Conversion to int and vice versa

1.3 String built-in functions

strlen, strcmp, strcpy, strcat, strchr, strstr, strrev, atoi, itoa

Unit 2 (19 Hours)

2.1 Structures and Unions

Defining a Structure - Declaring a structure variable - Member operator - Structures and Functions - Arrays of Structures - Pointers to Structures - Nested Structures - Arrow operator - Self-referential Structures - Typedef - Unions - Bit-fields

Unit 3 **(12 Hours)**

3.1 Designing a Large Program

Issues in developing a large program - Module & its Components (Header files, Object files & The process of linking) - Make utility – MakeFile structure (Rules, Targets, Prerequisites, Commands) – Variables - Dependency Checking –Minimizing Rebuilds - Invoking Make – Basic Make syntax

Storage classes – extern keyword in multiple files

Unit 4 **(17 Hours)**

4.1 File I/O

File Descriptors - Opening a file - Creating a file - Closing - Unlinking - Reading - Writing - File Access (Sequential, Random) - Error Handling

4.2 Command Line Arguments

Unit 5 **(10 Hours)**

5.1 Pre-processing

File Inclusion, Macro Substitution, Conditional Compilation, Macros – Simple, Nested, Argumented

OPTIONAL SELF STUDY

The following source code will help enhance C skills of the students. Hence it is recommended.

- Source code walkthrough and demo - Listing Directories Example

BOOKS FOR STUDY

Kernighan, Brian, and Dennis M. Ritchie. *The C programming language*. Prentice hall, 2012.

Mecklenburg, Robert. *Managing Projects with GNU Make: The Power of GNU Make for Building Anything*. " O'Reilly Media, Inc.", 2004.

BOOKS FOR REFERENCE

Balagurusamy, E. *programming in ANSI C*. 7 ed., Tata McGraw-Hill Education, 2017

Stallman, Richard M., and Roland McGrath, Paul D. Smith "GNU Make-A Program for Directing Recompilation." Version 4.2, May 2016

WEB RESOURCES

https://www.gnu.org/software/make/manual/make.html
https://www.gnu.org/software/make/manual/html_node/Simple-Makefile.html
https://www.cs.swarthmore.edu/~newhall/unixhelp/howto_makefiles.html
https://www.programiz.com/c-programming

PRACTICAL EXERCISES

Implementing sorting and searching algorithms
Implement Programs to manipulate pointers like pointers and functions, pointers and arrays, pointers and strings
Programs Implementing structures, nested structures, manipulating structures with pointers and dynamic allocation and unions
Implementing stack, queue, linked list data structures
Program to create a file, perform copying, merge and search operations using command line arguments
Programs using pre-processing

PATTERN OF ASSESSMENT:

Continuous Assessment Test:

Total Marks: 50 (Theory-25, Practical -25) **Duration: 90 minutes**

Section A - 10 × 1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)

Section B - 3 × 5 =15 marks (3 out of 4)

Other Components: **Total Marks:50**

Component 1:

Quiz/Open book tests/Case study/Assignments/Debugging/Coding

Component 2:

Mini Project as a team

* Each student creates a module and it is finally built using Make

End-Semester Examination: **Total Marks:100** **Duration:3 hours**

Theory - 50 marks **Duration – 1 ½ hours**

Practical - 50 marks **Duration – 1 ½ hours**

Section A-10 x 1 = 10 (Answer all the Questions)
(5 Multiple choice questions and 5 Fill-in the Blanks)

Section B - 5 × 2 = 10 (Answer all the Questions)
(Atleast 1 question from each unit)

Section C - 6 ×5 = 30 (6 out of 8)
(Atleast 1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019–2020)

ALGORITHMS AND DATA STRUCTURES

CODE:19CS/MC/AD23 **CREDITS:3**
L T P:3 1 0
TOTAL TEACHING HOURS: 52

OBJECTIVES OF THE COURSE

- To understand Searching and Sorting Algorithms
- To develop the ability to analyse the effectiveness of algorithms using Asymptotic notations
- To understand List ADT and its operations using Array and Linked list
- To understand Stack and Queue ADT
- To understand Tree and Heap data structures
- To understand Graph data structure, Hash tables and Hash functions

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Trace searching and sorting algorithms
- Compute effectiveness of an algorithm
- Identify the operations possible on List ADT
- Identify processes that use Stack and Queue ADT
- Identify appropriate data structures for real time applications

Unit 1 **(10 Hours)**

1.1 Introduction to Algorithms and Data Structures

Pseudo code - Algorithm - Characteristics (Finite steps, Unambiguous, Input, Output) - Algorithm Notations - Efficiency of Algorithm- Role of Technology in Efficiency – Best, Average, Worse case – Asymptotic notations - Abstract Data Type –Examples - Data Structure- Examples - Difference between ADT and Data Structures

1.2 Search Algorithms

Linear - Binary

1.3 Sorting Algorithms

Bubble Sort - Insertion Sort

Unit 2 **(11 Hours)**

2.1 List

ADT specification - Operations – Traversing, Searching, Insert, Delete – Implementation - Array, Memory Allocation, Linked List (Singly, Doubly, Circular, Header) – Implementing a Lexicon using Linked List

Unit 3 **(11 Hours)**

3.1 Stack

ADT sp1ecification - Operations – Push, Pop – Implementation (Array, Linked List) - Applications -Infix to Postfix conversion, Postfix Evaluation, Recursion – QuickSort, Merge Sort

3.2 Queue

ADT specification - Operations- Enqueue, Dequeue – Implementation (Array, Linked List)

Unit 4 **(10 Hours)**

4.1 Tree

Definition and Terms - Binary Tree - Representation, Traversal, Searching - Binary Search Tree - Searching, Deleting and Inserting – Linked List Implementation of BST- Implementing a Lexicon using BST – Heap – Priority Queue ADT - Heap Property and Shape Property – Types of Heap(MinHeap, MaxHeap) – Build a heap – Operations(Insert, Delete) - Heap sort

Unit 5 **(10 Hours)**

5.1 Graph

Definition and Concepts - Representation of Graphs - Graph Traversals (Breadth First Search and Traversal, Depth First Search and Traversal) – Shortest Path algorithm (Dijkstra's algorithm)

5.2 Hashing

Hash Table – Hash function - Properties of hash function – Collision – Collision Resolution (Open Addressing, Closed Addressing) - Implementing a Lexicon using Hash Table

5.3 Identifying data structures for real time applications

BOOKS FOR STUDY

Lipschutz Seymour. *Schaum Series Data structures.* New Delhi: Tata McGraw Hill, 2013.

Niema Moshiri, Liz Izhikevich. *Design and Analysis of Data Structures (*Hashing, Heap, Implementing a Lexicon*)*

Shaffer, Clifford A. "Data Structures and Algorithm Analysis." *Update* 3 (2012): 0-3. (Best, Worst, Average case, Asymptotic notations)

BOOKS FOR REFERENCE

Alfred V. Aho , Hopcroft, Jeffrey D. Ullman. Data Structures and Algorithms. Bell Laboratories

Goodrich, Michael T., Roberto Tamassia, and Michael H. Goldwasser. Data structures and algorithms in Java. John Wiley & Sons, 2014.

Horowitz, Ellis, Sartaj Sahni, and Susan Anderson-Freed. Fundamentals of data structures

Weiss, M.A. *Data Structures and Algorithm Analysis in C.* 2nd ed. Pearson Education, 2002.

WEB RESOURCES

http://www.cs.armstrong.edu/liang/animation/animation.html
https://www.geeksforgeeks.org/linked-list-set-1-introduction/

PATTERN OF ASSESSMENT

Continuous Assessment Test: Total Marks: 50 Duration: 90 minutes

Section A - 10 × 1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - 5 × 2 = 10 marks (Answer all the questions)
Section C - 4 × 5 = 20 marks (4 out of 5)
Section D - 1 × 10 = 10 marks (1 out of 2)

Other Components: Total Marks:50

Seminars/Quiz/Open book tests/Group discussion/Assignments/Problem solving/
Role plays/Tracing algorithms/Identifying appropriate data structures for different processes

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20 × 1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)
Section B - 5 × 2 = 10 marks (Answer all the questions)
(1 question from each unit)
Section C - 8 × 5 = 40 marks (8 out of 10)
(2 questions from each unit)
Section D - 3 × 10 = 30 marks (3 out of 5)
(1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 600 086

General Core Course Offered to students of
B.A. / B.Sc. / B.Com. / B.B.A. / B.V.A. / B.S.W. / B.C.A. Degree Programme

SYLLABUS
(Effective from the academic year 2019-2020**)**
ENVIRONMENTAL STUDIES

CODE:19CS/GC/ES12 **CREDITS:2**
L T P:2 0 0
TOTAL TEACHING HOURS:26

OBJECTIVES OF THE COURSE

- To help students to gain the fundamental knowledge of the environment
- To create in students an awareness of current environmental issues
- To inculcate in students an eco-sensitive, eco-conscious and eco-friendly attitude

COURSE LEARNING OUTCOMES
On successful completion of this course, students will be able to

- Articulate the interdisciplinary context of environmental issues
- Adopt sustainable alternatives that integrate science, humanities and social perspectives
- Appreciate the importance of biodiversity and a balanced ecosystem
- Calculate one's carbon footprint

Unit 1 **(10 Hours)**

1.1 Introduction: The multidisciplinary nature of environmental studies; Environmental Ethics-Role of the Individual in protecting the environment

1.2 Natural Resources: renewable (forests and water)and non-renewable (minerals)-energy resources: renewable and non-renewable sources, impact of over-exploitation

1.3 Ecosystems: terrestrial (forest, grassland and desert) and aquatic (ponds, oceans and estuaries); structure and function

1.4 Biodiversity: India as a mega-diversity nation; threats to biodiversity; i*n-situ* and *ex-situ* conservation of biodiversity

1.5 Solid Waste Management, Source Segregation and Rain Water Harvesting

Unit 2 **(10 Hours)**

2.1 Environmental Pollution: Air, Water, Noise and Plastic Pollution: causes, effects and control measures -Impact of over-population on pollution and health – carbon footprint

2.2 The Environmental Dimension of Sustainable Development: The United Nations Sustainable Development Goals of the 2030 Agenda

2.3 Climate Change and Environmental Disasters: Natural Disasters: floods, earthquakes, cyclones, tsunamis and landslides; man-made disasters: Bhopal Gas Tragedy and Chernobyl Nuclear Disaster

2.4 Environmental Movements: Chipko, Silent Valley and Narmada Bachao Andolan International Agreements: Montreal Protocol, Kyoto Protocol and Climate Change Conferences

2.5 An Overview of Environmental Laws in India: Environmental (Protection) Act 1986, Biological Act, 2002, National Green Tribunal Act, 2010, Coastal Regulation Zone Notification, 2011

Unit 3 **(6 Hours)**

3.1 A study of the eco-friendly initiatives on campus

3.2 A critical review of an environmental documentary film

3.3 Ecofeminism and the contributions of Indian Women Environmentalists

3.4 The highlights of Environmental Encyclical-*Laudato si*-On Care for our Common Home

3.5 Environmental Calendar

BOOK FOR STUDY

Bharucha, Erach. *Textbook of Environmental Studies for Undergraduate Courses,* (2nd ed.) Universities Press, 2013.

BOOKS FOR REFERENCE

Bhattacharya, K.S. Arunima Sharma, *Comprehensive Environmental Studies* Narosa Publishing House Pvt.. Ltd., New Delhi, 2015.

Saha, T.K., *Ecology and Environmental Biology* Books and Allied (P) Ltd., Kolkata 2016.

Sharma, J.P. *Environmental Studies (for undergraduate classes)* 3rd edition, University Science Press, 2016.

JOURNALS

Journal of Environmental Studies and Sciences

Journal of Environmental Studies

WEB RESOURCES

www.enn.com

www.nationalgeographic.com

PATTERN OF ASSESSMENT

Continuous Assessment Test: **Total Marks: 25** **Duration: 60 minutes**

Section A-10 x 1 = 10 Marks (All questions to be answered) Multiple Choice Questions

Section B - 3 x 5 = 15 Marks (3 out of 6 to be answered in 150 words each)

Other Component: **Total Marks: 25**

Any **one** of the following for 25 marks

Quiz/Scrap Book/Assignment / Poster Making/Case Study/Project/Survey/Model-Making

No End Semester Examination

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

Soft Skills Course Offered to students of
B.A. / B.Sc. / B.Com. / B.B.A. / B.V.A. / B.S.W. / B.C.A. Degree Programme

SYLLABUS
(Effective from the academic year 2019 - 2020)

LIFE SKILLS: PERSONAL AND SOCIAL

CODE: 19CS/SS/PS13 **CREDITS: 3**
L T P: 3 0 0
TOTAL TEACHING HOURS: 39

OBJECTIVES OF THE COURSE

- To enable students to understand the working of Indian Governance and laws
- To empower students as citizens by teaching them how to use the RTI, the PIL and the FIR
- To provide students an insight into the strengths and virtues essential to improve wellbeing
- To bring about awareness of societal dynamics
- To create awareness, impart knowledge and hone skills necessary to make sound financial decisions

COURSE LEARNING OUTCOMES

On successful completion of this course, students will be able to

- demonstrate knowledge of the working of the government
- file RTIs, PILs and FIRs
- improve their quality of life
- exhibit social consciousness
- exhibit prudent behaviour in managing personal finance

Unit 1 **(13 Hours)**

Legal Literacy

1.1 Structure of Government- Central and State, Urban and Rural
1.2 Laws pertaining to Women (CEDAW) and Children (POCSO)
1.3 Right to Information Act 2005, drafting and filing an RTI
1.4 Introduction to PIL, Landmark PIL cases -Vishaka Vs. State of Rajasthan, Hussainara Khatoon Vs. State of Bihar, MC Mehta Vs. Union of India
1.5 Importance of FIR and lodging an FIR

Unit 2 **(13 Hours)**

2.1 Understanding Self

2.1.1 Psychological wellbeing - meaning, components and barriers
2.1.2 Gratitude- meaning, nature and expression
2.1.3 Resilience- meaning, nature, benefits and simple techniques for building resilience.

2.2 Understanding Society

2.2.1 Concepts of class, caste, gender, disability, race, culture, religion, ethnicity, context and language

2.2.2 Importance of societal analysis

2.2.3 Social indicators of development – HDI, GDI, Poverty Index, Hunger Index

2.2.4 Issues and challenges for social change in India

Unit 3 (13 Hours)

Personal Financial Planning

3.1 Meaning, Need and Importance of Personal Financial Planning

3.2 Core concepts in Financial Planning – Budget, Savings and Investment

3.3 Converting non-essential expenditure into Savings and Investment

3.3.1 Forms of Savings – Deposits, Insurance

3.3.2 Types of Investments – Securities, Real Estate and Gold

3.4 Digital transformation in Finance

3.4.1 De-Mat Account

3.4.2 Net Banking and Mobile Banking

BOOKS FOR REFERENCE

Agarwal, R.C. Constitutional Development and National Movement of India. New Delhi: S. Chand, 1988.

Ahuja Ram. Social Problems in India. Rawat Publications. 3rd Edition, 2014

Allan, R. Modern Politics and Government. New York: Palgrave MacMillan, 2000.

Baumgardner, S., & Crothers, M. Positive Psychology. Chennai: Pearson. 1st Edition,2015.

Grenville-Cleave, B. *Positive Psychology A practical Guide*. United Kingdom: Icon Books Ltd, 2012.

Pandey, J.N. Constitutional Law of India. Allahabad: Central Law Agency, 2014.

Weiner, M. The Indian Paradox. New Delhi: Sage , 1989.

PATTERN OF ASSESSMENT

Continuous Assessment: **Total Marks: 50**

Two to three Task based components

Task based classroom activities

Case studies

Group discussions

Group presentation

Role play

No End Semester Examination

No CA test

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019–2020)

CREATIVE WEB DESIGNING

CODE:19CS/MC/WD33 **CREDITS: 3**
L T P: 3 1 0
TOTAL TEACHING HOURS: 52

OBJECTIVES OF THE COURSE

- To pursue practical skills in image editing and animation using GIMP
- To impart creativity through logo design and 2D animation in GIMP
- To understand the principles of effective web page designing and learn the same with HTML5 and CSS
- To create interactive web pages using JavaScript
- To learn how to design webpages for multiple devices

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Edit images using GIMP
- Design their own textures, logos and also to create animations using GIMP
- Design and structure a web page with different elements using HTML5 and CSS
- Create web sites with dynamic content using JavaScript
- Understand the importance of having web pages designed for different devices and to do the same

Unit 1 **(10 Hours)**

1.1 Photo Editing

GIMP Basics – Image Handling Basics – Working with Images - Photograph Retouching – Global Transformations – Local Transformations – Painting and Drawing - Dodging, Burning and Smudging – Selections, Overlaying and Blending Modes – Digital Collage

Unit 2 **(12 Hours)**

2.1 Textures, Logos and 2D Animation

Creating Textures - Logos - Animation – Building an Animated GIF by Hand – Using Animation Tools – Using GAP

2.2 Designing a Website

Laying Out a Website – Fixed and Variable Width Designs – Web Design Tools – Optimizing Images for the Web

Unit 3 **(10 Hours)**

3.1 HTML5

Design Principles - HTML rules - Structure of HTML documents - Limitations of HTML – Introduction to HTML5 - Semantic/ Structural Elements - article, aside, bdi, details, dialog, fig caption, figure, footer, header, main, mark, menu item, meter, nav, section, summary, time, wbr - Handling Forms - Media Elements - audio, source, embed, video

3.2 CSS

Introducing CSS – Types of CSS – External, Embedded and Inline - Color - Text Boxes – List – Tables – Forms -Images – Page Layout

Unit 4 **(10 Hours)**

4.1 Basics of JavaScript

JavaScript and HTML Text - Variables, Operators, Functions, Arrays, Expressions and Control Flow - Literal and variables - The with statement - Using on error, try, catch – Conditionals – Looping - Event Handling **–** DOM - Form validation using DOM Constraints - Accessing CSS from JavaScript – JQuery

Unit 5 **(10 Hours)**

5.1 Responsive Web Design

Introduction to Responsive Web Design – Aspect Ratio - Media Queries – Fluid Layouts – Typography

Workshop on Look and Feel, Visualization

BOOKS FOR STUDY

Ben Frain, *Responsive Web Design with HTML5 and CSS3*, Packet Publishing, 2012 (Unit 3 & Unit 5).

