PROGRAMME GUIDE

2024-25

PROGRAMME GUIDE

- **Scheme of Examination**
- **Detailed Syllabus**
- **Counseling and Study Structure**
- **Study Modules & Books Information**

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SCOPE GLOBAL SKILLS UNIVERSITY
ONWARDS & UPWARDS

CONTENT

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING (DAIML)

Diploma in Artificial Intelligence and Machine Learning (DAIML)

डिप्लोमा इन आर्टिफिशियल इंटेलिजेंश एण्ड मशीन लर्निगं (DAIML)

(A) Duration : **12 Months** **(D) Courses** : **14**

(अ) अवधि : 12 माह (द) कोर्सेस : 14

(B) Eligibility : **12th Pass** **(E) Credit** : **40**

(ब) पात्रता : 12वीं पास (द) कोर्सेस : 40

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
Semester I										
DAIML1	Introduction to AI-ML	3	100	50	20	20	8	30	12	• Acquaint with AI-ML Basic Concepts
DAIML2	Mathematics and Statistics for AI-ML	3	100	50	20	20	8	30	12	• Learn Statistical Tools for Machine Learning
DAIML3	Python Programming and Data Manipulation	3	100	50	20	20	8	30	12	• Perform data analysis and manipulation using data structures and tools provided in the Pandas package
DAIML4	AI-Data Steward SSC/Q8111	3	100	50	20	20	8	30	12	• Deep understanding of data governance concepts and technologies, as well as a strong ability to manage and secure an organization's data assets

DAIML5	Supervised and Unsupervised & Reinforcement Learning	3	100	50	20	20	8	30	12	• To make Learner understand and implement ML Algorithms for Supervised and Unsupervised Learning, To make Learner understand and implement ML Algorithms for Reinforcement Learning.
DAIML6	Safety Practices in the Work Environment	3	100	50	20	20	8	30	12	• Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, • Ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene.
DAIML7	Digital and Financial Literacy	2	100	50	20	20	8	30	12	• Financial fraud tends to be less prevalent among people who are aware of finances. By employing the proper medium and forms, learners will be able to successfully communicate information and ideas to an audience..
Semester II										
DAIML8	Tensor Flow Keras & Cloud Essentials	2	100	50	20	20	8	30	12	• All Basic information for Using Tensor flow algorithms
DAIML9	Natural Language Processing	2	100	50	20	20	8	30	12	• Learn how natural language processing is done

DAIML10	Artificial Neural Network	3	100	50	20	20	8	30	12	• In depth understanding of ANN and Implementation algorithm
DAIML11	AI-Business Intelligence Analyst SSC/Q8102	3	100	50	20	20	8	30	12	• Understanding of business intelligence concepts and technologies, as well as a strong ability to analyze data and provide actionable insights to drive business decisions.
DAIML12	Communication and Personality Development	3	100	50	20	20	8	30	12	• Understand reading and writing skills to be able to read and write various instruction.
DAIML13	Intellectual property Rights	3	100	70	28	–	–	30	12	• Learn the important aspects of property rights
DAIML14	Project / Internship	4	100	–	–	100	40	–	–	• Learn hands On project to gain more skilful learning

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
1400	560

Details Syllabus

Semester – I

DAIML 1 - Introduction to AI-ML

Module 1: AI and ML- An Introduction

What is AI and Types of AI, Understanding AI with various use-cases, Relevance of AI – ML for the society, Introduction to fields of AI-ML (Computer vision, NLP, Robotics, Deep Learning, Robotics, etc.), What is ML, Types of Machine Learning, Application of ML.

Module 2: AI Applications and Algorithms

AI Application, Recent trends and AI techniques, Problem Definition, searching for solutions-Breadth-first search, Depth-first search, Hill-climbing search, simulated annealing search, Local Search in continuous spaces, A*, AO*, Constraints Satisfaction - algorithms

Module 3: Pattern Recognition

Pattern Recognition fundamentals: Basic concepts of pattern recognition, fundamental problems in pattern recognition system, design concepts and methodologies, example of atomic pattern recognition systems.

Module 4: Knowledge Representation and Inference

Knowledge representation, knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of Predicate calculus, Inference – Backward chaining, Rule value approach, Fuzzy Reasoning – Bayesian Theory.

Module 5: Fundamentals of Machine Learning

Machine Learning Fundamentals, Generalization, over fitting, Validation, Training, Testing Data, Bias, variance, Model, Metrics in Machine Learning, Machine Learning Algorithms.

DAIML 2 - Mathematics and Statistics for AI-ML

Module 1: Probability and Statistics for AI-ML

Probability and Statistics for AI-ML, Data Structures and Object-Oriented Programming & Methodology, Descriptive and Inferential Statistics and Methods Correlation Techniques in ML (Pearson's Correlation, Methods of Least Squares, Spearman correlation, etc.), Statistical distributions, Poisson distribution, Binomial distribution, Normal Distribution, Real-world example

Module 2: Regression Techniques for Analysis in Statistics

Regression Techniques for analysis in Statistics linear regression, logistic regression, ridge and lasso regression techniques, difference between linear and logistic regression techniques, difference among various regression techniques for analysis.

Module 3: Introduction to Mathematical and Statistical Tools and Usage

Introduction to python software libraries like NumPy, Pandas, Matplotlib, Seaborn, Introduction to R language software libraries like dplyr, ggplot, readr, tidy verse, etc, Working with IDEs such as Jupyter Notebook, PyCharm, VS Code, RStudio etc.

Module 4: Mathematics for AI-ML

Scalars, Vectors, Tensors, Matrices, Eigen Values and Eigen Vectors, Calculus, Algebra, probability, Multivariate Calculus, PCA, SVD

Module 5: Sampling and Estimation, Inferential Statistics

Sample vs population, Sample Techniques (Simple, Stratified, clustered, random), Sample Distributions, Parameter Estimation, Unbalanced data treatment, Inferential Statistics, Test of Hypothesis, Null Hypothesis and Alternative Hypothesis, Cross Tabulation, contingency table and uses, chi-square test, Fisher's exact test, z-test, F-test, one-way ANOVA

DAIML 3 - Python Programming and Data Manipulation

Perform data analysis and manipulation using data structures and tools provided in the Pandas package.

Data Analytics Tools and Software, Data Analytics using tools R/PowerBI/Tableau/Python

Module 1: Introduction to Python

Python scope and Applications of Python, Python Data Types and Data Structure, Python control statements, Python functions, in-build function and user-defined functions, Object-Oriented Programming, Principles of OOP, Python Programs, Python packages, libraries.

Module 2: Data Manipulation with Pandas

Installing Pandas, Pandas Series Object, Pandas Data Frame Object, Pandas Index object, Data Indexing and Selection in Pandas, Operations on Data using Pandas Handling missing data, working with dataset, combining datasets, concatenation and append functions in pandas, merge and join in Pandas, Aggregation and Grouping, Pivot tables in Pandas.

Module 3: Time-Series Using Pandas

Working with Time Series, Dates and Times in Python, Time Series Analysis using Pandas, Indexing by Time, Frequencies and Offsets, Resampling, Shifting, and Windowing.

Module 4: Data Visualization using Matplotlib and Seaborn

Importing packages, Visualization techniques, Line Plot, Box Plot, Scatter Plot, Histograms, Binning, and Density, Facet Grids, Multiple sub-plots, Text and Annotations, Exploring various Data with Seaborn

Module 5: Data Analytics Tools, Software's, and Storytelling

Data Analytics tools like PowerBI, Tableau, dashboard reporting with BI tools, Building interactive dashboards with BI tools and software packages, Introduction to storytelling with data, communication visualizations with storytelling.

DAIML4- AI-Data Steward SSC/Q8111

Module 1: IT-ITeS Sector – An Introduction

• Explain the relevance of the IT-ITeS sector • State the various subsectors in the IT-ITeS sector • Detail the nature of work performed across the subsectors • Identify and list organizations in the sector • Discuss the evolution of the sub sectors and the way forward • Explain the disruptions happening across the ITITeS sector

Module 2: Future Skills – An Introduction

• Define the general overview of the Future Skills subsector • Describe the profile of the Future Skills sub-sector • Explain the various occupations under this subsector • List key trends across the occupations in this subsector • List various roles in the Future Skills sub-sector

Module 3: Artificial Intelligence & Big Data Analytics – An Introduction

• Explain the relevance of AI & Big Data Analytics for the society • Explain a general overview of AI & Big Data Analytics and its roles • Define career map for roles in AI & Big Data Analytics • Explain the role of a Data Steward and his/her key responsibilities • List the range of skills and behavior, expected from a Data Steward • State the growth opportunities for a Data Steward • Whiteboard and Markers • LCD Projector and Laptop for presentations • Lab equipped with the following: • PCs/Laptops • Internet with Wi-Fi (Min 2 Mbps Dedicated) 4 Global Regulations and

Standards Theory Duration (hh:mm) 13:00 Practical Duration (hh:mm) 17:00 Corresponding NOS Code Bridge Module • Assess glob

Module 4: Data Governance – Quality

• Assess the various data requirements of different stakeholders, teams, data assets and products • Comprehend the limitations of using data that is not suitable to the requirements • Develop suitable evaluation criteria to measure the quality, completeness and suitability of data • Apply different approaches to evaluate the different sources used to acquire data.

Module 5: Manage Your Work to Meet Requirements

• Define scope of work and working within limits of authority • Summarize the details of the work and work environment • Recognize the importance of maintaining confidentiality

DAIML 5 - Supervised and Unsupervised

To make learners understand and implement ML algorithms for Supervised and unsupervised Machine Learning.

Module 1: Introduction to supervise and unsupervised ML

Introduction to Supervised Machine Learning, Types of Supervised Machine Learning, Classification and Regression, classification Techniques, Regression Techniques, Logistic Regression, Ridge Regression, Lasso Regression, ElasticNet Regression, factors for selecting right regression model.

Module 2: Supervised Machine Learning Algorithms and Implementation

K-Nearest Neighbours, Logistic Regression, Naïve Bayes Classifier, Decision tree classifier, Classification Machine Learning Problem and implementation, Linear Regression, Regression ML problem working with data.

Module 3: Unsupervised Machine Learning Techniques and Algorithms

Clustering Techniques, Distribution-based clustering, Density based clustering, Fuzzy clustering, Grid based clustering, Association Rules Techniques, PCA, Dimensionality Reduction using Feature Selection, Model Evaluation, Case study

Module 4: Case Studies, Machine Learning Projects

Predict whether or not an applicant will be able to repay a loan, build a prediction model that will accurately classify message as spam or ham

Feature Selection, Data Cleaning, Feature Engineering, handling missing values, handling outliers, binning, one-hot encoding, feature split, scaling, Normalization, min-max normalization, z-score normalization or standardization, use cases

Module 5:

DAIML 6- Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3- Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5- Common Food Borne Diseases & Infections

DAIML 7- Digital and Financial Literacy

An overview of digital financial literacy, which combines the skills needed to navigate financial services with the skills to use digital technologies.

Semester – II

DAIML 8 - Tensor Flow Keras and Cloud Essentials

Module 1: Introduction to Deep Learning

Introduction to Deep Learning, Applications of Deep Learning, difference between machine learning and deep learning, The building blocks of Neural Networks, Trainers and Optimizer, The McCulloch Pitts Model, The Rosenblatt perceptron model, Activation functions

Module 2: Introduction to TensorFlow, Keras

TensorFlow Introduction, Installing TensorFlow in Python, TensorFlow usage in IDE's like PyCharm, Google Collaboratory, Keras Introduction, Differences in Deep Learning Libraries, Usage.

Module 3: Public Datasets usage with TensorFlow Data sets

Introduction to TFDS, use of TFDS with Keras Models, Install versions, Mapping Functions, Custom Splits, TFRecord, ETL process for Managing Data in TensorFlow, Optimization, Parallelizing ETL for boosting performance.

Module 4: Creating Sentiment Programmable Using Embeddings

Vectors, Projecting words as vectors, TensorFlow Embeddings, Use case using Embeddings, Overfitting in Models, Visualizing Embeddings, using Pretrained Embeddings from TensorFlow Hub

Module 5: Using TensorFlow to Create Text

Turning sequences into Input Sequences, model building, generating text, next word prediction, extending the data, model architecture, improving the data. Character-Based Encoding

DAIML 9 - Natural Language Processing

Module 1: Introduction to NLP

NLP, Working of NLP, Phases/logical steps in NLP, Implementing NLP, Installing Python's NLTK Package, Downloading NLTK Corpus, Text Processing Techniques in NLP, Numbers, Tokenization, turning sentences into sequences, removing stop words and cleaning text, lemmatization, cleaning data, Working with real data sources

Module 2: Text to Numbers

Feature Engineering, Bag of words, N-gram model, TF_IFD, Encoding Language into Numbers, Tokenization, turning sentences into sequences, removing stop words and cleaning text, lemmatization, cleaning data, Working with real data sources

Module 2: Word Embeddings

Word embeddings and feature engineering, Global vector model (GloVe) Model, t-SNE visualization, Difference between Word2Vec, GloVe, and FastText, use of pre trained models.

Module 3: Topic Modelling

Introduction to topic modelling, Latent Dirichlet Allocation, generating Bi-grams(BoW), LDA model fitting, pre-processing of data, building ngram models.

Module 4: Text Classification with Deep Learning

Neural Networks with TF-IFD, working with libraries, pre-processing, model building, activation function, Neural network with word2vec, word2vec model, creating word vector, padding, cross-validation, sentiment analysis using LSTM, working with data.

Module 5: Transfer Learning and Machine Translation

Introduction to Machine Translation, Applications and types of Machine Translation, Libraries like textblob, langdetect, Fasttext, sequence-to-sequence modelling, Introduction to Transfer Learning, Universal sentence encoder, BERT, DAN.

DAIML 10 - Artificial Neural Network

Module 1: Understanding Artificial Neural Network (ANN)

Understanding biological neuron, working of ANN, Basic Structure of ANN, Types of ANN.

Module 2: Optimizers for Training Neural Network

Understanding Gradient Descent, Stochastic Gradient Descent, Mini-Batch Gradient Descent. Stochastic Gradient Descent with Momentum, Adam (Adaptive Moment Estimation)

Module 3: Convolution Neural Networks and Multi Layered Perceptron

Neural Networks and Representation Learning, Convolution Layers, Implementing Multichannel Convolution Operation, using this operation to train a CNN, Perceptron-based classifier, Single-layer neural networks, Multi-layer neural networks, vector quantization, Multi Layered Perceptron (MLP), Backpropagation algorithm, components of MLP, Architecture of MLP, Training Mechanisms in MLP, use cases to build MLP with different frameworks.

Module 4: Recurrent Neural Networks

RNN, gated recurrent units (GRU), Long Short Term Memory Networks (LSTM), Bi-directional LSTM, Attention-based LSTM, use cases and examples, NLP using LSTM and advancements. The basics of recurrence, feed-forward networks, Recurrence for language, Applications of Recurrent Neural Networks (RNNs), types of RNN, creating text classifier with RNNs, Introduction to LSTMs, using pretrained embeddings with RNNs

Module 5: Autoencoders, Generative Adversarial Networks (GANs)

Introduction to autoencoders, architecture, undercomplete autoencoders, overcomplete auto encoders, Denoising autoencoders, Sparse autoencoders, Stacked autoencoders, Variational autoencoders (VAEs), examples and use cases.

