DEPARTMENT OF COMPUTER SCIENCE
Conducts

DIGITAL MISSION

https://christuniversity.in/center/C/digitalmission

Aim:

To equip all Christies with the digital skills required for today's workforce.

Guidelines:

- All communication will be done through CHRIST University Official Mail Id.
- For from the 2023 batch, if the course is taken as mandatory value-added course, then successful completion student will get the credentials in a **separate transcript (additional transcript).**
- For the 2021 and 2022 batch, if the course is taken as mandatory value-added course, student will get **E Certificate** on successful completion.
- AY 2024-25 mandate will be updated soon after the MoU collaboration with Infosys.
- Assessment criteria:

Name of Component	Mark
MCQ	25
Assignment	15
Attendance	10
Total	**50**

Note: Minimum of 20 marks secured for pass

- Usage of the Laptop is only with the prior permission (as per the requirements of the class/Lab/demo).

Courses:

Digital Skills – ESSENTIALS **15 Hours**

S.NO	Course Code	Course Name	No. of Hours per Week
1	CSC989	Google Workspace	2
2	CSC990	Formulas & Design	
3	CSC991	Essentials for handling images	
4	CSC992	Fundamentals of Programming	

Digital Skills – ENTERPRISE **15 Hours**

S.NO	Course Code	Course Name	No. of Hours per Week
1	CSC993	Automating Spreadsheets	2
2	CSC994	Automating Google Workspace	
3	CSC995	Automate using Python	
4	CSC996	Visualizing Data	
5	CSC997	Cloud Literacy	

DIGITAL SKILLS – ESSENTIALS

GOOGLE WORKSPACE

Total Teaching Hours for Semester:15 **No. Of Hours Weekly Hours:2**
Max Marks: 50

Course Description

This course aims at equipping students with hands-on Digital Skills required for preparing classroom assignments. Also, upskill in Digital technologies to work efficiently, so that students are industry-ready and employable.

Course Objectives

This course will help the learner to

- create and share content online using Google Workspace.
- collaborative work using online tools.
- Teach students the techniques for using spreadsheets.
- The various uses of mind-mapping skills using online tools

Course Outcomes
By the end of the course the student should be able to:
• CO1: Understand the applications of google work space.
• CO2: Apply the various tools in google workspace for collaborative work.
• CO3: Create google space contents for effective office management..

UNIT 1 **3 Hours**

GOOGLE WORKSPACE: Chrome Browser - Browser settings - Browser Extensions- Chrome Apps. **GMail** - Communicate with Gmail - Mail , Chat , Spaces , Meet - Basic Settings - Advanced settings - Labeling / Grouping Emails - Scheduling an Email, Confidential Email - Search Email -Task in Gmail - Templates / Signature - Cancel / Undo the sent email

Calendar - Basic settings - Organize your Events - Setup- Notifications - Add task Video Conferencing Meeting / Study Groups - Share calendar / Add calendar (Co-workers) - Book an appointment. **Drive** - Cloud storage - opening Drive - through email / direct link - Create Folder - Upload Files / Folder - Share the file / Collaborate – settings - Create Files / Folder (color the folder) - Delete Files.

UNIT 2 **4 Hours**

GOOGLE DOCS - Basic Docs - Template -add style to your text - font , style , alignment - enhance your document - Image / Table / Drawing / Link/ chart / bookmark / table of Content - share your document / collaborate with your team - Voice input/ @ options / Comments / Explore options - citations - building blocks / emoji/ dropdown / watermark / equation - export the document - docx, PDF, Publish to web -shortcuts

UNIT 3 **4 Hours**

GOOGLE SHEETS: Basic Sheets / Spreadsheets - Create New file - Import data / Work with data - Format data / Publish data - Manage data in Sheets - Basic operations - search for data - Restrict data sharing - keyboard shortcuts. Analyse the data - Add charts - Get automatic charts - add chart to docs and slides - Function in sheets - add pivot tables - get automatic pivot tables. Export sheets - Export to excel / PDF - download in different formats - Make a copy - Email a copy

UNIT 4 **4 Hours**

GOOGLE SLIDES: Basics of Presentation / Slides - Create a basic presentation - Add/ edit images - add flowchart / diagram - insert / edit charts - Import Powerpoint slides - use theme - collaborate / share / download different formats / set expiry date for access - embed presentation / Publish for web - Presentation with Q&A option
Explore option to make your presentation professional

Essential Reference:

GOOGLE WORKSPACE FOR BEGINNERS: The Complete User Guide from Beginner to Expert Level with Useful Tips & Tricks to Master Google Cloud Computing & Collaborative Apps in Less Than 7 Days, By TABINA HENDRICK

1. https://workspace.google.com/intl/en_in

DIGITAL SKILLS – ESSENTIALS

FORMULAS & DESIGN

Total Teaching Hours for Semester:15 **No. Of Hours Weekly Hours:2**
Max Marks: 50

Course Description

This course aims at equip students with hands-on Digital Skills required for preparing classroom assignments. Also, upskill in Digital technologies to work efficiently, so that students are industry-ready and employable.