Olivier Lecarme, Karine Delvare, *The Book of GIMP: A Complete Guide to Nearly Everything*, No Starch Press, 2013 (Unit 1 & Unit 2).

Robin Nixon, *Learning PHP, MySQL, JavaScript, CSS and HTML5*. 3rd ed. USA: O'Reilly, 2014 (Unit 4).

BOOKS FOR REFERENCE

Jason van Gumster Robert Shimonski, *GIMP Bible,* Wiley Publishing, 2010.

Karin Kylander & Olof S Kylander The Complete Guide to Gimp.

WEB RESOURCES

https://docs.gimp.org/2.10/en/
https://www.w3schools.com/js/
http://prosetech.com/html5/
https://www.html-5-tutorial.com/
https://developer.mozilla.org/bm/docs/Web/JavaScript

PATTERN OF ASSESSMENT

Continuous Assessment Test: Total Marks: 50 Duration: 90 minutes

Section A - 10 × 1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)

Section B - 5 × 2 = 10 marks (Answer all the questions)

Section C - 4 × 5 = 20 marks (4 out of 5)

Section D - 1 × 10 = 10 marks (1 out of 2)

Other Components: Total Marks:50

Quiz/Assignments/Case study

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20 × 1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)

Section B - 5 × 2 = 10 marks (Answer all the questions)
(1 question from each unit)

Section C - 8 × 5 = 40 marks (8 out of 10)
(2 questions from each unit)

Section D - 3 × 10 = 30 marks (3 out of 5)
(1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS) – CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

ESSENTIALS OF OBJECT ORIENTED PROGRAMMING

CODE:19CS/MC/OP33 **CREDITS:3**
L T P:3 1 0
TOTAL TEACHING HOURS:52

OBJECTIVES OF THE COURSE

- To learn the basic concepts of object oriented programming and classes with constructors
- To understand and demonstrate the concepts of inheritance and interfaces
- To provide an understanding of concepts such as packages, exception handling
- To introduce the concepts of multithreading and generics
- To give insight about java library

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Understand the concepts of object-oriented programming
- Use Java programming language at a basic level and construct simple software applications
- Understand classes, objects and implementing inheritance
- Analyze and understand the functionality of Inheritance, Interface and develop simple applications
- To develop software applications and services using Java code

Unit 1 **(14 Hours)**

1.1 Introduction

The History and Evolution of Java – Features of Java –Bytecode - Data Types – Variables –Arrays - Operators - Control Statements - Scanner - Javadoc

1.2 Classes, Objects and Constructors

Introduction to Classes - Overloading Methods- Overloading Constructors- Using Objects as Parameters - Returning Objects – Recursion - Introducing Access Control - Understanding static - Introducing final - Introducing Nested and Inner Classes

Unit 2 **(12 Hours)**

2.1 Inheritance

Inheritance Basics - Member Access and Inheritance - Using super - Creating a Multilevel Hierarchy - When Constructors Are Executed - Method Overriding - Dynamic Method Dispatch- Using Abstract Classes - Using final with Inheritance

2.2 Interfaces

Defining an Interface- Implementing Interfaces- Partial Implementations – Nested Interfaces -Applying Interfaces– Variables in Interfaces - Interfaces Can Be Extended

Unit 3 **(8 Hours)**

3.1 Packages

Defining a Package - Finding Packages and classpath - Access Protection - Importing Packages - Defining, Creating and Accessing a Package

3.2 Exception Handling

Exception-Handling Fundamentals - Exception Types - Uncaught Exceptions - Using try and catch- Multiple catch Clauses - Nested try Statements – throw – throws – finally - Java's Built-in Exceptions - Creating Your Own Exception Subclasses - Checked and Unchecked Exceptions

Unit 4 **(8 Hours)**

4.1 Multithreaded Programming

The Java Thread Model - Creating a Thread - Synchronization

4.2 Generics

Generics: What are Generics? –Simple Generics example, Generic Class with two type parameters, General form of a Generic class, Bounded Types

Unit 5 **(10 Hours)**

5.1 Java Library

String Handling – Exploring Java. Lang: Primitive type Wrappers - Number, Double and Float, Character – Math

5.2 Java.util

Collection Framework - Interfaces: Collection, list, Enumeration, Iterator, List Iterator - Classes: Array List -Utility Classes - Random, Date, Calendar

BOOK FOR STUDY

Schildt, Herbert. *Java: The Complete Reference*. McGraw-Hill Education Group, 2014

BOOKS FOR REFERENCE

Eckel, Bruce. *Thinking in Java*. 4th ed. Pearson Education, 2006.

Liang, Y. Daniel. *Intro to Java Programming, Brief Version*. Pearson Higher Ed, 2015.

Holmes, J. Barry, Joyce, T. Daniel. *Object-oriented Programming with Java*. Jones & Bartlett Learning. 2001

Somashekara, Guru D. S., Manjunatha K. S., *Object Oriented Programming with Java*. PHI Learning Pvt. Ltd., 2017

WEB RESOURCES

http://docs.oracle.com/javase/tutorial/java/index.html/
http://www.java2s.com/Tutorial/Java/CatalogJava.htm/
https://www.edureka.co/blog/object-oriented-programming/

PATTERN OF ASSESSMENT:

Continuous Assessment Test: Total Marks: 50 Duration: 90 minutes

Section A - 10×1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)

Section B - 5×2 = 10 marks (Answer all the questions)

Section C - 4×5 = 20 marks (4 out of 5)

Section D - 1×10 = 10 marks (1 out of 2)

Other Components: Total Marks:50

Seminars/Quiz/ Puzzles/Group discussion/Assignments/Code Reading/Case Studies

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20×1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)

Section B - 5×2 = 10 marks (Answer all the questions)
(1 question from each unit)

Section C - 8×5 = 40 marks (8 out of 10)
(2 questions from each unit)

Section D - 3×10 = 30 marks (3 out of 5)
(1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

SOFTWARE ENGINEERING AND TESTING

CODE:19CS/MC/TE35 **CREDITS:5**
L T P:4 0 2
TOTAL TEACHING HOURS:78

OBJECTIVES OF THE COURSE

- To enable the students to comprehend on the development of different types of software systems may require different software engineering techniques
- To enable the students to get a wider perspective on analysis with software process models
- To know about the fundamental process activities of software requirements engineering, software development, testing, and evolution
- To enable the students introduced to the idea of architectural patterns, well-tried ways of organizing system architectures, which can be reused in system designs
- To understand the stages of testing from testing, during development to acceptance testing by system customers and techniques that help you choose test cases that are geared to discovering program defects

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment
- Develops the ability to work in one or more significant application domains using the software models
- Work as an individual and as part of a multidisciplinary team to develop and deliver quality software using requirement engineering
- Construct the test cases for software applications
- Manage people, product, process and software configuration changes

Unit 1 (17 Hours)

1.1 Introduction to Software Engineering

Introduction - Professional software development, Software engineering ethics, Case studies

1.2 Software processes

Introduction - Software process models, Process activities, Coping with change, The rational unified process.

1.3 Agile software development

Introduction - Agile methods, Plan-driven and agile development - Extreme programming - Agile Project management - Scaling agile methods.

Unit 2 **(18 Hours)**

2.1 Requirements Engineering

Introduction - Functional and non-functional requirements - The software requirements document - Requirements specification - Requirements engineering processes - Requirements Elicitation and analysis - Requirements Validation - Requirements Management.

2.2 System Modeling

Introduction - Context models - Interaction models - Structural models - Behavioral models- Model driven engineering.

Unit 3 **(15 Hours)**

3.1 Architectural Design

Introduction - Architectural design decisions, Architectural views, Architectural patterns, Application architectures.

3.2 Design and implementation

Object-oriented design using the UML - Design patterns.

3.3 Product Metrics for Software

Product Metrics – Framework for product metrics - Architectural Design Metrics - Metrics for the Requirement Model.

Unit 4 **(15 Hours)**

4.1 Software Testing

Software Testing Techniques - Software Testing Fundamentals - Test Case Design - White-Box Testing - Basis Path Testing - Control Structure Testing - Black-Box Testing - Testing for Specialized Environments – Architectures and Applications.

4.2 Software Testing Strategies

A Strategic Approach to Software Testing - Strategic Issues - Unit Testing - Integration Testing - Validation Testing - Component Testing - System Testing - The Art of Debugging.

4.3 Software Evolution

Evolution processes - Program evolution dynamics - Software maintenance - Legacy System Management.

Unit 5 **(13 Hours)**

5.1 Software Configuration Management

Introduction – Software Configuration Management – The SCM Repository, The SCM Process.

5.2 Project Management Concept

The Management Spectrum – People - The Product - The Process – The Project - The W^5HH Principle.

5.3 Estimation for Software Project

The Project Planning Process - Software Scope and Feasibility – Resources - Software Project Estimation - Empirical Estimation Models.

BOOKS FOR STUDY

Pressman, Roger S. *Software Engineering – A Practitioner's Approach*, 7th ed., McGraw-Hill International Edition, 2010.

Sommerville, Ian. *Software Engineering*, 9th ed., Pearson Education Asia, 2011.

BOOKS FOR REFERENCE

Ghezzi, Carlo, Mehdi Jazayeri, and Dino Mandrioli. *Fundamentals of software engineering*. Prentice Hall PTR, 2002.

Pfleeger and Lawrence. *Software Engineering: Theory and Practice*. 2nd ed. Pearson Education, 2010

Schach, Stephen R. *Object-oriented software engineering*. McGraw-Hill, 2008.

WEB RESOURCES

http://www.diva-portal.org/smash/get/diva2:215169/fulltext01

http://github.com/collections/software-development-tools

https://www.d.unn.edu/~gshute/softeng/principles/html

PATTERN OF ASSESSMENT:

Continuous Assessment Test: **Total Marks: 50 (Theory-25, Practical -25)**
Duration: 90 minutes

Section A - 10 × 1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - 3 × 5 =15 marks (3 out of 4)

Other Components: **Total Marks:50**
Case study/Assignments/Practical Test

End-Semester Examination: **Total Marks:100** **Duration:3 hours**
Theory - 50 marks **Duration – 1 ½ hours**
Practical - 50 marks **Duration – 1 ½ hours**

Section A-10 x 1 = 10 (Answer all the Questions)
(5 Multiple choice questions and 5 Fill-in the Blanks)
Section B - 5 × 2 = 10 (Answer all the Questions)
(Atleast 1 question from each unit)
Section C - 6 ×5 = 30 (6 out of 8)
(Atleast 1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019–2020)

CREATIVE WEB DESIGNING - PRACTICAL

CODE:19CS/MC/P132 **CREDITS:2**
L T P:0 0 3
TOTAL TEACHING HOURS:39

OBJECTIVES OF THE COURSE

- To pursue practical skills in image editing and animation using GIMP
- To impart creativity through logo design and 2D animation in GIMP
- To understand the principles of effective web page designing and learn the same with HTML5 and CSS
- To create interactive web pages using JavaScript
- To learn how to design webpages for multiple devices

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to
`

- Have an expertise in photo editing using GIMP
- Design their own textures, logos and also to create animations using GIMP
- Learn how to design and structure a web page with different elements using HTML5 and CSS
- Create web-pages with dynamic content using JavaScript
- Understand the importance of having web pages designed for different devices and to do the same

GIMP

1. Exercise to create a picture using layers and basic tools.
2. Exercise on photography retouching.
3. Exercise to create a photo collage.
4. Exercise to create a logo.
5. Exercise to create a banner.
6. Exercise to create a webpage background image using filters
7. Exercise on animation using frame by frame and moving along the path.
8. Exercise on laying out a website.

HTML5 and CSS

9. Using HTML features - standard tags, fonts, headings, paragraphs, formatting, list, anchor tags, image linking and multimedia
10. Designing a web page with focus on tables and layers
11. Designing a web page with focus on forms and hands-on experience on different page
12. layouts, web pages with interactivity
13. Exploring and learning the above concepts using Dreamweaver
14. Exercises on div tag, navigations, CSS
15. Exercise a building a Multilingual Web page

JavaScript

16. Programs using operators and control statements
17. Implementing text, number, date and email id validations
18. Exercises on events
19. Using arrays
20. Processing inputs and displaying messages incorporating system time
21. Programs implementing JavaScript objects
22. Programs to handle exceptions

PATTERN OF ASSESSMENT:

Continuous Assessment Test:	**Total Marks: 50**	**Duration: 90 minutes**
Practical		
Other Components:	**Total Marks: 50**	
Practical	25 Marks	
Mini Project	25 Marks	
End-Semester Examination:	**Total Marks: 100**	**Duration: 3 hours**
Practical		

STELLA MARIS COLLEGE (AUTONOMOUS) – CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

OBJECT ORIENTED PROGRAMMING - PRACTICAL

CODE:19CS/MC/P232

CREDITS:2
L T P:0 0 4
TOTAL TEACHING HOURS:52

OBJECTIVES OF THE COURSE

- To solve computational problems using basic constructs like if-else, control structures, array, and strings
- To implement relationships between classes
- To demonstrate various collection classes
- To implement and understand programs on exceptions, multithreading

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Understand the basic approaches to the design of software applications
- Understand the concepts of Objects and Classes through Java programming
- Use Java programming to implement OOPs concepts like Inheritance, Interface
- Understand the concepts like Threading using programming
- Learn the concepts of Package by implementing

A. Basic Java components:
   - Program to demonstrate the use of command line argument.
   - Program to demonstrate basic constructs like if-else and control structures.
   - Program to understand the working of an array.
   - Program to understand string class and demonstrate its various functions.

B. Perform following practical on some case study like Banking Application, Library Application etc.
   - Find out classes, objects and their properties.
   - Create and display objects.
   - Add methods to classes and implement.
   - Refine above objects by adding constructors and local variables and also usage of static keyword.
   - Show communication between the objects by calling instance of one object from another class.
   - Find relationships like inheritance and implement it.
   - Apply Method overriding and implement it in the Application.

C. Applications of the concepts in Java.
- Program to implement Abstract classes and Dynamic method dispatch.
- Program to implement Interfaces
- Program to implement Packages
- Program to implement user defined exceptions.
- Program to illustrate Multithreading.
- Program to illustrate the use of Java Library.

PATTERN OF ASSESSMENT

Continuous Assessment Test:	**Total Marks: 50**	**Duration: 90 minutes**
Practical		
Other Components:	**Total Marks: 50**	
Practical	25 Marks	
Mini Project	25 Marks	
End-Semester Examination:	**Total Marks: 100**	**Duration: 3 hours**
Practical		

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

(Effective from the academic year 2019–2020)

OPERATING SYSTEMS

CODE:19CS/MC/OS45 **CREDITS: 5**

L T P: 5 0 0

TOTAL TEACHING HOURS: 65

OBJECTIVES OF THE COURSE

- To provide an overview of the working and structure of an operating system
- To understand the concepts of Process management
- To understand the concepts of Storage management
- To understand the concepts of Secondary storage management
- To understand the concepts of File Management

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Describe the basic components of an operating system and its services
- Define the concepts of processes, threads, asynchronous signals and competitive system resource allocation
- Outline standard scheduling algorithms for multi-tasking
- Describe secondary storage management
- Describe memory management and File management concepts

Unit 1 (14 Hours)

1.1 Introduction

Introduction – Computer System Organisation – Computer System Architecture – Operating System - Structure, Operations – Process Management – Memory Management – Storage Management - Protection and Security – Kernel Data Structures

1.2 Operating System Structures

Operating System Services – System Calls – System Programs – Operating System Design and Implementation - Operating System Structure –System Boot

Unit 2 (14 Hours)

2.1 Processes

Process Concept – Process Scheduling – Operations on Processes – Interprocess Communication

2.2 Process Synchronisation

Background – The Critical-Section Problem – Peterson's Solution – Synchronisation Hardware – Semaphores – Classic problems of Synchronisation – Monitors

Unit 3 **(13 Hours)**

3.1 Threads

Overview – Multithreading models – Threading issues

3.2 CPU Scheduling

Basic Concepts – Scheduling Criteria – Scheduling Algorithms

3.3 Deadlocks

System Model – Deadlock Characterisation – Methods for handling Deadlocks - Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock

Unit 4 **(13 Hours)**

4.1 Main Memory

Background – Swapping – Contiguous Memory allocation – Paging – Structure of Page Table – Segmentation

4.2 Virtual Memory

Background – Demand Paging – Copy on Write – Page Replacement – Thrashing

Unit 5 **(11 Hours)**

5.1 Secondary Storage Structure

Overview of Mass Storage Structure – Disk Structure – Disk Attachment – Disk Scheduling – Disk Management – Swap Space Management – RAID Structure

5.2 File Management

File System – File Concepts – Access Methods – Directory Structures

5.3 File System Implementation

File System Structures – Allocation Methods – Free Space Management

BOOKS FOR STUDY

Silberschatz, Abraham, Peter B. Galvin and Greg Gagne. *Operating System Concepts*.9 ed. Wiley, 2014.

