Krantiguru Shyamji Krishna Verma Kachchh University

CURRICULAM AND CREDIT FRAMEWORK FOR

MSc(CA&IT) 3 YEARS AND 4 YEARS PROGRAMMES

AS PER THE NEP 2020

Guidelines, Rules and Regulations

1. Title

The degree shall be titled as '**Master of Computer Application and Information Technology**' under the faculty of commerce with effect from the academic year

MSc(CA&IT) INT. Sem I & II from Academic Year 2023-24
MSc(CA&IT) INT. Sem III & IV from Academic Year 2024-25
MSc(CA&IT) INT. Sem V & VI from Academic Year 2025-26
MSc(CA&IT) INT. Sem VII & VIII from Academic Year 2026-27

2. Objective of the Program

1. The primary objective of this program is to provide a foundation of computing principles and business practices for effectively using/managing information systems and enterprise software
2. It helps students analyze the requirements for system development and exposes students to business software and information systems
3. This course provides students with options to specialize in legacy application software, system software or mobile applications
4. To produce outstanding IT professionals who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves
5. To provide opportunity for the study of modern methods of information processing and its applications.
6. To develop among students the programming techniques and the problem- solving skills through programming
7. To prepare students who wish to go on to further studies in computer science and related subjects. 8. To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications

3. Program Outcomes

1. Discipline knowledge: Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity
2. Problem Solving: Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.

3. Design and Development of Solutions: Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems.

4. Programming a computer: Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with thorough knowledge on programming languages of various levels.

5. Application Systems Knowledge: Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.

6. Modern Tool Usage: Identify, select and use a modern scientific and IT tool or technique for modeling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.

7. Communication: Must have a reasonably good communication knowledge both in oral and writing.

8. Project Management: Practicing of existing projects and becoming independent to launch own project by identifying a gap in solutions.

9. Ethics on Profession, Environment and Society: Exhibiting professional ethics to maintain the integrality in a working environment and also have concern on societal impacts due to computer-based solutions for problems.

10. Lifelong Learning: Should become an independent learner. So, learn to learn ability.

11. Motivation to take up Higher Studies: Inspiration to continue educations towards advanced studies on Computer Science.

4. Credit Framework for 3 Years/4 Years UG Programme

NCrF Credit Levels	Qualification Title	Credit Requirement	No. of Semesters	Year
4.5	UG Certificate	44	2	1
5.0	UG Diploma	88	4	2
5.5	Three Years Bachelors Degree	132	6	3
6.0	Bachelor's Degree with Honors OR Bachelor's Degree with Honors with Research			

- 1 credit = 1 Hour of Theory
- 1 credit = 2 Hour of Practical/Project

5. Degree programs offered by Faculty

- Bachelor of Science (Honors) / Bachelor of Science (Honors with Research) (4-Year Programme) and maximum duration of the programme is 7 Years.

6. Minimum Eligibility:

1) H.Sc. or an equivalent examination from a recognized board of examinations with science stream and commerce stream.

2) Diploma (After SSC) in Computer Science or Information Technology from recognized university is eligible to take admission in first year of MSc(CA&IT).

3) Students who secure 75% marks or above in the first six semesters will be eligible for choosing a research stream in the fourth year. These students will be required to undertake a rigorous research project or Dissertation under the guidance of a research guide in prominent research area of computer science. These students will be awarded MSc(CA&IT) - (Honors with Research) on successful completion of four years.

4) In take capacity of MSc(CA&IT) - (Honors with Research) program will be determined based on the availability of research guides in the department.

7. CREDIT FRAMEWORK FOR INTEGRATED PROGRAMMES (MSc (CA&IT))

MSc(CA&IT) – MASTER OF SCIENCE (Computer Application and Information Technology)

Arrangement of Credit Distribution Framework for three/four years Honors/Honors with Research Degree Programme with Multiple Entry and Exit Options
(As per GR No: KCG/admin/2023-24/0607/kh.1, Sachivalaya, Gandhinagar, Date-11/07/2023)

Sr.No	**Broad Category of Courses**	**Credit Requirement of Each Category**				
		Certificate (1 Year)	**Diploma (2 Years)**	**3-Year UG**	**4-Year UG (Honors)**	**4-Year UG (Honors+Research)**
1.	Major - Core Courses	16	40	64	88	88
2.	Minor-Discipline Specific Electives	08	12	24	32	32
3.	Multidisciplinary Courses Open Electives	08	12	12	12	12
4.	Ability Enhancement Courses(AEC)	04	08	10	10	10
5.	Skill Enhancement Courses(SEC)	04	08	14	14	14
6.	Value Added Courses (VAC)	04	08	08	08	08
7.	Summer Internship/ Research Project /Dissertation	-	-	-	12	12
8.	Exit Courses	04	04	-	-	-
9.	**Total**	**48**	**92**	**132**	**176**	**176**

Structure of Integrated Programme of Master of Science (MSc (CA&IT))
AS PER NATIONAL EDUCATION POLICY 2020
Krantiguru Shyamji Krishna Verma Kachchh University, Bhuj-Kachchh-370001

NCrF Credit Level	Semester	Major Core	Minor	Multi/Inter-disciplinary	Ability Enhancement Courses (AEC)	Skill Enhancement Courses (SEC)	Value Added Courses (VAC)/IKS	Research Project /Dissertation	Total Credits	Qualification/ Certificate
4.5 First Year	I	08	04	04	02	02	02	-	22	UG Certificate
	II	08	04	04	02	02	02	-	22	
1st Year Credit Total		16	08	08	04	04	04		44	
Exit 1: Award of UG certificate in Major course with 44 credits with additional 4 credits of Summer Internship in core specific NSQF defined course OR continue with Major and Minor course for the next NCrF credit level										
5.0 Second Year	III	12	-	04	02	02	02	-	22	UG Diploma
	IV	12	04	-	02	02	02	-	22	
2nd Year Credit Total		40	12	12	08	08	08	-	88	
Exit 2: Award of UG Diploma in Major course with 88 credits with additional 4 credits of Summer Internship in core specific NSQF defined course OR continue with Major and Minor course for the next NCrF credit level										
5.5 Third Year	V	12	08	-	-	02	-	-	22	*UG Degree*
	VI	12	04	-	02	04	-	-	22	
3rd Year Credit Total		64	24	12	10	14	8	-	132	
Award of UG Degree in Major course with 132 credits with internship in core discipline.										

