AC- 12/10/2023

Item No- 5.170

Rayat Shikshan Sanstha's

KARMAVEER BHAURAO PATIL COLLEGE, VASHI.
NAVI MUMBAI
(EMPOWERED AUTONOMOUS COLLEGE)

Sector-15- A, Vashi, Navi Mumbai - 400 703

Program: B.Sc. Information Technology

Syllabus for F.Y.B.Sc. Information Technology

NEP 2023-2024

Rayat Shikshan Sanstha‟s

Karmaveer Bhaurao Patil College Vashi, Navi Mumbai Empowered Autonomous College

[University of Mumbai]

Syllabus

Sr. No.	Heading	Particulars
1	**Title of Course**	**F.Y.B.Sc.** **Information Technology**
2	**Eligibility for Admission**	**12th Maths**
3	**Passing Marks**	**40%**
4	**Ordinances/Regulations** **(if any)**	
5	**No. of Years/Semesters**	**One year/Two semester**
6	**Level**	**U.G.**
7	**Pattern**	**Semester**
8	**Status**	**Revised**
9	**To be implemented from** **Academic year**	**2023-2024**

Objectives of the Program:

- To acquaint students with the fundamental of computer hardware and software in information technology
- To develop analytical skills and critical thinking through application of theory knowledge into practical course
- To construct and apply knowledge of programming, and appreciate the relationship between several programming languages and other disciplines
- To enable students to understand IT and its industrial and social context

Program Outcome:

By the end of the course, a student should develop the ability:

- Student will understand, coherently and effectively about various basic components of computers.
- Student can improve their computer literacy, their basic understanding of operative systems and a working knowledge of software commonly used in academic and professional environments.
- Student can able to develop basic skills in practical of Information Technology and its industrial applications.
- Student can do Academic and Professional Presentations - Designing and delivering an effective presentations and developing the various IT skills to the electronic databases.
- Student can develop ability to solve IT-oriented security issues and protocols
- Student can definitely design and implement a web page.
- Student can improve communication and business management skills, especially in providing technical support.

SEM	MAJOR(DSC/SSC/FSC/DSE/SSE/FSE)	MINOR	GENERIC (GE/OE)	VOCATIONAL/ SKILL(VSEC)	AEC/IKS/EVLSCC OCURRICULAR	INTERNSHIPS/PROJECTS/	TOTAL MIN
I	DSC 4	4	4	2+2	2+2+2	2	
	Operating System (3+1)		Basic computer Skill(2+2)	Programming Principles with C(2) Web Programming(2)	SDP-2 M/E-2 IKS-2	NCC/NSS/DANCE/ YOGA/MUSIC/CE	24
II	DSC 4	4	4	2+2	2+2+2	2	
	Object Oriented Programming with C++ (3+1)		E- content Devlopment(2+2)	Digital Logic and Applications(2) Web Technology(2)	SDP-2 M/E-2	NCC/NSS/DANCE/ YOGA/MUSIC/CE	24

Semester – I

Course Code	Course Type	Course Title	Credits
IT101	DSE (Major)	Operating System	04
IT103	OE	Basic Computer Skills	04
IT104	VSC	Programming Principles with C	02
IT105	SEC	Web Programming	02

Semester – II

Course Code	Course Type	Course Title	Credits
IT151	DSE (Major)	Object Oriented Programming with C++	04
IT153	OE	E-Content Development	04
IT154	VSC	Digital Logic and Applications	02
IT155	SEC	Web Technology	02

***DSE: Discipline Specific Elective**
***GE: Open Elective**
***VSC: Vocational Skill Course**
***SEC: Skill Enhancement Course**

Rayat Shikshan Sanstha"s
Karmaveer Bhaurao Patil College, Vashi
Navi Mumbai
(Autonomous)
Department of Information Technology
B.Sc. Information Technology

Program Outcomes (POs)

Learners are able to-

PO-1	**Disciplinary Knowledge and Skills**	Acquire the comprehensive and in-depth knowledge of various subjects in sciences such as Physics, Chemistry, Mathematics, Microbiology, Bio-analytical Science, Computer Science, Data Science, Information Technology and disciplinary skills and ability to apply these skills in the field of science, technology, and its allied branches
PO-2	**Communication and Presentation Skills**	Develop various communication skills including presentation to express ideas evidently to achieve common goals of the organization.
PO-3	**Creativity and Critical Judgment**	Facilitate solutions to current issues based on investigations, evaluation and justification using evidence-based approach.
PO-4	**Analytical Reasoning and Problem Solving**	Build critical and analytical attitude in handling the problems and situations.
PO-5	**Sense of Inquiry**	Curiously raise relevant questions based on highly developed ideas, scientific theories and its applications including research.
PO-6	**Use of Digital Technologies**	Use various digital technologies to explore information/data for business, scientific research, and related purposes.
PO-7	**Research Skills**	Construct, collect, investigate, evaluate, and interpret information/data relevant to science and technology to adapt, evolve and shape the future.
PO-8	**Application of Knowledge**	Develop a scientific outlook to create consciousness against the social myths and blind faith.
PO-9	**Moral and Ethical Reasoning**	Imbibe ethical, moral, and social values to develop virtues such as justice, generosity, and charity as beneficial to individuals and society at large.