DAIML 11 - AI-Business Intelligence Analyst SSC/Q8102

Module 1: IT-ITeS Sector – An Introduction

• Explain the relevance of the IT-ITeS sector • State the various subsectors in the IT-ITeS sector • Detail the nature of work performed across the subsectors • Identify and list organizations in the sector • Discuss the evolution of the sub sectors and the way forward • Explain the disruptions happening across the ITITeS sector

Module 2: Future Skills – An Introduction

• Define the general overview of the Future Skills subsector • Describe the profile of the Future Skills sub-sector • Explain the various occupations under this subsector • List key trends across the occupations in this subsector • List various roles in the Future Skills sub-sector

Module 3: Artificial Intelligence & Big Data Analytics – An Introduction

• Explain the relevance of AI & Big Data Analytics for the society • Explain a general overview of AI & Big Data Analytics and its roles • Define career map for roles in AI & Big Data Analytics • Explain the role of a Data Steward and his/her key responsibilities • List the range of skills and behavior, expected from a Data Steward • State the growth opportunities for a Data Steward • Whiteboard and Markers • LCD Projector and Laptop for presentations • Lab equipped with the

following: • PCs/Laptops • Internet with Wi-Fi (Min 2 Mbps Dedicated) 4 Global Regulations and Standards Theory Duration (hh:mm) 13:00 Practical Duration (hh:mm) 17:00 Corresponding NOS Code Bridge Module • Assess glob

Module 4: Statistical Tools and Usage

• Distinguish between the different type of statistical tools and software packages • Discover the basics of using statistical software packages and IDEs such as RStudio, Jupyter Notebooks • Apply basic functions and libraries present in statistical software packages and IDEs • Make use of statistical packages, frameworks and libraries such as NumPy and Pandas in developing applications

Module 5: Business Requirements Analysis

Distinguish between the various types of requirements that different teams and organizations have • Comprehend the nuances of conducting a business contextual discussion with relevant stakeholders • Apply different approaches to gather business requirements from relevant stakeholders • Apply different approaches to map requirements to the capabilities of the delivery team

DAIML 12 - Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

DAIML 13- Intellectual Property Rights

The course is designed to provide comprehensive knowledge to the students regarding the general principles of IPR, Concept and Theories, Criticisms of Intellectual Property Rights, International Regime Relating to IPR

DAIML 14 - Project/ Internship

Counselling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
Semester I								
1	DAIML 1	Introduction to AL-ML	3	90	12	33	18	27
2	DAIML 2	Mathematics and Statistics for AL-ML	3	90	12	33	18	27
3	DAIML 3	Python Programming and Data Manipulation	2	60	08	22	12	18
4	DAIML 4	AI-Data Steward SSC/Q8111	3	90	12	33	18	27
5	DAIML 5	Supervised and Unsupervised	2	60	08	22	12	18
6	DAIML 6	Safety Practices in the Work Environment	2	60	08	22	12	18
7	DAIML 7	Digital and Financial Literacy	2	60	08	22	12	18
Semester II								
8	DAIML 8	Tensor Flow Keras & Cloud Essentials	3	90	12	33	18	27
9	DAIML 9	Natural Language Processing	3	90	12	33	18	27
10	DAIML 10	Artificial Neural Network	3	90	12	33	18	27
11.	DAIML 11	AI-Business Intelligence Analyst SSC/Q8102	90	12	33	18	27	
12	DAIML 11	Communication and Personality Development	2	60	08	22	12	18
13	DAIML13	Intellectual property Rights	90	12	33	18	27	
14	DAIML14	Project / Internship	5	180	-	-	150	-

Study Modules & Books Information

S.No	Course Code	Course Name	Module Used
Semester I			
1	DAIML1	Introduction to AI-ML	Introduction to Machine Learning with Python; Andreas C. Muller & Sarah Guido, Shroff Publishers & Distribution PVT. Ltd.
2	DAIML2	Mathematics and Statistics for AI-ML	Mathematics for Machine Learning, Marc Peter Deisenroth, Cambridge University press
3	DAIML3	Python Programming and Data Manipulation	Machine Learning with Python ; Abhishek Vijayvargia, BPB Publications
4	DAIML4	AI-Data Steward SSC/Q8111	Aisect Module (under development)
5	DAIML5	Supervised and Unsupervised & Reinforcement Learning	Supervised and Unsupervised Learning for Data Science, Michael W. Berry, Springer international publishing
6	DAIML6	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
7	DAIML7	Digital and Financial Literacy	Digital and finance literacy
Semester II			
8	DAIML8	Tensor Flow Keras & Cloud Essentials	Deep Learning with Tensor flow, Keras and PyTorch, Jon Krohn, Addison-Wesley Professional
9	DAIML9	Natural Language Processing	Natural Language Processing with Python, Steven bird, O'Reilly
10	DAIML10	Artificial Neural Network	Neural Networks and Deep Learning, Charu C. Aggarwal, Springer
11	DAIML11	AI-Business Intelligence Analyst SSC/Q8102	Aisect Module (under development)
12	DAIML12	Communication and Personality Development	Effective – 68 Communication & Personality Development
13	DAIML13	Intellectual property Rights	Intellectual Property: A Very Short Introduction" by Siva Vaidhyanathan
14	DAIML14	Project / Internship	-

DIPLOMA IN WEB DEVELOPMENT (DWD)

Diploma in Web Development (DWD)

डिप्लोमा इन वेब डेवलपमेंट (DWD)

(A) Duration : 12 Months (D) Courses : 13

(अ) अवधि : 12 माह (द) कोर्सेस : 13

(B) Eligibility : 12th Pass (E) Credit : 40

(ब) पात्रता : 12वीं पास (द) कोर्सेस : 40

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
Semester I										
DWD1	Fundamentals of Website design	2	100	50	20	20	8	30	12	• Learn the essentials Basic knowledge of Web designing and Market value
DWD2	Basics of HTML	4	100	50	20	20	8	30	12	• Learn all tags and structure of HTML
DWD3	CSS	3	100	50	20	20	8	30	12	• Learn Styling on Html tags ,about inline ,internal or external CSS Styling Processes
DWD4	BOOTSTRAP	3	100	50	20	20	8	30	12	• Learn Bootstrap use for making quick website components
DWD5	JAVASCRIPT	4	100	50	20	20	8	30	12	• Understanding JavaScript Platform backend programming, Learn Event handling, DOM, BOM
DWD6	SSC/Q0503 Web Developer	2	100	50	20	20	8	30	12	• This module prepares learners for web developers job role.

DWD7	Safety Practices in the Work Environment	2	100	50	20	20	8	30	12	• Familiarity with safety practices at workplace • Knowledge about various Hazards and their remedies • Ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene.
Semester II										
DWD8	Mongo DB database	4	100	50	20	20	8	30	12	• Learn all the basics of NOSQL database.
DWD9	Node JS and Express JS for backend	3	100	50	20	20	8	30	12	• This module teaches how to write API and connect with database.
DWD10	Web Hosting and Publishing Concepts in Cloud	4	100	50	20	20	8	30	12	• Learn ways to host website for free on cloud
DWD11	SSC/Q8403 Application Developer – Web & Mobile	2	100	50	20	20	8	30	12	• This module prepares learners for application developers job role
DWD12	Communication and Personality Development	2	100	70	28	–	–	30	12	• Understand reading and writing skills to be able to read and write various instruction
DWD13	Project/ Internship	5	100	–	–	100	40	–	–	• Hands-On projects

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
1300	520

Details Syllabus

Semester I

DWD 1 - Fundamental of Website design

Module 1

Introduction to Website Design: What is website design?, The importance of website design, Historical perspectives on website design, Trends and best practices in website design, Principles of design theory, including balance, contrast, unity, and proportion, Layout design, including the use of grids, columns, and modules, Visual hierarchy, including the use of size, colour, and contrast to guide the user's eye, Composition, including the use of whitespace, proximity, and alignment to create effective layouts.

Module 2

Typography: Typography principles, including font families, sizes, and styles, choosing fonts for different types of content, including body text, headlines, and navigation, Web typography best practices, including the use of web-safe fonts and font pairing techniques. Colour Theory: Colour theory principles, including colour harmony, contrast, and saturation, choosing colour schemes for different types of websites, including monochromatic, complementary, and analogous schemes, Colour psychology and the use of colour to create emotional impact.

Module 3

User Experience Design: User-centered design principles, including the use of personas and user stories, Effective navigation design, including the use of menus, breadcrumbs, and search Information architecture, including the use of site maps and wireframes Accessibility and usability, including the use of alt tags, semantic HTML, and responsive design principles.

Module 4

Responsive Design: Principles of responsive design, including fluid grids, flexible images, and media queries, creating flexible layouts and images that adjust to different screen sizes Designing for different devices, including desktop, tablet, and mobile, Mobile-first design and the use of progressive enhancement and graceful degradation techniques.

Module 5

Design Tools and Technologies: HTML and CSS basics, including the use of selectors, properties, and values, Design tools, including Adobe Creative Suite, Sketch, and InVision, Web design frameworks and libraries, including Bootstrap, Foundation, and Material Design.

DWD 2 - Basics of HTML

Module 1

Introduction to HTTP, HTML, Basic HTML Tags, Body Tags, Coding Style, Modifying & formatting Text.

Module 2

Lists – Unordered, Ordered, Definition, Insert Links -Linking to another Document, Internal Links, Email Links, Relative and Absolute Links.

Module 3

Insert Images - Referencing Images, Clickable Images, Image Placement and Alignment, Image Size, Image Margins, Image Formats, Image Maps- Defining an Image Map, Advanced Coloring Body Content.

Module 4

Working with tables - Basic Tables, Table Attributes, Table Cell Attributes, Table Row Attributes, Tables Inside of Tables.

Module 5

Working with Frame-Based PagesCreating Windows, Single Window Frames, Creating Column Frames, Creating Row Frames, Creating Complex Frames.

DWD 3 - CSS

Module 1

Introduction to CSS**,** what is CSS? History and evolution of CSS. How CSS works with HTML and web browsers. Basic syntax and structure of CSS code. CSS selectors and properties.

Module 2

CSS Box Model and Layout, Understanding the box model. Box model properties (padding, border, margin). Block-level and inline-level elements. Display and positioning properties. CSS layout techniques (float, flexbox, grid).

Module 3

Typography and Colours in CSS, Font properties (font-family, font-size, font-style, etc.). Text properties (colour, text-align, text-decoration, etc.). CSS units of measurement (px, em, rem, %, etc.). Understanding colour in CSS (colour values, colour schemes). Background properties.

Module 4

Responsive Web Design with CSS, understanding responsive design, Media queries and viewport meta tag, Responsive units (vw, vh, vmin, vmax), Responsive images (srcset, sizes), Mobile-first design approach.

Module 5

Advanced CSS Topics, CSS preprocessors (Sass, Less, Stylus). CSS frameworks (Bootstrap, Foundation, Bulma), CSS animations and transitions, CSS variables (custom properties), CSS methodologies (BEM, SMACSS, OOCSS).

DWD 4 - Bootstrap

Module 1

Introduction to Bootstrap, what is Bootstrap? History and evolution of Bootstrap, Advantages of using Bootstrap in web development, Basic setup and installation of Bootstrap, Understanding the Bootstrap grid system.

Module 2

Bootstrap Components, Typography and text utilities, Buttons and forms, Navigation and menus, Images and media, Cards and alerts.

Module 3

Layout with Bootstrap, understanding containers, rows, and columns, building responsive layouts with Bootstrap, understanding breakpoints and media queries, creating fluid and fixed layouts, Working with the Bootstrap grid system.

Module 4

Customizing Bootstrap**,** Theming Bootstrap with CSS, Customizing colors and fonts, Overriding Bootstrap default styles, Using Sass with Bootstrap, Customizing and extending Bootstrap components.

Module 5

Advanced Bootstrap Topics**,** Bootstrap JavaScript components (carousel, modal, accordion, etc.), Working with Bootstrap icons and typography, Integrating Bootstrap with other frameworks and libraries, Best practices for using Bootstrap in web development, building a responsive website using Bootstrap.

DWD 5 - JavaScript

Module 1

Introduction to JavaScript, what is JavaScript? History and evolution of JavaScript. How JavaScript works with HTML and web browsers Basic syntax and structure of JavaScript code. Variables, data types, and operators

Module 2

Control Flow and Functions in JavaScript, Conditional statements (if, else, switch). Loop statements (for, while, do-while). Functions and function calls. Parameters and arguments. Scope and closures.

Module 3

Working with the DOM and Events, Understanding the Document Object Model (DOM). Selecting and manipulating elements with JavaScript. Responding to user events (click, hover, submit). Event listeners and handlers. Creating dynamic content with JavaScript.

Module 4

Advanced JavaScript Topics, Object-oriented programming (OOP) in JavaScript. Prototypes and inheritance. Error handling and debugging. Asynchronous programming with callbacks, promises, and async/await. JavaScript libraries and frameworks (jQuery, React, Vue)

Module 5

JavaScript for Web Development, Ajax and fetch requests. Working with JSON data. Browser storage (cookies, local storage, session storage). Working with APIs. JavaScript and modern web development tools (Webpack, Babel, ESLint).

DWD 6 - SSC/Q0503 Web Developer

Module 1: IT-ITeS Sector – An Introduction

Explain the relevance of the IT-ITeS sector • State the various subsectors in the IT-ITeS sector • Detail the nature of work performed across the subsectors • Identify and list

Module 2: Programming for the Web

Evaluate the use of the Business Requirements Specification (BRS)/User Requirements Specification (URS). • Identify the Software Requirements Specification (SRS).

Module 3: Contribute to the Design of Software Products and Applications

Collate inputs from design experts to identify, resolve and record design defects. • Discuss conclusions from defects for improving future designs. • Discuss how to use various ranges of coding tools.

Module 4: Technical Skills for Software Design

List the functional and non-functional requirements in software application for web development. • Discuss the current practice in the design of software products.

Module 5: Analysis and Design of Web Based Applications

Discuss the implications that new products and applications may have on business processes. • Identify the sources of information to design software products and specifications. • List range of equipment used to design software products and applications.

DWD 7 - Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3- Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5- Common Food Borne Diseases & Infections

Semester II

DWD 8 - Mongo DB database

Module 1 Intro to MongoDB

This unit gives an overview of MongoDB fundamentals, from the document model to CRUD operations to indexing, that you will learn during the Introduction to MongoDB course.

Module 2 Getting Started with MongoDB Atlas

Learn about MongoDB Atlas, our multi-cloud developer data platform, its latest features, and how to deploy your first cluster.

Module 3 MongoDB and the Document Model

Want to learn more about MongoDB and the document model? In this unit, you'll learn how to manage MongoDB databases, collections, and documents.

Module 4 Connecting to a MongoDB Database

Learn how to connect to MongoDB databases by using connection strings. Connection strings allow you to connect your cluster with the mongo shell, with Compass (our GUI that enables querying, optimizing and analyzing MongoDB data), and to an application.

Module 5 MongoDB Transactions

Learn about ACID transactions in MongoDB and how they guarantee certain database operations happen together or not at all to ensure data integrity within the database.

DWD 9 - Node JS and Express JS for backend

Module 1 Node JS Modules

- Functions
- Buffer
- Module
- Modules Types
- Core Modules
- Local Modules
- Modules Exports

Module 2 Node Package Manager

- What is NPM

- Installing Packages Locally
- Installing package globally
- Adding dependency in package Json
- Updating packages

Module 3 Creating Web Server

- Creating Web Server
- Sending Requests
- Handling HTTP requests

Module 4 File System

- Read File
- Writing a File
- Opening a File
- Deleting a File
- Writing a file asynchronously
- Other I/O Operations

Module 5 Database Connectivity

- Connecting String
- Configuring
- Updating Records
- Working with Select Command
- Deleting Records

DWD 10 - Web hosting and publishing Concepts in Cloud

Module 1

Introduction to Cloud Computing, what is Cloud Computing, Advantages of Cloud Computing. Cloud Deployment Models (Public, Private, Hybrid). Cloud Service Models (IaaS, PaaS, SaaS)

Module 2

Cloud Web Hosting, Introduction to Web Hosting, Cloud Hosting Architecture (Load Balancer, Auto Scaling, Elasticity) Cloud Hosting Providers (AWS, Azure, Google Cloud, Digital Ocean), Deploying Web Applications on Cloud.

Module 3

Cloud Web Publishing, Introduction to Web Publishing, Continuous Integration and Continuous Deployment (CI/CD) Pipelines, Tools for Web Publishing (Docker, Kubernetes), Deploying Web Applications on Cloud using CI/CD.

Module 4

Cloud Security, Security Risks and Threats in Cloud, Cloud Security Best Practices (Identity and Access Management, Network Security, Encryption), Compliance and Regulatory Requirements (HIPAA, GDPR, SOC 2), Security Monitoring and Incident Response in Cloud.

Module 5

Cloud Performance and Cost Optimization, Monitoring and Optimizing Cloud Resources (CPU, Memory, Storage), Performance Optimization Techniques (Caching, Content Delivery Networks),

Cost Optimization Techniques (Reserved Instances, Spot Instances), Scaling and Resource Allocation in Cloud Hosting and Publishing.