6.0 Fourth Year	VII	12	04	-	-	-	-	06 (OJT)	22	*UG* *Honors Degree*
	VIII	12	04	-	-	-	-	06 (OJT)	22	
4th Year Credit Total		88	32	12	10	14	8	12	176	
Award of UG Honors Degree in Major course with 176 credits.										
6.0 Fourth Year	VII	12	04	-	-	-	-	06 (RP)	22	*UG* *Honors With Research Degree*
	VIII	12	04	-	-	-	-	06 (RP)	22	
4th Year Credit Total		88	32	12	10	14	8	12	176	
Award of UG Honors with Research Degree in Major course with 176 credits.										
	** OJT – On the Job Training * RP – Research Project With Major Core Courses Only*									
	* MDC – Multidisciplinary Courses									

	MSc (CA&IT) Course Outline with Subject Titles						
Semester	**Course Type**	**Course Code**	**Name of the Subject**	**Theory/ Practical**	**Marks**		**Credits**
					IA	**UA**	
1	Major	CAIT-101	Introduction to Computer Science and Programming	Theory	25	25	2
		CAIT -101-P	Lab : Practical based on CAIT-101	Practical	25	25	2
	Major	CAIT -102	Web Designing and Programming - I	Theory	25	25	2
		CAIT -102-P	Lab : Practical based on CAIT-102	Practical	25	25	2
	Minor	CAIT -103	Fundamental of Information Technology	Theory	50	50	4
	ID/MDC	CAIT -104	Mathematical Foundation of Computer Science	Theory	50	50	4
	Ability Enhancement Courses (AEC)	CAIT -105	Communication Skills in English	Theory	25	25	2
	Value-Added courses (VAC) (Select Any One)	CAIT -106A CAIT -106B	Introduction to Indic Knowledge System – I Bhagavad Gita and Life Management	Theory	25	25	2
	Skill Enhancement Courses(SEC)	CAIT -107-P	Practical Skills in Office Automation	Practical	25	25	2
					275	**275**	**22**
2	Major	CAIT-201	Programming with Python	Theory	25	25	2
		CAIT-201-P	Lab: Practical Based on CAIT-201	Practical	25	25	2
	Major	CAIT-202	Web Designing and Programming - I I	Theory	25	25	2
		CAIT-202-P	Lab: Practical Based on CAIT-203	Practical	25	25	2
	Minor	CAIT-203	Latest Trends in IT	Theory	50	50	4
	ID/MDC	CAIT-204-P	Practical Skills in Statistical Data Analysis	Practical	50	50	4
	Ability Enhancement Courses	CAIT-205	Soft Skills and Personality Development	Theory	25	25	2
	Value-Added courses	CAIT-206A CAIT-206B	Try to Understand our Mother Earth Yoga- Nityansh	Theory	25	25	2
	Skill Enhancement Courses	CAIT-207	Practical Skills in Desktop Publishing	Practical	25	25	2
					275	275	22
	For Certificate in Computer Application	*CAIT-001*	*Summer Internship and Viva*				*4*
	External Exam Hours: 2.5 Hrs – 4 Credit Course – 50 Marks *2 Hrs – 2 Credit Course – 25 Marks* *Passing Marks: 40%*						

8. Evaluation System:

8.1 Internal Assessment will be based on CCE (Continuous and comprehensive Evaluation) Scheme as under:

4 Credit Course		
Sr. No	**Mode**	**Marks**
1.	Test	25 Marks
2.	CCE Activities (Quizzes, Attendance, Seminar, Assignments etc	25 Marks
Total		**50 Marks**

2 Credit Course		
Sr. No	**Mode**	**Marks**
1.	Test	15 Marks
2.	CCE Activities (Quizzes, Attendance, Seminar, Assignments etc	10 Marks
Total		**25 Marks**

8.2 External evaluation will be based on Semester End Evaluation (SEE) pattern.

The SEE carries 50% of the marks assigned to a course. SEE shall be of 2 ½ hours for 4 credit course and 2 hours in case of 2 credit courses. The controller of the examination will conduct these examinations. Paper setting and evaluation will be done by the external examiners to an extent of 50% of the evaluation process. This examination shall be conducted as per a schedule which shall be notified in advance.

Component, the end semester examination, which will be a written-type examination of at 2:30 hours duration, would also form an integral component to the evaluation. The ratio of marks to be allotted to continuous internal assessment and to end semester examination is 50:50.
The external evaluation pattern would be based on the written examination taken at the end of the semester. The format includes subjective, objective and applications questions so the test of students can be done on parameters like conceptual knowledge, its application in actual sense, his or her memory and presence of mind. The structure is as under:

Table 1.1

MSc (CA&IT) – 3 Years and 4 Years Programme

Structure of the University or External Exam for 4 Credit Course

Q-1 All Units	Objective Questions (It can include: definitions, FIBs, True or false, one line answers, MCQs etc)	10
Q-2 (Unit -1)	Answer two short questions carrying 2 marks respectively (Compulsory) Answer two questions, Short notes carrying 3 marks respectively (3 out of 4)	10
Q-3 (Unit -2)	Answer two short questions carrying 2 marks respectively (Compulsory) Answer two questions, Short notes carrying 3 marks respectively (3 out of 4)	10
Q-4 (Unit -3)	Answer two short questions carrying 5 marks respectively OR Any one question which could be a long question, case study, application of concepts, practical problem etc carrying 10 marks	10
Q-5 (Unit -4)	Answer two short questions carrying 5 marks respectively OR Any one question which could be a long question, case study, application of concepts, practical problem etc carrying 10 marks	10
Note - University examination will be of 50 Marks and 150 minutes (2.30Hrs.)		

Table 1.2

MSc (CA&IT) – 3 Years and 4 Years Programme

Structure of the University or External Exam for 2 Credit Course

Q-1 All Units	Objective Questions (It can include: definitions, FIBs, True or false, one line answers, MCQs etc)	05
Q-2 (Unit -1)	Answer two short questions carrying 2 marks respectively (Compulsory) Answer two questions, Short notes carrying 3 marks respectively (3 out of 4)	10
Q-3 (Unit -2)	Answer two short questions carrying 2 marks respectively (Compulsory) Answer two questions, Short notes carrying 3 marks respectively (3 out of 4)	10

Note - University examination will be of 25 Marks and 120 minutes (2Hrs.)

Table 1.3

Structure of the University or External Practical Exam for 2 Credit Course

Sr.No	Contents	Marks
1.	Practical	15
2.	Viva	10
Total		**25**

MSC (CA&IT) - Semester: I

(Effective from year 2023-24)

Course Code:	**CAIT-101**	**Course Title:**	Introduction to Computer Science and Programming
Course Credits:	02	**Hour of Teaching/Week:**	02
Internal Assessment Marks:	25	**External Exam Marks:**	25
Exam Duration	**2 Hrs**		

Unit	**Contents**
1.	Computer Science Introduction, The Basic Model of Computation, Algorithms, Flow-charts and Flow charts symbols, Programming Languages, Compilation, Linking and Loading, Testing and Debugging, Documentation. Problem analysis, program design, algorithm construction. Algorithm and flow charts construction for the problems like odd-even number, prime number, Armstrong number, Factorial problem, Fibonacci Series, Linear search, Binary search problems. Introduction to C Programming: Over View of C; History and Features of C; Structure of a C. Program with Examples; Creating and Executing a C Program; Compilation process in C. C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants. Input and output with C: Formatted I/O functions - printf and scanf, control stings and escape sequences, output specifications with printf functions; Unformatted I/O functions to read and display single character and a string - getchar, putchar, gets and puts functions. C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associatively; Evaluation of arithmetic expressions; Type conversion.
2.	Control Structures: Decision making Statements - Simple if, if_else, nested if_else, else_if ladder, Switch-case, goto, break & continue statements; Looping Statements - Entry controlled and Exit controlled statements, while, do-while, for loops, Nested loops. Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation. Strings: Declaring & Initializing string variables; String handling functions - strlen, strcmp, strcpy and strcat; Character handling functions - toascii, toupper, tolower, isalpha, isnumeric etc. Pointers in C: Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and

	disadvantages of using pointers; User Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type. User defined data types: Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.