Course Objectives

This course will help the learner to

- create and share content online using Google Workspace.
- collaborative work using online tools.
- Teach students the techniques for using spreadsheets.
- The various uses of mind-mapping skills using online tools

Course Outcomes

By the end of the course the student should be able to:

- CO1: Understand the applications of MS Excel and Digital portfolios..
- CO2: Apply the various tools such as Excel, Canva, Google sites and mind mapping tools to simplify and enable creative office contents.
- CO3: Create formulas, digital portfolio contents for effective office management.

UNIT 1 **4 Hours**

MS Excel : Introduction to excel - Interface , Tabs, Ribbons, document windows, navigation , Office button - Entering, Editing and formatting Data: entering data, Fonts, fills, alignment, paste special, moving finding , replacing a value, cell style - Formatting Numbers - Currency format, format painter, formatting dates - Managing worksheets - Naming worksheets , copying worksheets, adding, deleting and hiding worksheets, grouping worksheets - moving copying , deleting , hiding grouped worksheets - modifying rows and columns - insert / modify rows and columns.

Understanding formulas : using operators , creating formulas , auto sum, common formulas, searching for formulas , copy formulas - Change view, auto fill, custom lists - Conditional

formatting, Tables, Data tools , Conditional logic, - charts , format charts - style , layouts, label, options, title, legends.

UNIT 2 **4 Hours**

Digital Portfolio Creation: Understand basics of Portfolio through Google Sites - Understand Layout , options , settings - Understand Insert, Pages, themes - Adding banner - adding image, text , embed YouTube video , maps - content to site - create links format the text content - create Resume site , create team site - share , collaborate - publish the site - Create Digital portfolio - share the link.

UNIT 3 **4 Hours**

Canva for Design: Concept of Design - Raster Graphics and Vector Graphics - Canva Basics - design for web / social media/ presentation / print - selecting the dimension - selecting the background - inserting the images / colour - adding elements - Choose right fonts - Using templates - collaborate and work together - save export.

UNIT 4 **3 Hours**

Mind Mapping Tools: Understanding mind mapping - tools available - practice coggle for mind mapping - creating mind mapping for simple topics - sharing, collaboration, export.

Reference:

1. Jainn, Rinkoo. A to Z of MS EXCEL: A Book for Learners and Trainers. N.p., Amazon Digital Services LLC - KDP Print US, 2021.
2. K, Koushik. Canva Tips and Tricks Beyond The Limits. N.p., Draft2Digital, 2020.
3. Bates, Troye. How to Mind Map: 7 Easy Steps to Master Mind Mapping Techniques, Note-taking, Creative Thinking & Brainstorming Skills. N.p., Lulu Press, Incorporated, 2019.

Digital Skills – ESSENTIALS

ESSENTIALS FOR HANDLING IMAGES

Total Teaching Hours for Semester:15 **No. Of Hours Weekly Hours:2**
Max Marks: 50

Course Description

Graphic Designing will enable students to develop advertisements, logos and other digital entities for creating brand equity for assortment of products, services and organizations.

Course Objectives

This course will help the learner to

- Provide an overview of the Graphic designing.
- To familiarize the methods and techniques of Graphic designing.
- To enhance the skill set of the students in designing digital entities for businesses.
- To imbibe the concepts of graphics designing to strengthen the campaigns of digital marketing.

Course Outcomes

By the end of the course the student should be able to:

- CO1: Understand the applications of photoshop.
- CO2: Analyze various graphical tools used for digital marketing.
- CO3: Create various creative models using graphical elements.

Prerequisites:

- Students should have a copy of Adobe Photoshop to follow along.

UNIT 1 **4 Hours**

Photoshop Basics: History of Photoshop - About Photoshop, Photoshop Features - Opening and Importing images, Creating Documents with different sizes - Digital Marketing – Digital Branding.

UNIT 2 **6 Hours**

Importance of Designs, Logos, Mascots and other Digital Entities in Marketing & Branding - Basic Concepts of Designing, Design principles, Basics of design elements, Typography, Colour theory.