BOOKS FOR REFERENCE

Madnick, Stuart E., John J. Donovan. *Operating Systems*. McGraw Hill International Edition, 1974.

McHoes, Ann, Flynn, Ida M. *Understanding Operating System.*7th Ed., Cengage Learning. 2014.

Tanenbaum, Andrew. *Modern Operating Systems.* 9th Ed., Prentice Hall, 2014.

WEB RESOURCES

https://www.linux.com/learn/new-user-guides/376-linux-is-everywhere-an-overview-of-the-linux-operating-system/

http://nptel.ac.in/courses/106108101//

https://www.guru99.com/introduction-linux.html

PATTERN OF ASSESSMENT

Continuous Assessment Test: Total Marks:50 Duration: 90 minutes

Section A - 10 × 1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - 5 × 2 = 10 marks (Answer all the questions)
Section C - 4 × 5 = 20 marks (4 out of 5)
Section D - 1 × 10 = 10 marks (1 out of 2)

Other Components: Total Marks:50

Quiz/Assignment/Seminar/Group Discussion/Problem solving

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20 × 1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)
Section B - 5 × 2 = 10 marks (Answer all the questions)
Section C - 8 × 5 = 40 marks (8 out of 10)
Section D - 3 × 10 = 30 marks (3 out of 5)

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BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

FUNDAMENTALS OF DATABASE MANAGEMENT SYSTEMS

CODE:19CS/MC/FD45 **CREDITS:5**
L T P:5 0 0
TOTAL TEACHING HOURS:65

OBJECTIVES OF THE COURSE

- To enable the students to understand the difference between database systems and file systems and the importance of relational data model
- To enable a comprehensive and detailed understanding of the features and characteristics of database systems
- To understand functional dependencies and normalization of database and be able to apply the same on a database
- To be able to apply knowledge to new problems
- To demonstrate an understanding on transaction processing, concurrency control and DB recovery techniques

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Differentiate database systems from file systems
- Define the terminologies, features and characteristics of database systems
- Understand and discuss the importance of relational data modeling and conceptual modeling
- Apply knowledge to new situations
- Normalize databases effectively
- Describe the transaction processing, concurrency control and recovery control

Unit 1 (9 Hours)

1.1 Introduction to Databases

Introduction - An example - Characteristics of the Database Approach - Actors on the Scene - Workers behind the Scene - Advantages of Using the DBMS Approach - A Brief History of Database Applications -When Not to Use a DBMS

1.2 Database System Concepts and Architecture

Data Models, Schemas and Instances - Three Schema Architecture and Data Independence - Database Languages and Interfaces – The Database System Environment - Centralized and Client/Server Architectures for DBMSs - Classification of Database Management Systems

Unit 2 (14 Hours)

2.1 The Relational Data Model and Relational Database Constraints

Relational Model Concepts - Relational Model Constraints and Relational Database Schemas - Update Operations, Transactions and Dealing with Constraint

2.2 Data Modeling Using the Entity-Relationship Model

Using High-Level Conceptual Data Models for Database Design - A Sample Database Application - Entity Types, Entity Sets, Attributes and Keys - Relationship Types, Relationship Sets, Roles and Structural Constraints - Weak Entity Types - Refining the ER Diagram – ER Diagrams, Naming Conventions and Design Issues - Relationship Types of Degree Higher than Two

2.3 The Enhanced ER model

Subclasses, SuperClasses and Inheritance, Specialization and Generalization, Constraints and Characteristics of Specialization and Generalization Hierarchies, Modelling of Union Types Using Categories, Data Abstraction

2.4 Relational Database Design by ER- and EER-to- Relational Mapping

Relational Database Design Using ER-to-Relational Mapping - Mapping EER Model Constructs to Relations

Unit 3 **(14 Hours)**

3.1 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

3.2 More SQL: Complex Queries, Triggers, Views and Schema Modification

More Complex SQL Retrieval Queries - Specifying Constrains as Assertions and Actions as Triggers – Views - Schema Change Statements in SQL

3.3 The Relational Algebra

Unary Relational Operations: Select and Project - Relational Algebra Operations from Set Theory - Binary Relational Operations: Join and Division, Additional Relational Operations, Examples of Queries in Relational Algebra.

Unit 4 **(14 Hours)**

4.1 DB Programming techniques

Introduction to SQL programming Techniques - DB programming: Techniques and Issues -Embedded SQL, Dynamic SQL, DB Stored procedures.

4.2 DB design theory and normalization

Basics of Functional Dependencies and normalization for relational DB-relational DB design algorithms and further dependencies

4.3 PL/ SQL

PL/ SQL Blocks – Architecture - Data Types and their usage - Control Structures - Exceptions - Predefined, User Defined Cursors and Triggers: Introduction – Cursors - Cursor Management – Procedures – Functions - Triggers and its types

Unit 5

5.1 Transaction processing **(14 Hours)**

Introduction, transaction and system concepts, desirable properties of transactions, characterizing schedules based on recoverability and serializability, transaction support in SQL

5.2 Concurrency Control Techniques

Two phase locking techniques, concurrency control based on timestamp ordering, multiversity concurrency control techniques, validation concurrency control techniques, granularity of data items and multiple granularity locking, using locks for concurrency control in indexes, other concurrency control issues

5.3 DB Recovery Techniques

Recovery concepts, no undo /redo recovery based on deferred update, recovery techniques based on immediate update, shadow paging, Aries recovery algorithm, recovery in multi DB systems, DB backup and recovery for catastrophic failures

BOOKS FOR STUDY

Elmasri, Ramez, and Shamkant Navathe. Fundamentals of database systems. Addison-Wesley Publishing Company, 2010.

BOOKS FOR REFERENCE

Bayross, Ivan. *SQL, PL/SQL: The Programming Language of Oracle*. Tech Publications Private Limited, 2000.

Chopra, Rajiv. *Database Management System (DBMS) A Practical Approach*. S. Chand Publishing, 2010.

Date C. J. *Introduction to Database Systems*. USA: Pearson Education, 2003.

Garcia-Molina, Hector. *Database systems: the complete book*. Pearson Education India, 2008.

Michael Mclaughlin. Oracle Database 11g PL/SQL Programming.Oracle Press. McGraw Hill, 2008

Ramakrishna, Raghu and Johannes Gerhke. *Database Management Systems*. McGraw Hill, 2002.

Silberschatz, Abraham, Henry F. Korth, and S. Sudarshan. Database System Concepts. McGraw Hill, 2008.

WEB RESOURCES

http://www.w3schools.com/sql/

http://www.oracle.com/technetwork/tutorials/index.html

http://sqlzoo.net/

https://eu.udacity.com/course/intro-to-relational-databases--ud197

http://www.sql-tutorial.ru/

PATTERN OF ASSESSMENT

Continuous Assessment Test: Total Marks: 50 Duration: 90 minutes

Section A - 10×1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)

Section B - 5×2 = 10 marks (Answer all the questions)

Section C - 4×5 = 20 marks (4 out of 5)

Section D - 1×10 = 10 marks (1 out of 2)

Other Components: Total Marks:50

Seminars/Quiz/Open book tests/Case Studies/Analysis and Optimization of queries

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20×1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)

Section B - 5×2 = 10 marks (Answer all the questions)

Section C - 8×5 = 40 marks (8 out of 10)

Section D - 3×10 = 30 marks (3 out of 5)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

(Effective from the academic year 2019–2020)

OPERATING SYSTEM CONCEPTS IMPLEMENTATION

CODE:19CS/MC/P342 **CREDITS:2**

L T P:0 0 4

TOTAL TEACHING HOURS: 52

OBJECTIVES OF THE COURSE

- To reinforce the understanding of Operating System Concepts by using commands that interact with the Operating System
- To introduce System Programming

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Use Operating System basic commands and utilities
- View and change file access permission of user files
- Access devices using mount and unmount commands
- Write system programs to manage files and processes

Commands

1. Basic Commands - cat, date, who, pwd, history- filter –head - tail, cut, paste, grep – sed - awk – sort – man - su - whoami - echo
2. Process Utilities - ps - shell process, Parents and children, Process status, System process, running jobs in background, Process System calls – getpid, getppid, fork, executing a process, exit, wait, kill, nice, Job control, cron, pstree
3. Boot Process - Run Levels - init, systemd - Daemon Process
4. Scheduling policies and Priorities – at and batch
5. File System – file- File Access Permission – chmod, chown, chgrp - File Comparisons - View Files - Listing files with attributes – Wildcards – Translating Characters - Links and its types - The File System – Partitions, File Systems types- System calls for file management, directory management
6. Kernel Accesses – Mounting - Unmounting - umask - ulimit - I/O redirection – Pipes
7. Disk Utilities - Disk usage(du), disk free(df), dd, Backups- cpio, tar

System Programming (using system calls)

8. Program to create, execute, terminate a process
9. Program to demonstrate the Memory Layout of a Process
10. Program to perform file operations (open, close, read, write)
11. Program to set permissions on files and directories
12. Program to demonstrate Inter-Process communication

BOOKS FOR REFERENCE

Kerrisk,Michael. *The Linux Programming interface A Linux and UNIX System Programming Handbook*

Mark G Sobell. *Practical guide to Linux - Commands, Editors and Shell programming*, Fourth Edition, 2018

Sumitabha Das. *UNIX Concepts and Applications*, Fourth Edition

PATTERN OF ASSESSMENT

Continuous Assessment Test:	**Total Marks: 50**	**Duration: 90 minutes**
Practical		
Other Components:	**Total Marks: 50**	
Practical / Code Reading / Case Study		
End-Semester Examination:	**Total Marks: 100**	**Duration: 3 hours**
Practical		

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BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

DATABASE MANAGEMENT SYSTEMS PRACTICAL

CODE:19CS/MC/P442 **CREDITS:2**
L T P:0 0 4
TOTAL TEACHING HOURS:52

OBJECTIVES OF THE COURSE

- To enable the students to understand database creation by using commands
- To understand and normalize the table based on the dependencies
- To be able to apply exceptions handling

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Understand the relational data modeling and conceptual modeling
- Understand table creation with keys and Constraints
- Normalize databases effectively
- Apply knowledge to new situations

List of Programs

1. Schema design.
2. ER modelling using a tool.
3. DDL commands.
4. DML and TCL commands.
5. SQL programming, Embedded SQL, Dynamic SQL.
6. Sub queries.
7. Single Row and Aggregate functions, Set operations.
8. Joins.
9. Views, index, synonyms and sequence
10. Report generation
11. Cursors
12. Procedures & Functions
13. Triggers
14. Exception Handling

PATTERN OF ASSESSMENT:

Continuous Assessment Test: **Total Marks: 50** **Duration: 90 minutes**

Practical

Other Components: **Total Marks: 50**

Component I - Data Modeling 25 marks

Component II - DBMS Implementation/Queries 25 marks

End-Semester Examination: **Total Marks: 100** **Duration: 3 hours**

Practical

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BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

COMPUTER NETWORKS

CODE:19CS/MC/CN55 **CREDITS:5**
L T P:5 0 0
TOTAL TEACHING HOURS:65

OBJECTIVES OF THE COURSE

- To understand the division of network functionalities into layers
- To be familiar with the components required to build different types of networks
- To be exposed to the required functionality at each layer
- To learn the flow control and congestion control algorithms
- To introduce the latest networking technologies

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Understands basic computer network technology
- Understand and explain Data Communications System and its components
- Identify the different types of network topologies and protocols
- Enumerate the layers of the OSI model and TCP/IP and explain the function(s) of each layer
- Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation

Unit 1 **(10 Hours)**

1.1 Basic Network Concepts

Data Communication – Networks – Network Types – Internet History – Standard and Administration

1.2 Network Models

Protocol Layering – TCP/IP Protocol Suite – The OSI Model

Unit 2 **(13 Hours)**

2.1 Physical Layer

Data and Signals – Digital Signals – Performance - Transmission Modes – Multiplexing – Transmission Media – Switching - Introduction- Circuit-Switched Networks- Packet Switching

Unit 3 **(15 Hours)**

3.1 Data Link Layer

Introduction -Data Link Control – Framing -Data-Link Layer Protocols -Error Detection and Correction –Introduction -Cyclic Codes-Cyclic Redundancy Check - Checksum

3.2 MAC and Ethernet

Random Access, Controlled Access, Channelization-Ethernet - Ethernet Protocol, Standard Ethernet, Fast Ethernet (100 Mbps), Gigabit Ethernet, 10 Gigabit Ethernet

3.3 Network Layer

Network-Layer Services - IPV4 Addresses - IPv6 Addressing - Representation, Address Space - Address Space Allocation

Unit 4 **(15 Hours)**

4.1 Transport Layer

Transport Layer Services - Connectionless and Connection-Oriented Protocols

4.2 Application Layer

Domain Naming System – DNS Name Space, Distribution of Name Space, DNS in the Internet, Resolution, DNS Messages, Electronic Mail, FTP, TELNET

Unit 5 **(12 Hours)**

5.1 Wireless Networking

Introduction - Components of a Wireless Communication System – Architectural Comparison – Characteristics – Access Control – IEEE 802.11 Project -Wireless Networking Standards – Bluetooth Technology – Other Wireless Technology – WiMax – Cellular Telephony – Satellite networks - Wireless network protocols: ZigBee - ZWAVE, THREAD - Bluetooth Low Energy(BLE) - IPv6 for Low Power and Lossy Networks (6LoWPAN) - Routing Protocol for Low power and lossy networks (RPL) – 2G – 3G and 4G

5.2 Distributed Networking

Introduction – Definition of a Distributed System, Goals, Types of Distributed Systems, Architecture-Architectural Styles, System Architectures, Architecture Vs Middleware, Applications of Distributed Networking

BOOKS FOR STUDY

Forouzan, A. Behrouz. *Data communications & networking.* Tata McGraw-Hill Education, 2012.

Tanenbaum, Andrew S., and Maarten Van Steen. *Distributed systems: principles and paradigms*. Prentice-Hall, 2007. [Unit V – Chapter 1 & 2]

BOOKS FOR REFERENCE

Bonaventure, Olivier. *Computer Networking: Principles, Protocols and Practice*. cnp3book, 2018.

Qureshi, A. Anique, Levine, H. Marc, Shim, K.Jae. *The international handbook of computer networks.* Global Professional Publishing, 2004

Tanenbaum, Andrew S. *Computer Networks*. 5th ed. Pearson publication, 2011.

WEB RESOURCES

http://compnetworking.about.com/od/basicnetworkingconcepts/
http://www.networkconceptsinc.com
http://computerguru.net/Network
http://www.tutorialspoint.com/data_communication_computer_network
https://www.link-labs.com/blog/complete-list-iot-network-protocols

PATTERN OF ASSESSMENT

Continuous Assessment Test: Total Marks: 50 Duration: 90 minutes

Section A - 10×1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - 5×2 = 10 marks (Answer all the questions)
Section C - 4×5 = 20 marks (4 out of 5)
Section D - 1×10 = 10 marks (1 out of 2)

Other Components: Total Marks: 50

Seminars/Quiz/Open book test/Case Study

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20×1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)
Section B - 5×2 = 10 marks (Answer all the questions)
(1 question from each unit)
Section C - 8×5 = 40 marks (8 out of 10)
(2 questions from each unit)
Section D - 3×10 = 30 marks (3 out of 5)
(1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

DATA SCIENCE

CODE:19CS/MC/DS54 **CREDITS:4**
L T P:4 1 0
TOTAL TEACHING HOURS:65

OBJECTIVES OF THE COURSE

- To enable the students to understand the basics of Python language
- To enable a comprehensive and detailed understanding of the Data Science, data formats and data exploratory analysis
- To explore different machine learning techniques
- To understand the various applications of python
- To explore different visualizations techniques in python

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Critically analyze and follow the mechanism to manage, explore, and deep understanding of uncertain and complex data
- Apply Machine Learning techniques to extract actionable value from data
- Assess the use of data from acquisition through cleansing, analytics, and visualization
- Describe the Data Science Process and mechanism
- Institute the skills required for the Data Scientist role

Unit 1 **(10 Hours)**

1.1 Python language Basics

The Python Interpreter-IPython basics- Python Language Basics

1.2 Built-in Data Structures, Functions and Files

Data Structure and Sequences-Functions-Files

1.3 NumPy Basics: Arrays and Vectorized Computation

The NumPy ndarray: A Multidimensional Array Object -Universal Functions-Array Oriented Programming with Arrays-File Input and Output with Arrays

Unit 2 **(15 Hours)**

2.1 Introduction of Data Science and Data pipeline

What Is Data Science? -Data Science Process- Data Loading, Storage and File Formats – Reading and Writing Data in Text Format-Binary Data Formats-Interacting with Web API-Interacting with Databases

2.2 Visualization

Matplotlib – Simple Line Plots-Simple Scatter Plots-Visualizing Errors-Density and Contour Plots-Histogram, Binnings and Density -Customizing Color Bars-Customizing Plot Legends -Multiple Subplots-Text and Annotation-Customizing Ticks

Unit 3 **(15 Hours)**

3.1 Data Cleaning and Preparation

Handling Missing Data-Data Transformation-String Manipulation

3.2 Data Wrangling-Join, Combine and Reshape

Hierarchical Indexing – Combining and Merging Datasets-Reshaping and Pivoting-Getting Started with Pandas-Introduction to Pandas Data Structures- Essential Functionality

Unit 4 **(15 Hours)**

4.1 Machine Learning

Introduction to Machine Learning- Why Machine Learning?