DWD 11 - SSC/Q8403 Application Developer – Web & Mobile

Module 1: IT-ITeS Sector – An Introduction

• Explain the relevance of the IT-ITeS sector • State the various subsectors in the IT-ITeS sector • Detail the nature of work performed across the subsectors • Identify and list organizations in the sector • Discuss the evolution of the sub sectors and the way forward • Explain the disruptions happening across the IT-ITeS sector

Module 2: Future Skills – An Introduction

• Define the general overview of the Future Skills subsector • Describe the profile of the Future Skills sub-sector • Explain the various occupations under this subsector • List key trends across the occupations in this subsector • List various roles in the Future Skills sub-sector

Module 3: Web technology – An Introduction

Define the terms "Internet" and "Web technology" • Provide an overview of different components of the internet • Discuss the evolving information technology landscape and the importance and relevance of Web technologies • State the key business drivers for adoption of web technologies • Discuss the different types of web technologies • Analyze different use cases and applications of web technologies and their applications across industries

Module 4: Mobile Development – An Introduction

Define "Mobile technology" and its different components • Discuss the commonly used Mobile development platforms (such as iOS, Android etc.) • Discuss the evolving information technology landscape and the importance and relevance of Mobile technologies • State the key business drivers for adoption of Mobile technologies • Analyze different use cases and applications of Mobile technologies and their applications across industries

Module 5: Development Tools and Usage

• Examine good programming styles and documentation habits • Use scripting languages to automate tasks and write simple programs • Use appropriate tools for building, debugging, testing, tuning, and maintaining programs • Configure operating system components • Identify software development needs and changes • Use various cloud computing platforms and services • Apply principles of code and design quality

DWD 12 – Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

DWD 13 - Project/Internship

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
Semester I								
1	DWD1	Fundamentals of Website design	3	90	12	33	18	27
2	DWD2	Basics of HTML	3	90	12	33	18	27
3	DWD3	CSS	2	60	08	22	12	18
4	DWD4	BOOTSTRAP	2	60	08	22	12	18
5	DWD5	JAVASCRIPT	2	60	08	22	12	18
6	DWD6	SSC/Q0503 Web Developer	2	60	08	22	12	18
7	DWD7	Safety Practices in the Work Environment	2	60	08	22	12	18
Semester II								
8	DWD8	Mongo DB database	4	120	16	44	24	36
9	DWD9	Node JS and Express JS for backend	3	90	12	33	18	27
10	DWD10	Web Hosting and Publishing Concepts in Cloud	3	90	12	33	18	27
11.	DWD11	SSC/Q8403 Application Developer – Web & Mobile	2	60	08	22	12	18
12	DWD12	Communication and Personality Development	2	60	08	22	12	18
13	DWD 13	Project/ Internship	5	150	-	-	150	-

Study Modules & Books Information

S.No	Course Code	Course Name	Module Used
Semester I			
1	DWD 1	Fundamentals of Website design	Learning Web Designing, Jennifer Niederst Robbins, O'Reilly Media
2	DWD 2	Basics of HTML	HTML and CSS: Design and Build Websites, Jon Duckett, John Wiley & Sons
3	DWD 3	CSS	"CSS: The Definitive Guide" by Eric Meyer and Estelle Weyl, published by O'Reilly Media.
4	DWD 4	BOOTSTRAP	"Bootstrap 4: Exploring Basic Concepts, Techniques, and Templates" by Aravind Shenoy, published by Packt Publishing.
5	DWD 5	JAVASCRIPT	"JavaScript: The Definitive Guide" by David Flanagan, published by O'Reilly Media.
6	DWD 6	SSC/QO503Web Developer	Aisect Module (under development)
7	DWD 7	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
Semester II			
8	DWD 8	Mongo DB database	MongoDB: The Definitive Guide" by Kristina Chodorow and Shannon Bradshaw
9	DWD 9	Node JS & Express JS for Backend	Node.js Design Patterns" by Mario Casciaro
10	DWD 10	Web Hosting and Publishing Concepts in Cloud	"Cloud Native Infrastructure" by Justin Garrison and Kris Nova, published by O'Reilly Media
11	DWD11	SSC/Q8403 App Developer Web & Mobile	Aisect Module (under development)
12	DWD 12	Communication and Personality Development	Effective – 68 Communication & Personality Development
13	DWD 13	Project/ Internship	-

DIPLOMA IN DATA SCIENCE (DDS)

Diploma in Data Science (DDS)

डिप्लोमा इन डाटा साइंस (DDS)

(A) Duration : 12 Months (D) Courses : 14

(अ) अवधि : 12 माह (द) कोर्सेस : 14

(B) Eligibility : 12th Pass (E) Credit : 40

(ब) पात्रता : 12वीं पास (द) कोर्सेस : 40

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
Semester I										
DDS1	Introduction to Data Science	3	100	50	20	20	8	30	12	• Basics of Programming and Structures
DDS2	Mathematical Foundation for Data Science	3	100	50	20	20	8	30	12	• Learn C programming structure basics commands
DDS3	Storytelling with data	3	100	50	20	20	8	30	12	• Understand Data and structure for programming structure
DDS4	Python Essentials	3	100	50	20	20	8	30	12	• Understand Object Programming Structure, programs to create instances
DDS5	SSC/N8101 AI-Data Quality Analyst	2	100	50	20	20	8	30	12	• Learn Java concepts, Abstraction, Inheritance, Exception Handling

DDS6	Digital and Financial Literacy	3	100	50	20	20	8	30	12	• Financial fraud tends to be less prevalent among people who are aware of finances. By employing the proper medium and forms, learners will be able to successfully communicate information and ideas to an audience..
DDS7	Safety Practices in the Work Environment	3	100	50	20	20	8	30	12	• Familiarity with safety practices at workplace, • Knowledge about various Hazards and their remedies, • Ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene.
Semester II										
DDS8	Basic Statistics For Data Science	3	100	50	20	20	8	30	12	• Concepts of Software and how to implement it
DDS9	Python-Statistics	3	100	50	20	20	8	30	12	• Python language fundamental, data types, List, tuple, strings
DDS10	Pandas in Python	3	100	50	20	20	8	30	12	• .Net Concepts and using C sharp
DDS11	Junior Data Associate SSC/Q0401	3	100	50	20	20	8	30	12	• Learn Graphical user interface creation
DDS12	Communication and Personality Development	2	100	70	28	–	–	30	12	• Understand reading and writing skills to be able to read and write various instructions.

DDS13	Entrepreneurship Skills	2	100	50	20	20	8	30	12	Learn the essential skills to become successful entrepreneur
DDS14	Project/ Internship	4	100	–	–	100	40	–	–	• Projects to make a working complete software

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
1400	560

Details Syllabus

Semester-1

DDS1 - Introduction to Data Science

Module 1:

Introduction to core concepts and technologies: Introduction Terminology, data science process, Data science toolkit, Types of data, Example applications, Data formats, Parsing and transformation, Scalability and real-time issues. Tableau, Excel, Matplotlib, NumPy, Pandas.

Module 2:

Data collection and management: Introduction, Sources of data, Data collection and APIs. Exploring and fixing data. Data storage and management, using multiple data sources.

Module 3:

Data analysis: Introduction, Terminology and concepts. Introduction to statistics Variance, Distribution properties and arithmetic Samples/CLT, Basic machine learning algorithms, linear regression, SVM, Naive Bayes.

Module 4:

Data Visualization: Introduction, Types of data visualization, Data for visualization, Data types, Data encodings, Retinal variables, mapping variables to encodings. Visual encodings.

Module 5:

Applications of Data Science Technologies for visualization, Bokeh (Python) Recent trends in various data collection and analysis techniques various visualization techniques, application development methods of used in data science.

DDS2 - Mathematical Foundations for Data Science

Module 1:

Descriptive and Inferential Statistics, Measures of central tendency: Arithmetic Mean, Median and Mode, Geometric mean, Harmonic Mean and Partition values.

Module 2:

Measures of dispersion: Dispersion, Range, Quartile Deviation, Mean deviation, Standard Deviation, Variance and Coefficient of Dispersion.

Module 3:

Skewness, Kurtosis, Moments, Measure of skewness and kurtosis, Introduction and definition of Probability, Event, Sample Space, Law of addition and multiplication of Probabilities and Conditional Probability. Independent and Dependent events, Bayes' theorem, Mathematical Expectations and Moment generating functions.

Module 4:

Theoretical Distribution: Discrete Distribution- Binomial Distribution and Poisson distribution. Continuous Distribution –Rectangular and Normal distribution. Curve fitting: Curve fitting and Methods of Least square, fitting a Straight line and a Parabola.

Module 5:

Correlation and Regression: Correlation, Coefficient of Correlation, Rank Correlation, Lines of Regression. Multiple and Partial Correlation. Null and Alternative hypothesis, two types of errors, level of significance and power of the test.

DDS3 - Storytelling with data

Module 1:

Probability spaces, conditional probability, independence; Discrete random variables, Independent random variables, Expectation of Discrete Random Variables, Moments, Variance of a sum, Correlation coefficient, Chebyshev's Inequality.

Module 2:

the multinomial distribution, Poisson approximation to the binomial distribution, infinite sequences of Bernoulli trials, sums of independent random variables, Data Cleaning: Consistency checking, Heterogeneous and missing data, Data Transformation and Segmentation

Module 3:

Probability mass density and cumulative distribution functions. Parametric families of distributions, expected value, Time series, Geo located data, Correlations and Connections, Hierarchies and networks, interactivity.

Module 4:

Variance, conditional expectation, Applications of the univariate and multivariate Central Limit Theorem, Probabilistic inequalities, Markov chains.

Module 5:

Continuous Probability Distributions: Continuous random variables and their properties, distribution functions and densities, normal, exponential and gamma densities.

DDS 4 - Python Essentials

Module 1:

Introduction to python language, Basic syntax, Literal Constants, Numbers, Variable and Basic data types, String, Escape Sequences, Operators and Expressions, Evaluation Order, Indentation, Input, Output, Functions, Comments.

Module 2:

Data Structure: List, Tuples, Dictionary, DataFrame and Sets, constructing, indexing, slicing and content manipulation.

Module 3:

Control Flow: Conditional Statements - If, If-else, Nested If-else. Iterative Statement - For, While, Nested Loops. Control statements - Break, Continue, Pass.

Module 4:

Object oriented programming: Class and Object, Attributes, Methods, Scopes and Namespaces, Inheritance, Overloading, Overriding, Data hiding, Exception: Exception Handling, except clause, try finally clause, User Defined Exceptions.

Module 5:

Modules and Packages: Standard Libraries: File I/0, Sys, logging, Regular expression, Date and Time, Network programming, multi-processing and multithreading.

DDS 5 - SSC/N8101 AI-Data Quality Analyst

Module 1: Artificial Intelligence & Big Data Analytics

Explain the relevance of AI & Big Data Analytics for the society, Explain the various use-cases of AI & Big Data in the industry, define “general” and “narrow” AI, Describe the fields of AI such as image processing, computer vision, robotics, NLP, etc.

Module 2: Basic Statistical Concepts

Apply basics of descriptive statistics including measures of central tendency such as mean, median and mode, apply different correlation techniques such as Pearson's Correlation Coefficient, Methods of Least Squares etc., Apply different techniques for regression analysis including linear, logistic, ridge, lasso, etc., Use hypothesis testing to draw inferences and measure statistical significance.

Module 3: Statistical Tools and Usage

Explain the basics of using statistical software packages and IDEs such as RStudio, Jupyter Notebooks, apply basic functions and libraries present in statistical software packages and IDEs, use statistical packages, frameworks and libraries such as NumPy and Pandas for developing applications.

Module 4: Importing Data

Identify the type of data, volume of data, and variables required for the analysis, distinguish between different types of data such as numerical, categorical, etc, identify common open and paid data sources, Discuss the uses and characteristics of different open source and paid data sources.

Module 5: Pre-processing Data

Differentiate the unprocessed and processed data, Explain the impact of unprocessed data on subsequent analytical operations, Describe the various anomalies that may be found in unprocessed data (e.g. missing values, incorrect data types, and redundant data), Explain the Data Normalization techniques and concepts

DDS 6 - Digital and Financial Literacy

Module 1: Introduction to Digital and Financial Literacy

Understanding the importance of digital and financial literacy in today's world

Basic concepts of digital technology and financial management

Exploring digital tools and resources for financial management

Module 2: Digital Tools and Skills for Financial Management

Introduction to digital banking services and online financial platforms

Basic skills for managing bank accounts, transactions, and online payments securely

Using budgeting apps and digital tools to track expenses, set financial goals, and manage personal finances effectively

Module 3: Understanding Financial Products and Services

Overview of different types of financial products and services (e.g., savings accounts, credit cards, loans)

Understanding interest rates, fees, and terms associated with financial products

Evaluating and comparing financial products to make informed decisions

Module 4: Financial Planning and Goal Setting

Importance of financial planning in achieving short-term and long-term financial goals

Creating a personal budget and managing income and expenses effectively

Setting SMART (Specific, Measurable, Achievable, Relevant, Time-bound) financial goals and developing a plan to achieve them

Module 5: Responsible Financial Behavior and Risk Management

Understanding the risks associated with financial decisions and investments

Practicing responsible financial behavior, including saving, budgeting, and avoiding debt

Identifying common financial scams and frauds and practicing online security measures to protect personal and financial information

DDS 7 - Safety Practices in the Work Environment

Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, Ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3 - Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5 - Common Food Borne Diseases & Infections

Semester - II

DDS 8 - Basic Statistic for Data Science

Module 1:

Descriptive and Inferential Statistics, Measures of central tendency: Arithmetic Mean, Median and Mode. Geometric mean, Harmonic Mean and Partition values.

Module 2:

Measures of dispersion: Dispersion, Range, Quartile Deviation, Mean deviation, Standard Deviation, Variance and Coefficient of Dispersion.

Module 3:

Measure of spread functions of statistics**: variance, pvariance, Statistical Functions for Random Sampling:** Bernoulli, normal, poisson, randn, randperm.

Module 4:

Assumptions in Statistical Model: Independence, Normality, Linearity, No multicollinearity, outliers.

Module 5:

measures of central location, Measures of spread, covariance, correlation.

DDS 9- Python Statistics

Module 1:

Python Concepts, Data Structures and OOPs in Python Interpreter – Program Execution – Statements – Expressions – Flow Controls – Functions – Numeric Data Types – Sequences – Strings – Tuples – Lists – Dictionaries – Class Definition – Constructors – Object Creation – Inheritance.

Module 2:

Numpy and Pandas Libraries of Python Numerical operations with Numpy– Pandas Series and Data frames– Data Manipulation with Pandas – Overloading – Text Files and Binary Files – Reading and Writing.

Module 3:

Data Wrangling Combining and Merging Data Sets – Reshaping and Pivoting – Data Transformation – String manipulations – Regular Expressions.

Module 4:

Data Aggregation and Group Operations Group by Mechanics – Data Aggregation – GroupWise Operations – Transformations – Pivot Tables – Cross Tabulations – Date and Time data types.

Module 5:

Visualization in Python Matplotlib Package – Plotting Graph - Controlling Graphs – Adding Text – More Graph Types – Getting and Setting Values – Patches.

DDS 10 - Pandas in Python

Module 1:

Introduction to pandas, analysing, cleaning, exploring, and manipulating.

Module 2:

Creating Objects Creating a Pandas DataFrame, Creating a Pandas Series.

Module 3:

Viewing Data, Selection, Dealing with Rows and Columns, Pandas Extracting rows using loc[], iloc[], Indexing and Selecting Data with Pandas, Grouping Data, Merging, Joining and Concatenating.

Module 4:

Manipulating, Data Adding new column to existing DataFrame, Delete rows/columns from DataFrame, iterating over rows and columns, working with Missing Data, Sorts a data frame.

Module 5:

Working with Text Data, working with CSV and Excel files, Working with Date and Time.

DDS 11 – Junior Data Associate SSC/Q0401

Module 1: IT-ITeS/IT Service Industry - An Introduction

Discuss the relevance of the IT-ITeS sector. Identify the career path for a data associate, collate information, evidence, and articles regarding the IT- ITeS/IT services through internet surfing, Categorize the services of a data scientist and the industries that utilize them.

Module 2: Data Science Fundamentals

Identify the scope of analysis as per the research data selected by analysts, identify suitable data sources required for analysis, Evaluate the methods of analysis to be performed on the data, Use programming, in at least one of Python or R, as well as SQL and using the command line, organize data from multiple data sources using appropriate software tools.

Module 3: Basics of Statistics

Define the role of statistics, identify how to represent data analysis and interpretation through statistical presentation, Discuss the two basic types of statistics, namely descriptive statistics, and inferential statistics, Clean data and make it ready for analysis using appropriate software tools, infer justifiable conclusion from the analysis, Construct results and inferences from the analysis using standard templates and tools.

Module 4: Managing Data from Disparate Sources

Identify different data sources and methods to obtain information from organizational databases, online data sources, research reports, discuss how to use secondary data base for methodological approaches in analysis.

Module 5: Tools and Software for Analysing Data

Identify the tools, platforms, and architecture available for handling big data, Discuss the process to create scripts to automate analysis using SPSS software, collate service requests/data analysis using standard tools and procedures.