Text Books

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
2. E. Balgurusamy: Programming in ANSI C (TMH)
3. Computer fundamentals and programming in c, "Reema Thareja", Oxford University, Second edition, 2017.
4. Brian W. Kernighan and Dennis M. Ritchie, The 'C' Programming Language, Prentice Hall of India.

References

1. Kamthane: Programming with ANSI and TURBO C (Pearson Education)
2. V. Rajaraman: Programming in C (PHI – EEE)
3. Yashwant Kanitkar: Let us C

Online Resources:

1. https://nptel.ac.in/courses/106/105/106105171/ MOOC courses can be adopted for more clarity in understanding the topics and verities of problem solving methods.

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: I

(Effective from year 2023-24)

Course Code:	**CAIT-101-P**	**Course Title:**	Lab: Practical based on CAIT-101
Course Credits:	03	**Hour of Teaching/Week:**	03
Internal Assessment Marks:	30	**External Exam Marks:**	70
Exam Duration	**3Hrs**		

The following activities may be carried out/ discussed in the lab during the initial period of the semester.

1. Basic Computer Proficiency
    a. Familiarization of Computer Hardware Parts
    b. Basic Computer Operations and Maintenance.
    c. Do's and Don'ts, Safety Guidelines in Computer Lab
2. Familiarization of Basic Software – Operating System, Word Processors, Internet Browsers, Integrated Development Environment (IDE) with Examples.
3. Type Program Code, Debug and Compile basic programs covering C Programming fundamentals discussed during theory classes.

List of Sample Programs

1. Write a C Program to read radius of a circle and to find area and circumference
2. Write a C Program to read three numbers and find the biggest of three
3. Write a C Program to demonstrate library functions in math.h
4. Write a C Program to check for prime
5. Write a C Program to generate n primes
6. Write a C Program to read a number, find the sum of the digits, reverse the number and check it for palindrome
7. Write a C Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers
8. Write a C Program to read percentage of marks and to display appropriate message (Demonstration of else-if ladder)
9. Write a C Program to find the roots of quadratic equation (demonstration of switch-case statement)
10. Write a C program to read marks scored by n students and find the average of marks (Demonstration of

single dimensional array)

11. Write a C Program to remove Duplicate Element in a single dimensional Array.
12. Program to perform addition and subtraction of Matrices
13. Write a C Program to find the length of a string without using built in function
14. Write a C Program to demonstrate string functions.
15. Write a C Program to demonstrate pointers in C
16. Write a C Program to check a number for prime by defining isprime( ) function
18. Write a C Program to read, display and to find the trace of a square matrix
19. Write a C Program to read, display and add two m x n matrices using functions
20. Write a C Program to read, display and multiply two m x n matrices using functions
21. Write a C Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
22. Write a C Program to Reverse a String using Pointer
23. Write a C Program to Swap Two Numbers using Pointers
24. Write a C Program to demonstrate student structure to read & display records of n students.
25. Write a C Program to demonstrate the difference between structure & union.

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: I

(Effective from year 2023-24)

Course Code:	**CAIT-102**	**Course Title:**	Web Designing and Programming - I
Course Credits:	02	**Hour of Teaching/Week:**	02
Internal Assessment Marks:	**25**	**External Exam Marks:**	25
Exam Duration	2 Hrs		

Unit	Contents
1.	Introduction to Internet and Web Technologies: Introduction to the Internet, History of the Internet, Services provided by the Internet, Some basic terminology and concepts (WWW, URL, webpage, web site, web servers, web browsers, HTML, search engines, etc.) , Introduction to Web Technologies, Careers in Web Technologies and Job Roles, How the Website Works?, Client and Server Scripting,Languages , Domains and Hosting, Responsive Web Designing, Types of Websites (Static and Dynamic Websites) What is Markup Language, Basic Structure of HTML, Difference Between HTML and XHTML, Head Section and Elements of Head Section, Meta Tags, Css Tags, Script Tag, Table Tag, Div Tag, Header Tags, Paragraph, Span, Pre Tags, Anchor Links and Named Anchors, Image Tag, Object Tag, Iframe Tag, Forms, Form Tag, Attributes of Form, POST and GET Method, Fieldset and Legend, Text input, Text area, Checkbox and Radio Button, Dropdown, List and Optgroup, File Upload and Hidden Fields, Submit, Image, Normal, Reset Button, Creating a Live Website Form, HTML Validators Introduction to HTML5, Features of HTML5, HTML5 DocType, New Structure Tags, Section, Nav, Article, Aside, Header, Footer, Designing a HTML Structure of Page, New Media Tags, Audio Tag, Video Tag, Canvas and Svg Tag, Placeholder Attribute, Require Attribute, Pattern Attribute, Autofocus Attribute, email , tel, url types, number type, date type, range type, voice search
2.	Introduction to Cascading Style Sheets, Types of CSS, CSS Selectors, Universal Selector, ID Selector, Tag Selector, Class Selector, Sub Selector, Child Combinatory, Selector, Adjacent Sibling Selector, Attribute Selector, Group selector, First-line and First-letter selector, Before and After Selector, CSS Properties & Type Properties, Background Properties, Block Properties, Box Properties, List Properties, Border Properties, Positioning Propeties, Realtime Implementation, Conversation of Table to CSS Layout, CSS Menu Design (Horizontal, Vertical)

	Introduction to CSS 3, New CSS 3 Selectors, Attribute Selectors, First-of-type, Last-of-type, Nth-child, Element: empty, New CSS3 Properties, Custom Fonts, Text-Shadow Property, Text-Stroke Property, Rounded Corners, Box Shadows, CSS Gradients, CSS Multiple backgrounds, Opacity Property, Transition effect, Transform effect, Animation effects, Css Media Queries Responsive Web Design with Bootstrap Introduction to Responsive Design, Mobile first design concepts, Common device dimensions, View-port tag, Using css media queries, Menu conversion script, Basic Custom Layout, Introduction to Bootstrap, Installation of Bootstrap, Grid System, Forms, Buttons, Icons Integration, Using CSS3 14

Text Books

1. Ivan Bayross, "Web Enabled Commercial Applications Development using HTML,DHTML, Javascript, Perl CGI", BPB, 2004

2. Xavier C : World Wide Web Design With HTML, Tata McGraw Hill Publication

3. Bootstrap 4 Quick Start: A Beginner's Guide to Building Responsive Layouts with Bootstrap 4 Jacob Lett, 2018

References

References

1. Jon Duckett: HTML and CSS: Design and Build Websites

2. Ben Frain: Responsive Web Design with HTML5 and CSS

3. DT Editorial Services: HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: I

(Effective from year 2023-24)

Course Code:	**CAITCC-102-P**	**Course Title:**	Lab : Practical based on CAIT-102
Course Credits:	**02**	**Hour of Teaching/Week:**	04
Internal Assessment Marks:	**25**	**External Exam Marks:**	25
Exam Duration	**2 Hrs**		