4.2 Supervised Learning

Classifications and Regression-Generalization-Overfitting-Underfitting- Supervised Machine Leaning Algorithms-K-Nearest Neighbor-Linear Models-Naïve Bayes Classifiers-Decision Tree-Ensemble of Decision Trees

4.3 Unsupervised Learning

Types of Unsupervised Learning -Dimensionality Reduction, Feature Extraction-Clustering- Model Evaluation and Improvement- Cross Validation- Grid Search - Evaluation metrics and Scoring- Using evaluation metrics in model selection

Unit 5 **(10 Hours)**

5.1 Natural Language Processing (NLP)

Natural Language Processing (NLP)- Understand the Problem Statement- Tweets Preprocessing and Cleaning-Removing Twitter Handles-Removing Punctuations, Numbers and Special Characters-Removing Short Words- Tokenization-Stemming-Story Generation and Visualization from Tweets-Hashtags-Extracting Features from Cleaned Tweets-Model Building and Sentiment Analysis

5.2 Social Network Analysis

Introduction to Graph Theory-Graph Algorithms-Graph Loading-Dumping and Sampling

BOOKS FOR STUDY

Alberto Boschetti. Luca Masaaron. Python Data Science Essentials. UK: Packt Publishing Ltd, 2016. (Unit 4: Chapter 5, Unit 5: Chapter 6)

Andreas C. Mueller. Sarah Guido. Introduction to Machine Learning with Python. USA: O'Reilly Media, Inc. ,2016. (Unit 3: Chapter1: Introduction to Machine Learning, Chapter 2, Chapter 3)

Jake VanderPlas. Python Data Science Handbook. USA: O'Reilly Media, Inc., 2016. (Unit 5: Chapter 4)

Wes McKinney. Python for Data Analysis. Gravenstein Highway North, Sebastopol: O'Reilly Media, Inc., 2018. Second Edition. (Unit 1: Chapter 2, 3, 4, Unit 2: Chapter 5,6,7,8)

BOOKS FOR REFERENCE

Aurélien Géron. Hands-On Machine Learning with Scikit-Learn and Tensor Flow: Concepts, Tools, and Techniques to Build Intelligent Systems. USA: O'Reilly Media, 2019.

Brian K. Jones. David Beazley. Python Cookbook. USA: O'Reilly Media, Incorporated, 2013.

WEB RESOURCES

https://intellipaat.com/tutorial/data-science-tutorial/introduction-of-data-science/(Unit2: introduction of Data science)
https://machinelearningmastery.com/about/
https://www.analyticsvidhya.com/
https://www.analyticsvidhya.com/blog/2018/07/hands-on-sentiment-analysis-datasetpython/ (Unit 4)

PATTERN OF ASSESSMENT

Continuous Assessment Test: Total Marks: 50 Duration: 90 minutes

Section A - 10×1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - 5×2 = 10 marks (Answer all the questions)
Section C - 4×5 = 20 marks (4 out of 5)
Section D - 1×10 = 10 marks (1 out of 2)

Other Components: Total Marks:50

Case study/Assignments//Seminar/Quiz

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20×1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)
Section B - 5×2 = 10 marks (Answer all the questions)
(1 question from each unit)
Section C - 8×5 = 40 marks (8 out of 10)
(2 questions from each unit)
Section D - 3×10 = 30 marks (3 out of 5)
(1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS) – CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

(Effective from the academic year 2019-2020)

FUNCTIONAL WEB DEVELOPMENT

CODE:19CS/MC/FW54 **CREDITS:4**

L T P:3 0 2

TOTAL TEACHING HOURS:65

OBJECTIVES OF THE COURSE

- To provide awareness about ReactJS and keep updated yourself with latest trends
- To understand functional programming
- To manage data by using State and Props of React
- To create smaller components to build Interactive User interfaces
- To understand about React and how it fits into your web developing process

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Build React applications using React Components
- Manage the state and lifecycle methods of React Components
- Build lists and forms using React Components
- Acquire hands-on knowledge on basic React components and apply them
- Apply database operations in React

Unit 1 **(12 Hours)**

1.1 Introduction to React

Understanding React – React's Future – Keeping up the changes -Setting up the Environment - Working with Files

1.2 Emerging JavaScript

Declaring Variables – Arrow Functions – Transpiling ES6 – ES6 Objects and Arrays – Promises – Classes – ES6 Modules – CommonJS

Unit 2 **(14 Hours)**

2.1 Functional Programming with JS

Understanding Functional Programming – Functional Concepts : Immutability, Pure Functions, Data Transformations, Higher- Order Functions, Recursion, Composition

2.2 Pure React

Page Setup – The Virtual DOM- React Elements – ReactDOM – Children – Constructing Elements with Data – React Components - DOM Rendering – Factories

2.3 React with JSX

React Elements as JSX – Babel – Recipes as JSX – Intro to Webpack

Unit 3 **(14 Hours)**

3.1 Props, State and Component Tree

Property Validation – Validating Props with createClass – Default Props – Custom Property Validation – ES6 Classes and Stateless Functional Components – Refs – React State Management – State within the Component Tree

3.2 Enhancing Components

Component Life Cycles: Mounting, Updating, React Children – JavaScript Library Integration – Higher Order Components – Managing State Outside of React –Flux: Views, Actions and Action Creators, Dispatcher, stores, Flux Implementations

Unit 4 **(14 Hours)**

4.1 Forms

Basic Button – Events and Event Handlers – Text Input – Remote Data – Async Persistence – Redux – Form Modules

4.2 React Router

Incorporating the Router – Nesting Routes – Router Parameters

Unit 5 **(11 Hours)**

5.1 React and Server

Isomorphism vs Universalism – Universal Color Organizer – Communicating with the Server

5.2 Database Operations

CRUD operations in ReactJS - Case study

BOOKS FOR STUDY

Anthony, Accomazzo, Murray Nathaniel, and Lerner Ari. Fullstack React: The Complete Guide to ReactJS and Friends. (2017). [Unit 4.1: Chapter 6]

Banks, Alex, and Eve Porcello. *Learning React: Functional Web Development with React and Redux*. O'Reilly Media, Inc., 2017

BOOKS FOR REFERENCE

Lopez, Lionel, *React: Quickstart Step-by-step Guide to Learning React Javascript Library*

Robin Wieruch, *The Road to learn React*, LeanPub, 2017.

Sidelnikov, Greg, *React.js Book: Learning React JavaScript Library From Scratch*, 1st Ed. River Tigris LLC, 2017.

ReactJS notes for Professionals, Goal Kicker.com

WEB RESOURCES

https://reactjs.org/tutorial/tutorial.html#before-we-start-the-tutorial
https://www.tutorialspoint.com/reactjs/reactjs_useful_resources.htm

PATTERN OF ASSESSMENT:
Continuous Assessment Test: Total Marks: 50 Duration: 90 minutes
Theory- 25 marks
Practical: 25 marks

Section A - 10 x 1= 10 (To answer all the Questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - 3 × 5 =15 (To answer three out of Four Questions)

Other Components: Total Marks: 50
Quiz/Puzzles/Case Study/Story board of Website with elaborate description on controls and events/Mini Project

End-Semester Examination: Total Marks: 100 Duration: 3 hours
Theory - 50 marks Duration – 1 ½ hours
Practical - 50 marks Duration – 1 ½ hours
Section A-10 x 1 = 10 (Answer all the Questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - 5 × 2 = 10 (Answer all the Questions)
(1 question from each unit)
Section C - 6 ×5 = 30 (6 out of 8)
(atleast 1 question from each unit)

List of Practical Exercises

1. Implementing basic JavaScript
2. Implementing Emerging JavaScript (Let, Const, Arrow Functions, Import and Export, Classes)
3. Implementing Functions, Recursion
4. Implementing Components, Props
5. Implementing Inter Component Communication
6. Implementing State Management
7. Implementing Component Life Cycle
8. Implementing Forms
9. Implementing Routing
10. Implementing Flux, Redux
11. Implementing CRUD operations

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

(Effective from the academic year 2019–2020)

DATA SCIENCE PRACTICAL

CODE:19CS/MC/P552 **CREDITS:2**

L T P:0 0 3

TOTAL TEACHING HOURS:39

OBJECTIVES OF THE COURSE

- To enable the students to understand the basics of Python language
- To enable a comprehensive and detailed understanding of the Data Science, data formats and data exploratory analysis
- To explore different machine learning techniques
- To understand the various applications of python
- To explore different visualizations techniques in python

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Critically analyze and follow the mechanism to manage, explore, and deep understanding of uncertain and complex data
- Apply Machine Learning techniques to extract actionable value from data
- Assess the use of data from acquisition through cleansing, analytics, and visualization

List of Exercises

1. Basic python programs
2. The installation of python packages - Scikit-learn toy datasets
3. Loading the datasets of different formats and dataset creation.
4. Cleaning and pre-processing datasets
5. Missing data substitution
6. Data transformation
7. Data wrangling: Splitting large datasets and combining datasets
8. Indexing and pivoting
9. Machine learning: Supervised Learning algorithms
10. K-nearest neighbor
11. Linear model
12. Naïve bayes
13. Decision tree
14. Random forest
15. Unsupervised learning algorithms
16. Feature extraction
17. Clustering: k-means, agglomerative and dbscan clustering
18. Model evaluation
19. Visualization with different plots Matpplot's commands and package usage for visual representation
20. Applications: case study

PATTERN OF ASSESSMENT

Continuous Assessment Test: **Total Marks: 50** **Duration: 90 minutes**

Practical

Other Components

Total Marks: 50

Practical	25 Marks
Mini Project (Case study)	25 Marks

End-Semester Examination : **Total Marks: 100** **Duration: 3 hours**

Practical

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

CRITICAL ANALYSIS ON AN ADVANCED TECHNOLOGY

CODE:19CS/MC/CA51 **CREDITS:1**
L T P:0 0 2
TOTAL TEACHING HOURS:26

OBJECTIVES OF THE COURSE

- To enable students to explore and critically analyse the selected technology
- To enable students to adapt to changes in the technological landscape
- To train students with the skills and knowledge of the process of writing
- To enable students to present ideas clearly and firmly, both orally and in writing
- To equip them with skills to describe and synthesise new ideas
- To train students to work with academic integrity
- To train students to work in a group

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Demonstrate clear, precise, ethically sound ideas on the chosen topic
- Find, evaluate and use information from varied sources effectively
- Critically analyse, argue and counter argue on the topic chosen
- Understand the significance, bias and applications of the technology chosen
- Formulate and synthesise new ideas and opinions in the form of projects /and papers
- Create clear, grammatically correct, ethically sound, well-organised pieces of writing

Students will be formed into groups. The groups will have to select a topic related to the Emerging /Advanced Trends and Technologies in the field of Computer Science. Each group has to give three presentations to their fellow classmates and their guide. They need to prepare the synopsis and detailed report in consultation with their guide.

PATTERN OF ASSESSMENT

Component I - Presentation / Review (Includes continuous evaluation of 3 presentations)
Component II - Papers and /Projects

End-Semester Examination
Documentation - 30 marks
Projects and /papers - 30 marks
Presentation - 20 marks
Viva - 20 marks

Format of the report

Abstract

Short description of the paper. Describe what the technology is, why it is significant or interesting, and your conclusion.

Introduction

- What is the technology?
- Literature review: what is the current thinking, findings, and approaches on the technology?
- What is the significance of the technology?
- How do you plan to use the technology?

Methods/ Approaches

- What is your opinion of the utility, relevance, challenges or quality of the technology you have selected? (Support with project/papers)

Results

- What are your conclusions?
- What do your conclusions mean?
- How do your results fit into a broader context?

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 600 086

Interdisciplinary Core Course Offered by the Departments of Computer Science and Psychology to B.C.A. Degree Programme

SYLLABUS
(Effective from the academic year 2019–2020)

HUMAN COMPUTER INTERACTION

CODE:19ID/IC/HC55 **CREDITS:5**
L T P:5 1 0
TOTAL TEACHING HOURS:78

OBJECTIVES OF THE COURSE

- To learn the foundations of Human Computer Interaction concepts
- To be familiar with the design technologies for individuals and persons with disabilities
- To learn the guidelines for user interface
- To understand constraints, get an insight into the design space, and on deep knowledge of the materials of the design, that is, the user, the task, and the machine
- To discuss the psychological and physiological attributes of the user, providing the students with a basic overview of the capabilities and limitations that affect the ability to use computer systems

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- To design an effective HCI for any interface
- To design an effective HCI for individuals and persons with disabilities
- To assess the importance of user feedback
- To explain the HCI implications for designing Multimedia/ VR
- To develop meaningful user interface

Unit 1 (15 Hours)

1.1 Introduction to Interaction Design

Introduction-Good and poor design-What is Interaction Design? -What is involved in the process of Interaction Design? -The goals of interaction design-More on usability: Design and usability principles.

1.2 The Human

Understanding the human mind- computation: connectionism and symbol systems. Levels of information processing. Memory- Atkinson and Shriffin model; structure of the working memory.

1.3 The Computer

Devices – Memory – Processing and Networks.

1.4 Interaction

Models – Frameworks – Ergonomics: Bias - Arrangement of controls and displays, physical environment of interaction, health issues, use of colours, and ergonomics and HCI. – Styles – Elements – Interactivity- Paradigms-Experience, engagement and fun-understanding and designing experience and physical design & engagement.

Unit 2 **(12 Hours)**

2.1 Understanding Users

Cognition- Attention: visual and auditory attention. Parallel processing. Perception- perceptual grouping- figure and ground, similarity, proximity, continuity, symmetry, closure.

2.2 Designing for collaboration and communication

Introduction- Social mechanisms used in communication and Collaboration- Ethnographic studies of collaboration and Communication-Conceptual frameworks

2.3 Understanding how interfaces affect users

Introduction- What are affective aspects? - Expressive Interfaces-User Frustration Virtual characters: agents

Unit 3 **(15 Hours)**

3.1. Types of Users

Visualizers and verbalizers. High and low OSL. Variety and Novelty Seekers. Need for cognition.

Designing for special populations- children, the elderly and the disabled.

3.2 Observing users

Introduction-Goals, questions and Paradigms-What and when to observe -How to observe- Participant observation and Ethnography-Data collection- Indirect observation tracking users' activities- Analyzing, interpreting and presenting data.

3.3. Asking users and experts

Introduction -Asking users: Interviews- Asking users: Questionnaires- Asking users: Inspections- Asking users: Walkthroughs

Unit 4 **(18 Hours)**

4.1. Interactive Design Basics

Process – Scenarios – Navigation – Screen Design – Iteration and Prototyping.

4.2. HCI in Software Process

Software Life Cycle – Usability Engineering – Prototyping in Practice – Design Rationale.

4.3. Design Rules – Principles, Standards, Guidelines, Rules -Universal Design-User-centred approaches to interaction design

Unit 5 (**18 Hours)**

5.1 Modelling Interaction

Descriptive models. Predictive model- A model continuum model

5.2 Groupware

Introduction-Groupware Systems-Computer-mediated Communication-Meeting and decision support systems-Shared applications and artifacts-Frameworks for groupware- Implementing synchronous groupware

5.3 Ubiquitous computing and augmented realities

Introduction-Ubiquitous computing applications research-Virtual and augmented reality-Information and data visualization

5.4. Hypertext, multimedia and the World Wide Web

Introduction-Understanding hypertext- Finding Things-Web technology and issues - Static web content-Dynamic web content

BOOKS FOR STUDY

Dix Alan, Finlay Janet, Abowd Gregory, Beale Russell. Human Computer Interaction, 3rd Edition, Pearson Education, 2004 (Unit 1(Chap1,2,3), Unit 4(Chap 5,6,7,10), Unit 5(Chap 19,20,21))

MacKenzie, I. Scott. *Human-computer interaction: An empirical research perspective*. Newnes, 2013. Elsevier. (Unit 5(Chap 7).

Preece Jenny. Rogers Yvonne. Interaction design beyond human-computer interaction, John Wiley & Sons, 2nd Edition 2002 (Unit 1(Chap1), Unit 2(Chap 3,4,5), Unit 3(Chap12,13), Unit 4(Chap 9))

BOOKS FOR REFERENCE

Cooper Alan. Riemann Robert. Cronin David. Essentials of Interaction Design, Wiley India

Hourcade, J. P. (2008). *Interaction Design and Children*. Now Publishers.

Lauesen Soren. User Interface Design. Pearson Education Asia, 4th Edition.

O. Galitz, Wilbert. The Essential Guide to User Interface Design. Wiley India,3rd Edition

Pullin,G. (2009). *Desgin Meets Disability*. Cambridge, MA: MIT Press.

Rogers Prece. Sharps Interaction Design. Wiley India,3rd Edition.

Schiffman, Leon G, Wisenblitt, Joseph, Kuman S Ramesh. *Consumer behaviour.* Chennai. Pearson Education, Inc.2015.

Sears, A., & Jacko, Julie. A (2008) *The Human- Computer Interaction Handbook*, New York. Taylor and Francis Group.

Sears, A., & Jacko, Julie. A (2009) *The Human- Computer Interaction- Interaction Designs and Usability,* , Boca Raton, FL:CRC Press.