DDS 12 - Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

DDS 13- Entrepreneurship Skills

Module 1 - The Concept, Theory and Growth of Entrepreneurship, Motivation, Leadership

Module 2 - Nature Classification, Types and Importance of Entrepreneurs, Nature and Scope of Management, Communication

Module 3 -Planning (Concept, Process & Types), Concept of Organisation (Significance, Process and Nature)

Module 4- Accounts for Small Enterprise, Entrepreneurship Development Institutions 184

Module 5 - Aisect Model of Entrepreneurship, how to Set Up On Aisect Centre, Training for Self Employment

DDS 14 - Project/Internship

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
Semester I								
1	DDS1	Introduction to Data Science	3	90	12	33	18	27
2	DDS2	Mathematical Foundation for Data Science	3	90	12	33	18	27
3	DDS3	Storytelling with data	2	60	08	22	12	18
4	DDS4	Python Essentials	2	60	08	22	12	18
5	DDS5	SSC/N8101 AI-Data Quality Analyst	2	60	08	22	12	18
6	DDS6	Digital and Financial Literacy	3	90	12	33	18	27
7	DDS7	Safety Practices in the Work Environment	2	60	08	22	12	18
Semester II								
8	DDS8	Basic Statistics For Data Science	3	90	12	33	18	27
9	DDS9	Python-Statistics	3	90	12	33	18	27
10	DDS10	Pandas in Python	3	90	12	33	18	27
11	DDS11	Junior Data Associate SSC/Q0401	3	90	12	33	18	27
12	DDS12	Communication and Personality Development	2	60	08	22	12	18
13	DDS13	Entrepreneurship Skills	2	60	08	22	12	18
14	DDS14	Project/ Internship	5	150	-	-	150	-

Study Modules & Books Information

S.No	Course Code	Course Name	Module Used
Semester I			
1	DDS1	Introduction to Data Science	"Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython" by Wes McKinney. The book is published by O'Reilly Media.
2	DDS2	Mathematical Foundation for Data Science	**Statistics for Machine Learning,** Himanshu Singh, BPB Publications
3	DDS3	Storytelling with Data	"Storytelling with Data: A Data Visualization Guide for Business Professionals" by Cole Nussbaumer Knaflic. The book is published by Wiley.
4	DDS4	Python Essentials	"Python Crash Course: A Hands-On, Project-Based Introduction to Programming" by Eric Matthes. The book is published by No Starch Press.
5	DDS5	SSC/N8101 AI-Data Quality Analyst	Data Quality: The Accuracy Dimension by Jack E. Olson
6	DDS6	Digital and Financial Literacy	-
7	DDS7	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
Semester II			
8	DDS8	Basic Statistics For Data Science	"Statistics for Data Science: A Beginner's Guide to Learn Statistics with Examples and Practice Problems" by Tom Scioli. The book is published by Independently published.
9	DDS9	Python-Statistics	"Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython" by Wes McKinney, published by O'Reilly Media.
10	DDS10	Pandas in Python	Python for Data Analysis, by Wes McKinney, published by O'Reilly Media.
11	DDS11	Junior Data Associate SSC/Q0401	Data Science for Business by Foster Provost and Tom Fawcett
12	DDS12	Communication and Personality Development	Effective – 68 Communication & Personality Development
13	DDS13	Entrepreneurship Skills	The Lean Startup by Eric Ries
14	DDS14	Project/ Internship	-

DIPLOMA IN CYBER SECURITY (DCS)

Diploma in Cyber Security (DCS)

डिप्लोमा इन सायबर सिक्यूरिटी (DCS)

(A) Duration : 12 Months (D) Courses : 12

(अ) अवधि : 12 माह (द) कोर्सेस : 12

(B) Eligibility : 12th Pass (E) Credit : 40

(ब) पात्रता : 12वीं पास (द) कोर्सेस : 40

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
Semester I										
DCS1	Introduction to Cyber Security & Computer Programming	3	100	50	20	20	8	30	12	• To know about Cyber Security
DCS2	Digital Communication & Computer Networks	3	100	50	20	20	8	30	12	• Knowledge of Data Communications, Understanding of Data, Transmission Modes
DCS3	Fundamentals of Windows NT & Linux Operating System	3	100	50	20	20	8	30	12	• Knowledge of Windows NT, Understanding of Networking with Windows NT Server 4.0 Windows NT System Architecture
DCS4	SSC/N0925 QP_IT_Penetration-Tester	3	100	50	20	20	8	30	12	• Recognizing

DCS5	Python Programming for Cyber Security	3	100	50	20	20	8	30	12	• Knowledge of Python Programming, Why Python is Better for Cybersecurity
DCS6	Digital and Financial Literacy	3	100	50	20	20	8	30	12	• Learn necessary digital skills
DCS7	Safety Practices in the Work Environment	2	100	50	20	20	8	30	12	• Familiarity with safety practices at workplace, • Knowledge about various Hazards and their remedies, • Ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene.
Semester II										
DCS8	Cyber Security Framework and Security Operations	3	100	50	20	20	8	30	12	• Risk Management and the Cybersecurity Framework
DCS9	Exploitation and Malware Analysis	3	100	50	20	20	8	30	12	• Understanding of Exploitation Basic Malware Analysis, • To know the Tools for Malware Analysis
DCS10	SSC/N0906 QP_IT_Analyst-SOC	3	100	50	20	20	8	30	12	• Understanding of Network Access Control and Cloud Security

DCS11	Blue Teaming & Cyber SOC	3	100	50	20	20	8	30	12	• To know the Windows Event Logs, • Understanding of Accessing Event Logs in Python Identifying Unauthorized Access to Default Accounts
DCS12	Entrepreneurship Skills	2	100	50	20	20	8	30	12	• Learn necessary skills to become successful entrepreneur
DCS13	Communication and Personality Development	2	100	70	28	–	–	30	12	• Understand reading and writing skills to be able to read and write various instruction.
DCS14	Project/ Internship	4	100	–	–	100	40	–	–	

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
100	480

Details Syllabus

Semester – I

DCS1 - Introduction to Cyber Security and Computer Programming

Acquaint with cyber security and computer programming basic concepts

Module 1: Cyber Security Fundamentals

What is cyber space?, what is cyber security?, concepts of cyber security ,OSI/TCP-IP model, Layers of cyber security (Mission critical assets, data security, application security, endpoint security, network security, perimeter security, the human layer)

Module 2: Cyber Threats

Understanding of cyber threats, know about governance idea about CIA triad and crimes, motive of attackers, Understanding different attacks, what is cybercrime, knowledge of cyber security policies.

Module 3: Cyber Law and Regulation

Regulation of cyber space, what is the need for regulation of cyber space, how cyberspace can be regulated, legal and self-regulatory framework, understanding of international cyber law, other legislation like UETA, UCITA, HIPPA, GDPR, regulation of cyberspace in India, IT Act 2000, OECD

Module 4: Computer Programming Basics

What is computer?, What is program?, Variables & Syntax, Data types, flow control structures, why do we need to learn any programming language?, Programming methods, what is an algorithm?, Most popular programming language.

Module 5: Cyber Forensics

The cyber security policies, history of cyber forensics, what is forensics science?, Understanding of forensics analysis, the digital forensics lifecycle, idea of forensics investigation, knowing challenges in computer forensics. Data recovery.

DCS 2 - Digital Communication & Computer Networks

Module 1: Digital Communications

Knowledge of data communication, understanding of data, Transmission modes, simplex, half-duplex, full duplex, knowledge of network categories, LAN, WAN, MAN, PAN, Understanding of physical structures, Knowledge of network topology, Bus topology, ring topology, star topology, tree topology etc.

Module 2: Analog and Digital Communication

Understanding of analog and digital transmission impairment, Data rate limits, Multiplexing, knowledge of transmission media, understanding of switching, data transmission and modes, OSI model, TCP/IP protocol suite (Application layer, Presentation layer, Session layer, Transport layer, Network layer, Data link layer, Physical layer)

Module 3: Internet Infrastructure and Protocols

Infrastructure of internet (technical overview), Computer network building blocks, node identifier, network interface controller, media, interconnected devices, network areas of coverage, ISP technologies, Design goal of DNS, overview of internet governance, networking protocols, IP, Ethernet, http, smptp, tcp, udp, pop3, imap.

Module 4: Network Attacks and Vulnerabilities

What is network attacks?, Types of attacks, malware, worm, DoS, DDoS, bandwidth flooding, connection flooding, Packet sniffing, IP spoofing, ARP poisoning, Man-in-the-Middle Attack, compromised-key attack, phishing, DNS spoofing, network vulnerabilities & threats, unpatched software, weak passwords, open ports, unsecured API, misconfigurations

Module 5: Network Security

Understanding of connecting devices internet protocol address, know common network applications, knowledge of computer security concepts, OSI security architecture, knowledge of security attacks, understanding of model for network security

DCS 3 - Fundamentals of Windows and Linux OS

Module 1: OS Basics

Introduction to Operating Systems, Functionalities of OS, memory management, processor management, device management, file management, other important activities, Difference between applications and OS, Difference between 32-bit and 64-bit OS, Different types of mobile OS, Compatibility between Oss

Module 2: Windows Essentials

Origin of windows, different versions of windows, prerequisites, network sharing, windows deployment services, Types of installation, different boot options in windows, Basic commands you should know, understanding file types, File allocation table, NTFS, Basic network configuration, Account settings, Understanding windows security basics

Module 3: Linux Essentials

Exploring different Linux distributions, Prerequisites and compatibility, understanding different boot process, BIOS, MBR, GRUB, Kernel Init, Runlevel, Knowledge of basic terminal and bash commands, Repositories and packages of Linux, rpm and dpkg, understanding file system, walkthrough basic network configuration, Linux NFS server, running a simple local HTTP server understanding users and permissions, Network connectivity & troubleshooting

Module 4: Virtualization Basics

Basics of virtualization, what is hypervisor, Types of hypervisor, what is cloud hypervisor, how does hypervisor work, container vs hypervisor, need & benefits of virtualization, disadvantages of virtualization, hands on Vitualbox workstation

Module 5: Basic Concept of Web

Overview of web technology, mark-up languages, the internet and world wide web, terminology of web technology, web page, HTML, Web Server, URL, Protocol, IP address, HTTP, XML gateway API etc, Web components, Different web technologies, XML, CSS, Javascript, PHP, ASP.net Perl

DCS 4 - SSC/N0925 QP_IT_Penetration-Tester

Module 1: Understanding Customer Requirements and Project Scope

Consult with customers to evaluate functional requirements for network security

Define project scope and objectives based on customer requirements

Confirm availability of complete and accurate details of the security objectives

Module 2: Assessing Existing Network Infrastructure and Security Measures

Evaluate the existing network protocols and topology of users

Review the usage of existing network security measures and assess risks with respect to security objectives

Consult with engineering teams engaged in IT networking and network security to identify network security vulnerabilities and requirements

Module 3: Technical Risk Analysis and Solution Identification

Conduct technical risk analysis and threat identification of the existing network security measures

Identify the level of risk acceptable for business requirements by discussing with business and technical leads

Research relevant information required to meet the security objectives based on the evaluation of assets, threats, vulnerabilities, and security risks

Module 4: Security Solutions Evaluation and Recommendation

Identify and record details of constraints that may impact the business and security options

Explore potential vulnerabilities and categorize them based on their extent and root cause

Research options of network security solutions that match productivity and security requirements and gather sufficient accurate information on potential costs, benefits, and effectiveness

Module 5: Solution Implementation, Evaluation, and Maintenance

Determine the cost, potential benefits, and effectiveness of recommended security solutions

Prepare recommendations to meet the security objectives of the organization and provide details of costs, benefits, effectiveness, limitations, and constraints

Coordinate with equipment manufacturers or solution providers for troubleshooting and enhancements to existing solutions

Evaluate ways and means of closing weaknesses in the network and maintain logs for all activities performed

DCS 5 - Python Programming for Cyber Security

To make learners understand and implement python in cyber security, which libraries needed for hacking?

Module 1: Python Basics for Hacking

Basics of python programming, Python syntax, data types, control structures, and functions, why python is better for cyber security, knowledge of environment setup data structures in python

Module2: Setting Up the Development Environment

Installing anaconda or visual studio code, set up git hub, setup windows environment, sample python scripts, debugging python scripts

Module 3: Python Libraries for Hacking

Some useful python libraries for hacking, Scapy, Nmap and Metasploit, knowledge of python libraries for data analysis, pandas, understanding of accessing code samples Installing packages scanning networks with scapy, to know performing a DNS scan in scapy

Module 4: More Python Libraries for Advance Hacking

Understanding of network scanning for defenders offensive DNS exploration, know the handling of DNS requests, discovering default accounts, starting SSH connections in python, Account monitoring for defenders, understanding requests library, IMpacket, pwntools, Faker, twisted, pylibnet

Module 5: Practice with Python Hacking Tools

Black hat python, penetration testing with python, Violent python, creating port scanner with python, participate in different hacking platforms, TryHackMe, VulnHub etc.

DCS 6- Digital and Financial Literacy

Module 1: Introduction to Digital and Financial Literacy

Understanding the importance of digital and financial literacy in today's world

Basic concepts of digital technology and financial management

Exploring digital tools and resources for financial management

Module 2: Digital Tools and Skills for Financial Management

Introduction to digital banking services and online financial platforms

Basic skills for managing bank accounts, transactions, and online payments securely

Using budgeting apps and digital tools to track expenses, set financial goals, and manage personal finances effectively

Module 3: Understanding Financial Products and Services

Overview of different types of financial products and services (e.g., savings accounts, credit cards, loans)

Understanding interest rates, fees, and terms associated with financial products

Evaluating and comparing financial products to make informed decisions

Module 4: Financial Planning and Goal Setting

Importance of financial planning in achieving short-term and long-term financial goals

Creating a personal budget and managing income and expenses effectively

Setting SMART (Specific, Measurable, Achievable, Relevant, Time-bound) financial goals and developing a plan to achieve them

Module 5: Responsible Financial Behavior and Risk Management

Understanding the risks associated with financial decisions and investments

Practicing responsible financial behavior, including saving, budgeting, and avoiding debt

Identifying common financial scams and frauds and practicing online security measures to protect personal and financial information

DCS 7 - Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Chapter 3 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3- Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5- Common Food Borne Diseases & Infections

Semester – II

DCS 8 - Cyber Security Framework and Security Operations

Module 1: Risk Management and The Cybersecurity Framework

What is cyber security risk management?, Stages of risk management, Identifying risk, Assess risk, Control risk, Review controls, Inside of cyber threats, Cyber risk management frameworks,

NIST CSF, ISO 27001, DoD RMF, FAIR Framework, Best practice for cybersecurity risk assessment.

Module 2: Implementation of Cyber Security Framework

Understanding cyber security framework, Implementation tiers coordination of framework implementation, Understanding how to use framework, Establishing or improving cybersecurity program, Communicating cybersecurity requirements with stakeholders, Know the self-assessing Cybersecurity, Risk background of security operations.

Module 3: What is SOC?

What is Security Operations Centre & Its role?, Security Operations Centre (SOC) organization model, Know the Security Operations Centre capabilities, Tool architecture structuring the SOC, Know other enabling policies, Understanding Intrusion Detection and Prevention System (IDPS)

Module 4: Cyber Security Building Blocks and Cyber Threats

Malicious codes and terminologies, Cybersecurity breaches, Frameworks and Standards for cybersecurity, CIA triad, Cyber threats, Cyber attack vectors, Protocols, Cybersecurity controls, Cybersecurity Policies, CVE & CVSS.

Module 5: Security Basics

Attacks & Threats, Architecture & Design, Implementation, Operations & Incident Response, Governance, Risk & Compliance, Firewalls, Encryption, Anti-virus, Password management, What is Cyber Kill Chain?, Reconnaissance & Weaponization, Delivery & Exploitation, Installation, C2C

DCS 9 - Exploitation and Malware Analysis

Module 1: Exploitation Basic

What is exploit, what is payload, Exploit development for penetration testing, Zero-day exploits, design and use different exploits in windows or linux server using metasploit, msf venom and manually, reverse engineering

Module 2: Malware Analysis

Introduction to malwares, Virus, Worms, Trojans, Adware, Spyware, Introduction to ransomware, Building ransomware, Creating Trojans, Types of malware analysis, What is Static or code analysis?, What is Dynamic or behavioural analysis?

Module 3: Static Malware Analysis

Practical Static Analysis, Understand the malicious codes, Static Code Analysis, Signatures, Magic numbers, Static Malware analysis using Virustotal, Hexdump, filetype, String, Remnux., Yara rules.

Module 4: Dynamic Malware Analysis

Malware analysis in virtual machine basics, Understanding Dynamic analysis, Know the malware behaviour, Sandboxing using Hybrid Analysis, Run malware in sandbox and analyse the behaviour.

Module 5: Assembly and Disassembly of Binaries

Understanding of covert malware launching, Know the anti-disassembly, Understanding of Anti-debugging, Know the Anti-virtual machine techniques, Know the packers and unpacking, Understanding Shellcode analysis, Reverse engineering using IDA

DCS 10 - SSC/N0906 QP_IT_Analyst-SOC

Module 1: Alarm and Alert Analysis

Receive and analyze alarms and alerts from various sources within the enterprise

Determine possible causes of alerts by interpreting and incorporating data from multiple tool sources

Validate Intrusion Detection and Prevention System (IDPS) alerts against network traffic using packet analysis tools

Module 2: Threat Detection and Incident Identification

Perform deep packet analysis to identify DDoS/DoS attack vectors and security threats

Develop mitigation strategies based on the analysis findings Verify the scope of detected incidents with relevant persons and distinguish them from benign activities

Module 3: Incident Impact Analysis

Identify the information assets and system components potentially impacted by detected incidents

Analyze identified malicious activity to determine weaknesses exploited, exploitation methods, and effects on system and information

Module 4: Log Analysis and Incident Triage

Analyze log files from various sources to identify possible threats to network security

Perform Computer Network Defense (CND) incident triage, determining scope, urgency, and potential impact

Correlate data through research, log analysis, and packet inspection to provide detailed reports

Module 5: Security Incident Management and Vulnerability Analysis

Correlate and analyze events using Security Information and Event Management (SIEM) tools to detect IT security incidents

Obtain and preserve evidence related to detected incidents

Examine how access to affected information assets and system components was obtained

Identify and categorize types of vulnerabilities and associated attacks

DCS 11- Blue Teaming & Cyber SOC

Module 1: Introduction to Cybersecurity and Blue Teaming

Overview of cybersecurity fundamentals

Introduction to Blue Teaming and SOC operations

Understanding the role of Blue Teams in cybersecurity defense

Basic concepts of threat intelligence and incident response

Module 2: Security Tools and Technologies

Introduction to security tools used in SOC environments (SIEM, IDS/IPS, firewalls, etc.)