List of Sample Programs

1. Develop a simple web page having attractive background color, text color.
2. Develop a HTML document for a web page of your course detail. Design a page with attractive font, suitable heading and horizontal rules (use paragraph and line tag).
3. Develop a HTML document with an example of Ordered Lists and Unordered List.
4. Develop a HTML document for a web page of your favorite teacher. Design a page with attractive color combination, suitable headings and appropriate text styles.
5. Develop a HTML document for a web page having the Image and also indicate the another image as background.
6. Develop a HTML document for a web page with an example of Table Format having the information of Hardware and Software used in your lab.
7. Develop a HTML document for a web page of your Bio-Data with use of Table tag.
8. Develop a HTML document for a web page with use of frame and frameset tag.
9. Develop a HTML document for a web page which linking with another pages.
10. Develop a HTML document having the Student Information Form.(Use all necessary tags)
11. Develop an HTML document which will use style sheets. Use inline style sheet and external style sheet.
12. Develop an HTML document for a web page of your favorite National Leader. Design the page with an attractive color combination, with suitable headings and horizontal rules.
13. Write an HTML document with an example of Table format to print your Telephone Bill. Write an HTML code for designing the subscription form of mail account in the e-mail website with appropriate fields.
14. Using HTML, CSS create a styled checkbox with animation on state change.
15. Using HTML, CSS create a staggered animation for the elements of a list.
16. Using HTML, CSS, JavaScript create a typewriter effect animati

17. Using HTML, CSS create an animated underline effect when the user hovers over the text.

18. Create Responsive login, signup and home page of website using bootsstap.

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: I

(Effective from year 2023-24)

Course Code:	CAIT-103	**Course Title:**	Fundamentals of Information Technology
Course Credits:	04	**Hour of Teaching/Week:**	04
Internal Assessment Marks:	50	**External Exam Marks:**	50
Exam Duration	**2.5 Hrs**		

Unit	**Contents**
1	What is Computer? Representation of data / information. What is Data Processing? Characteristics of a Computer System, Evolution of Computer, Generation of computers, Block Diagram of Digital Computer, Classification of Digital Computers Classification of Computers, Functional Components of a computer- Central Processing Unit, Memory-Primary Memory RAM, ROM, Types of ROM, Booting, Secondary Storages Devices : Floppy and Hard Disks, Optical Disks CD-ROM, DVD, Mass Storage Devices : USB thumb drive. Input /Output Devices- Keyboard, Mouse, Trackball, Joystick, Digitizing Tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light Pen, Touch Screen, Monitors, Printers & types – Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers.
2.	Types of Software, Classification of System and Application Software, System Software - Operating System, Devices Drivers, Overview of languages- Machine language, Assembly language, high level languages, Types of high level languages, Generation of languages, Commands , Utility Program- Disk Cleanup Utility, Desk backup Utility, Antivirus Utilities. NUMBER SYSTEM: Binary, Octal, Decimal, Hexadecimal and Conversion between Number Systems, ASCII Codes.
3.	MICROPROCESSOR: Basic concepts, Clock speed (MHz, GHz), 16 bit, 32 bit, 64 bit processors: Types: CISC, RISC, Concepts of System Buses, Address Bus, Data Bus, Concepts of Accumulator, Instruction Register, Program counter, Commonly used CPUs and CPU related Terminologies: Intel Pentium Series, Intel Celeron, Cyrix, AMD Series, Xeon, Intel Mobile, Mac Series, CPU Cache, Concept of heat sink and CPU fan, Motherboard; Single, Dual and Multiple Processors.
4.	**Computer Networks and Internet:** What is network? Need for networking, Evolution of networking, Types of networks, Data Communication & Terminologies, Network Topologies, Network Devices-Modem, Ethernet Card, Hub, Switch, Repeater, Bridge, Router, Gateway; Switching Techniques, Transmission Media, Communication Protocols. Basic concept of Internet, World Wide Web, Web Browser, Web Server,

	Web Sites , Web Pages, URL, Domain Names, Hyper Text Mark Up Languages, Internet Address, Electronic Mail, Internet Service Provider, Search Engines.

Text Books and References/ Online Resources:

1. https://ciet.nic.in/smsw.php
2. Basics of Information Technology-Sumita Arora,Dhanpat Rai & Co (Pvt.) Ltd.,New Delhi.
3. Foundation of Information Technology – D.S. Yadav, New Age International Publisher.
4. V. Raja Raman, “Introduction to Computers”, PHI, 1998.
5. Alex Leon & Mathews Leon, “Introduction to Computers”, Vikas Publishing House, 1999. Norton Peter, “Introduction to computers”, 4th Ed., TMH, 2001.

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: I

(Effective from year 2023-24)

Course Code:	CAIT-104	**Course Title:**	Mathematical Foundation of Computer Science
Course Credits:	04	**Hour of Teaching/Week:**	04
Internal Assessment Marks:	50	**External Exam Marks:**	50
Exam Duration	**2.5 Hrs**		

Unit	Contents
1	Mathematical Logic: Propositional Calculus: Statement and Notation, Truth Values, Connectives, Truth Tables, Tautologies, Equivalence Formulas, Laws, GATEs, AND, OR, NOT, NOT, NAND and their network diagrams.
2.	Set Theory: Set, Types of Sets: Finite, Infinite, Singleton, Empty, Subset, Proper Subset, Power Set, Universal. Venn Diagram, Operations on Set: Union, Intersection, Compliment, Cartesian product, Difference of sets, De'Morgan's Laws, Examples of operations on set and laws.
3.	Matrices: Types of Matrices: Row, Column, Square, Diagonal, Unit, Triangular, Symmetric, Ske-symmetric, Transpose of a Matrix. Operations on Matrices: Addition, Subtraction, Scalar Multiplication, Multiplications Determinants of Matrix, Adjoin, Minor and Inverse of a Matrix
4.	Graph Theory: Graph related terminology, Types of Graph: Directed Graph, Undirected Graph, Simple Graph, Multi-Graph, Isomorphic Graph, Complete Graph, Regular Graph. Matrix Representation of Graph

Text Books and References/ Online Resources:

1. S.Lipschutz and Marc Lars Lipson : Discrete Mathematics, Schaum's series (Interational edition,1992).
2. Vinay Kumar: Discrete Mathematics (BPB Publication, First edition-2002)

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: I

(Effective from year 2023-24)

Course Code:	CAIT-105	**Course Title:**	Communication Skills in English
Course Credits:	**02**	**Hour of Teaching/Week:**	02
Internal Assessment Marks:	**25**	**External Exam Marks:**	25
Exam Duration	**2Hrs**		

Unit	Contents
1.	Theory of Communication, Nature of Communication, Modes of communication, Process of Communication, Importance of Communication, Different forms of Communication: Verbal ,Non-Verbal, Written, Kinesics etc.. Techniques of effective speech - Meaning and Definition - Process – Functions – Objectives - Importance – Essentials of good communication. Barriers to Communication: Semantic barriers, Psychological barriers, Organisational barriers, Cultural barriers, Physical barriers, Physiological barriers Non Verbal Communication: Encoding Meaning Using Nonverbal Symbols, How to Improve Body Language, Eye Communication, Facial Expression, Dress and Appearance, Posture and Movement, Gesture, Paralanguage. Cross Culture Communication. Listening Skills: Process of Listening, Importance of Listening, Basic Types of Listening, Barriers of effective listening, Benefits of effective listening Phonetics : Standard Language and Queen's English, Phonemes of English: Vowels, Phonemes of English: Diphthongs and Consonants, Stress and Rhythm, Intonation
2.	Close Reading, Comprehension, Summary, Paraphrasing, Analysis and Interpretation, Translation(from Indian language to English and vice-versa), Literary/Knowledge Texts, Writing Skills-Documenting, Making notes, Letter writing [Informal]. Formal Letter Writing, presentation, Inviting quotations, Sending quotations, Placing orders, Inviting tenders, Sales letters, claim & adjustment letters and social correspondence, Memorandum, Inter - office Memo, Notices, Agenda, Minutes, Job application letter, preparing the Resume.