Shneidermann Ben. Designing the user interfaces. Pearson Education Asia, 3rd Edition.

WEB RESOURCES

http://www.hcibook.com/e3/online/
http://teaching.paulos.net/cs160_FL2018/syllabus.html
http://www.it.bton.ac.uk/staff/rng/teaching/CS221/CS221syllabus.html
https://course.ccs.neu.edu/is4300f15/schedule.htm
https://graphics.tu-bs.de/teaching/ss17/AHCI

CASE STUDY

http://reports-archive.adm.cs.cmu.edu/anon/2000/CMU-CS-00-132.pdf
https://medium.com/mlreview/case-study-sign-to-speech-converter-facilitated-wireless-communication-358b3914d398
http://campar.in.tum.de/pub/bigdelou2012m2cai/bigdelou2012m2cai.slides.pdf

PATTERN OF ASSESSMENT

Continuous Assessment Test: **Total Marks: 50** **Duration:1 1/2 hours**

Section A - $3 \times 2 = 6$ (3 out of 5)
Section B - $3 \times 8 = 24$ (3 out of 5)
Section C - $1 \times 20 = 20$ (1 out of 2)

Other Components: **Total Marks: 50**

Assignment/Seminars/Quiz/Open book tests/Case Studies

End-Semester Examination: **Total Marks: 100** **Duration:3 hours**

Section A – $10 \times 2 = 20$
Section B - $8 \times 5 = 40$ marks (8 out of 10)
Section C - $2 \times 20 = 40$ marks (2 out of 4)

STELLA MARIS COLLEGE (AUTONOMOUS) – CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

(Effective from the academic year 2019-2020)

SECURITY CONCEPTS

CODE: 19CS/MC/SC65 **CREDITS: 5**

L T P: 5 0 0

TOTAL TEACHING HOURS: 65

OBJECTIVES OF THE COURSE

- To learn about the models and standards for security
- To find the vulnerabilities in programs and to overcome them
- To know the different kinds of security threats in networks and the solutions available
- To know the different kinds of security threats in databases and the solutions available
- To understand the basics of cryptography

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Get the knowledge about the security services available for internet and web applications
- Understand data vulnerability and SQL injection
- Gain the knowledge of security models and published standards
- Apply cryptographic algorithms for encryption and decryption for secure data transmission
- Understand the program threats and follow good programming practices

Unit 1 **(10 Hours)**

1.1 Computer security overview

Computer security concepts -The OSI security architecture -Security attacks- Security services -Security mechanisms- A Model for network security.

1.2 Physical security

Classification of assets- Choosing site location for security- Securing assets: Locks and entry controls- Physical intrusion detection- Compliance with standards.

1.3 Access Control

Access Control Techniques- Authentication Tokens-Authentication-Role of Tokens-Access Control Administration -Accountability

Unit 2 **(10 Hours)**

2.1 Computer Security

Operating System Models- Classic security model- Reference monitor

Case studies UNIX security-Windows security -Securing infrastructure services-Virtual Machines and cloud computing- Securing mobile devices

2.2 Network Security

Securing network design-Introduction to secure network design Network Device Security-Switch and router basics -Network hardening.

2.3 Firewall

Overview- Core firewall functions- Additional firewall capabilities -Firewall design

Unit 3 **(15 Hours)**

3.1 VPN

How a VPN works-VPN protocols- Remote access VPN security-Site-to-Site VPN security

3.2 Wireless network security

Radio frequency security basics-Data-link layer Wireless security features, flaws, and threats-Wireless vulnerabilities and mitigations-Wireless network hardening practices and recommendations

3.3 VOIP

Background -VoIP components-VoIP vulnerabilities and countermeasures

3.4 IDS and Prevention System

IDS concepts- IDS types and detection models-IDS features - IDS deployment considerations

Unit 4 **(15 Hours)**

4.1 Securing unstructured Data

Structured data vs. unstructured data -At rest, in transit, and in use -Approaches to securing unstructured data- Newer approaches to securing unstructured data

4.2 Storage Security

Storage security evolution- Modern storage security.

4.3 Database Security

General database security concepts-Understanding database security layers-Understanding database-level security- Using other database objects for security Database backup and recovery-Database auditing and monitoring.

Unit 5 **(15 Hours)**

5.1 User Security

Authentication –Authorization- Compliance with standards.

5.2 Application Security

Secure development life cycle- Application security practices-Web application security- Client application security- Remote administration security

5.3 Classical Encryption Techniques

Symmetric cipher model- Substitution techniques-Transposition techniques-Rotor machines- Steganography

BOOKS FOR STUDY

Harold F. Tipton, Micki Krause, Information Security Management Handbook 6th Edition (unit 1.3 chap -10,11)

Rhodes Mark. Ousley. Information Security: The Complete Reference. McGraw Hill, 2nd Edition, 2013(Unit 1.2 (Chap 34) Unit 2(Chap-13, 14, 15, 20-25), Unit 3(Chap 16,17,18,19), Unit 4(Chap 11,12), Unit 5.1 (Chap-7) ,5.2(Chap 26)

Stallings William. Cryptography and Network Security: Principles and Practices. Prentice Hall, 5th Edition, 2010. (Unit1.1(Chap 1), Unit 5.3(Chap 2))

BOOKS FOR REFERENCE

Information Security Handbook for Network Beginners.National Center of Incident Readiness and Strategy for Cybersecurity (NISC), The Government of JAPAN, Ver 2.11e
Lawrence C. Miller Cyber security for dummies. CISSP
Michael E. Whitman and Herbert J. Mattord. Principles of Information Security.4th ed.
P. Pfleeger Charles. Pfleeger Shari Lawrence. Security in Computing. Pearson, 4th Edition, 2007
Whitman Michael. J. Mattord Herbert. Management of Information Security. Course Technology,3rd Edition, 2010.

WEB RESOURCE

www.cas.mcmaster.ca/khedri/wp-content/uploads/COURSES/3A04/Tutorial04.pdf
https://www.slideshare.net/gurya87/understanding-security-basics-a-tutorial-on-security-concepts-and-technology
https://training.apnic.net/wp-content/uploads/sites/2/2016/12/TSEC01.pdf
https://www.wisdomjobs.com/e-university/network-security-tutorial-449.html
https://www.geeksforgeeks.org/computer-network-tutorials/

PATTERN OF ASSESSMENT

Continuous Assessment Test: Total Marks: 50 Duration: 90 minutes

Section A - 10×1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - 5×2 = 10 marks (Answer all the questions)
Section C - 4×5 = 20 marks (4 out of 5)
Section D - 1×10 = 10 marks (1 out of 2)

Other Components: Total Marks:50

Quiz/Assignment /Seminar/Group Discussion/Case Studies

End Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20×1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)
Section B - 5×2 = 10 marks (Answer all the questions)
Section C - 8×5 = 40 marks (8 out of 10)
Section D - 3×10 = 30 marks (3 out of 5)

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BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

CLOUD COMPUTING

CODE:19CS/MC/CC65 **CREDITS: 5**
L T P: 5 1 0
TOTAL TEACHING HOURS:78

OBJECTIVES OF THE COURSE

- To introduce the concept of Cloud Computing, Parallel and Distributed Computing
- To enable students to learn about Virtualization and the Cloud Architecture
- To give a detailed overview on Resource Pooling, Scaling, Capacity Planning and Load Balancing in the Cloud
- To familiarize concepts on Cloud Security, Service Oriented Architecture (SOA) and Cloud-based Storage
- To give a better understanding on the above said concepts through case studies on various cloud platforms

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Gain insights about cloud, parallel and distributed computing
- Define virtualization and the architecture of cloud computing
- Understand the need for resource pooling, scaling, capacity planning and load balancing along with their roles in the cloud
- Interpret on securing and storing data over the cloud
- Build a simple application and host it using cloud

Unit 1 (15 Hours)

1.1 Introduction

Cloud Computing at a Glance – The Vision of Cloud Computing - Defining a Cloud - A Closer Look – The Cloud Computing Reference Model - Characteristics and Benefits - Challenges Ahead – Historical Developments - Distributed Systems - Virtualization - Web 2.0 - Service-oriented Computing - Utility-oriented Computing - Building Cloud Computing Environments - Application Development – Infrastructure and System Development – Computing Platforms and Technologies

1.2 Principles of Parallel and Distributed Computing

Eras of Computing - Parallel vs. Distributed Computing – Elements of Parallel Computing - Elements of Distributed Computing – Technologies for Distributed Computing

Unit 2 **(15 Hours)**

2.1 Virtualization

Introduction – Characteristics of Virtualized Environments – Taxonomy of Virtualization Techniques – Virtualization and Cloud Computing - Pros and Cons of Virtualization

2.2 Cloud Computing Architecture

Introduction – The Cloud Reference Model – Types of Clouds – Economics of the Cloud – Open Challenges

2.3 Practical Demonstration

Virtualization in Cloud - Infrastructure as a Service - Software as a Service

Unit 3 **(20 Hours)**

3.1 Resource Pooling, Sharing and Provisioning

Resource Pooling - Commoditization of the Data Center - Standardization, Automation and Optimization – Resource Sharing – Resource Provisioning

3.2 Scaling in the Cloud

What is Scaling – Scaling in Traditional Computing – Scaling in Cloud Computing – Foundation of Cloud Scaling – Scalable Application – Scaling Strategies in Cloud – Auto Scaling in Cloud – Types of Scaling – Horizontal Scaling is more Cloud-Native Approach – Performance and Scalability – The Resource Contention Problem – Cloud Bursting: a scenario of flexible scaling – Scalability is a business concern

3.3 Capacity Planning

What is Capacity Planning – Capacity Planning in Computing- Capacity Planning in Cloud Computing - Cloud Capacity: Consumers' View vs. Providers' View – Capacity Planning Then and Now – Approaches for Maintaining Sufficient Capacity – Role of Auto-Scaling in Capacity Planning - Capacity and Performance: Two Important System Attributes – Steps for Capacity Planning

3.4 Load Balancing

Load Balancing – Importance of Load Balancing in Cloud Computing – How Load Balancing is done in Cloud – Goals of Load Balancing – Categories of Load Balancing – Parameters for Consideration – Load Balancing Algorithms – The Persistence Issue – Application Delivery Controller

Unit 4 **(18 Hours)**

4.1 Understanding Cloud Security

Securing the Cloud – Securing Data – Establishing Identity and Presence

4.2 SOA and Moving Applications to the Cloud

Introducing Service Oriented Architecture – Defining SOA Communications - Applications in the Clouds – Applications and Cloud APIs

4.3 Working with Cloud-based Storage

Measuring the Digital Universe – Provisioning Cloud Storage – Exploring Cloud Backup Solutions – Cloud Storage Interoperability

Unit 5 **(10 Hours)**

5.1 Case Studies

Google Web Service – Amazon Web Service – Microsoft Cloud Service

BOOKS FOR STUDY

Bhowmik, Sandeep. *Cloud Computing*. Cambridge University Press, 2017.. (Unit 3)

Buyya, Rajkumar, Christian Vecchiola, and S. Thamarai Selvi. *Mastering cloud computing: foundations and applications programming*. Elsevier, 2013. (Units 1 & 2)

Sosinsky, Barrie. *Cloud Computing Bible*. John Wiley & Sons, 2011. (Units 4 & 5)

BOOKS FOR REFERENCE

Kavis, Michael J. "Architecting the cloud: design decisions for cloud computing service models

Marinescu, Dan C. *Cloud computing: theory and practice*. Morgan Kaufmann, 2017 (SaaS, PaaS, and IaaS)." *Hoboken, NJ: Wiley*.(2014)

WEB RESOURCES

https://aws.amazon.com/what-is-cloud-computing/
https://azure.microsoft.com/en-in/overview/what-is-cloud-computing/
https://www.salesforce.com/what-is-cloud-computing/
https://cloud.google.com/docs/
https://www.ibm.com/cloud/learn/what-is-cloud-computing

PATTERN OF ASSESSMENT

Continuous Assessment Test: Total Marks: 50 Duration: 90 minutes

Section A - $10 \times 1 = 10$ marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - $5 \times 2 = 10$ marks (Answer all the questions)
Section C - $4 \times 5 = 20$ marks (4 out of 5)
Section D - $1 \times 10 = 10$ marks (1 out of 2)

Other Components: Total Marks: 50

Component 1 – Unit 5.1
Component 2 – Hosting a simple application in Cloud

End-Semester Examination: Total Marks : 100 Duration : 3 hours

Section A - $20 \times 1 = 20$ marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)
Section B - $5 \times 2 = 10$ marks (Answer all the questions)
Section C - $8 \times 5 = 40$ marks (8 out of 10)
Section D - $3 \times 10 = 30$ marks (3 out of 5)

(Units 2.3 and 5.1 – Not included for End Semester Examinations)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 86

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

PROJECT

CODE:19CS/MC/PR64 **CREDITS:4**

OBJECTIVES OF THE COURSE

- To help students to apply the concepts learnt throughout the course and develop an application
- To enable the students to understand and analyse the requirements and deliver the product on time

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Analyse the feasibility and understand the requirements of the client
- Build Applications as desired by the client
- Apply their creativity and design knowledge gained
- Generate all required reports

GUIDELINES

One of the important stipulations regarding project for B.C.A. is that it should be in the area of Computer Science/ Computer Applications. Students are required to develop an application to suit the research/business needs.

The Dissertation must include the following. These are general guidelines which may differ slightly as per the demand of the study topic.

Introduction

- Existing System
- Proposed System
- Creating a set of Design principles to implement the proposed system

System Analysis

- Development Environment
- Requirement Specification
- Software Requirements Specification

System Design

- Logical Design of the System
- Database Design
- Screen Design
- Report Design

Implementation

- Database creation
- Coding

Code Review and Testing

- Code Review
- Testing Process
  - Front-end Validation
  - Back-end Validation

Deployment

Conclusion

- Conclusion and scope for future enhancement

Bibliography
Appendix

PATTERN OF ASSESSMENT

Internal Assessment – 50 marks

Based on the criteria listed below, internal marks will be awarded.

1. Timely completion of assigned tasks
2. Individual involvement and team work
3. Quality of the application and documentation (Design, Workflow, Testing, Precision, Relevance)
4. Achievement of project deliverables
5. Presentation of completed work
6. Viva-Voce

End Semester Examination – 100 marks

Project Document must be submitted at the end of the semester. The student must present the completed project work. A viva–voce based on the work will also be conducted.
Mark will be allotted based on the following criteria which may differ slightly as per the demand of the domain and converted to 50 marks

Requirement Analysis	– 10 marks
Database Design	– 10 marks
Screen Design	– 10 marks
Coding	– 10 marks
Validation	– 10 marks
Testing	– 10 marks
Reports	– 5 marks
Documentation	– 20 marks
Special Features	– 5 marks
Viva – Voce	– 10 marks

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

(Effective from the academic year 2019 -2020)

ADVANCED JAVA PROGRAMMING

CODE: 19CS/ME/AJ45 **CREDITS: 5**

L T P:3 0 3

TOTAL TEACHING HOURS: 78

OBJECTIVES OF THE COURSE

- To understand XML basics
- To develop applications with a backend
- To enable the students to create window based applications using JavaFX
- To design user interface using CSS
- To acquire knowledge on simple animation techniques in JavaFX
- To understand concepts behind the terms - HTTP, Request, Response, Client, Server, Get, Post, Web Server, Web Container, Session and Cookies
- To develop web based applications using Servlets and JSP

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Appreciate the purpose of XML documents; actively use the terminology of XML markup documents
- Implement Console based application and JDBC to communicate with database
- Create a window based application using JavaFX and the styling using CSS
- Create simple animation using JavaFX
- Comprehend the web application terminology and concepts
- Develop web applications using Servlets and JSP

Unit 1 **(10 Hours)**

1.1 Basics of XML

Need for XML - Well Formed XML Documents - Validating an XML Document using XML Schema

1.2 Database Connectivity

JDBC Database Connectivity - Types of JDBC drivers - Establishing a Connection - Executing Statements - Prepared statements - Callable statements - Mapping SQL types to Java- ResultSetMetadata

Unit 2 **(19 Hours)**

2.1 JavaFX Basics

What is JavaFX - JavaFX Application Life Cycle, Defining the Main Window by using the Stage class, Key JavaFX packages

2.2 Scene Graph

Using and Integrating Scene graph in JavaFX Application - Scene Class - Event

Handling - Node Types - Primitive Nodes, LayoutPanes, Complex Nodes - Node Basics - Image and ImageView

2.3 Layouts and JavaFX Basic Controls

HBox - VBox - StackPane - FlowPane - GridPane - BorderPane

Control Class - Basic Controls -Labeled Controls, Controls for Text Input, ProgressIndicator and ProgressBar - Tooltip of a Control - Menus -ToolBar - Separators

Unit 3 **(17 Hours)**

3.1 Additional JavaFX Controls

Controls with a Data Model - ComboBox, ListView, TableView, TreeView - Controls that act as Containers - Canvas

3.2 Styling a Control

CSS Basics - CSS in JavaFX - Using Selectors

3.3 Basic Animation using JavaFX

javafx.animation package - TranslateTransition, RotateTransition, ScaleTransition, FadeTransition, SequentialTransition, ParallelTransition

Unit 4 **(19 Hours)**

4.1 Introduction to HTTP

HTTP Protocol - HTTP Request, Get, Post, HTTP Response, HTTP Response codes - Client side and Server side programming

4.2 Web Applications

Web Applications and Web Containers - Web components - Web Application Life Cycle - Creating, Building and Deploying - Web Archive Structure

4.3 Servlet Technology

Need for Servlets - Characteristics of Servlets - Comparison between Servlets and other Server side scripting languages - Working of Servlet - javax.servlet package - Life Cycle of Servlet - Session - Interservlet communication – Request Dispatcher Interface

Unit 5 **(13 Hours)**

5.1 Java Server Pages

Introduction – Comparison between JSP and Servlets – Life Cycle – Structure – Components - JSP Tags - JSP Session - Cookie – Static content- Dynamic content – Scripting Elements

BOOKS FOR STUDY

Ebbers, Hendrik. "Mastering JavaFX 8 Controls: Create Custom JavaFX Controls for Cross-Platform Applications." (2014).