Hands-on training with popular security tools and platforms

Understanding log analysis and event correlation

Basics of network security monitoring and packet analysis

Module 3: Threat Detection and Analysis

Identifying common cyber threats and attack vectors

Techniques for threat hunting and detection

Behavioral analysis and anomaly detection

Incident triage and prioritization

Module 4: Incident Response and Handling

Incident response lifecycle and procedures

Developing incident response playbooks

Hands-on exercises in incident handling and containment

Post-incident analysis and lessons learned

Module 5: Advanced Topics in Blue Teaming

Threat intelligence integration and utilization

Advanced SOC operations and optimization

Red team vs. Blue team exercises and simulations

Emerging trends and challenges in cybersecurity and SOC operations

DCS 12 - Entrepreneurship Skills

Module 1 - The Concept, Theory and Growth of Entrepreneurship, Motivation, Leadership

Module 2 - Nature Classification, Types and Importance of Entrepreneurs, Nature and Scope of Management, Communication

Module 3 -Planning (Concept, Process & Types), Concept of Organisation (Significance, Process and Nature)

Module 4- Accounts for Small Enterprise, Entrepreneurship Development Institutions 184

Module 5 - Aisect Model of Entrepreneurship, how to Set Up On Aisect Centre, Training for Self Employment

DCS 13 - Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

DCS 14 - Project/Internship

Counselling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
Semester I								
1	DCS1	Introduction to Cyber Security & Computer Programming	3	90	12	33	18	27
2	DCS2	Digital Communication & Computer Networks	3	90	12	33	18	27
3	DCS3	Fundamentals of Windows NT & Linux Operating System	2	60	08	22	12	18
4	DCS4	SSC/N0925 QP_IT_Penetration-Tester	3	90	12	33	18	27
5	DCS5	Python Programming for Cyber Security	2	60	08	22	12	18
6	DCS6	Digital and Financial Literacy	3	90	12	33	18	27
7	DCS7	Safety Practices in the Work Environment	2	60	08	22	12	18
Semester II								
8	DCS8	Cyber Security Framework and Security Operations	3	90	12	33	18	27
9	DCS9	Exploitation and Malware Analysis	3	90	12	33	18	27
10	DCS10	SSC/N0906 QP_IT_Analyst-SOC	3	90	12	33	18	27
11	DCS11	Blue Teaming & Cyber SOC	3	90	12	33	18	27
12	DCS12	Entrepreneurship Skills	2	60	08	22	12	18
13	DCS13	Communication and Personality Development	2	60	08	22	12	18
14	DCS14	Project/ Internship	5	150	-	-	150	-

STUDY MODULES & BOOKS INFORMATION

S.No	Course Code	Course Name	Module Used
Semester I			
1	DCS 1	Introduction to Cyber Security & Computer Programming	**Hacking: The Art of Exploitation**, Jon Erickson, No Starch Press
2	DCS 2	Digital Communication & Computer Networks	**Advanced Penetration testing**, Wil Allsopp, Wiley
3	DCS 3	Fundamentals of Windows NT & Linux Operating System	**The Art of Invisibility,** Kevin Mitnick, Little, Brown and Company
4	DCS 4	SSC/N0925 QP_IT_Penetration-Tester	-
5	DCS 5	Python Programming for Cyber Security	**Ghost in the wires**, Kevin Mitnick, Back Bay Books; Illustrated edition
6	DCS 6	Digital and Financial Literacy	**Digital Literacy For Dummies" by Faithe Wempen**
7	DCS 7	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
Semester II			
8	DCS 8	Cyber Security Framework and Security Operations	**Threat Modeling: Designing for Security**, Adam Shostack, John Wiley & Sons
9	DCS 9	Exploitation and Malware Analysis	**Practical Malware Analysis**, Michael Sikorski and Andrew Honig, No Starch Press
10	DCS10	SSC/N0906 QP_IT_Analyst-SOC	-
11	DCS 11	Blue Teaming & Cyber SOC	-
12	DCS 12	Entrepreneurship Skills	-
13	DCS 13	Communication and Personality Development	Effective – 68 Communication & Personality Development
14	DCS 14	Project/ Internship	-

DIPLOMA IN BIG DATA TECHNOLOGY (DBDT)

Diploma in Big Data Technology (DBDT)

डिप्लोमा इन बिग डाटा टेक्नोलॉजी **(DBDT)**

(A) Duration : 12 Months (D) Courses : 14

(अ) **अवधि : 12 माह (द) कोर्सेस : 14**

(B) Eligibility : 12th Pass (E) Credit : 40

(ब) **पात्रता : 12वीं पास (द) कोर्सेस : 40**

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
Semester I										
DBDT1	Data Introduction	3	100	50	20	20	8	30	12	• Understand All about data and its types
DBDT2	DBMS/RDBMS	4	100	50	20	20	8	30	12	• Implementation of RDBMS tools and queries
DBDT3	Web Development	2	100	50	20	20	8	30	12	• Concepts required in Front end designing
DBDT4	Cloud Computing	3	100	50	20	20	8	30	12	• Understand what is cloud and its essentials
DBDT5	AI-Data Engineer SSC/Q8106	4	100	50	20	20	8	30	12	• Deep understanding of both data engineering and machine learning concepts to design and implement data infrastructures that enable successful AI applications.

DBDT6	Big Data Introduction	2	100	50	20	20	8	30	12	• Big Data Understanding and Processing
DBDT7	Safety Practices in the Work Environment	2	100	50	20	20	8	30	12	• Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, • Ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene.
Semester II										
DBDT8	Apache Spark	3	100	50	20	20	8	30	12	• Apache Introduction and Practical of data processing framework
DBDT9	Introduction to Scala for Apache Spark	3	100	50	20	20	8	30	12	• Learn the basics of spark a functionally-oriented framework for big data processing
DBDT10	What is Big Query?	3	100	50	20	20	8	30	12	• Learn to modernize smart analytics warehouse with Big Query
DBDT11	AI - Data Architect SSC/Q8107	3	100	50	20	20	8	30	12	• Deep understanding of data architecture concepts and technologies, as well as a strong ability to design and implement data architectures.
DBDT12	Digital and Financial Literacy	2	100	50	20	20	8	30	12	• Financial fraud tends to be less prevalent among people who are aware of finances. By employing the proper medium and forms, learners will be able to successfully communicate information and ideas to an audience..

DBDT13	Communication and Personality Development	2	100	70	28	–	–	30	12	• Understand reading and writing skills to be able to read and write various instruction.
DBDT14	Project/ Internship	4	100	–	–	100	40	–	–	• Learn hands On project to gain more skilful learning

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
1400	560

Details Syllabus

Semester-1

DBDT 1 - Data Introduction

Module 1:

Introduction to Big Data and Data Analytics, Introduction to Excel: About Excel & Microsoft, Uses of Excel, Excel software, Spreadsheet window pane, Title Bar, Menu Bar, Standard Toolbar, Formatting Toolbar, the Ribbon, File Tab and Backstage

Module 2:

Big Data Storage and Management, Selecting Columns & Rows, Changing Column Width & Row Height, Autofitting Columns & Rows, Hiding/Unhiding Columns & Rows, Inserting & Deleting Columns & Rows, Cell, Address of a cell, Components of a cell – Format, value, formula, Use of paste and paste special. Data Mining Techniques and Tools.

Module 3:

Data Visualization and Reporting, Using Ranges, Selecting Ranges, Entering Information into a Range, Using AutoFill, Using Formulas, Formula Functions – Sum, Average, if, Count, max, min, Proper, Upper, Lower, Using AutoSum

Module 4:

Concatenate, Vlookup, Hlookup, Match, Countif, Text, Trim, Creating Charts, Different types of chart, Formatting Chart Objects, Changing the Chart Type, Showing and Hiding the Legend, Showing and Hiding the Data Table.

Module 5:

Statistical Analysis and Modeling, Data Analysis: Sorting, Filter, Text to Column, Data Validation, Changing DataField, Properties, displaying a PivotChart, Data between Spreadsheets, Hiding, Protecting worksheets, Data Cleaning and Preprocessing.

DBDT 2 - DBMS/RDBMS

Module 1:

Basic Concepts: Introduction to DBMS, File system vs DBMS, Advantages of database systems, Database System architecture, Data models, Schemas and instances, Data independence, Functions of DBA and designer, Entities and attributes, Entity types, Key attributes, Relationships, Defining the E-R d iagram of database.

Module 2:

Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. Database Design: Data Modeling and Normalization: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams – De -normalization – Another Example of Normalization.

Module 3:

Relational Model: Structure of relational databases, Domains, Relations, Relational algebra – fundamental operators and syntax, relational algebra queries, Entity-Relationship model : Basic concepts, Design process, constraints, Keys, Design issues, E-R diagrams, weak entity sets, extended E-R features –generalization, specialization and aggregation

Module 4:

SQL: Data definition in SQL, update statements and views in SQL: Data storage and definitions, Data retrieval queries and update statements, Query Processing & Query Optimization: Overview,

measures of query cost, selection operation, sorting, join, evaluation of expressions, transformation of relational expressions, estimating statistics of expression results, evaluation plans. Case Study of ORACLE and DB2.

Module 5:

Relational Database design: Functional Dependency –definition, trivial and non-trivial FD, closure of FD set, closure of attributes, irreducible set of FD, Normalization –1NF, 2NF, 3NF, Decomposition using FD-dependency preservation, lossless join, BCNF, Multi-valued dependency, 4NF, Join dependency and 5NF

DBDT 3 - Web Development

Module 1:

Internet Basics: Protocols, Servers and their Functions, Internet Clients, Network Security, Internet Development, Design Functional Internet site & Business Concepts.

Module 2:

HTML: Fundamentals/ Basic HTML, Text formatting on Web Pages, Incorporate images, creating hyperlinks, complex image maps, tables and nested tables, inserting web page, Setting & modifying field properties, Validating HTML.

Module 3:

Cascading Style Sheet: Introduction, designing with Style Sheets, Style Sheet Syntax, ID, Class Contextual Selectors, Cascading Order, Properties, Absolute and Relative Positioning, Layering Elements using Z-Index, Animating objects.

Module 4:

Extensible Markup Language: Introduction to XML, Benefits, Holding Data, Separates Structure from Formatting, Data Sharing XM.

Module 5:

SQL & MySQL: Introduction to SQL & MySQL & its Versions, Administration & Query Browser, Creating Databases & Tables, using keys, Types of Table in MySQL, Data Types, deleting databases and tables, Inserting, Retrieving, Updating & Deleting data, User Accounts, Access Control & documentation.

DBDT 4 - Cloud Computing

Module 1:

Introduction of Grid and Cloud computing, characteristics, components, business and IT perspective, cloud services requirements, cloud models, Security in public model, public verses private clouds, Cloud computing platforms: Amazon EC2, Platform as Service: Google App Engine, Microsoft Azure, Utility Computing, Elastic Computing.

Module 2:

Cloud services- SAAS, PAAS, IAAS, cloud design and implementation using SOA, conceptual cloud model, cloud stack, computing on demand, Information life cycle management, cloud analytics, information security, virtual desktop infrastructure, storage cloud.

Module 3:

Virtualization technology: Definition, benefits, sensor virtualization, HVM, study of hypervisor, logical partitioning- LPAR, Storage virtualization, SAN, NAS, cloud server virtualization, virtualized data center.

Module 4:

Cloud security fundamentals, Vulnerability assessment tool for cloud, Privacy and Security in cloud, Cloud computing security architecture: Architectural Considerations- General Issues, Trusted Cloud computing.

Module 5:

SOA and cloud, SOA and IAAS, cloud infrastructure benchmarks, OLAP, business intelligence, e-Business, ISV, Cloud performance monitoring commands, issues in cloud computing. QOS issues in cloud, mobile cloud computing, Inter cloud issues.

DBDT 5 AI-Data Engineer SSC/Q8106

Module 1: IT-ITeS Sector – An Introduction

• Explain the relevance of the IT-ITeS sector • State the various subsectors in the IT-ITeS sector • Detail the nature of work performed across the subsectors • Identify and list organizations in the sector • Discuss the evolution of the sub sectors and the way forward • Explain the disruptions happening across the ITITeS sector

Module 2: Future Skills – An Introduction

• Define the general overview of the Future Skills subsector • Describe the profile of the Future Skills sub-sector • Explain the various occupations under this subsector • List key trends across the occupations in this subsector • List various roles in the Future Skills sub-sector

Module 3: Artificial Intelligence & Big Data Analytics – An Introduction

• Explain the relevance of AI & Big Data Analytics for the society • Explain a general overview of AI & Big Data Analytics and its roles • Define career map for roles in AI & Big Data Analytics • Explain the role of a Data Steward and his/her key responsibilities • List the range of skills and behavior, expected from a Data Steward • State the growth opportunities for a Data Steward • Whiteboard and Markers • LCD Projector and Laptop for presentations • Lab equipped with the following: • PCs/Laptops • Internet with Wi-Fi (Min 2 Mbps Dedicated) 4 Global Regulations and Standards Theory Duration (hh:mm) 13:00 Practical Duration (hh:mm) 17:00 Corresponding NOS Code Bridge Module • Assess glob

Module 4: Data Ingestion and Synchronization

• Get data out of source systems and ingest it into a data lake • Evaluate data segmentation and schema and partition the data to ensure optimal loading • Efficiently extract the data from a source, including multiple approaches for both batch and real time extraction • Deal with issues around incremental data loading, fitting within small source windows and parallelization of loading data as well

Module 5 Manage Your Work to Meet Requirements

• Define scope of work and working within limits of authority • Summarize the details of the work and work environment • Recognize the importance of maintaining confidentiality

DBDT 6 – Big Data Introduction

Module 1:

Introduction to Big Data and Data Analytics, Introduction to Excel: About Excel & Microsoft, Uses of Excel, Excel software, Spreadsheet window pane, Title Bar, Menu Bar, Standard Toolbar, Formatting Toolbar, the Ribbon, File Tab and Backstage

Module 2:

Big Data Storage and Management, Selecting Columns & Rows, Changing Column Width & Row Height, Autofitting Columns & Rows, Hiding/Unhiding Columns & Rows, Inserting & Deleting Columns & Rows, Cell, Address of a cell, Components of a cell – Format, value, formula, Use of paste and paste special. Data Mining Techniques and Tools.

Module 3:

Data Visualization and Reporting, Using Ranges, Selecting Ranges, Entering Information into a Range, Using AutoFill, Using Formulas, Formula Functions – Sum, Average, if, Count, max, min, Proper, Upper, Lower, Using AutoSum

Module 4:

Concatenate, Vlookup, Hlookup, Match, Countif, Text, Trim, Creating Charts, Different types of chart, Formatting Chart Objects, Changing the Chart Type, Showing and Hiding the Legend, Showing and Hiding the Data Table.

Module 5:

Statistical Analysis and Modeling, Data Analysis: Sorting, Filter, Text to Column, Data Validation, Changing DataField, Properties, Displaying a PivotChart, Data between Spreadsheets, Hiding, Protecting worksheets, Data Cleaning and Preprocessing.

DBDT 7 – Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3 - Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5 - Common Food Borne Diseases & Infections

Semester-II

DBDT 8 - Apache Spark

Module 1:

Introduction to Spark: What is Spark and what is its purpose, Components of the Spark unified stack, Resilient Distributed Dataset (RDD), Downloading and installing Spark standalone, Scala and Python overview.

Module 2:

Resilient Distributed Dataset and DataFrames: Understand how to create parallelized collections and external datasets, Work with Resilient Distributed Dataset (RDD) operations, Utilize shared variables and key-value pairs.

Module 3:

Spark application programming: Understand the purpose and usage of the SparkContext, Initialize Spark with the various programming languages, Describe and run some Spark examples, pass functions to Spark, Create and run a Spark standalone application, Submit applications to the cluster.

Module 4:

Introduction to Spark libraries: Understand and use the various Spark libraries.

Module 5:

Spark configuration, monitoring and tuning: Understand components of the Spark cluster, Configure Spark to modify the Spark properties, environmental variables, or logging properties, Monitor Spark using the web UIs, metrics, and external instrumentation, understand performance tuning considerations.

DBDT 9- Introduction to Scala for Apache Spark

Module 1:

Introduction to Apache Spark, History and evolution of Spark, Key features and benefits of Spark, Spark vs Hadoop.

Module 2:

Scala basics: Introduction to Scala, Scala data types and variables, Control structures, Functions and methods, Collections and arrays.

Module 3:

Spark Core: RDD in Spark, RDD transformations and actions, Caching and persistence, Spark SQL and DataFrames, Introduction to Spark Streaming, Streaming concepts and architecture, DStreams.

Module 4:

Spark MLlib: Introduction to Spark MLlib, Machine learning concepts, Supervised and unsupervised learning, Clustering, classification, and regression algorithms, Introduction to Spark GraphX.

Module 5:

Spark Performance Tuning: Understanding Spark performance, Bottlenecks and performance issues, Spark configuration and tuning Building Spark applications, Running Spark on a cluster, Deploying Spark applications to a production environment, Monitoring and debugging Spark applications.