Text books and References

1. Creative English Communication By N.Krishnaswami and T.Sriraman.
2. Contemporary English Grammar, Structure and Composition By David Green.(MacMillan)
3. Essential of Business Communication By Rajendra Pal and J.S.Korlahalli(S.Chand & Sons)
4. *Fluency in English* - Part II, Oxford University Press, 2006.
5. https://nptel.ac.in/courses/109104031

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: I

(Effective from year 2023-24)

Course Code:	CAIT-106A	**Course Title:**	Introduction to Indic Knowledge System – I
Course Credits:	**02**	**Hour of Teaching/Week:**	**02**
Internal Assessment Marks:	**25**	**External Exam Marks:**	**25**
Exam Duration	**2Hrs**		

Unit	Contents
1	**Introduction to IKS** o Introduction to IKS & Its importance ▪ Introduction & importance of IKS ▪ Various IKS Systems o Shashtra – Foundational Literature of Bharatvarsha ▪ What is Shashtra? ▪ Importance of Shashtra ▪ Classification of Shashtra – Vaidic & Avaidic (with examples of imp. Literature) o Base of IKS proliferation ▪ Bhartiya Education Systemand its philosophy ▪ History of BES from Ancient to Modern Domains of Education: Gurukul, Pathshala, Vidyalay, Vishvavidyalay
2.	**Contribution of IKS to the World** o Mathematics & Astronomy ▪ Number System ▪ Algebra & Arithmetic ▪ Geometry ▪ Trigonometry ▪ Planetary System ▪ Speed of Light ▪ Eclipse o Life sciences ▪ Physics ▪ Chemistry ▪ Botany o Metal Technology ▪ Mining Techniques ▪ Types of Metals

- Tools & Techniques for Metal Smelting with examples

- Town planning& Temple Architecture
  - Indigenous tools & technologies for town planning & Temple Architecture
  - Science of Architecture
  - Lothal, Mohan Jo Daro, Dholavira
  - Angkorvat, Lepakshi Temple, Jagannath Puri Temple, Thanjavur Temple, Modhera and Konark Sun Temple, Hampi Temple Etc.
- Ayurveda
  - Introduction of Ayurveda- Definition, Branches of Ayurveda, Books and Pioneers
  - Concept of Tri Dosh and importance of its Balance in the body
  - Indic Medical Science Achievement: Tools & Technology

- Art & Traditions
  - History and Origin
  - Skill Enhancement with 64 Kala

Science behind our traditions and rituals

Evaluation Method:

Internal	Attendance	Assignment	Seminar	Unit Test	**Total Marks**
	5	5	5	15	30
External	**Online MCQ Test**				70

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAIT-106B	**Course Title:**	Bhagavad Gita and Life Management
Course Credits:	**02**	**Hour of Teaching/Week:**	-
Internal Assessment Marks:	**100**	**External Exam Marks:**	-
Exam Duration	**2Hrs**		

1	Name of Course:	Bhagavad Gita and Life Management
2	Proposed Faculty and Semester (If any):	Swami Pradiptanandji and few other scholars as decided by the committee.
3	Name of Professors who have designed/framed the course:	(1) Swami Pradeeptanandji (2) Dr Kanishk Shah (3) Dr Jyotindra Bhatt
	Phone number:	(1) 9998815809 (2) 9426591752
	Email Address:	shakanishk@gmail.com jyotindrajbhatt@gmail.com
	Affiliation:	Shree Daxinamurti Trust, Coimbatore and KSKV Kachchh University, Bhuj
4	Total Credits:___	Credit of Theory: 2Total Hours of Teaching: 30 Credit of Practical:NATotal Hours of Practical:NA
5	Significance of the course with reference to Indian Knowledge System (IKS):	Gitaji is a part of Smriti literature as it is a part of Mahabharat which forms the Brightest everHistory as far as IKS is concerned this is timeless and relevant even after 5000 years. The applications of this scripture are significant for life management.
6	Expected outcome of the course:	1. Awareness towards IKS in general and Bhagavad Gita in specific 2. In this competitive world this will help students cope up with the 21st century challenges of stress, peer pressure, work life balance and specifically spiritual development. 3. It will reduce the suicidal tendencies in students 4. Help to develop Emotional Quotient (EQ) 5. Help in developing positivity towards life and every creature of the world. 6. Ultimately positive outlook towards life lead a happy life
7	UNIT 1:Need, Origin	Bhagavad Gita:Fundamental problems of human life and its answers in Bhagavad Gita;

	and impact of Bhagavad Gita	History: Mahabharat, VedVyasji (Introduction to Ved); Impact of Bhagavad Gita on successful people of different domains. Origin of Bhagavad Gita: Arjun- Duryodhan episode, DhritrashtraVed Vyas –episode, Kurukshetra battle field.
	UNIT – II:Introduction to Bhagavad Gita – A Psychological analysis of human mind and Life changing mantras from Bhagavad Gita	Basic Introduction of Bhagavad Gita Psychological Analysis of Arjuna's mind set: An insight into human dilemma. Address the person not the question:Bhagwan Shri Krishna's initial response to Arjuna's dilemma. Arjun's transformation: Characteristics of an ideal student. (2/7.8) <u>Selected (8)10 Life changing mantras from Bhagavad Gita form 10 mantras symbol / icon</u> 1. "*Na hanyatehanyamanesharire* " (Adhyay-2,Shlok–20) 2. *"Karmanyevadhikaraste*" (Adhyay-2,Shlok –47) 3. "*Ma tesangotstakarmani*" (Adhyay-2,Shlok –47) 4. "*Yogasthah kuru karmani*"(Adhyay-2,Shlok –48) 5. "*Siddhyashddyohosamobhutva*" (Adhyay -2,Shlok–48) 6. "*Buddhi nashatpranashyati*"(Adhyay -2,Shlok –63) 7. "*Prasadesarvadukhanamhani*"(Adhyay-2,Shlok –65) 8. "*Swadharmenidhanamshreyah*"(Adhyay-3,Shlok–35) 9. "*Uddhredatmnatmanamnatmanamvsadyet*" (Adhyay -6,Shlok –5) 10. "*Na me bhaktahpranashyti*" (Adhyay -9,Shlok–31)
	Education Materials (Reference Books, Web Link for materials/video/ MOOC etc.)	1. Bhagavad Gita with translation by Gita press Gorakhpur 2. The Teachings of Bhagavad Gita by Swami Dayanand 3. Bhagavad Gita by Swami Viditaatmaanand

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: I

(Effective from year 2023-24)

Course Code:	CAIT-107-P	**Course Title:**	Practical Skills in Office Automation
Course Credits:	**02**	**Hour of Teaching/Week:**	02
Internal Assessment Marks:	**25**	**External Exam Marks:**	25
Exam Duration	**2Hrs**		

Practical Based on the Following Topics

Windows Desk top and GUI Related Components.