Schildt, Herbert. *The Complete Reference - Java.* 10th ed. Mc Graw Hill, 2017.

BOOKS FOR REFERENCE

Hall, Marty and Larry Brown. *Core Servlets and JavaServer Pages: Advanced Technologies.2nd* ed. Prentice Hall, 2007.

Phillip, Hanna. *JSP 2.0: The Complete Reference*, Second Edition, 2017.

WEB RESOURCES

https://www.w3schools.com/xml/default.asp
https://docs.oracle.com/javase/8/javafx/api/javafx/animation/package-summary.html
https://docs.oracle.com/javase/8/javafx/get-started-tutorial/index.html
https://docs.oracle.com/javase/8/javafx/api/javafx/scene/doc-files/cssref.html

PATTERN OF ASSESSMENT

Continuous Assessment Test:

Total Marks – 50 [Theory: 25 marks Practical: 25 marks] **Duration: 90 minutes**

Section A- 10 x 1= 10 marks (Answer all the Questions)

(5 Multiple choice questions and 5 Fill-in the Blanks)

Section B - 3 × 5 =15 marks (3 out of 4)

Other Components: **Total Marks:50**

Seminars / Quiz /Open book tests/Assignments /Code Reading

End Semester Examination: **Total Marks: 100**

Theory - 50 marks **Duration: 90 minutes**

Project - 50 marks (Demonstration and Viva)

Section A-10 x 1 = 10 (Answer all the Questions)

(5 Multiple choice questions and 5 Fill-in the Blanks)

Section B - 5 × 2 = 10 (Answer all the Questions)

(1 question from each unit)

Section C - 6 ×5 = 30 (6 out of 8)

(atleast 1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

(Effective from the academic year 2019-2020)

VISUAL PROGRAMMING

CODE:19CS/ME/VP45 **CREDITS:5**

L T P:3 0 3

TOTAL TEACHING HOURS:78

OBJECTIVES OF THE COURSE

- To introduce students about .NET Framework and Windows Application
- To enable the students to create windows forms and events
- To introduce students about presentation controls and namespaces
- To augment the knowledge on data Access with ADO.NET
- To introduce students about web application and state management
- To create simple animations
- To introduce students to XML, LINQ and AJAX

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Comprehend.NET Framework and Windows Application
- Know about presentation controls and namespaces
- Connect with backend using ADO.NET
- Get the knowledge about web application and state management
- Gain knowledge on connecting XML, LINQ and AJAX

Unit 1 (15 Hours)

1.1 Overview of .NET Framework:

CLR-CTS- Metadata and Assemblies-.NET Framework Class Library – BCL-Windows Forms – ASP.NET and ASP.NET AJAX-ADO.NET – Tools in the .NET Framework- New Features of .NET Framework: Portable Class Libraries.

1.2 Introducing Windows Application

Introduction – Creating WindowsForms- Customizing a Form

1.3 Collecting User Input in windows Forms and Events

Buttons-Text Boxes- Check Boxes- Radio Buttons –Combo Boxes –Date and Time Picker – Calendar-List Boxes –Checked List Box –List View – Tree View.

Unit 2 **(15 Hours)**

2.1 Presentation and Informational Controls in Windows Forms and Events

Labeling- Link Label- Status Bar- Picture Box-Image List-Progress Bar-Tool Tip – MDI and Menus Creation

2.2 Data Types in C#

Type Conversions – Boxing and Unboxing

2.3 Namespaces

Introduction – Adding a reference to the Namespace – Accessing a predefined Namespace through the using Directive

2.4 Introducing to ADO.net

Understanding ADO.NET- Creating Connection Strings –Creating a Connection to a Database- Creating a Command Object- Working with DataAdapters –Using DataReader work with Database.

Unit 3 **(16 Hours)**

3.1 ASP.NET

Life cycle- Specifying a Location for a Web Application -Single-File Page Model - Code-Behind Page Model- Adding controls to web form.

3.2 Web Server Controls

The Control Class - The WebControl Class - The Button Control - The TextBox Control -The Label Control - The HyperLink Control -The LinkButton Control -The PlaceHolder Control -The HiddenField Control - The CheckBox Control -The RadioButton Control -The ListBox Control -The DropDownList Control -The Image Control -The ImageButton Control - The Table Control - Menus - Validation Server Controls - Master Page - Web.Config.

Unit 4 **(16 Hours)**

4.1 State Management

Understanding the session object Sessions and the Event Model, Configuring, In-Process Session State, Out-of-Process Session state Application Object, Query strings, Cookies, ViewState, Global.asax.

4.2 XML and .NET

Basics of XML, Create XML Document - Reading XML with XmlReader - Reading XML with XmlDocument - Working with XmlNode

4.3 Animations

Understanding WPF's Animation services – The Role of the Animation class types- The To, From and by properties – The Role of the Timeline Base Class – Authoring and Animation in C# Code – Controlling the pace of an animation – Reversing and Looping an Animation – The Role of StoryBoards

Unit 5 **(16 Hours)**

5.1 LINQ

Introducing LINQ Queries- Standard Query Operators- Introducing LINQ to Dataset, SQL and XML- The LinqDataSource Control. Data Binding – Grid View, Details view, Forms view

5.2 ASP. NET AJAX

Understanding the need for AJAX, Building a simple ASP.NET page without AJAX, Building a simple ASP.NET page with AJAX

BOOKS FOR STUDY

C# 2012 Programming Covers .NET 4.5 Black Book. Dreamtech press, Kogent Learning Solutions, 2013.(Unit 1.1,Unit 2.2,Unit 2.3,Unit 2.4, Unit 3,Unit 4, Unit 5)

Liberty, Jesse, and Dan Hurwitz. *Programming. NET Windows Applications*. " O'Reilly Media, Inc.", 2004. (Unit 1.2,1.3, 2.1)

Troelsen, Andrew, and Philip Japikse, *C# 6.0 and the .NET 4.6 Framework*. Apress, 2015. (Unit 4.3)

BOOKS FOR REFERENCE

Albahan Joseph, and Ben Albahari. *C# 5.0 in a NutShell: The Definitive Reference*. "Orielly Media Inc", 2012

Anne Boehm . Joel. *Murach's C# 2015. United States of America:* Murach's,2016.

Delamater. Mary. Anne Boehm. *ASP.NET 4.5 Web Programming with C# 2012. United States of America:* Murach's, 2013.

John Sharp. *Microsoft Visual C# Step by Step. United States of America:* Pearson Edition, 2018.

Price, Jason, and Mike Gunderlov. Mastering Visual C#.Net. John Wiley & Sons, 2006

WEB RESOURCES

https://msdn.microsoft.com/en-us/library/aa288436%28v=vs.71%29.aspx
http://www.w3schools.com/aspnet/aspnet.asp
http://csharp.net-tutorials.com/xml/introduction/
http://ajax.net-tutorials.com/basics/introduction/
http://www.c-sharpcorner.com/

PATTERN OF ASSESSMENT

Continuous Assessment Test:
Theory- 25 marks **Practical: 25 marks** **Duration: 90 minutes**
Theory Pattern
Section A- 10 x 1= 10 marks (Answer all the Questions)
(5 Multiple choice questions and 5 Fill-in the Blanks)
Section B - 3 × 5 =15 marks (3 out of 4)

Other Components: **Total Marks:50**
Seminars / Quiz/Open book tests/Assignments /Code Reading / Case Study
End Semester Examination: Total Marks: 100

Theory - 50 marks **Duration: 90 minutes**

Project - 50 marks (Demonstration and Viva)

Section A-10 x 1 = 10 (Answer all the Questions)

(5 Multiple choice questions and 5 Fill-in the Blanks)

Section B - 5 × 2 = 10 (Answer all the Questions) (1 question from each unit)

Section C - 6 ×5 = 30 (6 out of 8) (atleast 1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019 - 2020)

GAME PROGRAMMING

CODE: 19CS/ME/GP45 **CREDITS:5**
L T P: 3 0 3
TOTAL TEACHING HOURS:78

OBJECTIVES OF THE COURSE

- To understand the concepts of Game design and development using Flash and ActionScript
- To enable the learning processes, mechanics and issues in Game Design
- To enable the students to create characters and control their movement
- To detect and avoid the collision
- To understand the natural motion using physics concepts
- To enable the students to develop games

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Comprehend the learning processes, mechanics and issues in Game Designing
- Create different characters and control their movements
- Detect and avoid collision
- Understand and apply the natural motion
- Develop a game with different levels

Unit 1 **(15 Hours)**

1.1 Programming Foundations - How to Make a Video Game
Laying the foundation - Writing your first program - Publishing the SWF file

1.2 Making Objects
Understanding Interactive Objects - Drawing the first page - Creating a Character, using Buttons

Unit 2 **(16 Hours)**

2.1 Programming Objects
Displaying the First Page of the Storybook - Programming Buttons - Understanding - Events and Event listeners - Programming Storybook Buttons

2.2 Controlling Movie Clip Objects
Movie Clip Properties - Controlling Movie Clip Timelines

Unit 3 **(16 Hours)**

3.1 Decision Making
Designing a GUI - Building a Simple Guessing Game - Learning more about Variables, Making Decisions, Polishing up

3.2 Controlling a Player Character
Controlling a Player Character with the Keyboard - Setting Screen Boundaries – Scrolling

Unit 4 **(18 Hours)**

4.1 Bumping into Things

Changing a Dynamic Text Field - Triggering a Change of State - Reducing a Health Meter - Updating a Score - Picking up and Dropping Objects – Drawbacks of hitTestObject - Using hitTestPoint - Creating Objects with Block Movement – Working with Axis - Based Collision Detection

4.2 Object-Oriented Game Design

Introducing Object-Oriented Programming

Unit 5 **(13 Hours)**

5.1 Platform Game - Physics and Data Management

Natural Motion using Physics

BOOKS FOR STUDY

Rex van der Spuy. *Foundation Game Design with Flash*. Apress, 2009.

BOOKS FOR REFERENCE

Peters, Keith. *Foundation Action Script 3.0 Animation: Making Things Move!*. Apress, 2007.

WEB RESOURCES

www.makeflashgames.com/
www.kongregate.com/labs
www.asgamer.com/
www.as3gametuts.com/

PATTERN OF ASSESSMENT

Continuous Assessment Test: **Total Marks: 50** **Duration: 90 minutes**

Practical

Other Components: **Total Marks: 50**

Story board for a game with background, Character formation and animation using movie clips, Implementing concepts of player movement and gravity/ Case Study

End Semester Examination: **Total Marks:100**

Game Development – Demonstration and Viva

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BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019 - 2020)

INTELLIGENT SYSTEMS

CODE: 19CS/ME/IS45 **CREDITS: 5**
LTP: 5 1 0
TOTAL TEACHING HOURS: 78

OBJECTIVES OF THE COURSE

- To introduce the concept of artificial intelligence and expert systems
- To enable students to understand and manage the uncertainties
- To understand fuzzy and frame based systems
- To equip the students with knowledge on artificial neural network and evolutionary computation
- To detail about neural based systems and knowledge engineering
- To comprehend knowledge engineering and data mining

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Understand about the premise of artificial intelligence
- Learn about the uncertainties and its management in rule-based systems
- Know extensively about fuzzy and frame-based systems
- Interpret about neural networks and evolutionary computation through case studies on maintenance scheduling with genetic algorithms
- Interpret on securing and storing data over the cloud
- Relate with concepts on hybrid intelligent systems, knowledge engineering and data mining through case studies

Unit 1 (14 Hours)

1.1 Introduction to Knowledge Based IS

Introduction to AI – The Foundation of AI - State of Art - Intelligent machines, or what machines can do- The History of Artificial Intelligence, or from the 'Dark Ages' to Knowledge-Based Systems.

1.2 Rule Based Expert Systems

Introduction - Rules as a Knowledge Representation Technique - The Main Players in the Expert System Development Team - Structure of a Rule-Based Expert System - Fundamental Characteristics of an Expert System - Forward Chaining and Backward Chaining Inference Techniques -Media Advisor: A Demonstration Rule-Based Expert System – Advantages and Disadvantages of Rule Based Expert Systems.

Unit 2 **(14 Hours)**

2.1 Uncertainty Management in Rule- Based Expert Systems

Introduction or What is Uncertainty? - Basic Probability Theory - Bayesian Reasoning - FORECAST: Bayesian Accumulation of Evidence - Bias of the Bayesian Method - Certainty Factors Theory and Evidential Reasoning - FORECAST: An Application of Certainty Factors - Comparison of Bayesian Reasoning and Certainty Factors.

Unit 3 **(15 Hours)**

3.1 Fuzzy Expert Systems

Introduction to Fuzzy Thinking - Fuzzy Sets - Linguistic Variables and Hedges - Linguistic Variables and Hedges - Fuzzy Rules - Fuzzy Inference - Building A Fuzzy Expert System.

3.2 Frame –Based Expert Systems

Introduction - Frame-Based Expert Systems - Frames as A Knowledge Representation Technique - Inheritance in Frame-Based Systems - Methods and Demons - Interaction of Frames and Rules - Buy Smart: A Frame-Based Expert System.

Unit 4 **(17 Hours)**

4.1 Artificial Neural Networks

Introduction on How Brain Works - The Neuron as a Simple Computing Element - The Perceptron - Multilayer Neural Networks - Accelerated Learning in Multilayer Neural Networks - The Hopfield Network - Bidirectional Associative Memory - Self-Organising Neural Networks.

4.2 Evolutionary Computation

Introduction to Evolutionary Computation - Simulation of Natural Evolution - Genetic Algorithms - Genetic Algorithms Work Mechanisms - Case Study: Maintenance Scheduling with Genetic Algorithms - Evolution Strategies.

Unit 5 **(18 Hours)**

5.1 Hybrid intelligent systems

Introduction – Neural Expert Systems - Neuro-Fuzzy Systems - ANFIS: Adaptive Neuro-Fuzzy Inference System – Evolutionary Neural Networks – Fuzzy Evolutionary Systems

5.2 Knowledge Engineering and Data Mining

Introduction to Knowledge Engineering – Data Mining and Knowledge Discovery - Case Studies for Dealing Real Time Problems Using Expert System - Fuzzy Expert System - Fuzzy Expert System, Genetic Algorithms and Hybrid Intelligent System.

BOOKS FOR STUDY

Negnevitsky, Michael. Artificial intelligence: a guide to intelligent systems. Pearson Education, 2005.

BOOKS FOR REFERENCE

Russell, Stuart J., and Peter Norvig. Artificial intelligence: a modern approach. Malaysia; Pearson Education Limited,, 2016.

Schalkoff, Robert J. Intelligent systems: principles, paradigms and pragmatics. Jones & Bartlett Publishers, 2011.

WEB RESOURCES

https://link.springer.com/chapter/10.1007/978-3-319-91189-2_30
https://www.uu.nl/en/research/artificial-intelligence/intelligent-systems
https://pdfs.semanticscholar.org/c9eb/49cb2d09c8b103bf52572a1b0287137db8f4.pdf
https://towardsdatascience.com/how-to-design-an-artificial-intelligent-system-part-1-concept-development-cdbc8aee30d8

PATTERN OF ASSESSMENT

Continuous Assessment Test: Total Marks:50 Duration: 90 minutes.

Section A - 10 × 1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - 5 × 2 = 10 marks (Answer all the questions)
Section C - 4 × 5 = 20 marks (4 out of 5)
Section D - 1 × 10 = 10 marks (1 out of 2)

Other Components: Total Marks: 50

Quiz/Assignment /Case Study/ Presentation

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20 × 1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)
Section B - 5 × 2 = 10 marks (Answer all the questions)
(1 question from each unit)
Section C - 8 × 5 = 40 marks (8 out of 10)
(2 questions from each unit)
Section D - 3 × 10 = 30 marks (3 out of 5)
(1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

(Effective from the academic year 2019 - 2020)

INTERNET OF THINGS

CODE: 19CS/ME/IT45 **CREDITS: 5**

LTP: 5 1 0

TOTAL TEACHING HOURS: 78

OBJECTIVES OF THE COURSE

- To introduce the concepts of Internet of Things (IoT)
- To know about the data and framework of IoT
- To understand the standards and protocols associated with IoT
- To learn how to develop an IoT application
- To define the concepts of reliability, security and privacy in IoT

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Define the fundamental concepts of IoT
- Understand the framework involved in IoT and its governance
- Realize the scope of different standards and protocols
- Practically know how an IoT application works
- Understand the perspective of having a reliable, secure IoT

Unit 1

IoT Ecosystem Concepts and Architectures **(14 Hours)**

1.1 Introduction – IoT definition and evolution – IoT Architectures - OpenIoT Architecture for IoT/Cloud Convergence - Resource Management – IoT Data Management and Analytics - Communication Protocols – Internet of Things applications.