PO-10	**Leadership and Teamwork**	Work cooperatively and lead proactively to achieve the goals of the organization by implementing the plans and projects in various field-based situations related to science, technology, and society at large.
PO-11	**Environment and Sustainability**	Create social awareness about the environment and develop sustainability for betterment of the future.
PO-12	**Lifelong Learning**	Realize that pursuit of knowledge is a lifelong activity and in combination with determined efforts, positive attitude and other qualities to lead a successful life.

Department of Information Technology
Program Specific Outcomes (PSO)

PSO-1	To acquaint students with the fundamental of computer hardware and software in information technology
PSO-2	To develop analytical skills and critical thinking through application of theory knowledge into practical course
PSO-3	To construct and apply knowledge of programming, and appreciate the relationship between several programming languages and other disciplines
PSO-4	To enable students to understand IT and its industrial and social context

Semester – I

F.Y.B.Sc Information Technology
Course Code: IT101
Course Name: Operating System

Periods per week(1 periods is 60 minutes)	No. of Credits	Evaluation System
03	03	Th-60 Marks

IT101 Operating System

Course Outcomes: After successful completion of this course, students will be able to:
CO-1: understand operating system, its structures and functioning.
CO-2: develop and master understanding of algorithms used by operating systems for various purposes.
CO-3: understand process, thread, and relation between them.
CO-4: understand scheduling and solve problem based on it.
CO-5: understand algorithms based on memory management.

ICT Tools Used: Videos, PPT, Pen-Tablet, Ubuntu

Students Centric Methods: Problem Solving and Participative (Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:
1) https://www.udemy.com/course/operating-system-j/
2) https://www.coursera.org/specializations/codio-introduction-operating-systems
3) https://onlinecourses.nptel.ac.in/noc23_cs101/preview

The CO-PO Mapping Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	1	-	2	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-
CO4	2	-	-	2	-	-	-	-	-	-	-	-
CO5	2	-	-	-	-	2	-	-	-	-	-	-

Unit	Details	Lectures
I	**Introduction and Operating-Systems Structures**: Operating System Structure, Operations and Services; System Calls, Operating-System Design and Implementation; **Process Management:** Process Scheduling and Operations; Interprocess Communication, Process Synchronization, Critical-Section Problem, Peterson‟s Solution, Semaphores	12
II	**CPU Scheduling** – Scheduling criteria, Scheduling algorithms, **Threads -** Overview, Multithreading models, Threading issues **Deadlock** - Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock.	12

III	**Input-Output:** Principles of I/O hardware, Principles of I/O software, I/O software layers, disks, clocks, user interfaces: keyboard, mouse, monitor, thin clients, power management, **Deadlocks:** Resources, introduction to deadlocks, the ostrich algorithm, deadlock detection and recovery, deadlock avoidance, deadlock prevention, issues. **Multiple Processor Systems**: Multiprocessors, multicomputers, distributed systems	**12**

Reference Books:

1. Modern Operating Systems, Andrew S.Tanenbaum,Herbert Bos,Pearson, 4th,2014
2. Operating Systems –Internals and Design Principles Willaim Stallings,Pearson 8th,2009
3. Operating System Concepts ,Abraham Silberschatz, Peter B. Galvineg Gagne Wiley,8th
4. Operating Systems, Godbole and Kahate, McGraw Hill,3rd

E-Books and Online Learning Material :

1. https://www.udemy.com/course/operating-system-j/
2. https://www.coursera.org/specializations/codio-introduction-operating-systems
3. https://onlinecourses.nptel.ac.in/noc23_cs101/preview

F.Y.B.Sc Information Technology
Course Code: IT101
Course Name: Operating System Practical

Practical per week(1 periods is 60 minutes)	No. of Credits	Evaluation System
02	01	PR-50 Marks

List of Practical

1. Installation of virtual machine software.

2. Installation of Linux operating system (RedHat / Ubuntu) on virtual machine.

3. Customise desktop environment by changing different default options like changing default background, themes, screensavers

4. Screen Resolution: Ascertain the current screen resolution for your desktop

5. Networking: Get the current networking configuration for your desktop. Are you on a wired or a wireless connection? What wireless networks are available, if any?

6. Linux commands: Working with Directories:

    a. pwd, cd, ls, mkdir, rmdir,

    b. file, touch, rm, cp. mv, rename, head, tail, cat, tac, more, less, strings, chmod

7. Linux commands: Working with files:

    a. ps, top, kill, pkill, bg, fg,

    b. grep, locate, find, locate.

    c. date, cal, uptime, w, whoami, finger, uname, man, df, du, free, whereis, which.

    d. Compression: tar, gzip.

8. Windows (DOS) Commands – 1

a. Date, time, prompt, md, cd, rd, path.

b. Chkdsk, copy, xcopy, format, fidsk, cls, defrag, del, move.