DBDT 10 - What is Big Query

Module 1:

Introduction to MongoDB, and advanced concepts of SQL.

Module 2:

Features of MongoDB: Support ad hoc queries, Indexing, Replication, Duplication of data, Load balancing, supports map reduce and aggregation tools.

Module 3:

Data Modelling, Create Database, Drop Database, Create Collection, Drop Collection, Datatypes, Insert Document, Query Document, Update Document, Delete Document, Projection, Limit Records, Sort Records, Indexing, Aggregation, Replication, Shading.

Module 4:

Advanced MongoDB: Relationships, Database References, Covered Queries, Analysing Queries, Atomic Operations, Advanced Indexing, Indexing.

Module 5:

Limitations, ObjectId, MapReduce, Text Search, Regular Expression, RockMongo, GridFS, Capped Collections, Auto-Increment Sequence.

AI - Data Architect

DBDT 11 – SSC/Q8107

Module 1: Artificial Intelligence & Big Data Analytics – An Introduction Bridge Module

Explain the relevance of AI & Big Data Analytics for the society • Explain the various use-cases of AI & Big Data in the industry • Define “general” and “narrow” AI • Describe the fields of AI such as image processing, computer vision, robotics, NLP, etc.

Module 2: Basics of Architecture

Explain enterprise architecture principles, components and their practical application • Identify critical success factors for common enterprise architect approaches

Module 3: Global Data Regulations and Standards

Discuss the need for data regulations and standards • Analyse commonly used global data regulation policies (such as GDPR) • Discuss the roles and responsibilities of key actors involved in enforcing data regulations and standards • Identify best practices used by various organizations in the enforcement of data regulations and standards

Module 4: Manage and plan work requirements Mapped to SSC/N9001 (Version No. 2)

Discuss the role, responsibilities, limits of the responsibilities • Discuss the importance of gathering detailed work requirements and prioritizing work areas • Describe the organizational guideline and policies • Identify commonly made mistakes in the prioritized work areas • Explain the importance of completing work accurately

Module 5: Communication and collaboration with colleagues Mapped to SSC/N9002 (Version No. 2)

Explain the principles of clear communication • Outline the importance of being a good listener and adhering to the commitments • Identify challenges and pain points related to work distribution while working in a team • Explain the importance of distributing and sharing workloads

DBDT 12- Digital and Financial Literacy

An overview of digital financial literacy, which combines the skills needed to navigate financial services with the skills to use digital technologies

DBDT 13 – Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

DBDT 14 - Project/Internship

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
Semester I								
1	DBDT1	Data Introduction	3	90	12	33	18	27
2	DBDT2	DBMS/RDBMS	3	90	12	33	18	27
3	DBDT3	Web Development	2	60	08	22	12	18
4	DBDT4	Cloud Computing	2	60	08	22	12	18
5	DBDT5	AI-Data Engineer SSC/Q8106	4	120	16	44	24	36
6	DBDT6	Big Data Introduction	2	60	08	22	12	18
7	DBDT7	Safety Practices in the Work Environment	2	60	08	22	12	18
Semester II								
8	DBDT8	Apache Spark	3	90	12	33	18	27
9	DBDT9	Introduction to Scala for Apache Spark	3	90	12	33	18	27
10	DBDT10	What is Big Query?	3	90	12	33	18	27
11	DBDT11	AI - Data Architect SSC/Q8107	3	90	12	33	18	27
12	DBDT12	Digital and Financial Literacy	2	60	08	22	12	18
13	DBDT13	Communication and Personality Development	2	60	08	22	12	18
14	DBDT14	Project/ Internship	5	150	-	-	150	-

Study Modules & Books Information

S. No	Course Code	Course Name	Module Used
Semester I			
1	DBDT 1	Data Introduction	**Engage your Customer More Effectively and Drive Value**, Lisa Arthur, Wiley
2	DBDT 2	DBMS/RDBMS	**Database System Concepts,** Abraham Silberschatz, Henry F. Korth, and S. Sudarshan Publisher McGraw-Hill Education
3	DBDT 3	Web Development	**Learning Web Design,** Jennifer Niederst Robbins, O'Reilly Media
4	DBDT 4	Cloud Computing	**Cloud Computing: Concepts, Technology & Architecture,** Author -Thomas Erl, Ricardo Puttini, and Zaigham Mahmood Publisher -Prentice Hall
5	DBDT 5	AI-Data Engineer SSC/Q8106	-
6	DBDT 6	Intellectual property Rights	Intellectual Property: A Very Short Introduction" by Siva Vaidhyanathan
7	DBDT 7	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
Semester II			
8	DBDT 8	Apache Spark	Learning Spark: Lightning-Fast Big Data Analysis" by Holden Karau, Andy Konwinski, Patrick Wendell, and Matei Zaharia - published by O'Reilly Media
9	DBDT 9	Introduction to Scala for Apache Spark	"Scala and Spark for Big Data Analytics" by Md. Rezaul Karim and Sridhar Alla - published by Apress
10	DBDT 10	What is Big Query?	**Google Big Query Analytics,** Jordan Tigani, O/Reilly
11	DBDT 11	Introducing Big Data SQL	SQL Performance Explained" by Markus Winand
12	DBDT 12	Digital and Financial Literacy	Digital Literacy: A Primer on Media, Identity, and the Evolution of Technology" by Susan Wiesinger
13	DBDT 13	Communication and Personality Development	Effective – 68 Communication & Personality Development
14	DBDT 14	Project/ Internship	-

DIPLOMA IN IOT USING AI - ML (DIUAM)

Diploma in IoT Using AI - ML (DIUAM)

डिप्लोमा इन आईओटी युसिंग ए आई – एमएल (DIUAM)

(A) Duration : 12 Months (D) Courses : 14

(अ) अवधि : 12 माह (द) कोर्सेस : 14

(B) Eligibility : 12th Pass (E) Credit : 40

(ब) पात्रता : 12वीं पास (द) कोर्सेस : 40

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
Semester I										
DIUAM 1	Introduction of IOT	3	100	50	20	20	8	30	12	• Introduce to IOT and Familiarizing in embedded concept and programming
DIUAM 2	Fundamental components of IOT system	3	100	50	20	20	8	30	12	• Learn different components and its capacity
DIUAM 3	Basic architecture and networking	3	100	50	20	20	8	30	12	• Understanding the architecture behind the network
DIUAM 4	Design Methodology	3	100	50	20	20	8	30	12	• Device design and planning
DIUAM 5	IoT- Test Analyst SSC/Q8206	2	100	50	20	20	8	30	12	• By completing this course, learners will acquire the necessary knowledge and skills to effectively test IoT systems, ensuring their reliability, security, and performance in diverse real-world scenarios.
DIUAM 6	Digital and Financial Literacy	3	100	50	20	20	8	30	12	• An overview of digital financial literacy, which combines the skills needed to

										navigate financial services with the skills to use digital technologies.
DIUAM 7	Safety Practices in the Work Environment	3	100	50	20	20	8	30	12	• Familiarity with safety practices at workplace, • Knowledge about various Hazards and their remedies, • Ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene.
Semester II										
DIUAM 8	Role of AI/ML IN IOT	3	100	50	20	20	8	30	12	• Learn how to program device using AI - ML
DIUAM 9	Electronics and IOT	3	100	50	20	20	8	30	12	• Learn and platforms on which the components can be placed
DIUAM 10	Arduino language	3	100	50	20	20	8	30	12	• Complete Arduino board and Its Implementation
DIUAM 11	IoT- Software Analyst SSC/Q8205	3	100	50	20	20	8	30	12	• Create IOT device complete working project
DIUAM 12	Entrepreneurship Skills	2	100	50	20	20	8	30	12	• Learn necessary skills to become successful entrepreneur
DIUAM 13	Communication and Personality Development	2	100	70	28	–	–	30	12	• Understand reading and writing skills to be able to read and write various instruction.
DIUAM 14	Project/ Internship	4	100	–	–	100	40	–	–	• Acquire practical knowledge through project/internship

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
1400	560

Details Syllabus

Semester - I

DIUAM 1 - Introduction to IoT

Introduction to IoT and familiarizing in embedded concepts and programming.

Module 1: Introduction to IoT

Introduction to IoT, Characteristics of IoT, Advantages and Disadvantages of IoT, Applications of IoT, Components of IoT Ecosystem

Module 2: IoT Architecture and Design

Physical Design of IoT, IoT Conceptual and Architectural Framework, Logical design of IoT, IoT Devices and IoT Protocols, IoT communication Models.

Module 3: Functional Blocks of IoT Ecosystem

Fundamental Blocks – Sensors, Actuators, Smart Objects and Connecting Objects.

Module 4: Basics of IoT

Simplified IoT Architecture and Core IoT Functional Stack- Fog, Edge, and Cloud in IoT

Module 5: IoT Communication Models

IoT communication models and APIs, REST based communication API, IoT and M2M, Difference between IoT and M2M, Software define Network.

DIUAM 2 - Fundamental components of IOT System

Learn different components and its capacity

Module1: Fundamentals of IoT

Evolution of IoT, Enabling Technologies, IoT Architectures: one M2M, IoT World Forum (IoTWF) and Alternative IoT models.

Module 2: IoT Protocols

IoT Access technologies, Physical and MAC layers, topology, Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Issues with IoT Standardization – Unified Data Standards – Protocols – IEEE802.15.4–BACnet Protocol– Modbus – KNX – Zigbee– Network layer – APS layer – Security

Module 3: IoT Architecture

-IoT Open source architecture (OIC)- OIC Architecture & Design principles- IoT Devices and deployment models- IoTivity : An Open source IoT stack - Overview- IoTivity stack architecture- Resource model and Abstraction.

Module 4: Web of Things

Web of Things versus Internet of Things – Two Pillars of the Web – Architecture Standardization for WoT– Platform Middleware for WoT – Unified Multitier WoT Architecture – WoT Portals and Business Intelligence.

Module 5: IoT Applications

IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications. Study of existing IoT platforms /middleware, IoT- A, Hydra etc.

DIUAM 3 - Basic Architecture and Networking

Understanding the architecture behind the network

Module I: IoT Networking Core

Technologies involved in IoT development, Internet web and Networking technologies, Infrastructure, Overview of IoT supported Hardware platforms such as: Raspberry pi, ARM Cortex Processors, Arduino and Intel Galileo boards, Wireless networking equipment and configurations, accessing hardware and device file interactions.

Module 2: M2M to IoT

Role of M2M in IoT, M2M Value Chains, IoT Value Chains, an emerging industrial structure for IoT, the international driven global value chain and global information monopolies. Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.

Module 3: IoT Architecture -State of the Art

IoT reference Model and Architecture- Functional View, Information View, Deployment and Operational View, Other Relevant architectural views, Middleware Introduction-FiWare etc., Remote monitoring and sensing, remote controlling and performance analysis, layering concepts, communication pattern, 6LoWPAN, Sensors and sensor Node and interfacing using any Embedded target boards (Raspberry Pi / Intel Galileo/ARM Cortex/ Arduino)

Module 4: IoT Application Development

Application protocols: MQTT, REST/HTTP, CoAP, MySQL, Back-end Application Designing Apache for handling HTTP Requests, MongoDB Object Type Database, HTML, CSS & jQuery for UI Designing, JSON lib for data processing, Security & Privacy during development

Module 5: IoT Security and case studies

Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities.

DIUAM 4 - Design Methodology

Device design and planning

Module 1: Design and Development

Design Methodology – Embedded Computing Logic, Microcontroller, System on Chips-IoT system building blocks- Arduino – Board details.

Module 2: WOT and Sensors

WOT- Web of Things, IoT vs WoT, Sensors and its properties, Characteristics of Sensors

Module 3: Sensors and Device

Sensors and Components of Sensor node, Classification of Sensors-Analog and Digital Sensors, Analog Sensors Vs Digital Sensors, Scalar vs Vector Sensors, Sensor Types, Sensor Errors

Module 4: Programming

IDE programming - Raspberry Pi - Interfaces and Raspberry Pi with Python Programming

Module 5: Python Programming

Python scope and Applications of Python, Python Data Types and Data Structure, Python control statements, Python functions, in-build function and user-defined functions, Object-Oriented Programming, Principles of OOP, Python Programs, Python packages, libraries.

DIUAM 5 IoT- Test Analyst SSC/Q8206

Module1: Introduction to IoT Testing

1. Overview of Internet of Things (IoT) and its significance in modern technology.
2. Understanding IoT architecture and components.
3. Challenges and considerations in testing IoT systems.
4. Introduction to IoT testing methodologies and strategies.
5. Tools and technologies used in IoT testing.

Module 2: IoT Communication Protocols and Testing

1. Common IoT communication protocols (e.g., MQTT, CoAP, HTTP, WebSocket).
2. Understanding protocol stacks and their relevance in IoT testing.
3. Testing message integrity, reliability, and security in IoT communication.
4. Hands-on exercises on testing IoT communication protocols.
5. Best practices for protocol-specific testing in IoT environments.

Module 3: Security Testing for IoT Systems

1. Introduction to IoT security challenges and risks.
2. Threat modeling for IoT devices and ecosystems.
3. Techniques for identifying vulnerabilities in IoT systems.
4. Penetration testing and ethical hacking in IoT environments.
5. Securing IoT deployments: encryption, authentication, and access control.

Module 4: Performance Testing for IoT Applications

1. Understanding the importance of performance testing in IoT.
2. Performance metrics for IoT systems (e.g., throughput, latency, scalability).
3. Load testing IoT applications and devices.
4. Stress testing and endurance testing for IoT deployments.
5. Performance optimization strategies for IoT solutions.

Module 5: IoT Data Management and Analytics Testing

1. Overview of IoT data management and analytics.
2. Testing data ingestion and processing pipelines in IoT platforms.
3. Validating data integrity and consistency in IoT ecosystems.
4. Testing real-time analytics and machine learning models in IoT.
5. Quality assurance for IoT data visualization and reporting tools.

DIUAM 6 Digital and Financial Literacy

An overview of digital financial literacy, which combines the skills needed to navigate financial services with the skills to use digital technologies.

DIUAM 7 - Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3- Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5- Common Food Borne Diseases & Infections

Semester - II

DIUAM 8 - Role of AI-ML in IoT

Learn how to program devices using AI-ML

Module 1: Introduction to AI/ ML

What is AI and Types of AI, Understanding AI with various use-cases, ML for the society, Introduction to fields of AI-ML (Computer vision, NLP, Robotics, Deep Learning, Robotics, etc), What is ML, Types of Machine Learning, Application of ML.

Module 2: AI and ML Applications and Algorithms

AI Application, Recent trends and AI techniques, Problem Definition, searching for solutions- Breadth-first search, Depth-first search, Hill-climbing search, simulated annealing search, Local Search in continuous spaces, A*, AO*, Constraints Satisfaction – algorithms, ML Algorithms, SVM, Decision Tree, Naïve Bayes, Classification and regression Analysis

Module 3: Knowledge Representation and Inference

Knowledge representation, knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of Predicate calculus, Inference – Backward chaining, Rule value approach, Fuzzy Reasoning – Bayesian Theory.

Module 4: Pattern Recognition

Pattern Recognition fundamentals: Basic concepts of pattern recognition, fundamental problems in pattern recognition system, design concepts and methodologies, example of atomic pattern recognition systems.

Module 5: Fundamentals of Machine Learning

Machine Learning Fundamentals, Generalization, Overfitting, Validation, Training, Testing Data, Bias, variance, Model, Metrics in Machine Learning, Machine Learning Algorithms.

DIUAM 9 - Electronics and IoT

Learn and platforms on which the components can be placed

Module 1: Semi-conductor Physics

Mobility & conductivity, Charge densities in a semiconductor, Fermi Dirac distribution, carrier concentration and Fermi levels in semiconductor, generation and recombination of charges, diffuse and continuity equations, Hall effect.

Module 2: Semiconductor Diode and Diode Circuits

Junction diode, Diode as circuit element, Different types of diodes: Zener, Schottky, LED. Zener as voltage regulator, Diffusion capacitance, Drift capacitance, the load line concept, half wave, full wave rectifiers, clipping and clamping circuits.