MS Word - Working with Documents -Opening & Saving files, Editing text documents, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help, Formatting Documents. Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering. Setting Page style - Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula, Drawing - Inserting ClipArt, Pictures/Files etc., Tools – Word Completion, Spell Checks, Mail merge, Templates, Printing Documents – Shortcut keys.

MS Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, saving files, setting Margins, Converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc., Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spreadsheets, Formatting layout for Graphics, Clipart etc.,

Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility - Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Colour etc, Borders

& Shading – Shortcut keys.

MS Power point: Introduction to presentation, Creating a presentation - Setting Presentation style, Adding text to the Presentation. Formatting a Presentation - Adding style, Colour, gradient fills, arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using Draw. Adding Effects to the Presentation Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer.

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAIT-201	**Course Title:**	Programming with Python
Course Credits:	**02**	**Hour of Teaching/Week:**	02
Internal Assessment Marks:	**25**	**External Exam Marks:**	25
Exam Duration	**2Hrs**		

Unit	**Contents**
1.	Introduction and Overview: Overview of Python Programming: Structure of a Python Program, Elements of Python, Python Interpreter, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings. Operators and Statements: Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator). Creating Python Programs: Input and Output Statements. Decision making and Branching: Control statements (Branching, Looping, Conditional Statement, Difference between break, continue and pass, default arguments. Defining Functions. Object in Python: Tuples, lists, dictionaries, methods, identifiers, modifying objects, aliasing, mutability
2.	Basics of Object Oriented Programming in python, classes and object, __init__() , self keyword, functions using class, functions with default arguments using class Pandas Pandas Introduction, Data frame , reading files (json , csv), Pandas - Analyzing Data-Frames , cleaning Empty Cells, cleaning Wrong Format, Cleaning Wrong Data, Removing Duplicates, Data Correlations, Merging more than one data frame together, NumPy Arrays, indexing, slicing, copy as view, shape, reshape, iterating, join, split, search, sort, filter, product, LCM, GCD , Trigonometric, Set Operation Matplotlib Introduction to matplotlib , plotting, marker, line, labels, grid, subplot, scatter, bars, histograms, pie charts.

Text Books and References:

1 T. Budd, Exploring Python, TMH, 1st Ed, 2011

2. Python Tutorial/Documentation www.python.or 2015

3. Allen Downey, Jeffrey Elkner, Chris Meyers, how to think like a computer scientist: learning with Python, Freely available online.2012

4. https://nptel.ac.in/noc/courses/noc22/SEM1/noc22-cs31/

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAIT-201-P	**Course Title:**	Lab: Practical Based on CAIT-201
Course Credits:	**02**	**Hour of Teaching/Week:**	04
Internal Assessment Marks:	**25**	**External Exam Marks:**	25
Exam Duration	**2Hrs**		

List of Sample Programs

1. Understanding IDLE: Installing, Running Programs, Saving and Loading Files

2. Understanding Python Operators.

3. Understanding Branching.

4. Understanding Looping.

5. Understanding Functions and Parameters.

6. Understanding Tuples, Lists, Dictionaries.

7. Understanding Mutability of various objects.

8. Understanding Recursion.

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAIT-202	**Course Title:**	Web Designing and Programming - I I
Course Credits:	**02**	**Hour of Teaching/Week:**	04
Internal Assessment Marks:	**25**	**External Exam Marks:**	**25**
Exam Duration	**2Hrs**		

Unit	Contents
1.	**Introduction to Javascript** What is JavaScript?, What Is AJAX?, Writing your first script, Internal vs. external scripts, Using comments in scripts, Using the NoScript tag in HTML **JavaScript Language Essentials (** Creating alert dialogs, Understanding conditional statements, Getting confirmations from users, Creating prompts for users, Understanding functions, Making links smarter, Using switch/case statements, Creating loops, Handling errors, functions, arrays) **Creating Rollovers and More:** Creating a basic image rollover, How to write a better rollover, Creating a three-state rollover, Making rollovers accessible and 508 compliant, Making disjointed rollovers, Creating slideshows, Displaying random images. **Building Smarter Forms :** Creating jump menus, Creating dynamic menus, Requiring fields, Cross-checking fields, Displaying more informative errors, Verifying radio button selections, Setting one field with another field, Verifying email addresses. **Handling Events:** Responding to window events, Responding to mouse movements, Responding to mouse clicks, Responding to onBlur form events, Responding to onFocus form events, Responding to keyboard events

2.	**Introduction to JQuery** JQuery Intro, JQuery Syntax, JQuery Selectors, JQuery Events JQuery Effects (JQuery Hide/Show, JQuery Fade, JQuery Slide, JQuery Animate, JQuery stop(), JQuery Callback, JQuery Chaining) , JQuery Get, JQuery Set, JQuery Add, JQuery Remove, JQuery CSS Classes, JQuery css() Traversing (JQuery Traversing, JQuery Ancestors, JQuery Descendants, JQuery Siblings), Jquery with AJAX (JQuery AJAX Intro JQuery Load JQuery Get/Post), noConflict(), JQuery Filters	

Text Books

1. Dayley Brad and Dayley Brendan, "AngularJS, JavaScript, and jQuery All in One, Sams Teach Yourself"
2. Jon Duckett , "Web Design with HTML, CSS, JavaScript and Jquery Set"
3. Helder da Rocha :Learn Chart.js: Create interactive visualizations for the Web with Chart.js

References

1. Kyle Simpson: JavaScript and HTML5 Now
2. DT Editorial Services: HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, Jquery)
3. Laurence Lars Svekis , Maaike van Putten: JavaScript from Beginner to Professional: Learn JavaScript quickly by building fun, interactive, and dynamic web apps, games, and pages
4. Oswald Campesato : jQuery, CSS3, and HTML5 for Mobile/Desktop Devices

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAIT-202-P	**Course Title:**	Lab: Practical Based on CAIT-202
Course Credits:	**02**	**Hour of Teaching/Week:**	04
Internal Assessment Marks:	**25**	**External Exam Marks:**	25
Exam Duration	**2Hrs**		

Topics:
Unit 1 and 2 of CAIT-202 and Following components of Chart.js:
Corel Draw and Photoshop Practical from CAIT-207

Introduction, Installation , Syntax , Basics , Color , Options , Interactions , Legend , Title , Animation , Tooltip , Line Chart , Bar Chart , Radar Chart , Doughnut Chart , Pie Chart , Polar Area Chart , Bubble Chart , Scatter Chart , Mixed Chart , Cartesian Axis , Category Axis, Radial Axis

List of Sample Programs

1. Write a JavaScript program to display the current day and time in the following format.

Sample Output : Today is : Tuesday.