9. Windows (DOS) Commands – 2

a. Diskcomp, diskcopy, diskpart, doskey, echo

b. Edit, fc, find, rename, set, type, ver

10. Command line operations:

a. Install any new package on your system

b. Remove the package installed

c. Find the passwd file in / using find command

d. Create an empty file example.txt and move it in /tmp directory using relative pathname.

11. Command line operations:

a. Delete the file moved to /tmp in the previous step using absolute path.

b. Find the location of ls, ps, bash commands.

c. Use man command to find help for various commands

12. Try out the General Purpose Utility Commands.

13. Use environment

a. Which account are you logged in? How do you find out?

b. Display /etc/shadow file using cat and understand the importance of shadow file. How it‟s different from a passwd file.

14. Use environment

a. Get your current working directory.

b. Explore different ways of getting command history, how to run previously executed commands without typing it?

c. Create alias to most commonly used commands like.

F.Y.B.Sc Information Technology
Course Code: IT103
Course Name: Basic Computer Skills

Periods per week(1 periods is 60 minutes)	No. of Credits	Evaluation System
02	03	Th-50 Marks

IT103 Basic Computer Skills

Course Outcomes: After successful completion of this course, students will be able to:
CO-1: understand basic understanding of computer hardware and software.
CO-2: apply the skills that are the focus of this program to business scenarios.
CO-3: learn receive and send emails.
CO-4: understand the use a web browser to navigate the Internet.

ICT Tools Used: Videos, PPT, Pen-Tablet, MS Office, Internet

Students Centric Methods: Problem Solving and Participative
(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:
1) https://www.udemy.com/course/computer-basics-with-ms-office/
2) https://www.coursera.org/specializations/introduction-computer-infosystems

The CO-PO Mapping Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	2	-	2	-	-	-	-
CO3	-	-	-	-	-	2	-	-	-	-	-	-
CO4	3	-	-	-	-	-	-	-	-	-	-	2

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Unit	Details	Lectures
I	**Introduction to computer:** Generation of computers, Supercomputer and its applications Computer input & output Devices, Computer componen Computer storage Devices, Computer Languages, Computer File extension, Computer hardware, Software. **Computer Communication and Internet:** Basic of Computer networks: LAN, MAN, WAN. Internet Concept of Internet, Application of Internet. Service on InterNet WWW and web-sites, Electronic mails, Communication or Internet	12

II	**Computer security:** Overview of Computer Security Concepts and Foundations, Threats, Attacks, and Assets, Malicious Software, Denial-of-Service Attacks o Intrusion Detection o Firewalls and Intrusion Prevention Systems, Cyber-crime, Internet Security Protocols and Standards.	12
III	**Basic of Latest Technology:** Introduction, application, advantages and disadvantages of following topics:Cloud computing, social networking, blockchain, Internet of Things (IoT), Virtual Reality/ Augmented Reality (VR/AR), Artificial	12

	Intelligence/ Machine Learning (AI/ML), Robotics- Classification of Robots, Advantages and Disadvantages of Robot	

Reference Books:

1. Data Processing and Information Technology, C.S. French, BPB Publications,1998
2. Computer Fundamentals P.K Sinha, BPB Publications,1992
3. The ABCs of Microsoft Office 97 Professional edition,Guy Hart-Davis, BPB Publications, 1998
4. Microsoft Windows 98 Training Guide, Karl Schwartz, 1998

E-Books and Online Learning Material :

1. https://www.udemy.com/course/computer-basics-with-ms-office/
2. https://www.coursera.org/specializations/introduction-computer-infosystems

F.Y.B.Sc Information Technology
Course Code: IT103
Course Name: Basic Computer Skills Practical

Practical per week(1 periods is 60 minutes)	No. of Credits	Evaluation System
04	01	PR-50 Marks

List of Practical

1. To study MS Word: starting Ms Word, creating documents, opening a word document, cutting, copying and pasting text, modifying font, aligning text, indenting paragraphs and modifying line spacing, setting and modifying tabs, inserting numbers and bullets in the word document, inserting bullets, page breaks, auto correct, spelling check and grammar tool, changing default settings, finding text, finding and replacing text, split window option, working with columns, saving and protecting the document.

2. Creating and working with tables in MS Word: Creating Table, Adding columns and Rows to the Table, Deleting columns or rows from the Table, Splitting and merging cells, Text alignment within tables, changing text orientation, Adding Calculations.