Module 3: Bipolar Junction Transistor

Bipolar junction transistor: Introduction, Transistor, construction, transistor operations, BJT characteristics, load line, operating point, leakage currents, saturation and cut off mode of operations. Bias stabilization: Need for stabilization, fixed Bias, emitter bias, self-bias, bias stability with respect to variations in Ico, VBE &®, Stabilization factors, thermal stability

Module 4: Small signal Analysis of transistor and Multistage Amplifier

Hybrid model for transistors at low frequencies, Analysis of transistor amplifier using h parameters, emitter follower, Miller's theorem, THE CE amplifier with an emitter resistance, Hybrid model, Hybrid Conductance's and Capacitances, CE short circuit current gain, CE short circuit current gain with RL Multistage amplifier: Cascading of Amplifiers, coupling schemes (RC coupling and Transformer coupling)

Module 5: Field Effect transistors and Amplifiers

Field Effect Transistors Field effect transistor (JFET, MOSFET): volt-ampere characteristics, small signal model –common drain, common source, common gate, operating point, MOSFET, enhancement and -depletion mode, Common source amplifier, Source follower, Amplifiers-feedback and Power, Feedback concept, Classification of Feedback amplifiers, Properties of negative Feedback amplifiers, Impedance considerations in different Configurations, Examples of analysis of feedback Amplifiers, Power dissipation in transistors, difference with voltage amplifiers, Amplifier classification (Class A, Class B, Class C, Class AB) class AB push pull amplifier, collector efficiency of each, cross over distortion

DIUAM 10 - Arduino Language

Complete Arduino Board and its implementation

Module 1: Getting Started with Raspberry Pi

Basic functionality of Raspberry Pi B+ board, setting up the board, configuration and use, implications of an operating system on the behavior of the Raspberry Pi as an IoT device, booting Raspberry Pi 3, Downloading an Operating System, format an SD card and booting the OS. Basics of Linux and its use, main features including navigating the file system and managing processes, textbased user interface through the shell, overview of the graphic user interface for Raspian Linux distribution.

Module 2:

Interfacing Hardware with the Raspberry Pi, Raspberry Pi Remote Access, operate the Raspberry Pi in "headless mode", Bash Command line, operating Raspberry Pi without needing a GUI interface, Basics of the Python programming language, programming on the Raspberry Pi. Python on Raspberry Pi, Python Programming Environment, Python Expressions, Strings, Functions and Function arguments, Lists, List Methods, Control Flow.

Module 3:

Communication with devices through the pins of the Raspberry Pi, RPi.GPIO library, Python Functions, setting up the pins, General purpose IO Pins, Protocol Pins, GPIO Access, applying digital voltages, and generating Pulse Width Modulated signals, Tkinter Python library, accessing pins through a graphic user interface

Module 4: The Arduino Environment

Introduction to the Arduino environment, the Arduino board, the Arduino IDE, and the Arduino compatible shields together with their libraries. Arduino board main components, inputs, and outputs. Arduino Integrated Development Environment (IDE), Compiling Code, Arduino Shields and Libraries.

Module 5:

Basics of C programming, composition of an Arduino programs, Arduino tool chain, Arduino IDE, basic structure of a sketch, including the use of the setup () and loop () functions. Accessing the pins from a sketch for input and output, introduction on debugging embedded software on an Arduino, UART communication protocol, Synchronization, parity and stop, the use of the Serial library to communicate with the Arduino through the serial monitor.

DIUAM 11 IoT- Software Analyst SSC/Q8205

Module 1 Introduction to IoT

- Understanding the concept of IoT
- Evolution and significance of IoT
- IoT ecosystem and components
- Challenges and opportunities in IoT software development

Module 2 IoT Architectures and Protocols

- Overview of IoT architectures (e.g., centralized, decentralized, hybrid)
- Protocols for IoT communication (e.g., MQTT, CoAP, HTTP, WebSocket)
- Device-to-device communication protocols (e.g., Bluetooth, Zigbee, LoRaWAN)
- Security considerations in IoT architectures and protocols

Module 3 IoT Software Development Tools and Platforms

- Introduction to IoT software development frameworks (e.g., Arduino, Raspberry Pi)
- IoT platforms for rapid prototyping and development (e.g., AWS IoT, Google Cloud IoT, Azure IoT)
- Programming languages for IoT development (e.g., Python, C/C++, JavaScript)
- Integration of sensors, actuators, and communication modules in IoT software

Module 4 Data Management and Analytics in IoT

- Data collection, storage, and processing in IoT applications
- Big Data and analytics for IoT-generated data
- Edge computing and fog computing in IoT data management
- Visualization techniques for IoT data analytics

Module 5 IoT Software Testing and Deployment

- Testing methodologies for IoT software (e.g., unit testing, integration testing, system testing)
- Simulation and emulation techniques for IoT environments
- Deployment strategies for IoT applications (e.g., cloud-based deployment, edge deployment)
- Monitoring and maintenance of deployed IoT software systems

DIUAM 12 - Entrepreneurship Skills

Module 1 - The Concept, Theory and Growth of Entrepreneurship, Motivation, Leadership

Module 2 - Nature Classification, Types and Importance of Entrepreneurs, Nature and Scope of Management, Communication

Module 3 -Planning (Concept, Process & Types), Concept of Organisation (Significance, Process and Nature)

Module 4- Accounts for Small Enterprise, Entrepreneurship Development Institutions 184

Module 5 - Aisect Model of Entrepreneurship, how to Set Up On Aisect Centre, Training for Self Employment

DIUAM13 - Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

DIUAM14 - Project/ Internship

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
Semester I								
1	DIUAM1	Introduction of IOT	3	90	12	33	18	27
2	DIUAM 2	Fundamental components of IOT system	3	90	12	33	18	27
3	DUIAM 3	Basic architecture and networking	2	60	08	22	12	18
4	DIUAM 4	Design Methodology	2	60	08	22	12	18
5	DIUAM 5	IoT- Test Analyst SSC/Q8206	2	60	08	22	12	18
	DIUAM 6	Digital and Financial Literacy	3	90	12	33	18	27
6	DIUAM 7	Safety Practices in the Work Environment	2	60	08	22	12	18
Semester II								
7	DIUAM 8	Role of AI/ML IN IOT	3	90	12	33	18	27
8	DIUAM 9	Electronics and IOT	3	90	12	33	18	27
9	DIUAM 10	Arduino language	3	90	12	33	18	27
10	DIUAM11	IoT- Software Analyst SSC/Q8205	3	90	12	33	18	27
	DIUAM12	Entrepreneurship Skills	2	60	08	22	12	18
11.	DIUAM 13	Communication and Personality Development	2	60	08	22	12	18
12	DIUAM 14	Project/ Internship	5	150	-	-	150	-

Study Modules & Books Information

S.No	Course Code	Course Name	Module Used
Semester I			
1	DIUAM1	Introduction of IOT	"Getting Started with IoT" by Cuno Pfister, published by O'Reilly Media.
2	DIUAM 2	Fundamental Components of IOT System	"Internet of Things: Principles and Paradigms" by Rajkumar Buyya, Amir Vahid Dastjerdi, and Sriram Krishnamachari, published by Morgan Kaufmann Publishers.
3	DUIAM 3	Basic Architecture and Networking	"Computer Networking: A Top-Down Approach" by James Kurose and Keith Ross, published by Pearson.
4	DIUAM 4	Design Methodology	"A Designer's Art" by Paul Rand, published by Yale University Press.
5	DIUAM 5	IoT- Test Analyst SSC/Q8206	-
6	DIUAM 6	Digital and Financial Literacy	Digital Literacy: A Primer on Media, Identity, and the Evolution of Technology" by Susan Wiesinger
7	DIUAM 7	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
Semester II			
8	DIUAM 8	Role of AI/ML in IOT	"Artificial Intelligence for IoT Cookbook" by Ajay Kumar Jha and Raul Vijay, published by Packt Publishing.
9	DIUAM 9	Electronics and IOT	"Internet of Things (A Hands-on-Approach)" by Arshdeep Bahga and Vijay Madisetti, published by VPT.
10	DIUAM 10	Arduino Language	"Arduino Programming in 24 Hours, Sams Teach Yourself" by Richard Blum, published by Sams Publishing.
11	DIUAM 11	IoT- Software Analyst SSC/Q8205	-
12	DIUAM12	Entrepreneurship Skills	-
13	DIUAM13	Communication and Personality Development	Effective – 68 Communication & Personality Development
14	DIUAM14	Project/ Internship	-

DIPLOMA IN COMPUTER PROGRAMMING (DCP)

Diploma in Computer Programming (DCP)

डिप्लोमा इन कम्प्यूटर प्रोग्रामिंग (DCP)

(A) Duration : 12 Months (D) Courses : 16

(अ) अवधि : 12 माह (द) कोर्सेस : 16

(B) Eligibility : 12th Pass (E) Credit : 40

(ब) पात्रता : 12वीं पास (द) कोर्सेस : 40

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
Semester I										
DCP1	Programming Methodologies	3	100	50	20	20	8	30	12	• Basics of Programming and Structures
DCP2	Programming in C Commands	3	100	50	20	20	8	30	12	• Learn C programming structure basics commands
DCP3	Data Structure	3	100	50	20	20	8	30	12	• Understand Data and structure for programming structure
DCP4	OOPS and Programming in C++	3	100	50	20	20	8	30	12	• Understand Object Programming Structure, programs to create instances
DCP5	Programming in Java	2	100	50	20	20	8	30	12	• Learn Java concepts, Abstraction, Inheritance, Exception Handling
DCP6	Intellectual property Rights	2	100	50	20	20	8	30	12	

DCP7	Safety Practices in the Work Environment	2	100	50	20	20	8	30	12	• Familiarity with safety practices at workplace, • Knowledge about various Hazards and their remedies, • Ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene.
DCP8	Junior Software Developer SSC/Q0508	2	100	50	20	20	8	30	12	• Use components of web designing for development of website
Semester II										
DCP9	Software Engineering	3	100	50	20	20	8	30	12	• Concepts of Software and how to implement it
DCP10	Python Language	3	100	50	20	20	8	30	12	• Python language fundamental, data types, List, tuple, strings
DCP11	Programming in .NET using C#	2	100	50	20	20	8	30	12	• .Net Concepts and using C sharp
DCP12	GUI Programming using VB.NET	2	100	50	20	20	8	30	12	• Learn Graphical user interface creation
DCP13	Communication and Personality Development	2	100	70	28	–	–	30	12	• Understand reading and writing skills to be able to read and write various instruction.
DCP14	Digital and Financial Literacy	2	100	50	20	20	8	30	12	• Learn necessary digital skills

DCP15	Test Engineer SSC/Q1301	2	100	70	28	–	–	30	12	• Learn various testing skills to test any software program
DCP16	Project/ Internship	4	100	–	–	100	40	–	–	• Projects to make a working complete software

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
1600	640

Details Syllabus

Semester I

DCP 1 - Programming Methodologies

Module 1:

Basic Understanding of Programming Methodology, Introduction, Algorithm, Stepwise Refinement Techniques, Programming Style, Procedural Programming, Modular Programming, Top- down modular programming, Bottom-Up modular programming, Structured Programming, Object Oriented Programming, Analysis of Algorithm, Space Complexity, Time Complexity, Frequency Count, Growth of Functions and Asymptotic Notation, Big-O Notation, Big-Ω notation, Big-Θ notation

Module 2:

Algorithm Instructions, Flowchart Symbols, and Pseudocode, The Sequential Logic Structure, Problem Analysis

Module 3:

Problem Solving with Decisions, The Decision Logic Structure, Multiple If/Then/Else Instructions, Using Straight-Through Logic, Using Positive Logic, Using Negative Logic, Logic Conversion, The Case Logic Structure

Module 4:

Problem Solving with Loops, The Loop Logic Structure, Incrementing, Accumulating, While/While End, Repeat/Until, Automatic-Counter Loop, Indicators, Recursion.

Module 5:

Processing Arrays, Arrays, One-Dimensional Arrays, Two-Dimensional Arrays, Multidimensional Arrays

DCP 2 - Programming in C Commands

Module 1:

Introduction, Characteristics of C, Current Uses of C, Format of C Program, Character Set, C tokens, Keywords and identifiers, Constants, Variables, Data types, Declaration of variables. Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expression, Evaluation of Expression, Precedence of Arithmetic Operators, Type Conversion in Expressions, Operators Precedence and Associatively.

Module 2:

Decision Making with If Statements, Simple If Statements, The If Else Statements, Nesting of Else Statements, The Else If Ladder, The Switch Statement, The? Operator, The Go to Statement. The While Statement, The Do Statement, The for Statement, Jumps in Loops.

Module 3:

One Dimensional Arrays, Declaration of One Dimensional Array, Initialization of One Dimensional Array, Two-Dimensional Arrays, Declaration of Two Dimensional Arrays, Initialization of Two Dimensional Arrays, Example Programs.

Module 4:

Category of Functions, No Arguments and No Return Values, Arguments but No Return Values, Argument with Return Values, No Argument but Returns a Value, Function that Return Multiple Values. Need for User-Defined Function, A Multi-Function Program, Elements of User Defined

Functions, Definition of Functions, Return Values and Their Types, Function Calls, Function Declaration.

Module 5:

Understanding Pointers, Accessing the Address Space of a Variable, Declaring and Initialization Pointer Variables, Accessing a Variable through its Pointers, Structure and Unions. Different File Management Operations in C.

DCP 3 - Data Structures

Module 1:

Basic concepts: Introduction to data structures, classification of data structures, operations on data structures, abstract data type, algorithms, different approaches to design an algorithm, recursive algorithms; Searching techniques: Linear search, binary search and Fibonacci search; Sorting techniques: Bubble sort, selection sort, insertion sort, quick sort, merge sort, and comparison of sorting algorithms.

Module 2:

Linear Data Structures: Stacks: Primitive operations, implementation of stacks using Arrays, applications of stacks arithmetic expression conversion and evaluation; Queues: Primitive operations; Implementation of queues using Array, applications of linear queue, circular queue and double ended queue (DEQUE).

Module 3:

Linked lists: Introduction, singly linked list, representation of a linked list in memory, operations on a Single linked list; Applications of linked lists: Polynomial representation and sparse matrix manipulation. Types of linked lists: Circular linked lists, doubly linked lists; Linked list representation and operations of Stack, linked list representation and operations of queue.

Module 4:

Non Linear Data Structures: Trees: Basic concept, binary tree, binary tree representation, array and linked representations, binary tree traversal, binary search tree, tree variants, application of trees; Graphs: Basic concept, graph terminology, graph implementation, graph traversals, Application of graphs, Priority Queue.

Module 5:

Binary search trees: Binary search trees, properties and operations; Balanced search trees: AVL trees; Introduction to M - Way search trees, B trees; Hashing and collision: Introduction, hash tables, hash functions, collisions, applications of hashing.

DCP4 - Oops and Programming in C++

Module 1:

Introduction to object oriented programming: procedure oriented programming(pop) vs object oriented programming(OOP), Object oriented programming paradigm, Basic concepts of object oriented programming, Benefits of object oriented programming, Applications of OOP.

Module 2:

Basics of C++ language, about C++, structure of C++ program, C++ data types, datatype modifiers, variables in C++, Types of variables, basic input / output in C++, loops in C++, Decision making in C++ (if, if. Else, nested if, if-else-if, switch), Break, continue and goto statements, C++ environment setup, Operators in C++, operator precedence chart, specifying a class, defining member functions, types of member functions Static data members and static member's functions, Object as function arguments, friendly functions.

Module 3:

Constructors, destructors, Operator overloading-operator and function overloading, Inheritance in C++, types of inheritance Ambiguity in multiple inheritance (diamond problem in C++) Pointers in C++, pointers expression and pointer arithmetic Using pointers with arrays and strings, C++ pointers and strings, Pointers to derived classes.

Module 4:

Array in C++, Why Do We Need Arrays? Declaring an Array in C++, Initializing Arrays, C++ Array with Empty Members, Accessing Array Elements, Advantages of an Array in C++, Disadvantages of an Array in C++, Multidimensional Arrays, how are Pointers Related to Arrays? Vector in C++, Advantages of Vector over Array in C++, String in C++, Different Ways of Defining a String, Taking String Input, Concatenation of Strings.

Module 5:

File handling in C++, classes for file stream operators, Opening and closing a file, checking for of (), file modes- get () and put () functions, Binary files – write () and read () functions, error handling, Exception handling in C++.

DCP 5 - Programming in Java

Module 1:

Introduction to JAVA, Constant, Variables and Data Types, Operators and Control Structures**:** Basic Concepts of Object-Oriented Programming, Java Evolution, Features of Java, Java and Internet, Constants, Variables, Data Types, Java Tokens, Type Casting, Operators, Precedence in Arithmetic Operators, Control Structure with If Statement, the while Statement, the for Statement, the switch Statement, Break & Continue Statement, Return Statement**.**

Module 2:

Java Program Basic Structure, Arrays and Strings: Defining a Class, Fields and Methods Declaration, Creating Objects and Accessing Class Members, Constructors, Passing Arguments to Methods, Recursive Method, Overloading and Overriding Methods, Static Members, Final Variables, Methods and Class, Basic Java Program, One-dimensional Arrays, Multi-dimensional Arrays, Strings, Vectors, Enumerated Types, Annotations.

Module 3:

Inheritance and Polymorphism, Packages: Inheritance: Extending a Class, Types of Inheritances, Abstraction, Polymorphism, defining a Package, Creating Packages, Accessing and Using a Package, Access Protection, Importing Packages.

Module 4:

Exception Handling, Applets and Input/output in Java: Types of Errors, Exceptions, Exceptions Hierarchy, Syntax of Exception Handling Code, Multiple Catch Statements, using finally Statement, Throwing Our Own Exceptions, Streams, Reading Console Input, Writing Console Output, Random Access File.

Module 5:

Multithreaded Programming: The Java Thread Model, creating a Thread, Creating Multiple Threads, Stopping and Blocking a Thread, Life Cycle of a Thread.