1.2 Scheduling Process and IoT Services Lifecycle - IoT enabling technologies – IoT levels and Deployments templates – Introduction to M2M - Difference between IoT and M2M – SDN and NFV for IoT

Unit 2 **(14 Hours)**

2.1 IoT Data and Framework Essentials

Introduction - Programming framework for IoT– The foundation of Stream processing in IoT - Continuous Logic processing system – Challenges and Future directions – Anomaly detection – Problem statement and definitions – Efficient incremental local modelling – IoT Governance.

Unit 3 **(15 Hours)**

3.1 RF Protocols

RFID, NFC;IEEE 802.15.4: ZigBee - ZWAVE, THREAD - Bluetooth Low Energy (BLE) - IPv6 for Low Power and Lossy Networks (6LoWPAN) - Routing Protocol

for Low power and lossy networks (RPL) - CoAP - XMPP - Web Socket- AMQP – MQTT – WebRTC - PuSH Architectural Considerations in Smart Object Networking - TinyTO Protocol.

3.2 Introduction to IoT based applications – Scenarios – Architecture overview – Sensors – The gateway – Data Transmission – Internet of Vehicles (IoV) – IoV Characteristics, technologies and its application.

Unit 4 **(17 Hours)**

4.1 Developing Internet of Things

Introduction – IoT Design Methodology – Case study on IoT system for Weather monitoring – IoT Device - IoT physical devices and endpoints - Exemplary Device: Raspberry Pi - Linux on Raspberry Pi - Raspberry Pi interfaces – Programming Raspberry Pi and with python – Other IoT devices.

Unit 5 **(18 Hours)**

5.1 IoT Reliability, Security and Privacy

Introduction - Concepts - IoT Security Overview – Security Frameworks for IoT – Privacy in IoT networks – IoT characteristics and reliability issues - Addressing reliability – Error detections – Fault Preventions - Case studies illustrating IoT Design.

BOOKS FOR STUDY

Arshdeep Bahga, Vijay Madisetti, "Internet of Things, A Hands -on Approach", 1st Edition 2015, University Press, ISBN: 978-81-7371- 954-7

Buyya, Rajkumar, and Amir Vahid Dastjerdi, eds. Internet of Things: Principles and paradigms. Elsevier, 2016.

Hersent, Olivier, David Boswarthick, and Omar Elloumi. The internet of things: Key applications and protocols. John Wiley & Sons, 2011.

BOOKS FOR REFERENCE

Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer

Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.

Peter Waher, "Learning Internet of Things", PACKT publishing, BIRMINGHAM – MUMBAI

WEB RESOURCES

https://thingsee.com/blog/quality-hardware-list-for-your-iot-projects.
https://tools.ietf.org/html/rfc7452.
http://dret.net/lectures/iot-spring15/protocols.
http://iot.intersog.com/blog/overview-of-iot-development-standards-andframeworks.

PATTERN OF ASSESSMENT

Continuous Assessment Test: Total Marks: 50 Duration: 90 minutes.

Section A - 10×1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - 5×2 = 10 marks (Answer all the questions)
Section C - 4×5 = 20 marks (4 out of 5)
Section D - 1×10 = 10 marks (1 out of 2)

Other Components: Total Marks:50

Quiz/Assignment/ Case Study/Developing an IoT Application

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20×1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)
Section B - 5×2 = 10 marks (Answer all the questions)
(1 question from each unit)
Section C - 8×5 = 40 marks (8 out of 10)
(2 questions from each unit)
Section D - 3×10 = 30 marks (3 out of 5)
(1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

(Effective from the academic year 2019 -2020)

ALGORITHM DESIGN TECHNIQUES

CODE: 19CS/ME/AD45

CREDITS: 5
L T P:5 1 0
TOTAL TEACHING HOURS: 78

OBJECTIVES OF THE COURSE

- To be able to understand the various algorithm design techniques and strategies
- To be able to choose the right strategy for solving a problem
- To understand NP hard and NP complete problems
- To understand String Algorithms and its applications
- To be able to apply the knowledge gained to design their own algorithms

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Appreciate the various algorithm design techniques and strategies
- Comprehend the various problems and its solutions
- Comprehend NP hard and NP complete problems
- Apply string algorithms for solving other problems
- Design their own algorithms choosing the right strategy

Unit 1

1.1 Divide and conquer **(16 Hours)**

General method - Finding the maximum and minimum, Strassen's matrix multiplication.

1.2 Greedy method

General method - Applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

Unit 2

2.1 Dynamic Programming **(16 Hours)**

General method – Multistage graphs – All Pairs Shortest Paths – Single Source Shortest Paths, Optimal binary search trees, 0/1 knapsack problem, Travelling sales person problem, Reliability design

Unit 3 **(15 Hours)**

3.1 Backtracking

General method -8-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

Unit 4 **(15 Hours)**

4.1 Branch and Bound

Method – Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution

Unit 5 **(16 Hours)**

5.1 NP-Hard and NP-Complete problems

Basic concepts, P and NP, non-deterministic algorithms, NP – Hard and Complete classes

5.2 String Algorithms

String Sorts – Tries – Substring search – Regular Expressions – Data Compression

BOOKS FOR STUDY

Horowitz, Ellis, Sartaj Sahni, Sanguthevar Rajasekaran. *Fundamentals of Computer Algorithm*. Galgotia Publications Pvt Ltd.

Robert Sedgewick, and Kevin Wayne. *Algorithms.* 2011. Fourth Edition, Pearson Education

BOOKS FOR REFERENCE

Aho, Alfred V., and John E. Hopcroft. *The design and analysis of computer algorithms*. Pearson Education India

Cormen, Thomas H., et al. "Introduction to algorithms second edition." *The Knuth-Morris-Pratt Algorithm, year* (2001).

Goodrich, Michael T., and Roberto Tamassia. *Algorithm design: foundation, analysis and internet examples*. John Wiley & Sons, 2006.

Lee, Richard Char-Tung, et al. *Introduction to the design and analysis of algorithms: a strategic approach*. McGraw-Hill, 2005.

WEB RESOURCES

https://algs4.cs.princeton.edu/50strings/
https://web.stanford.edu/class/cs97si/10-string-algorithms.pdf
https://www.tutorialspoint.com/design_and_analysis_of_algorithms/
https://www.geeksforgeeks.org/fundamentals-of-algorithms/

PATTERN OF EVALUATION

Total Marks: 50 **Duration: 90 minutes**

Continuous Assessment Test:

Section A - 10×1 = 10 marks (Answer all the questions)
(5 Multiple choice questions and 5 Fill in the Blanks)
Section B - 5×2 = 10 marks (Answer all the questions)
Section C - 4×5 = 20 marks (4 out of 5)
Section D - 1×10 = 10 marks (1 out of 2)

Other Components

Quiz /Assignment/Seminar/Group Discussion/Problem solving/Algorithm Tracing

End-Semester Examination: **Total Marks: 100** **Duration: 3 hours**

Section A - $20 \times 1 = 20$ marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)

Section B - $5 \times 2 = 10$ marks (Answer all the questions)
(1 question from each unit)

Section C - $8 \times 5 = 40$ marks (8 out of 10)
(2 questions from each unit)

Section D - $3 \times 10 = 30$ marks (3 out of 5)
(1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS
SYLLABUS
(Effective from the academic year 2019-2020)

MOBILE APP DEVELOPMENT FOR ANDROID

CODE: 19CS/ME/MA45 **CREDITS: 5**
L T P: 3 0 3
TOTAL TEACHING HOURS: 78

OBJECTIVES OF THE COURSE

- To enable the students to understand the app development environment
- To help them understand effective User interface creation
- To train the students to develop a complete Mobile App
- To make them understand persistent storage
- To enable them to understand Location based services

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Write simple GUI applications
- Use built-in controls and components
- Understand activities, intents and fragments
- Work with the database to store data locally
- Understand advanced features of mobile application development

Unit 1 (12 Hours)

1.1 Introduction to Mobile App

Concept – Various App Development Platforms – Android - History, Versions - Overview of Android architecture - Android Stack - Linux, Dalvik Virtual Machine, Core Libraries, Application Framework, Applications - OS vs IOS

1.2 Understanding an Android App

Creating an Example Android Application - Anatomy of Android Application

Unit 2 (20 Hours)

2.1 Activities, Intents, Fragments

Activities and Activity Lifecycle - Activity state changes - Example, Saving and restoring UI state - Intents - Explicit and Implicit Intents, Example - Fragments- Creating, Adding and managing fragments, Handling Fragment events, Example

2.2 Android User Interface

Creating views and view groups - Layouts - Linear, Table, Relative, Absolute, Frame, Scroll view - Changing screen orientation - Creating GUI – button, text, checkbox, radio, Menus - Event Handling - ClickListener, FocusChangeListener, Touch Listener, MenuItemClickListener, LongClickListener

Unit 3 **(16 Hours)**

3.1 Persistent Storage

Files – Using application specific folders and files, creating files, reading data from files, listing contents of a directory Shared Preferences – Creating shared preferences, saving and retrieving data using Shared Preference Database

3.2 Database Programming

SQLite - SQLite classes, Cursor, SQLite database, SQLite Queries – create, insert, select, update and delete - Connecting to a Remote database using MySQL/PHP

Unit 4 **(15 Hours)**

4.1 Enhancing Android User Interface

Notification - Action Bar – Dialogs – Search - Styles and Themes – Defining, using Inheritance, Android themes, Default styles and themes, Android SMS – Deploying App in Play Store – Multilingual

4.2 Location Based Services

Using Location Manager, Location Provider - Using emulator with Location based services – Selecting a Location provider – Finding your current location – Best practice for location updates – Using proximity alerts – Using the Geocoder – Creating map based activities

Unit 5 **(15 Hours)**

5.1 Advanced User Experience

Designing for every screen size and density – Ensuring Accessibility – Introducing Android Text-to-Speech – Using Speech recognition

5.2 Case Study

Case study on recent apps

Project - Developing an Android App

BOOKS FOR STUDY

Deitel, Paul, Harvey Deitel and Abbey Deitel. *Android™ for Programmers: An App-Driven Approach*. 2nd ed. Prentice Hall, 2014.

Meier Reto. *Professional Android 4 Application Development.* Wiley India, (Wrox), 2012

Smyth,Neil. *Android App Development Essentials.*1st ed. CreateSpace Independent Publishing Platform, 2014.

Wei, Jason. *Android database programming.* Packt, 2012.

BOOKS FOR REFERENCE

Gargenta, Marko. *Learning Android*. O'Rielly, 2011.

Smith, Dave and Jeff Friesen. *Android Recipes: A Problem – Solution Approach.* 3rd ed. APress.

WEB RESOURCES

https://developer.android.com/training/index.html/
http://www.mkyong.com/tutorials/android-tutorial/
http://www.vogella.com/tutorials/AndroidSQLite/article.html#databasetutorial_database/
http://www.tutorialspoint.com/android/android_php_mysql.htm/

PATTERN OF ASSESSMENT

Continuous Assessment Test:

Theory Pattern

Section A- 10 x 1= 10 marks (Answer all the Questions)

(5 Multiple choice questions and 5 Fill-in the Blanks)

Section B - 3 × 5 =15 marks (3 out of 4)

Theory- 25 marks **Practical: 25 marks** **Duration: 90 minutes**

List of Other Components

Seminars / Quiz /Open book tests/Assignments/Code Reading

End Semester Examination: Total Marks: 100

Theory - 50 marks **Duration: 90 minutes**

Project - 50 marks (Demonstration and Viva)

Section A-10 x 1 = 10 (Answer all the Questions)

(5 Multiple choice questions and 5 Fill-in the Blanks)

Section B - 5 × 2 = 10 (Answer all the Questions)

(1 question from each unit)

Section C - 6 ×5 = 30 (6 out of 8)

(atleast 1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 600 086

General Elective Course offered by the Department of Computer Science to B.A. / B.Sc. / B.Com. / B.B.A / B.S.W. Degree

SYLLABUS

(Effective from the academic year 2019–2020**)**

COMPUTER FUNDAMENTALS

CODE:19CS/GE/CF22 **CREDITS:2**

L T P:2 0 0

TOTAL TEACHING HOURS:26

OBJECTIVES OF THE COURSE

- To expose the students to various functional units of a computer
- To give hands-on experience on assembling a personal computer
- To understand the post assembly operations
- To modify the basic settings of a computer
- To expose students to various web tools

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Comprehend the various functional units of a computer
- Assemble a personal computer
- Work on post assembly operations
- Modify the basic settings of a computer
- Decide on the essentials they require while purchasing a computer
- Work with various web tools

Unit 1 (10 Hours)

1.1 Computer System Hardware

Introduction - Inside a Computer Cabinet - Motherboard, BIOS, CMOS, Ports and Interfaces, Expansion Slots, Ribbon cables, Memory Chips, Storage Devices, Processor – Primary Memory, Secondary Memory, Magnetic disk – Hard disk, Optical Disk – CD-ROM

1.2 Plug and Play Devices

Mouse – Keyboard – Printer – Scanner - Webcam - Digital Devices – Microphone – External Hard Drive

Unit 2 (9 Hours)

2.1 Post Assembly Operations in Practice

Partitioning of Hard drive - Installation of Software - System and Application Software – Antivirus, MS Office package, installing updates from internet, Control Panel Features Programs, Manage User accounts, Network & Internet, Clock, Language and Region, Appearance and Personalization, System and Security, Hardware and Sound.

2.2 Troubleshooting Hardware problems

Approach towards Hardware problems - Troubleshooting - Mother Board, Processor, RAM, Hard drive, I/O Devices, Keyboards, Monitors and Video Cards.

Unit 3 **(7 Hours)**

3.1 Web Tools

The Read / Write Web – Weblogs - Pedagogy and Practice, Get Started – Wikis – Easy Collaboration for all – Flickr - Creating, Publishing and Using Images Online – Podcasting, Video and Screen casting - Multimedia Publishing for the Masses

3.2 Ways to improve one's digital life

Functionality – Security

BOOKS FOR STUDY

Andrews , Jean. *A+ Guide to Managing & Maintaining Your PC.* 8th ed. Cengage Learning, 2013. (Chapter 13) (unit 2)
Balasubramanian D. *Computer Installation and Servicing*. 2nd ed. Tata McGraw Hill, 2005.
Berger, Pam and Sally Trexler. *Choosing Web 2.0 Tools for Learning and Teaching in a Digital World*.1st ed. Library of Congress Cataloguing-in-Publication Data,2010. (unit -3)
Fadia, Ankit. *Faster 100 ways to improve your digital life*. Penguin Books India, 2013(unit-3)
Goel ,Anita. *Computer Fundamentals.* Pearson Education India, 2010. (unit 1)

BOOKS FOR REFERENCE

Gookin ,Dan. *Troubleshooting your PC – For Dummies*. John Wiley, 2008
Richardson, Will. *Blogs, Wikis, Podcasts, and Other Powerful Web Tools for Classrooms*. 3rd ed. SAGE.
Zacker, Craig and John Rourke, *PC Hardware, The Complete Reference*. Tata McGraw Hill Publications, 2001.

WEB RESOURCES

https://www.theblogstarter.com/
https://websitesetup.org/how-to-start-a-blog-guide/
https://themeisle.com/blog/how-to-create-a-blog/
https://startbloggingonline.com/
https://edu.gcfglobal.org/en/computerbasics/basic-troubleshooting-techniques/1/
https://www.bestvpn.com/tutorials/troubleshooting.shtml

PATTERN OF ASSESSMENT:

Only Internal Assessment
Total of component I and component II will be taken as Internal Assessment

Component 1 – 25 marks

Identifying the different Hardware Components
PC Assembling and Troubleshooting hardware problems

Component 2 – 25 marks

Case Study on various Web Tools

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SYLLABUS

(Effective from the academic year 2019–2020)

IMAGE EDITING AND ANIMATION

CODE:19CS/GE/IA22 **CREDITS:2**

L T P:1 0 1

TOTAL TEACHING HOURS:26

OBJECTIVES OF THE COURSE

- To provide an opportunity to pursue skills and applications using Multimedia
- To effectively use the tools available in photoshop
- To apply filters and masking techniques
- To understand the basic drawing techniques
- To provide software skills and hands on experience in digital media

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Identify the basics of multimedia elements
- Edit an image effectively
- Design logos, posters, etc
- Apply animation techniques appropriately
- Create a video for the given story board

Unit 1 (10 Hours)

1.1 Photoshop

Workspace overview - Custom workspace - Cruising main menus – Panels – - Layers- Organising files - Saving the files - Creating slideshow- Drawing tools - Painting – Selection tools - Lasso Options, Magic Wand, Quick - Selection - Correction Tools - Heal and Spot Healing, Patch tool - Eyedropper tool – Brush - Clone Source - Rubber Stamp - Text Tool-Smudge - Blur and Sharpen - Dodge - Burn - Blending modes - Transparency - Moving Path – Filters - Masking –Designing a Collage

Unit 2 (10 Hours)

2.1 Flash

Flash work environment – Stage - Drawing tools and their modifiers – Basic drawing techniques – Animation – Timeline - Tweening and its types - The power of layers – Learning about symbols – Libraries – Onion skinning – Text tool- Basic Action Scripting – Button behaviors – Navigation – Making presentation using Action Script – Symbols - Instances, Instance properties and methods – Dynamic input and text –

Events – Button Event Handling- Adding sound to movies – save files – Publishing movies

Unit 3 **(6 Hours)**

3.1 Mini Project

Mini Project using Photoshop and Flash

BOOKS FOR REFERENCE

Dayley ,Lisa DaNae and Brad Dayley. *Photoshop CS5 Bible*. 1st ed. Wiley Dreamtech India Pvt Ltd, 2010.