3. To Study Mail Merge: Creating the Main Document, Creating the Data Source

4.To study MS Excel: Creating workbooks, Entering text and data in cells, formatting the Text, setting alignments of the Text, working with multiple cells, formatting features on numbers, changing the column width, changing the row height, Inserting and Deleting the Rows, Inserting and Deleting Columns, Moving and Copying the Cell Contents, Transferring the Data between

Worksheets, Transferring the data between the Worksheets.
5.Using Formulae, referencing and creating range in MS Excel: Writing a simple formula, Inserting a column, Writing a complex formula, Editing the formula, Relative references, Absolute references, Creating an Range, Creating names from a Row or a Column,
6.Using Functions and Web Publishing in MS Excel: Using Excel Financial functions, Goal Seek, using common statistical functions, Creating Charts, Using Stock Charts, Preparing Excel Data for Web Publication, and Publishing Excel Data on the Web.
7.To study MS PowerPoint: Starting MS PowerPoint, Creating a presentation using a blank presentation, Using Design Templates, Different views of Slides, Customizing the background of Slide Master, Modifying text, adding footer to the Slide.
8.Creating Handouts and Notes and Customizing the Presentation: Making Handouts, Making Notes, Setting the slide timings, Drawing on the Slides, Customizing a presentation.
9.Working with Graphs and objects in MS PowerPoint: Creating Graphs, Inserting Objects and graphics, Adding Transition to the Slide, Adding Slide Animation, Modify the Slide Background Color and Fill Pattern, Saving Presentation

F.Y.B.Sc Information Technology **Course Code: IT104** **Course Name: Programming Principles with C**		
Practical per week(1 periods is 60 minutes)	**No. of Credits**	**Evaluation System**
04	**02**	**PR-50 Marks**

IT 104 Programming Principles with C

Course Outcomes: After successful completion of this course, students will be able to:

CO-1: Students should be able to write, compile and debug programs in C language.

CO-2: Students should be able to learn the simple program logic, structure of program, compilation and execution of a program, declarations of variables and expressions.

CO-3: Students should be able to use different data types and operators in a computer program.

CO-4: Students should be able to design programs in C involving decision structures, loops and functions.

CO-5: Students should be able to explain the difference between call by value and call b reference

CO-6: Students should be able to understand the dynamics of memory by the use of pointers, structures related to functions and arrays, unions.

ICT Tools Used: Videos, PPT, Pen-Tablet,Turbo-C

Students Centric Methods: Problem Solving and Participative
(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) https://www.udemy.com/share/101VoK/
2)https://www.udemy.com/share/1
01Wd4/

The CO-PO Mapping Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	1	-	-	-	-	-	-	-	-	-	-
CO2	-	-	1	-	-	-	-	-	-	-	3	-
CO3	-	-	-	3	-	-	-	-	-	-	-	-
CO4	-	-	-	2	-	-	-	-	-	-	-	
CO5	-	-	-	-	-	-	2	-	-	-		
CO6	-	-	-	-	-	-	1	-	-	-	-	1

List of Practical

1. Basic Programs:

a. Write a program in C to display the message HELLO WORLD.

b. Write a program in C to declare some variables of type int, float and double. Assign some values to these variables and display these values.

c. Write a program in C to find the addition, subtraction, multiplication and division of two numbers.

2. Programs on variables:

a. Write a program in C to swap two numbers without using third variable.

b. Write a program in C to find the area of rectangle, square and circle.

c. Write a program in C to find the volume of a cube, sphere, and cylinder.

3. Conditional statements and loops(basic)

a. Write a program in C to enter a number from the user and display the month name. If number >13 then display invalid input using switch case.

b. Write a program in C to check whether the number is even or odd.

c. Write a program in C to check whether the number is positive, negative or zero.

d. Write a program in C to find the factorial of a number.

e. Write a program in C to check whether the entered number is prime or not.

f. Write a program in C to find the largest of three numbers.

4. Conditional statements and loops(advanced)

a. Write a program in C to find the sum of squares of digits of a number.

b. Write a program in C to reverse the digits of an integer.

c. Write a program in C to find the sum of numbers from 1 to 100.

d. Write a program in C to print the Fibonacci series.

e. Write a program in C to find the reverse of a number.

f. Write a program in C to find whether a given number is palindrome or not.

g. Write a program to check whether the entered number is Armstrong or not.

h. Write a program to count the digit in a number

5. Programs on patterns:

a. Programs on different patterns

6. Functions:

a. Programs on Functions.

7. Recursive functions

a. Write a program to find the factorial of a number using recursive function.

b. Write a program to find the sum of natural number using recursive function.

8. Arrays

a. Write a program to find the largest value that is stored in the array.

b. Write a program using pointers to compute the sum of all elements stored in an array.

c. Write a program to arrange the „n" numbers stored in the array in ascending and descending order.

d. Write a program that performs addition and subtraction of matrices.

e. Write a program that performs multiplication of matrices.

9. Pointers

a. Write a program to demonstrate the use of pointers.

b. Write a program to perform addition and subtraction of two pointer variables.

10. Structures and Unions

a. Programs on structures.

b. Programs on unions.