UNIT 3 **5 Hours**

Introduction to Graphics, Introduction to Photoshop, Bitmap and Vector Images, Understanding Image Size and Resolution

Reference:

Adobe Photoshop CC – Classroom in a Book, Adobe system incorporation, Adobe Press, 2017

E-Books:

1. ptgmedia.pearsoncmg.com/images/9780134665351/.../9780134665351.pdf

Digital Skills – ESSENTIALS

FUNDAMENTALS OF PROGRAMMING

Total Teaching Hours for Semester:15 **No. Of Hours Weekly Hours:2**
Max Marks: 50

Course Description

This is an introductory course that provides required knowledge about programming. The course covers problem solving techniques and logic building using tools like flowchart and algorithm. This course also introduces the basic concepts of C programming language. Course includes a few exercises to make sure the student has not only gained the knowledge but can also apply and execute it.

Course Objectives

This course will help the learner to

- Understand the various number systems and their representation.
- Analyze real life problem statements to enhance problem solving skills using flowchart and algorithm
- Develop a program that is the foundation of any programming language

Course Outcomes

By the end of the course the student should be able to:

- CO1: Understand the applications of computers/ importance of programming..
- CO2: Apply fundamental concepts in C to solve problems.
- CO3: Develop simple applications to improve programming skills using control statements, arrays and string.

Prerequisites:

- Basic knowledge of using computers

UNIT 1 **4 Hours**

Introduction to computer: Introduction, Basic block diagram and functions of various components of computer, Concept of Hardware and Software, Types of software, Compiler and Interpreter. **Introduction to Programming:** Basic Difference between Procedure Oriented Language and Object Oriented Language, Concepts of Machine level, Assembly level and High level programming, Flow charts and Algorithms.

UNIT 2 **4 Hours**

Fundamentals of 'C': Features of C language, structure of C program, comments, header files, data types, constants and variables, operators, expressions, evaluation of expressions, type conversion, precedence and associativity, I/O function.

UNIT 3 **7 Hours**

Control Structures in 'C': Simple statements, Decision making statements, Looping statements, Nesting of control structures, break and continue statement, goto statement.
Array & String: Concept of array, One and Two dimensional arrays, declaration and initialization of arrays, String, String storage, Built-in string functions.

Reference:

1. Floyd, Thomas L: Digital Computer Fundamentals, 11th Edition, Pearson International, 2015.
2. Balagurusamy E., Programming in ANSI C, 6th Edition, Tata McGraw-Hill,2012.
3. Deitel H M and Deitel P J, C - How to Program, 5th Edition, Prentice-Hall, 2006.

Digital Skills – ENTERPRISE

AUTOMATING SPREADSHEETS

Total Teaching Hours for Semester:15 **No. Of Hours Weekly Hours:2**
Max Marks: 50

Course Description

The power of Excel goes beyond working with numbers and formulas. Automating the working of Excel is a much sought after skill for today's smart working needs. The course is designed for any student who possesses working knowledge in MS Excel.

Course Objectives

This course will help the learner to

- Understand the various advanced formulas of Excel.
- Analyze on macro recorder versus VBA.
- Develop a VBA program that is the foundation of any programming language
- Develop the real-world Macro/VBA projects from beginning to end.

Course Outcomes

By the end of the course the student should be able to:

- CO1: Understand the applications of advanced excel concepts.
- CO2: Apply fundamental concepts in excel interactivity and automation.
- CO3: Develop simple VBA applications to enable macros.

Prerequisites

- Basic Excel Knowledge is a strict prerequisite for this course.

UNIT 1 **4 Hours**

Advanced Excel: Templates, Efficiency, and Risk (Standard Deviation, Variance, and Coefficient of Variation), Data Validation; *Functions and Power functions, Array Formulae (Frequency Distribution, mode.mutt, mode.sngl), Tables, Advanced Range Names, What-if-analysis: Goal-seek, Data tables, and Scenario Manager; Data analysis ToolPak: Descriptive Statistics, Moving averages, Histogram, Covariance, correlation, and Regression analysis (only for projection); solver add- in. Problem Solving using Solver (optimal product mix, workforce scheduling, transportation, capital budgeting, financial planning), Integrating excel with other tools: MS word, outlook, PowerPoint, Access, Power BI.