Parekh ,Rajan. *Principles of Multimedia*. 2nd ed. Tata McGraw Hill Publishing, 2013.

Perkins , Todd. *Flash Professional CS5 Bible*. 1st ed. Wiley Dreamtech, 2010.

PATTERN OF ASSESSMENT

Only Internal Assessment

Mini Project

Phase I – Photoshop - 25 Marks

Phase II – Flash - 25 Marks

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SYLLABUS
(Effective from the academic year 2019–2020)

CYBER SECURITY

CODE:19CS/GE/CS22 **CREDITS:2**
L T P:2 0 0
TOTAL TEACHING HOURS:26

OBJECTIVES OF THE COURSE

- To familiarize the students with the core concepts and vocabulary of computer security
- To familiarize the students with information security laws and regulatory
- To enable students to recognize real time cyber security attacks

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Understand cyber security threats and counter measures
- Gain knowledge of information security governance, and related legal and regulatory issues
- Identify information security needs of personal and organization
- Know real-time security solutions for their day to day online activities

Unit 1 (**10 Hours)**

1.1 Introduction to Information Security: The History of Information Security-What Is Security-CNSS Security Model-The Need for Security: Business Needs First-Threats- Attacks.

1.2 Cyber Security Fundamentals

Cyber Attack: Attackers-Hackers-Crackers-Crimes and Problems-Social Engineering Attacks- A Step-By-Step Guide for Strengthen Your Security.

Unit 2 **(9 Hours)**

2.1 Understanding The Cyber security Landscape: The Changing Face of Cybercriminals-The Lifecycle of an Advanced Attack-Role of Malware

2.2 Cyber Terrorism

Terrorist Use of the Internet- Internet as Weapon, Wireless Threat

2.3 Laws and Regulatory Requirements:

Need of Cyber Law in India - Laws Related to Information Security - IT Act of India 2000- Copyright law in India- Intellectual property rights

Unit 3 **(7 Hours)**

3.1 Cryptography: Foundations of Cryptology- Cipher Methods

3.2 Security Measures: Basic-Passwords-Computers-Phones and Tablets- Social Media-Chatting and Phone Calls- Internet Banking

BOOKS FOR STUDY

*Information Security Handbook for Network Beginners.*National Center of Incident Readiness and Strategy for Cybersecurity (NISC), The Government of JAPAN, Ver 2.11e (Unit 1.2)

Lawrence C. Miller *Cyber security for dummies*. CISSP(Unit2.1)

Whitman, Michael E.,Whitman and Herbert J. Mattord. *Principles of Information Security*.Cengage Learning, 2011(Unit 1.1,3.1)

BOOKS FOR REFERENCE

Pfleeger ,Charles P and Shari Lawrence Pfleeger. *Security in Computing*, 4th ed. Consulting Group Pearson, 2007.

WEB RESOURCES

https://littlefield.co/cyber-terrorism-understanding-and-preventing-acts-of-terror-within-our-cyber-space-26ae6d53cfbb (Unit 2.2)

https://watchyourhack.com/(Unit 3.2)

http://www.ncb.mu/English/Documents/Downloads/Reports%20and%20Guidelines/Guideline%20on%20Secure%20Internet%20Banking.pdf

http://www.legalserviceindia.com/article/195-copyright-law-in-india.html

http://en.wikipedia.org/wiki/copyright_law_of_india

https://www.wipo.int/edocs/pubdocs/en/intproperty/450/wipo_pub_450.pdf

PATTERN OF ASSESSMENT:

Only Internal Assessment

Average of Component I and II will be taken as Internal Assessment

Component 1: Marks - 25

Section A – 5x1 = 5 Marks (Answer all the questions)

Section B – 5x2 =10 Marks (Answer all the questions)

Section C – 2x5 = 10 Marks (2 out of 4)

Component 2: Marks - 25

Case Study on Real-Time Cyber Security Issues

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 600 086

General Elective Course offered by the Department of Computer Science to B.A. / B.Sc. / B.Com. / B.V.A. / B.S.W. Degree

SYLLABUS

(Effective from the academic year 2019–2020)

DOCUMENTATION AND PRESENTATION

CODE:19CS/GE/DP22 **CREDITS:2**

L T P:1 0 1

TOTAL TEACHING HOURS:26

OBJECTIVES OF THE COURSE

- To give students the knowledge and understanding to prepare formatted documents and powerful presentations
- To provide hands-on use of Microsoft Office applications
- To familiarize the basics and advanced concepts of Word and PowerPoint
- To understand the method of protecting documents

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Create a document with proper formatting
- Create personal, academic and business documents following current industry standards
- Create a presentation in Microsoft PowerPoint that is interactive and with legible content
- Apply Designs to Enhance the feel of the Presentation
- Protect the documents and limit the access

Unit 1 (4 Hours)

1.1 Word Processing

Introduction – The Style Advantage, Outlining, -Autocorrect – Compatibility with previous versions of word –Drawing Canvas –Styles and Character/Font Formatting – Bullets and Numbering –Character Formatting –Paragraph Formatting –Styles and paragraph Formatting, Structural Formatting, paragraph Decoration – Find, Replace and GO To – Language Tools –Auto Correct – Auto Format –Tables – Pictures and SmartArt – Headers and Footers

Unit 2 (10 Hours)

2.1 Advanced Word Processing

Symbols and Equations –Charts –Inserting Objects and Files –Blogging-Templates and Themes – Bookmarks –Tables of Contents –Footnotes and Endnotes -Citations and Bibliography –Indexing –Table of Authorities –Hyperlinks and Cross-References –Envelopes and Labels -Data Documents and Mail Merge –The Ribbon -Security, Tracking and Comments –Protection Type-Integration with other office Applications –Excel, PowerPoint

Unit 3 **(12 Hours)**

3.1 Presentation Tool

Introduction to PowerPoint – Changing the view – Creating a good presentation- Creating and saving Presentation Files –Creating New Slides and Text Boxes – Working with Layout, Themes and Masters –Formatting Text –Formatting Paragraphs –Correcting and Improving Text –Creating and Formatting Tables- Creating SmartArt Diagrams–Importing Image Files into PowerPoint –Compressing Images –Creating a Photo Album Layout- Working with Charts – Working with External Content- Copying Content from Other Programs - Adding Sound Effects, Music and Soundtracks –Creating Animation Effects and Transitions –Creating Support Materials –Preparing for a Live Presentation –Limiting User Access to a Presentation

BOOKS FOR STUDY

Herb Tyson. *Microsoft® Word 2010 Bible*. Wiley Publishing, Inc.
Lisa A. Bucki. *Word 2013 Bible*. Wiley Publishing, Inc.
Faithe Wempen. *PowerPoint 2013 Bible*. Wiley Publishing, Inc.

BOOKS FOR REFERENCE

Lambert Joan. *Microsoft Word 2016 Step by Step* 1st ed. Microsoft Press.2016.
Price Michael. McGrath Mike *Office 2016 Step by Step* 1st ed. Microsoft Press 2016.
Freedman J. *Microsoft Word 2013 Plain & Simple* 2013. Microsoft Press
Echo Swinford. *My PowerPoint 2016*.Pearson education

WEB RESOURCES

https://www.microsoft.com/learning/en-us/book.aspx?ID=9600&locale=en-us
http://www.onlineprogrammingbooks.com/free-ebook-microsoft-office-powerpoint/
http://bookboon.com/en/microsoft-office-powerpoint-ebook#download
https://www.dit.ie/media/ittraining/msoffice/MOAC_Word_2016_Core.pdf

PATTERN OF ASSESSMENT:

Only Internal Assessment

Total of component I and component II will be taken as internal assessment

Component 1 – 25 marks

Preparing a detailed report for a College Event

Component 2 – 25 marks

Creating a presentation on the topic chosen in the component I and including data from the report appropriately

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SYLLABUS

(Effective from the academic year 2019 – 2020)

INTRODUCTION TO DATA ANALYSIS

CODE:19CS/GE/DA22 **CREDITS:2**

L T P:1 0 1

TOTAL TEACHING HOURS:26

OBJECTIVES OF THE COURSE

- To recognise different types of data and understand the implications of data type for subsequent analyses
- To enable the students to understand the various data collection tools and techniques
- To enable the students to understand the pre-processing steps in the analysis of data
- To identify the main issues that needs to be considered when preparing quantitative data for analysis
- To understand predictive data analysis

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Understand the types of data
- Apply appropriate tools and techniques for collecting data
- Prepare data for analysis
- Apply predictive data analysis on the prepared data

Unit 1 (8 Hours)

1.1 Fundamentals of Data Analysis

Purpose of Data Analysis- Different Types of Data- Quantitative and Qualitative Data-Numerical, Categorical- Sources of Data -Primary and Secondary

1.2 Data Collection

Steps, Tools and Techniques of Data Collection - Data layout- Coding - Entering data

Unit 2 (9 Hours)

2.1 Data Cleaning

Checking for errors- Spell Checking, removing duplicate rows, fixing numbers and signs, fixing dates and times, merging and splitting columns, transforming and rearranging columns and rows, reconciling table data by joining or matching.

2.2Importing Data

Importing Text or Microsoft Word Data into Excel-Importing Data from the Web into Excel-Validating Data.

2.3 Summarizing data

Summarizing Data with Histograms-Summarizing Data with Descriptive Statistics-Using PivotTables to Describe Data-Summarizing Data with Database Statistical Functions

Unit 3 **(9 Hours)**

3.1 Predictive Data Analysis

Sensitivity Analysis with Data Tables -Filtering Data- Consolidating Data -Using Correlations to Summarise Relationships - Incorporating Qualitative Factors into Multiple Regression Functions- Analysis of Variance: One-Way ANOVA - Randomised Blocks and Two-Way ANOVA- Software Tools

BOOKS FOR STUDY

Saunders, Mark, Philip Lewis and Adrian Thornhill. *Research methods for business students*. 5th ed**.** Pearson. (Chapters 12 & 13)

Winston, Wayne, L. *Microsoft Excel Data Analysis and Business Modeling*. Microsoft Press, 2004. (Chapters 15, 38, 37, 35, 44, 46, 48, 49)

BOOKS FOR REFERENCE

Dey, Ian. *Qualitative data analysis: A User Friendly Guide for Social Scientists.* Taylor and Francis Group, 2005.

WEB RESOURCES

https://nios.ac.in/media/documents/316courseE/E-JHA-31-10A.pdf

http://en.wikibooks.org/wiki/Statistics/Different_Types_of_Data

https://support.office.com/en-nz/article/Top-ten-ways-to-clean-your-data-2844b620-677c-47a7-ac3e-c2e157d1db19

https://www.proschoolonline.com/blog/top-10-data-analytics-tools/

http://scholarworks.lib.csusb.edu/cgi/viewcontent.cgi?article=1032&context=etd

PATTERN OF ASSESSMENT

Only Internal Assessment

Total of component I and component II will be taken as internal assessment

Component I - 25 marks

Collecting, Cleaning, Validating and Summarizing Data

Component II - 25 marks

Predictive analysis with the data

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)

COMPUTER GRAPHICS

CODE:19CS/UI/CG23 **CREDITS:3**

OBJECTIVES OF THE COURSE

- To be able to understand fundamentals of computer graphics and graphics primitives
- To be able to understand 2 D and 3 D transformations and representations
- To be able to visualization techniques

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Comprehend the concepts related to basics of computer graphics and visualization
- Demonstrate various graphics primitives and 2-D, 3-D geometric transformations and clipping techniques
- Comprehend the concepts related three dimensional object representations.
- Implement various hidden surface removal techniques

Unit 1

1.1 Fundamentals of Computer Graphics

Applications of computer Graphics in various, Video Display Devices, Random scan displays, raster scan displays, DVST, Flat Panel displays, I/O Devices.

1.2 Graphics Primitives

Algorithms for drawing Line, circle, ellipse, arcs & sectors, Boundary Fill & Flood Fill algorithm, Color Tables

Unit 2

2.1 Transformations & Projections

2D & 3D Scaling – Translation - Rotation, Shearing & Reflection, Composite Transformation, Window to View Port Transformation, Orthographic and Perspective Projections

2.2 Clipping

CohenSutherland, Liang Barsky, Nicholl-Lee-Nicholl Line Clipping algorithms, Sutherland Hodgeman, Weiler Atherton Polygon Clipping Algorithm

Unit 3

3.1 Three Dimensional Object Representations

3D Modeling transformations, Parallel & Perspective projection, Clipping in 3D - Curved Lines & Surfaces, Spline Representations, Spline Specifications, Bezier Curves & Surfaces, B-Spline Surves & Surfaces, Rational Splines, Displaying Spline Surves & Surfaces

Unit 4

4.1 Basic Rendering

Rendering in Nature - Polygonal Representation- Affine and Coordinate System Transformations - Visibility and Occlusion - Depth Buffering - Painter's Algorithm - ray tracing, forward and backward rendering equations - Phong Shading per pixel per vertex Shading

Unit 5

5.1 Visualization

Visualization of 2D/3D scalar fields: color mapping, iso surfaces. Direct volume data rendering: ray-casting, transfer functions, segmentation. Visualization of: Vector fields and flow data, Time-varying data, High-dimensional data: dimension reduction, parallel coordinates, Non-spatial data: multi-variate, tree/graph structured, text Perceptual and cognitive foundations, Evaluation of visualization methods, Applications of visualization, Basic Animation Techniques like traditional, keyframing

BOOKS FOR STUDY

Dave Shreiner, Mason Woo, Jackie Neider, Tom Davis, OpenGL Programming Guide: The Official Guide to Learning OpenGL, (2013).

Donald D Hearn, M. Pauline Baker, Computer Graphics C version, Pearson Education.

BOOKS FOR REFERENCE

James D. Foley, Andries van Dam, Steven K. Feiner, John F. Hughes, Computer Graphics: Principles & Practice in C, Addison Wesley Longman.

Zhigang Xiang, Roy A Plastock, Computer Graphics, Schaums Outline, TMH.

PATTERN OF ASSESSMENT

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20 × 1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)

Section B – 5 × 2 = 10 marks (Answer all the questions)
(1 question from each unit)

Section C - 8 × 5 = 40 marks (8 out of 10)
(2 questions from each unit)

Section D - 3 × 10 = 30 marks (3 out of 5)
(1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS) – CHENNAI – 600 086

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
(Effective from the academic year 2019-2020)
COMPUTER VISION

CODE: 19CS/UI/CV23 **CREDITS:3**

OBJECTIVES OF THE COURSE

- To understand fundamentals of images and Computer Vision
- To understand Geometric transformations
- To gain knowledge based on Recognition features

COURSE LEARNING OUTCOMES

On successful completion of the course, students will be able to

- Apply Histograms in real time images
- Demonstrate geometric transformations
- Implement various edge detection techniques
- Apply the vision related problems in further research.

Unit 1

1.1 Introduction

The Human Vision System - Practical Applications of Computer Vision - The Future of Computer Vision

1.2 Images

The Simple Pinhole Camera Model - Images - Sampling- Quantization- Color Images- Noise – Smoothing

Unit 2

2.1 Histograms

1D Histograms - Histogram/Image Equalization- Histogram Comparison- k-means Clustering

2.2 Binary Vision

Thresholding- Threshold Detection Methods- Mathematical Morphology

-

Unit 3

3.1 Geometric Transformations

Affine Transformations - Perspective Transformations – Interpolation

3.2 Edges

Edge Detection - Contour Segmentation - Hough Transform

Unit 4

4.1 Features

Moravec Corner Detection - Harris Corner Detection - FAST Corner Detection- SIFT- Recognition

Unit 5

5.1 Recognition

Template Matching - Chamfer Matching - Statistical Pattern Recognition - Cascade of Haar Classifiers - Other Recognition Techniques - Performance

5.2 Vision Problems

Abandoned and Removed Object Detection - Traffic Lights - Real Time Face Tracking - Road Sign Recognition - License Plates

BOOKS FOR STUDY

Kenneth Dawson. *A Practical Introduction to Computer Vision with OpenCV.* John Wiley & Sons Ltd, 2014.

BOOKS FOR REFERENCE

David A. Forsyth, Jean Ponce. *Computer Vision: A Modern Approach*. Pearson Edition,2015.
Jan Erik Solem. *Programming Computer Vision with Python: Tools and Algorithms for Analyzing Images*. O'Reilly Media, 2012.
Richard Szeliski. *Computer Vision: Algorithms and Applications*. Springer Publications, 2011.
Simon J. D. Prince. Computer *Vision: Models, Learning, and Inference*. Cambridge University Press,2012.

WEB RESOURCES

https://www.cs.toronto.edu/~urtasun/courses/CV/lecture01.pdf
https://www.cl.cam.ac.uk/teaching/0809/CompVision/CompVisNotes.pdf

PATTERN OF ASSESSMENT

End-Semester Examination: Total Marks: 100 Duration: 3 hours

Section A - 20 x 1 = 20 marks (Answer all the questions)
(10 Multiple choice questions and 10 Fill-in the Blanks)

Section B - 5 × 2 = 10 marks (Answer all the questions)
(1 question from each unit)

Section C - 8 ×5 = 40 marks (8 out of 10)
(2 questions from each unit)

Section D - 3 x 10 = 30 marks (3 out of 5)
(1 question from each unit)