Reference Books:

1. Programming Language, Brian W. Kernighan and Denis M. Ritchie, PHI,2nd,1988
2. Mastering C,K R Venugopal, Tata McGraw-Hill,6th,2007
3. Programming with C, Byron Gottfried, Tata McGRAW-Hill, 2nd,1996
4. Let us C, Yashwant P. Kanetkar, BPB publication
5. Programming in ANSI C,E.Balagurusamy, Tata McGraw-Hill,7th,1982

E-Books and Online Learning Material :

1. https://www.udemy.com/course/c-programming-for-beginners-/
2. https://onlinecourses.nptel.ac.in/noc23_cs93/preview
3. https://www.coursera.org/learn/c-for-everyone

F.Y.B.Sc Information Technology Course
Code: IT105
Course Name: Web Programming

Practical per week(1 periods is 60 minutes)	No. of Credits	Evaluation System
04	02	PR-50 Marks

IT105 Web Programming

Course Outcomes: After successful completion of this course, students will be able to:
CO-1: design valid, well-formed, scalable, and meaningful pages using emerging technologies.
CO-2: understand the various platforms, devices, display resolutions, viewports, and browsers that render websites.
CO-3: develop and implement client-side scripting language programs.
CO-4: use different multimedia option to enhance look and feel of website.
CO-5: apply style to enhance the overall impact of website.

ICT Tools Used: Videos, PPT, Pen-Table, Internet, Notepad

Students Centric Methods: Problem Solving and Participative
(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:
1) https://www.udemy.com/course/modern-html-css-from-the-beginning/
2) https://www.coursera.org/learn/html-css-javascript-for-web-developers
3) https://onlinecourses.swayam2.ac.in/aic20_sp11/preview

The CO-PO Mapping Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	2	-	-	2	-	-	-	-	-	1
CO2	3	-	-	-	-	-	-	-	-	-	-	-

CO3	-	-	-	-	-	-	-	2	-	-	-	-
CO4	-	-	1	-	-	2	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	3	-	-	-	-

Practical List	
1.	Design a web page to provide Myself using any 15 tags and provide appropriate title and heading to the web page
2.	Write a program to generate following List ● IT 1. FYIT 2. SYIT 3. TYIT ● CS 1. FYCS 2. SYCS 3. TYCS ● BMS 1. FYBMS 2. SYBMS 3. TYBMS

3.	Write a program to demonstrate the use of link A] Write a program to generate image link B] Write a program to demonstrate jumping from one location to another on same and different pages
4.	Design a web page to display a Calendar of December month and provide different formatting for Christmas Week and Christmas Day
5.	Design a Registration Form
6.	Design a web page with Image maps.
7.	Design a web page using CSS.
8.	Design a web page embedding with multimedia features.
9.	Design a web page demonstrating different semantics
10.	Create XML file to store student information like Roll Number, Name , Age, Mobile Number , Email Id.
11.	Create XML file to store Employee information like Empid, Name, Age, Mobile Number , Salary, designation, department where Empid is attribute.
12.	Create DTD for above XML Files
13.	Write a program to demonstrate the Frame
14.	Create website your college using Frame
15.	Create a simple Registration Form
16.	Write a program to demonstrate HTML 5 input types
17.	Design a web page embedding with multimedia features.

18.	Design a web page demonstrating different semantics
19.	Write program to demonstrate types of Selectors in CSS
20.	Write a program to demonstrate types of CSS
21.	Create XML file to store student information like Roll Number, Name , Age, Mobile Number , Email Id.
22.	Create DTD for above XML File
23.	Create XML file to store Employee information like Empid, Name, Age, Mobile Number, Salary, designation, department where Empid is attribute.
24.	Create DTD for above XML File
25.	Mini Project : Create a website using External CSS.

Semester – II

F.Y.B.Sc Information Technology Course
Code: IT151
Course Name: Object Oriented Programming with C++

Periods per week(1 periods is 60 minutes)	No. of Credits	Evaluation System
03	03	Th-60 Marks

IT151 Object Oriented Programming with C++

Course Outcomes: After successful completion of this course, students will be able to:
CO-1: write, compile and debug programs in C language.
CO-2: use different data types in a computer program.
CO-3: design programs involving decision structures, loops, and functions.
CO-4: explain the difference between call by value and call by referenceprogramming
CO-5: understand the dynamics of memory by the use of pointers.

ICT Tools Used: Videos, PPT, Pen-Tablet, Mobile Apps, Turbo C, Dev C++

Students Centric Methods: Problem Solving and Participative
(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:
1) https://www.udemy.com/course/beginning-c-plus-plus-programming/
2) https://www.coursera.org/specializations/coding-for-everyone
3) https://onlinecourses.swayam2.ac.in/aic20_sp06/preview

The CO-PO Mapping Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	-	2	-	-	-	3	-	-	-	-
CO2	-	3	-	-	-	-	-	2	-	-	2	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-
CO4	2	-	3	2	-	-	-	-	-	-	-	1
CO5	2	-	-	-	-	-	-	-	-	-	-	-

Unit	Details	Lectures
I	**Object Oriented Methodology:** Introduction, Advantages and Disadvantages of Procedure Oriented Languages, what is Object Oriented? What is Object Oriented Development? Benefits and Application of OOPS. **Basics of C++ programming:** C++ Program Structure, Character Set and Tokens, Data Type, Type Conversion, Preprocessor Directives, Input/output Streams and Manipulators, Array, pointers, structures, unions, Decision and Control Statements. **Principles of OOPS:** Basic Concepts of OOPS: Objects, Classes, Data Abstraction and Data Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing	12
II	**Classes and Objects:** Simple classes (Class specification, class members accessing: public ,private ,protected), Defining member functions, Writing function definition outside the class ,Making outside function inline, Array of objects, passing object as an argument, Returning object from functions, friend classes, Static Functions, Static data member.	12