UNIT 2 **4 Hours**

Excel Interactivity and Automation:Index and Match, Offset, Dynamic Charting, Database functions, Text functions, and Error functions: IfError, IsError, Aggregate, Circular Reference, Formula Auditing, Floating-Point Errors, Form Controls (Button, Combo, Check box, Spinner, List, Option), Visual Basic (only basic). Recording Macros, Absolute and relative macros, editing macros, Use of spinner buttons and command buttons; Sub Procedure, Function Procedure (creating New Functions); Working with Loops: Do_while loop, For_Next loop; Creating User Forms: Message Box, Input Box; If_Then_Else.

UNIT 3 **4 Hours**

Introduction to VBA : Conditional Formatting, Charts that Inspire (Waterfall, Column, Line, Combo, Thermometer, Scatter, Histogram) Slicers, Sparklines, Graphics Tricks and Techniques, Worksheet Automation using Macros: Absolute and relative macros, editing macros, Creating new functions using macros, Use of spinner buttons and command buttons.

UNIT 4 **3 Hours**

Macro: Develop a macro - Recording The Macro - Examining The Macro - Saving Workbooks That Contain Macros - Format worksheets using macros - Perform calculations

Reference:

1. Excel 2016 Power Programming with VBA, Michael Alexander, Dick Kusleika, Wiley. Financial Analysis and Modelling Using Excel and VBA, Chandan Sengupta, Second Edition, Wiley Student Edition.
2. MS Excel 2016, Data Analysis & Business Modelling, Wayne Winston, PHI.

Digital Skills – ENTERPRISE

AUTOMATING GOOGLE WORKSPACE

Total Teaching Hours for Semester:15 **No. Of Hours Weekly Hours:2**
Max Marks: 50

Course Description

This course starts an equip students with hands-on the solid Excel skills need to develop user-generated functions. Also, enhance upskill in accelerating manual activities through the use of automation techniques.

Course Objectives

This course will help the learner to

- Understand the use google apps script and how to apply it.
- Analyze on start writing and exploring google apps script.
- Develop a google scripts, edit debug.

Prerequisites

- JavaScript, HTML and CSS
- Prior programming knowledge
- Solid understanding of JavaScript

Course Outcomes

By the end of the course the student should be able to:

- CO1: Understand the applications of google app scripts.
- CO2: Apply various Google apps and tools to create real world applications.
- CO3: Create google calendar events, drive and use feed reader applications.

UNIT 1 **5 Hours**

Introducing Google Apps Scripts: Apps Scripts, create a first project and custom formulas. Creating Basic Elements**,** types of dialog and how to create and display dialog, how to use the Logger class to log values, and how to debug script.

UNIT 2 **5 Hours**

Parsing and Sending E-mails: ContactApp, MailApp, and GmailApp services. Create many useful real-world applications, including an e-mail merger application.

Creating Interactive Forms: creating Forms dynamically by script, publishing the script as a web application, creating Forms using HtmlService, creating an e-voting application, and creating a ticket reservation application.

UNIT 3 **5 Hours**

Creating Google Calendar and Drive Applications: create Calendar events and sync events from one Calendar to another Calendar - GAS advanced services.

Creating Feed Reader and Translator Applications: creating applications, including RSS/Atom reader and language translator applications.

Reference:

1. **https://www.google.com/script/start/**

Digital Skills – ENTERPRISE

AUTOMATE USING PYTHON

Total Teaching Hours for Semester:15 **No. Of Hours Weekly Hours:2**
Max Marks: 50

Course Description

Python is a general-purpose programming language, meaning it can be used in the development of both web and desktop applications. This course starts a design, develop, debug, execute, and refactor Python scripts. Also, think algorithmically to analyse problems and implement them as computer processes.

Course Objectives

1. To create and process arrays using mathematical operations from the NumPy library.
2. To manipulate and analyse data using the pandas library.
3. To perform data visualizations using the matplotlib plotting library.
4. To understand the role of a data scientist in data analysis projects.

Course Outcomes
By the end of the course the student should be able to:
- CO1: Understand the applications of python and machine learning.
- CO2: Apply fundamental concepts in pandas to solve problems.
- CO3: Analyze the applications of machine learning.

Prerequisites

Basic programming knowledge is required

UNIT 1 **5 Hours**

Python: General overview, Python vs. Excel , Anaconda and Jupyter notebook: Interface overview, Data types in Python, Python basic syntax: Assignment statements, creating variables, indentation, conditionals, and loops, writing user defined functions. Working with libraries: Pandas, NumPy, Matplotlib, and Seaborn. Python SQLDatabase Access: Introduction, Installation, DB Connection, Creating DB Table.