Current time is : 10 PM : 30 : 38

2. Write a JavaScript program to print the current window contents.

3. Write a JavaScript program to get the current date.

Expected Output :

mm-dd-yyyy, mm/dd/yyyy or dd-mm-yyyy, dd/mm/yyyy

4. Write a JavaScript program to find the area of a triangle where three sides are 5, 6, 7.

5. Write a JavaScript program to rotate the string 'w3resource' in the right direction. This is done by periodically removing one letter from the string end and attaching it to the front.

6. Write a JavaScript program to determine whether a given year is a leap year in the Gregorian calendar.

7. Write a JavaScript program to find out if 1st January will be a Sunday between 2014 and 2050.

8. Write a JavaScript program where the program takes a random integer between 1 and 10, and the user is then prompted to input a guess number. The program displays a message "Good Work" if the input matches the guess number otherwise "Not matched".

9. Write a JavaScript program to test whether the first character of a string is uppercase or not.

10. Write a JavaScript program to check a credit card number.

11. Write a pattern that matches e-mail addresses.

The personal information part contains the following ASCII characters.

- Uppercase (A-Z) and lowercase (a-z) English letters.
- Digits (0-9).
- Characters ! # $ % &' * + - / = ? ^ _ ` { | } ~
- Character . (period, dot or fullstop) provided that it is not the first or last character and it will not come one after the other.

12. Write a JavaScript program to search a date within a string.

13. Write a JavaScript program that works as a regular expression trim function (string).

14. Write a JavaScript program to count number of words in string.

Note :

- Remove white-space from start and end position.
- Convert 2 or more spaces to 1.
- Exclude newline with a start spacing.

15. Write a JavaScript function to check whether a given value is IP value or not.

16. Write a JavaScript function to count the number of vowels in a given string.

Test Data :

console.log(alphabetize_string('United States'));

Output :

"SUadeeinsttt"

17. Display aprropriate chats using chart.js library.

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAIT-203	**Course Title:**	Latest Trends in IT
Course Credits:	**04**	**Hour of Teaching/Week:**	04
Internal Assessment Marks:	**50**	**External Exam Marks:**	50
Exam Duration	**2.5 Hrs**		

Unit	Contents
1	**IOT** What isIoT?, Examples of IoT, Appliances, Smart Health care, Oil & Gas Industry, Smart Places, IoT v/s Computer v/s Smartphone, Adoption and trends in IoT, Social benefits of IoT, Risk-Security-Privacy of IoT. Introduction to Indestrial Revolution 4.O, Current application related to Indestrial Revolution 4.O, Introduction to devices related to IoT (Ardunio, Rasberry Pi, PLCs) **Arduino Basics** IDE, Setting up Arduino Board, Arduino Sketch, Uploading and Running Blink Sketch, Creating and Saving Sketch, Structure of Sketch, Primitive Types, Functional Blocks, Conditions, Loops, Operators **Working With Sensors** LED, LM393 Speed Sensor, Touch Sensor, MQ-2 Gas Sensor, Temperature Sensor LM35, Light Dependent Resistor(LDR), Humidity plus Temperature Sensor Module, IR Infrared, Ultrasonic Sensor (HC-SR04)
2.	**AI** What is Artificial Intelligence?, Examples of AI Systems, Types of artificial intelligence—weak AI vs. strong AI, Deep learning vs. machine learning, Introducion to fundamental of NLP, Breif Introduction about Genrative AI, Generative Pre-Trained Transformer and OpenAI , Recommendations System (Social Media Feeds, Amazon, and Netflix Recommendations)
3.	**VR** Defining Virtual Reality, History of VR, Human Physiology and Perception, Key Elements of Virtual Reality Experience, Virtual Reality System, Interface to the Virtual World-Input & output- Visual,

	Aural & Haptic Displays, Applications of Virtual Reality. *Case Study on the use of Virtual Reality at NASA* **AR** What Is Augmented Reality - Defining augmented reality, history of augmented reality. The Relationship Between Augmented Reality and Other Technologies-Media, Technologies, Other Ideas Related to the Spectrum Between Real and Virtual Worlds, applications of augmented reality. Augmented Reality Concepts- How Does Augmented Reality Work? Concepts Related to Augmented Reality, Ingredients of an Augmented Reality Experience
4.	**Data Science** **What is data science? ,The Data Science Life Cycle,** Data science versus data scientist, Data science versus business intelligence , Data science tools , Data science and cloud computing , Data science use cases *Case Study: Amazon uses data science to personalize shopping experiences and improve customer satisfaction*

Text Books

1. Allan Fowler-AR Game Development‖, 1st Edition, A press Publications, 2018, ISBN 978-1484236178

2. Virtual Reality, Steven M. LaValle, Cambridge University Press, 2016

3.Arduino Cookbook, Michael Margolis, O'Reilly

4. ARTIFICIAL INTELLIGENCE: A MODERN APPROACH, 4TH EDITION by Russell/Norvig (Author)

References

1. Augmented Reality: Principles & Practice by Schmalstieg / Hollerer, Pearson Education India; First edition (12 October 2016),ISBN-10: 9332578494

2. Sanni Siltanen- Theory and applications of marker-based augmented reality. Julkaisija – Utgivare Publisher. 2012. ISBN 978-951-38-7449

3.Doug A Bowman, Ernest Kuijff, Joseph J LaViola, Jr and Ivan Poupyrev, "3D User Interfaces, Theory and Practice", Addison Wesley, USA, 2005

4. IBM Data Science : https://www.ibm.com/topics/data-science

5. IBM AI : https://www.ibm.com/topics/ai

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAIT-204-P	**Course Title:**	Practical Skills in Statistical Data Analysis
Course Credits:	**04**	**Hour of Teaching/Week:**	**08**
Internal Assessment Marks:	**50**	**External Exam Marks:**	**50**
Exam Duration	**2.5 Hrs**		

Practical Implementation of the following topics should be incorporated using suitable practical tools/Languages like R Studio, Python, Etc…..

Collection of data, classification and tabulation of data, Types of data: Primary data, Secondary data, Presentation of data Diagrammatic and Graphical Representation: Histogram, frequency curve, frequency polygon, stem and leaf chart.