	Constructors and Destructors: Introduction, Default Constructor, Parameterized Constructor and examples , Destructors	
III	**Polymorphism:** Concept of function overloading, overloaded operators, overloading unary and binary operators with member and friend function, overloading comparison operator, overloading arithmetic assignment operator **Program development Using Inheritance:** Introduction, understanding inheritance, Advantages provided by inheritance, choosing the access specifier, Derived class declaration, derived class constructors, multiple inheritance, multilevel inheritance, hierarchical inheritance, virtual base classes, hybrid inheritance.	**12**

Reference Books:

1. Object Oriented Analysis and Design,Timothy Budd,TMH, 3rd,2012
2. Mastering C++ K R Venugopal, Rajkumar Buyya, T Ravishankar,Tata McGraw Hill, 2nd,Edition,2011
3. C++ for beginners,B. M. Hirwani,SPD,2013
4. Effective Modern C++, Scott Meyers, SPD
5. Object Oriented Programming with C++, E. Balagurusamy, Tata McGraw,Hill,4th
6. Learning Python,Mark Lutz,O‟ Reilly,5th ,2013
7. Mastering Object Oriented ,Python, Steven F. Lott,Pact,Publishing , 2014

E-Books and Online Learning Material :

1. https://www.coursera.org/specializations/object-oriented-programming-s12n
2. https://www.udemy.com/course/beginning-c-plus-plus-programming/
3. https://onlinecourses.swayam2.ac.in/aic20_sp06/preview

F.Y.B.Sc Information Technology
Course Code: IT151
Course Name: Object Oriented Programming with C++ Practical

Practical per week(1 periods is 60 minutes)	**No. of Credits**	**Evaluation System**
02	**01**	**PR-50 Marks**

List of Practical: To be implemented using Object Oriented Language

1.	**Conditional statements**
a.	Write a program to check whether the number is even or odd.
b.	Write a program to check whether the number is positive, negative or zero.

2.	**Loops**
a.	Write a program to find the sum of numbers from 1 to 100.
b.	Write a program to find the factorial of a number.
3.	**Array**
a.	Write a program to find the largest value that is stored in the array.
b.	Write a program using pointers to compute the sum of all elements stored in an array.
4.	**Pointer**
a.	Write a program to demonstrate the use of pointers.
b.	Write a program to perform addition and subtraction of two pointer variables.
5.	**Classes and methods**
a.	Design an employee class for reading and displaying the employee information, the getInfo() and displayInfo() methods will be used repectively. Where getInfo() will be private method
b.	Design the class student containing getData() and displayData() as two of its methods which will be used for reading and displaying the student information respectively.Where getData() will be private method.
c.	Design the class Demo which will contain the following methods: readNo(), factorial() for calculating the factorial of a number, reverseNo() will reverse the given number, isPalindrome() will check the given number is palindrome, isArmstrong() which will calculate the given number is armStrong or not.Where readNo() will be private method.
d.	Write a program to demonstrate function definition outside class and accessing class members in function definition.
6.	**Using friend functions.**
a.	Write a friend function for adding the two complex numbers, using a single class
b.	Write a friend function for adding the two matrix from two different classes and display its sum.
7.	**Constructors and method overloading.**
a.	Design a class Complex for adding the two complex numbers and also show the use of constructor.
b.	Design a class Geometry containing the methods area() and volume() and also overload the area() function .
c.	Design a class StaticDemo to show the implementation of static variable and static function.
8.	**Operator Overloading**
a.	Overload the operator unary (-) for demonstrating operator overloading.
b.	Overload the operator + for adding the timings of two clocks, And also pass objects as an argument.
c.	Overload the + for concatenating the two strings. For e.g “Py” + “thon” = Python
9.	**Inheritance**

a.	Design a class for single level inheritance using public and private type derivation.
b.	Design a class for multiple inheritance.
c.	Implement the hierarchical inheritance.
10.	**Virtual functions and abstract classes**
a.	Implement the concept of method overriding.
b.	Show the use of virtual function
c.	Show the implementation of abstract class.