UNIT 2 **5 Hours**

Pandas: Working with Data Frame, Importing fromExcel or .csv files, Powerful filters and indexes. Numpy:Selecting data with loc and iloc, Using NumPy for speed, Trade-offs between

arrays and lists, Array functions. Data cleansing and normalization: Libraries for data visualization, Types of charts/graphs and how to build them.

UNIT 3 **5 Hours**

Machine learning: Introduction, Definitions, Supervised, unsupervised, python libraries for machine learning: Sci-kit learn, Regression: Linear regression, logistic regression, over-fitting and regularization.

Reference:

1. Pilgrim, M. (2004). Dive Into Python. Apress.
2. S Raschka, Python Machine Learning, V Mirjalili (2020)
3. Mitchell, T. M. (1997). Machine Learning. New York: McGraw-Hill.

Digital Skills – ENTERPRISE

VISUALIZING DATA

Total Teaching Hours for Semester:15 **No. Of Hours Weekly Hours:2**
Max Marks: 50

Course Description

Data visualization package for the statistical programming language R. It starts with simple datasets and then graduates to case studies about world health, economics, and infectious disease trends in the United States. This course starts with fundamental computational concepts underlying most programming languages and also the solution of small problems using a programming language.

Course Objectives

1. To teach students about data visualization principles
2. To learn how to communicate data-driven findings
3. To teach how to use ggplot2 to create custom plots

Course Outcomes

By the end of the course the student should be able to:

- CO1: Understand the applications of tableau
- CO2: Apply fundamental concepts in tableau basic reports.
- CO3: Analyze the applications of tableau calculations and filters.

Prerequisites:

- Basic knowledge of using computers

UNIT 1 **5 Hours**

Introduction to Tableau: What is TABLEAU? Why Data Visualization - Unique Features compared to Traditional BI Tools - TABLEAU Overview & Architecture - File Types & Extensions - Start Page, Show Me, Connecting to Excel Files, Connecting to Text Files, Connect to Microsoft SQL Server, Connecting to Microsoft Analysis Services, Creating and Removing Hierarchies - Bins, Joining Tables, Data Blending.

UNIT 2 **5 Hours**

Tableau Basic Reports - Parameters - Set - Combined Sets - Creating a First Report - Data Labels - Create Folders - Sorting Data - Add Totals, Subtotals and Grand Totals to Report. Types of charts.

UNIT 3 **5 Hours**

Tableau Calculations & Filters : Calculated Fields - Basic Approach to Calculate Rank, Advanced Approach to Calculate Rank , Calculating Running Total - Filters Introduction - Quick Filters - Filters on Dimensions - Conditional Filters - Top and Bottom Filters - Filters on Measures - Context Filters - Slicing Filters - Data Source Filters - Extract Filters

Reference:

1. Milligan, Joshua N., and Guillevin, Tristan. Tableau 10 Complete Reference: Transform Your Business with Rich Data Visualizations and Interactive Dashboards with Tableau 10. United Kingdom, Packt Publishing, 2018.

Digital Skills – ENTERPRISE

CLOUD LITERACY

Total Teaching Hours for Semester:15 **No. Of Hours Weekly Hours:2**
Max Marks: 50

Course Description

The main objective of this course is to introduce the fundamentals of cloud computing and best practices to use the cloud services for scalable application development and deployment.

Course Objectives

- Describe basic characteristics of cloud computing
- Demonstrate application development using fundamental cloud services

Course Outcomes

By the end of the course the student should be able to:

- CO1: Understand the applications of cloud computing.
- CO2: Apply the strategies in cloud adoption for effective deployment.
- CO3: Analyze the scalable application development using cloud computing.

Prerequisites

General Understanding about Information Technology

UNIT 1 **5 Hours**

Introduction to cloud computing and its impacts – benefits of cloud computing – major services offered by cloud computing service providers – Deployment models of cloud computing – service delivery models of cloud computing – Cloud computing architecture – purpose of a Region, Availability Zone, and edge locations

UNIT 2 **5 Hours**

Cloud Adoption strategy for the business deployment on cloud – cloud adoption framework – Parameters considered for the selection of cloud service provider

UNIT 3 **5 Hours**

Scalable application development and deployment using cloud services – Web site hosting using cloud services – cloud service monitoring and billing.

Essential References:

1. Arshdeep Bahga and Vijay Madisetti, Cloud computing - A Hands-On Approach, CreateSpace Independent Publishing Platform, Reprint 2018
2. AWS Academy Cloud Foundation Modules, AWS
3. Google Cloud Platform Associated Qwiklabs