Loading Data (Reading Tabular Data files, Reading CSV files, Importing data from excel) , Manipulating Data (Selecting rows/observations, Selecting columns/fields, Merging data, Relabeling the column names, Converting variable types, Data sorting, Data aggregation), Commonly used Mathematical Functions , Commonly used Summary Functions , Commonly used String Functions

Data visualization (Box plot , Histogram, Pie graph , Line chart , Scatter plot)

Implementation of Central Tendency and Dispersion (Arithmetic Mean (A.M.), Mode, Median, Geometric Mean (G.M.), Harmonic Mean (H.M.), Weighted Mean and Standard Deviation)

Implementation of Correlation (correlation-scatter diagram, Karl Pearson's Coefficient of Correlation and Spearman's rank Correlation)

Implementation of Linear Regression and plot it on graph

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAIT-205	**Course Title:**	Soft Skills and Personality Development
Course Credits:	**02**	**Hour of Teaching/Week:**	02
Internal Assessment Marks:	**25**	**External Exam Marks:**	25
Exam Duration	**3Hrs**		

Unit	Contents
1.	**Personal Skills** Self-Assessment; Identifying Strength & Limitations; Habits, Will-Power and Drives; Developing Self-Esteem and Building Self-Confidence, Significance of Self-Discipline. Understanding Perceptions, Attitudes, and Personality Types. Mind-Set: Growth and Fixed; Values and Beliefs. Motivation and Achieving Excellence; Self-Actualization Need. Goal Setting, Life and Career Planning; Constructive Thinking **Professional Skills** Communicating Clearly: Understanding and Overcoming barriers; Cross gender/Cross Cultural communication, Strategic Communication. Active Listening. Persuasive Speaking and Presentation Skills. Conducting Meetings, Writing Minutes, Sending Memos and Notices. Netiquette: Effective E-mail Communication; Telephone Etiquette. Body Language in Group Discussion and Interview
2.	**Interpersonal Skills** Enhancing Empathy, Showing Sympathy and Dealing with Antipathy; Gaining Trust and Developing Emotional Bonding Ethics and Etiquettes (Social and Official Settings); Respecting Privacy; **Civic Sense and Care for the Environment** Negotiating, Decision-Making, Conflict-Resolution, Five Styles Emotional Literacy; Assertiveness versus Aggressiveness; Learning to Say "No."; Learning to Appreciate and Give Praise; Presenting Bad News Humour, Jokes and Anecdotes in Effective Communication

Text and Reference Books

1. Soft skills & Life skills: The dynamics of success-Nishitesh and Dr. Bhaskara Reddy
2. Soft Skills-Dr. Alex
3. Managing Soft skills-K. R Lakshminarayan and T. Murugavel
4. Soft skills and Professional Communication-Francis Peter S.J
5. The Ace of Soft skills-Gopalswamy Ramesh and Mahadevan Ramesh
6. Personality Development and Soft skills-Barun K. Mitra
7. https://onlinecourses.swayam2.ac.in/cec22_cm03/preview

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAIT-206A	**Course Title:**	Try to Understand our Mother Earth
Course Credits:	**02**	**Hour of Teaching/Week:**	02
Internal Assessment Marks:	**25**	**External Exam Marks:**	25
Exam Duration	**2Hrs**		

Unit 1	Introduction To Environment Science	- Introduction to Environment Science: Definition, Scope & Carrier, Approaches, Relation to other branches of Science. - Past, Present & Future Scenario, Various fields of Environment Science. - Structure and composition of atmosphere, hydrosphere, lithosphere and biosphere. - Meteorological parameters - pressure, temperature, precipitation, humidity, radiation. Laws of thermodynamics & Heat transfer processes. Environmental education and awareness. Environmental ethics.
	Unit 2: Atmosphere, Hydrosphere and Lithosphere	Atmosphere: Composition, structure and functions of atmosphere, atmospheric chemistry, classification of elements, earth's energy budget, reactions in the lower and upper atmosphere, radioactivity in the atmosphere, atmospheric stability, inversions and mixing heights, wind roses Hydrosphere: Structure and properties of water and their environmental significance, distribution of water in earth, fresh water and its chemistry, solubility of gases in water, role of water in environment Lithosphere: Factors and processes of soil development, soil types and their formation, soil profiles, physical and chemical properties

Reference Materials:

1. Environmental Science by S C Santra
2. Environmental Science by D D Chiras
3. Text Book for Environmental Studies by UGC, New Delhi
4. Environmental Chemistry by A K Dey
5. Fundamental of Ecology by E P Odum
6. Ecology and Environment by P D Sharma

External Exam Format : As per Table 1.1, 1.2 and 1.3

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAIT-206B	**Course Title:**	Yoga- Nityansh
Course Credits:	**02**	**Hour of Teaching/Week:**	02
Internal Assessment Marks:	**25**	**External Exam Marks:**	25
Exam Duration	**2Hrs**		

Unit 1	Study of patanjali yoga sutras. (pad -2.29 to 55,pad-3.1 to 8) Ashtanga yoga in patanjaliyogasutras. Yama,niyama,asana,pranayama,pratyahara,dharana,dhyana& samadhi.
Unit 2	Surya namaskara. (tadasana, vrikshasana, padmasana,vajrasana,shashankasana, paschimottanasana, vakrasana, shavasana.) Shatkarma. Mudra & bandha. Concept of purakarechaka and kumbhaka. Nadi shodhana
External Exam Format : As per Table 1.1, 1.2 and 1.3	

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAIT-207	**Course Title:**	Practical Skills in Desktop Publishing
Course Credits:	**02**	**Hour of Teaching/Week:**	**02**
Internal Assessment Marks:	**25**	**External Exam Marks:**	**25**
Exam Duration	**2Hrs**		

Unit	Contents
1.	**Corel Draw:** Introduction, Surfing the Interface, Getting to know the status bar. Getting to scrollbar and color palette. Understanding Dialog box, Exploring the standard toolbar, Toolbox. Browsing the Menus, File, Edit, View, Layout, Arrange, Effect, Bitmaps, Text, Tools, Drawing and working with Lines and Curves. Drawing and working with Rectangles, Ellipse and Polygons, Adding Text and Formatting Text, Working with Objects, Defining Outline and Fill Color, Working with outlines, The outline pen dialog, The outline color dialog, Understanding fills, Fountain fills, Pattern fills, Creating Special Effects, Using an envelope, Creating perspective effects, Blending objects
2.	**Photo Shop:** Photoshop's Environment Graphics and Environment Elements Navigating in Photoshop. Sizing Images, Image Size and Resolution Cropping. Selecting Image Areas. The Rectangular and Elliptical Marquee Tools. The Lasso Tools and Saving Selections. The Magic Wand Tool. The Magnetic Lasso Tool and Modifying Selections Layers, Feathering Edges: Image Modes, Color and Painting, Selecting Colors, Painting Tools and the Clone Stamp Tool. Text, Layer Effects, and Filters, Filters, Merging, and Flattening. Adjusting Images, Brightness/Contrast and Levels Adjustment Layers, Toning Tools and Hue/Saturation

Text and Reference Books

Mastering Corel Draw by Rick Altman, BPB 4th Edition

Tay Vaughan, “Multimedia – Making it Works”. Tata MacGrow Hill

Online Resources:

https://www.classcentral.com/swayam-animations-13880

MSC (CA&IT) - Semester: II

(Effective from year 2023-24)

Course Code:	CAITEX-001	**Course Title:**	Summer Internship and Viva
Course Credits:	04	**Hour of Teaching/Week:**	-
Internal Assessment Marks:	-	**External Exam Marks:**	100
Exam Duration	2.5 Hrs		

- Summer Internship shall be of 60 Hours.
- This course shall be application for those students who wish to exit from the course and wants avail certificate after successful completion of one year
- Summer Internship can be Online, subject to the approval from the authority in special case.
- At the end of the Internship students has to submit a project report and face a viva to avail a certificate.
- In special circumstances, if any students fail to get a suitable summer internship then he/she should be allowed to perform in-house project, subject to approval from the authority.