F.Y.B.Sc Information Technology
Course Code: IT153
Course Name: E-Content Development

Periods per week(1 periods is 60 minutes)	**No. of Credits**	**Evaluation System**
02	**03**	**PR-50 Marks**

IT153 E-Content Development

Course Outcomes: After successful completion of this course, students will be able to:
CO-1: Students should be able to understands the aims and objectives of E-content making
CO-2: Students will become masters in the techniques of word processing and presentation software
CO-3: Students should be able to familiarizes with the different teaching technologies used in the classroom
CO-4: Students should be able to acquires the knowledge of MOOCs

ICT Tools Used: Videos, PPT, Pen-Tablet, Mobile Apps, Turbo C, Dev C++

Students Centric Methods: Problem Solving and Participative
(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:
1) https://www.udemy.com/course/create-video-elearning-content-quiz-easy-quick-teachers-course/
2) https://www.shiksha.com/online-courses/content-development-certification

The CO-PO Mapping Matrix

CO/ PO	PO 1	PO 2	PO 3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO11	PO12
CO1	2	-	1	-	-	-	-	-	-	-	-	-

CO2	-	-	-	-	-	2	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	2
CO4	1	-	-	-	-	-	-	-	2	-	-	-

Unit	Details	Lectures
I	**E-Content :** Introduction, Designing and Development of E-content, Standards of E-content, E-content Tools **E-Learning:** Concept, Features and it"s Types : Introduction, Virtual Classroom, Learning Content Management Systems, Types of E-Learning, The Benefits of E-Learning, Disadvantages of E-Learning **Content Authoring Tool in e-Learning :** What is a Content Authoring Tool? Working of Content Authoring Tool, Feature and Capabilities of Authoring Software, The Benefits of Using Content Authoring Tool	**8**
II	**Digital Content Creation Tools :** Visual Content Creation Tools, Image Sourcing, Creating, Editing and Uploading Tools, Interactive Content Creation tools, Infographic and Chart Maker Tools, PowerPoint Presentation Tools, Audio Creation Tools, Video Creation Tools, Media Integration tools, Tools for Writing for the Web. **Massive Open Online Courses :** Define the MOOCs, Differentiate between various kinds of MOOCs, Four Quadrants of MOOCs, List the MOOCs preparing universities, companies and organizations, Know the MOOCs providing platforms, Understand the application of MOOCs, List the advantage and disadvantage of MOOCs.	**8**
III	**Graphic and Animation Tools** Meaning, Use of Graphic and Animation Tools in E-content Preparation - Identification of Proper Tools - How to Use the Tool in E-content Preparation - Infographics Tools: Meaning, Need and Use - Podcasting Tools: Need and Importance **Online Video Creation** Video Creation: Online Video Capturing Tools: Identification and Uses - Video Creation Software: Free Online Video Creation, Identification and Strategies to Use **Survey Tools and Presentation of E-content** Survey Tools: Need, Importance and Free Survey Tools - Quiz Tools: Need, Importance and Free Online Quiz Tools - Tips for Effective Presentation - Tips for Effective E-content	**8**

References and Text Book:

1. Diane Elkins et al. (2015). E-Learning Fundamentals: A PRACTICAL GUIDE.ISBN: 9781562869472, Pages: 176. Nick Rushby et al. (n.d.) Wiley Handbook of Learning Technology.
2. WileyEducation. WileyKathe Santilo. (2018). Google forms in the classroom. Kindle Edition: Amazon Asia-Pacific Holdings Private Limited.

E-Books and Online Learning Material :

1. https://www.coursera.org/learn/digitalcreativity
2. https://pdst.ie/sites/default/files/Google%20Drive_1.pdf

F.Y.B.Sc Information Technology
Course Code: IT153
Course Name: E-Content Development Practical Practical

Practical per week(1 periods is 60 minutes)	No. of Credits	Evaluation System
02	01	PR-50 Marks

List of Practicals

1. Designing amazing slides using Sozi or Gossip.
2. Video making and editing using Adobe Premiere Pro or Youtube Studio
3. Audio editing using MyEdit or TwistedWave
4. Digital Storytelling using StoryJumper or Plotagon Story
5. Animation using Animaker or VideoScribe
6. Survey using Google Form
7. Employee Survey and polls using Geekbot
8. Polling using Slides with Friends
9. Quiz making using Riddle‟s Quizmaker
10. Mini Project : Create a mini project using 3 to 4 tools listed above

F.Y.B.Sc Information Technology
Course Code: IT154
Course Name: Digital Logic and Applications

Periods per week(1 periods is 60 minutes)	No. of Credits	Evaluation System
03	03	50 Marks

IT153 Digital Logic and Applications

Course Outcomes: After successful completion of this course, students will be able to:

CO-1: To learn about how computer systems work and underlying principles.
CO-2: To understand the basics of digital electronics needed for computers
CO-3: To understand the basics of instruction set architecture for reduced and complex instruction sets
CO-4: To understand the basics of processor structure and operation
CO-5: To understand how data is transferred between the processor and I/O devices

ICT Tools Used: Videos, PPT, Pen-Tablet, Mobile Apps, Turbo C, Dev C++

Students Centric Methods: Problem Solving and Participative
(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:
1) https://www.udemy.com/courses/search/?src=ukw&q=Digital+Logic+and+Applications
2) https://www.coursera.org/learn/digital-systems
3) https://www.shiksha.com/online-courses/digital-logic-and-applications-certification?q=Digital%20Logic%20and%20Applications&fftid=hamburger

The CO-PO Mapping Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	2	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	3	-	-	-	-	-	-
CO3	3	-	-	2	-	-	-	-	-	-	-	-
CO4	3	-	-	3	-	-	-	-	-	-	-	-
CO5	3	-	-	2	-	-	-	-	-	-	-	-

Unit	Details	Lectures
I	**Number System:** Analog System, digital system, numbering system, binary number system, octal number system, hexadecimal number system, conversion from one number system to another, floating point numbers, weighted codes binary coded decimal, non-weighted codes Excess – 3 code, Gray code, Alphanumeric codes – ASCII Code, EBCDIC, Hollerith Code, Error detection and correction, Code conversion. **Binary Arithmetic:** Binary addition, Binary subtraction, Negative number representation, Subtraction using 1"s complement and 2"s complement, Binary multiplication and division, Arithmetic in octal number system, Arithmetic in hexadecimal number system, BCD and Excess – 3 arithmetic	**8**
II	**Boolean Algebra and Logic Gates:** IC Technology, Levels of IC Complexity, Introduction to Logic, Logic (AND OR NOT), Boolean theorems, Boolean Laws, De Morgan"s Theorem, Perfect Induction, Reduction of Logic expression using Boolean Algebra, Deriving Boolean expression from given circuit, exclusive OR and Exclusive NOR gates, Universal Logic gates, Implementation of othe gates using universal gates. **Minterm, Maxterm and Karnaugh Maps:** Introduction, minterms and sum of minterm form, maxterm and Product of maxterm form, Reduction technique using Karnaugh maps –2/3/4/5/6 variable K-maps, Grouping of variables in K maps, K-maps for product of sum form, minimize Boolean expression using K-map and obtain K-map from Boolean expression.	**8**

References and Text Book:

1. Digital Electronics, Dr. S. B. Kishor, S.,Dasarwar, S., Kasarla,Published by DAS GANU Prakashan.4th Ed., 2018
2. Digital Electronics and Logic Design,N. G. Palan ,Technova
3. Modern Digital Electronics R. P. Jain Tata McGraw Hill 3rd

E-Books and Online Learning Material :

1. https://onlinecourses.nptel.ac.in/noc20_ee32/preview
2. https://onlinecourses.nptel.ac.in/noc19_ee51/preview

F.Y.B.Sc Information Technology
Course Code: IT155
Course Name: Web Technology

Practical per week(1 periods is 60 minutes)	No. of Credits	Evaluation System
04	02	PR-50 Marks

IT155 Web Technology

Course Outcomes: After successful completion of this course, students will be able to:
CO-1: design valid, well-formed, scalable, and meaningful pages using emerging technologies.
CO-2: understand the various platforms, devices, display resolutions, viewports, and browsers that render websites.
CO-3: develop and implement server-side scripting language programs.
CO-4: use develop website along with database.
CO-5: understand the different events.

ICT Tools Used: Videos, PPT, Pen-Table, Online parser

Students Centric Methods: Problem Solving and Participative
(Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1. https://www.udemy.com/course/xml-and-xml-schema-definition-in-easy-steps/
2. https://www.coursera.org/learn/web-applications-php
3. https://onlinecourses.swayam2.ac.in/aic20_sp32/preview

The CO-PO Mapping Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	2	-	-	1	-	2	-	-	-	-
CO2	2	-	-	-	-	-	-	-	-	-	1	-
CO3	-	-	-	-	-	3	-	1	-	-	-	-
CO4	-	-	-	-	-	2	-	3	-	-	-	2
CO5	3	-	-	-	-	-	-	-	-	-	-	-

List of Practical:

1.	Write a program to display Hello using Javascript
2.	Write a Program to demonstrate type of Dialog Box
3.	Write a program to check whether given number is even or odd
4.	Write a program to find the greatest number between three numbers
5.	Write a program in JavaScript to check whether given character is vowel or not
6.	Write a program to find out Square of number using function.
7.	Write a program of demonstrates functions and properties of Array Object.

8.	Write a program of demonstrates functions and properties of String Object.
9.	Write a program of demonstrates functions and properties of Math Object
10.	Write a program to change font name using external JavaScript.
11.	Write a program to apply image as bullet using JavaScript.
12.	Write a program to explain working of different events.
13.	Write a program for Form Validation
14.	Including jQuery in HTML document
15.	Change text color of the elements using jQuery
16.	Selecting elements by jQuery custom selector
17	Run code on click event in jQuery
18	Creating animated show hide effect in jQuery
19	Creating simple toggle effect in jQuery
20	Creating animated toggle effect in jQuery
21	Creating fade-in and fade-out effect in jQuery
22	Creating animation effect in jQuery
23	Animate multiple CSS properties only by one in jQuery
24	Animate CSS property using relative values in jQuery
25	Mini Project : Create responsive website using Bootstrap
References and Text Book:	
1. Web Design The Complete Reference,Thomas Powell Tata, McGrawHill 2. HTML5 Step by Step, Faithe Wempen Microsoft Press	
E-Books and Online Learning Material :	
https://onlinecourses.swayam2.ac.in/nou20_cs05/preview https://www.udemy.com/course/the-complete-web-development-bootcamp/	