DCP 6 - Intellectual Property Rights

An overview of digital financial literacy, which combines the skills needed to navigate financial services with the skills to use digital technologies

DCP 7– Safety Practices in the Work Environment

Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3- Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5- Common Food Borne Diseases & Infections

DCP 8- Junior Software Developer SSC/Q0508

Module 1: Introduction to Programming Concepts

- Overview of programming languages (e.g., Python, JavaScript, Java)
- Basic syntax and control structures (loops, conditionals)
- Data types and variables
- Functions and methods
- Introduction to object-oriented programming (OOP) principles

Module 2: Web Development Fundamentals

- Introduction to HTML5 and CSS3
- Basics of client-side scripting with JavaScript
- DOM manipulation
- Responsive design and CSS frameworks (e.g., Bootstrap)
- Introduction to version control systems (e.g., Git)

Module 3: Database Fundamentals

- Introduction to Relational Databases (SQL)
- Basic SQL commands (Select, Insert, Update, Delete)
- Database design principles (normalization, relationships)
- Introduction to NoSQL databases (e.g., MongoDB)
- CRUD operations with SQL and NoSQL databases

Module 4: Software Development Lifecycle

- Overview of software development methodologies (Waterfall, Agile, Scrum)
- Requirements gathering and analysis
- Software design principles (UML, design patterns)
- Implementation phase: coding standards and best practices
- Introduction to testing (unit testing, integration testing)

Module 5: Web Application Development

- Introduction to server-side scripting (e.g., Node.js, Django)
- Building RESTful APIs
- Authentication and authorization
- Handling sessions and cookies
- Introduction to deploying web applications

Semester II

DCP 9- Software Engineering

Module 1:

Introduction to Software Engineering, Overview of software development lifecycle, Software development methodologies (Waterfall, Agile, etc.), Software requirements engineering Software design principles Introduction to software testing and quality assurance.

Module 2:

Programming Fundamentals: Introduction to programming languages (e.g., Java, Python) Object-oriented programming concepts (e.g., classes, objects, inheritance, polymorphism) Data structures and algorithms Debugging techniques and tools Software version control using Git.

Module 3:

Software Design and Architecture, Principles of software design patterns, Model-View-Controller (MVC) architecture, Service-Oriented Architecture (SOA), Microservices architecture, Scalable and distributed systems.

Module 4:

Project Management, Agile project management frameworks (e.g., Scrum, Kanban), Project planning and estimation, Risk management, Project tracking and reporting, Communication and collaboration tools.

Module 5:

Advanced Topics in Software Engineering Software security and testing, DevOps and Continuous Integration/Continuous Deployment (CI/CD), Cloud computing and infrastructure as code Big Data and analytics Artificial Intelligence and machine learning in software engineering.

DCP 10- Python Language

Module 1:

Python Basics: Python Interpreter, Python Idle, Basic Data Types, Variables, Operators, Input and Output statements, Conditionals, Iteration, Executing python scripts.

Module 2:

Data Structures: Lists, List Comprehension, Tuples, Dictionaries, Dictionary Comprehension, Strings, Sets, Union, Intersection, Subset, Superset, Difference, Copy, Add, Remove, Discard.

Module 3:

Function & File Handling: Inbuilt Functions, Defining and Calling Function, Arguments, Global vs Local Variables, Lambda Functions, working with Files-Read, Write, Append Modes.

Module 4:

Classes, Modules and Exceptional Handling**:** Classes, Member Variables, Functions, Constructor, Destructor, Data Encapsulation, Inheritance, Diamond Problem, Modules, Inbuilt Modules, Exception Handling.

Module 5:

Database & GUI Programming: Using SQLite, connecting to Database, creating table, insert, select, update, delete, drop tables, accessing and modifying tables through python, Graphical User Interfaces, Event Driven Paradigm, skinter module, Creating simple GUI in Python, Widgets

DCP 11 - Programming in .NET using C#

Module 1:

.NET and Core C#: About .NET, Some Terms in .NET, .NET Application Types, Developer Tools for .NET, About C# and Versions, Reasons for the popularity of C#, Features of C#, Types of Applications Developed using C#, Comparison between C# and Java, Structure of a C# Program, Top-Level Statements, Methods and Properties of Console Class in C#, Data Types in C#, Literals in C#, Type Casting in C#, Variables in C#.

Module 2:

Operators, Control Structures, Functions in C#: Various Operators in C#, Operator Precedence, Control Flow Statements, if-else, switch statements, Loops in C#, While Loop, Do While, for loop, Break and Continue Statement, GoTo Statement, Functions in C#, User-Defined Function, Call by Value and Reference, Recursion, User Input and Output in C#.

Module 3:

Object-Oriented Programming (OOPs) in C#: Why do we need Object-Oriented Programming (OOPs), Advantages of OOPS, Basic Concepts of OOPS, Creating a Class and Object in C#,, Constructors and it's types in C#, Static vs Non-Static Constructors in C#,Destructors in C#, Garbage Collection in .NET Framework, Access Specifiers, Encapsulation, Abstraction, Inheritance, Types of Inheritance, Types of Classes in C#, Interface, Polymorphism in C#,Method Overloading, Operator Overloading, Method Overriding, Partial Classes and Partial Methods, Sealed Class and Sealed Methods, Static Class.

Module 4:

Exception Handling and Delegates: Basic Concept of Catching Errors, Exception in C#, Multiple Catch Blocks and Finally Block, Custom Exception Inner Exception, Delegates, Types of Delegates in C#, Multicast Delegates, Anonymous Method, Lambda Expressions, Generic Delegates.

Module 5:

File Handling in C#: What is a File? What is Stream? class hierarchy in C#, File Stream Class, FileModes, FileAccess, FileShare, Stream Reader and StreamWriter, File Class, TextWriter and TextReader, Binary Writer and BinaryReader, StringWriter and StringReader.

DCP 12 - GUI Programming Using VB.NET

Module 1:

.NET Framework and VB.NET: About .NET, Visual Programming, Event Driven Programming, GUI Programming, About VB.NET, Features and Advantages of VB.NET, Visual Studio Installation, Structure of VB Program, Visual Basic Naming Conventions, Break and Combine Statements in Code, Special Characters in Code, Comments in Code, Me, My, My Base, and My Class in Visual Basic, Data Types, Variables, Constants.

Module 2:

Operators, Control Statements in VB.NET: VB.NET Operators, Operator Precedence in VB.NET, Control Statements, Loop Statements in VB.

Module 3:

VB.NET Form Control, Menus and Dialog Boxes: Label, Textbox, Button, Combo Box, List Box, Progress Bar, Timer, Checkbox, Radio Button, DateTimePicker, PictureBox, Tree View, List View, Menu Strip Control, OpenFile Dailog, FontDialog, ColorDialog, PrintDialog.

Module 4:

Object Oriented Programming using VB.NET, Functions, Procedures and Exception handling: Principle of OOPS, Access Modifiers, Arrays, Function, Procedure, Passing Arguments-By Value and ByRef Exception Handling in VB.NET.

Module 5:

Database Connectivity Using VB.NET: Introduction to ADO.NET, Populating Data in ADO.NET, Browsing Records, Editing, Saving, Adding and Deleting Records, Using Data Grid View, Language-Integrated Query (LINQ), Reading and Writing Text Files.

DCP 13 - Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

DCP 14 Digital and Financial Literacy

An overview of digital financial literacy, which combines the skills needed to navigate financial services with the skills to use digital technologies.

DCP 15 Test Engineer SSC/Q1301

Module 1: Introduction to Software Testing

- Understanding the role of a Test Engineer
- Software development life cycle (SDLC) and testing phases
- Types of software testing: functional, non-functional, manual, automated
- Importance of testing in software development

Module 2: Test Planning and Documentation

- Creating test plans and strategies
- Test case design techniques: equivalence partitioning, boundary value analysis, decision table testing, etc.
- Test documentation: test cases, test scenarios, test scripts
- Traceability matrix and requirement coverage
- Test estimation and scheduling

Module 3: Test Execution and Reporting

- Test execution process: setup, execution, and result analysis
- Techniques for executing test cases: manual and automated
- Defect management process: reporting, tracking, and resolution
- Test reporting: test summary reports, defect reports, metrics collection
- Regression testing and its importance

Module 4: Test Automation

- Introduction to test automation tools and frameworks
- Selecting appropriate tools for automation
- Test script development and maintenance
- Executing automated test suites
- Integration of test automation with continuous integration/continuous deployment (CI/CD) pipelines

Module 5: Specialized Testing Techniques

- Performance testing: load, stress, and scalability testing
- Security testing: vulnerabilities, penetration testing
- Usability testing: user experience, accessibility
- Compatibility testing: cross-browser, cross-platform
- Exploratory testing and its benefits

DCP 16- Project/Internship

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
Semester I								
1	DCP1	Programming Methodologies	3	90	12	33	18	27
2	DCP2	Programming in C Commands	3	90	12	33	18	27
3	DCP3	Data Structure	2	60	08	22	12	18
4	DCP4	OOPS and Programming in C++	2	60	08	22	12	18
5	DCP5	Programming in Java	2	60	08	22	12	18
6	DCP6	Intellectual property Rights	2	60	08	22	12	18
7	DCP7	Safety Practices in the Work Environment	2	60	08	22	12	18
8	DCP8	Junior Software Developer SSC/Q0508	2	60	08	22	12	18
Semester II								
9	DCP9	Software Engineering	3	90	12	33	18	27
10	DCP10	Python Language	3	90	12	33	18	27
11	DCP11	Programming in .NET using C#	3	90	12	33	18	27
12	DCP12	GUI Programming using VB.NET	2	60	08	22	12	18
13	DCP13	Communication and Personality Development	2	60	08	22	12	18
14	DCP14	Digital and Financial Literacy	2	60	08	22	12	18
15	DCP15	Test Engineer SSC/Q1301	2	60	08	22	12	18
16	DCP16	Project/ Internship	5	150	-	-	150	-

Study Modules & Books Information

S.No	Course Code	Course Name	Module Used
Semester I			
1	DCP 1	Programming Methodologies	"Code Complete: A Practical Handbook of Software Construction" by Steve McConnell, published by Microsoft Press.
2	DCP 2	Programming in C	"The C Programming Language" by Brian W. Kernighan and Dennis M. Ritchie, published by Prentice Hall.
3	DCP 3	Data Structure	"Data Structures and Algorithms Made Easy: Data Structures and Algorithmic Puzzles" by Narasimha Karumanchi, published by CareerMonk Publications.
4	DCP 4	OOPS and Programming in C++	"Data Structures and Algorithms Made Easy: Data Structures and Algorithmic Puzzles" by Narasimha Karumanchi, published by CareerMonk Publications.
5	DCP 5	Programming in Java	"Effective Java" by Joshua Bloch, published by Addison-Wesley Professional.
6	DCP 6	Intellectual property Rights	Intellectual Property: A Very Short Introduction" by Siva Vaidhyanathan
7	DCP 7	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
8	DCP 8	Junior Software Developer SSC/Q0508	-
Semester II			
9	DCP 9	Software Engineering	"Software Engineering: A Practitioner's Approach" by Roger S. Pressman, published by McGraw-Hill Education.
10	DCP 10	Python Language	"Python Crash Course: A Hands-On, Project-Based Introduction to Programming" by Eric Matthes, published by No Starch Press.
11	DCP 11	Programming in .NET using C#	"C# in Depth" by Jon Skeet, published by Manning Publications.
12	DCP 12	GUI Programming using VB.NET	"Windows Forms Programming in Visual Basic .NET" by Chris Sells and Justin Gehtland, published by Addison-Wesley Professional.
13	DCP 13	Communication and Personality Development	Effective – 68 Communication & Personality Development
14	DCP 14	Digital and Financial Literacy	Digital Literacy: A Primer on Media, Identity, and the Evolution of Technology" by Susan Wiesinger
15	DCP 15	Test Engineer SSC/Q1301	-
16	DCP 16	Project/ Internship	-

DIPLOMA IN DIGITAL MARKETING (DDM)

Diploma in Digital Marketing (DDM)

डिप्लोमा इन डिजिटल मार्केटिंग (DDM)

(A) Duration : 12 Months (D) Courses : 12

(अ) अवधि : 12 माह (द) कोर्सेस : 12

(B) Eligibility : 12th Pass (E) Credit : 40

(ब) पात्रता : 12वीं पास (द) कोर्सेस : 40

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
Semester I										
DDM1	Introduction in Digital Marketing	4	100	30	12	50	20	20	8	• Define digital marketing and its core principles. • Digital marketing channels • Understand the evolution of digital marketing and its impact on businesses.
DDM2	Market Research	4	100	30	12	50	20	20	8	• Understand what your target audience truly wants and needs online. • Learn from your rivals' successes and avoid their pitfalls.

DDM3	Make a Website	4	100	30	12	50	20	20	8	• Craft engaging text & visuals for your WordPress website. • Master key elements: posts, pages, menus & plugins. • Design & customize using themes & widgets.
DDM4	Communication Skills & Personality Development	2	100	30	12	50	20	20	8	• Basic communication skills • Personality grooming
DDM5	Email Marketing & Copywriting	4	100	30	12	50	20	20	8	• Craft compelling email copy that resonates with your audience and drives conversions. • Design effective email campaigns that get opened, read, and clicked. • Track and measure your email marketing results to improve your campaigns over time. • Stay up-to-date with the latest email marketing trends and best practices.
DDM6	Safety Practices in the Work Environment	2	100	30	12	50	20	20	8	• Familiarity with safety practices at workplace, • Knowledge about various Hazards and their remedies, • Ensure clean, dust free and organized working environment, knowledge of

										primary first aid for any accidental situation, understand about personal health and hygiene.
Semester II										
DDM7	Search Engine Optimization (SEO)	4	100	30	12	50	20	20	8	• Understand how search engines work to rank websites • Craft high-quality, relevant content users adore • Target the right keywords to attract your audience
DDM8	YouTube Marketing	4	100	30	12	50	20	20	8	• Craft targeted video ads & optimize campaigns for audience engagement. • Unlock YouTube SEO secrets to boost organic video discovery. • Measure and analyse YouTube channel performance for data-driven decisions.
DDM9	Facebook Marketing	4	100	30	12	50	20	20	8	• Craft ads reaching your ideal customers, not just a vast sea. • Utilize videos, images, carousels, and more to capture attention. • Optimize campaigns based on data insights for ROI mastery • Community: Interact with followers, build relationships, and foster loyalty.

DDM10	Twitter Marketing	3	100	30	12	50	20	20	8	• Build real connections, not follower counts. • Research & use relevant hashtags for reach.
DDM11	Introduction to Entrepreneurship	2	100	70	28	–	–	30	12	• Understanding of entrepreneurship development concepts
DDM12	Live Project	3	100	–	–	100	40	–	–	-

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
1200	480

Details Syllabus

Semester – I

DDM 1 - Introduction in Digital Marketing

Module 1: Definition and Significance of Digital Marketing

- This module defines digital marketing as the promotion of products or services using digital channels and explores its significance in modern business, highlighting its ability to reach a vast audience, target specific demographics, and track ROI effectively.

Module 2: Evolution of Digital Marketing

- This module delves into the historical development of digital marketing, from its early days of email marketing and banner ads to the current landscape dominated by social media, SEO, content marketing, and data-driven strategies, showcasing how it has adapted to technological advancements and changing consumer behaviour.

Module 3: Core Components of Digital Marketing Strategy

- This module identifies the essential elements of a digital marketing strategy, including website optimization, content creation, social media management, email marketing, search engine optimization (SEO), pay-per-click (PPC) advertising, and analytics, emphasizing the importance of a holistic approach to achieve marketing objectives.

Module 4: Benefits and Challenges of Digital Marketing

- This module analyzes the advantages of digital marketing, such as cost-effectiveness, global reach, real-time communication, and precise targeting, while also examining the challenges, such as information overload, privacy concerns, fierce competition, and evolving algorithms, highlighting the need for continuous adaptation and innovation.

Module 5: Case Studies and Best Practices in Digital Marketing

- This module showcases real-world examples of successful digital marketing campaigns across various industries, drawing insights from case studies and highlighting best practices, innovative strategies, and lessons learned, providing practical guidance for implementing effective digital marketing initiatives.

DDM 2 - Market Research

Module 1: Examining Key Digital Marketing Channels

This module delves into the various digital marketing channels such as social media, email, SEO, PPC, and content marketing, providing insights into their effectiveness, target audiences, and best practices.

Module 2: Exploring Emerging Trends in Digital Marketing Platforms

Participants in this module explore cutting-edge trends in digital marketing platforms, including AI-driven personalization, voice search optimization, immersive technologies like AR and VR, and the impact of block chain on advertising and data privacy.

Module 3: Understanding the Role of Content in Digital Marketing

Focusing on the significance of content, this module covers content creation, distribution, and optimization strategies across different digital channels, emphasizing the importance of engaging, valuable content in driving audience engagement and conversions.

Module 4: Discussing the Importance of Mobile Marketing

This module highlights the growing importance of mobile devices in digital marketing, discussing mobile-friendly website design, app marketing, location-based targeting, and the role of mobile in

Omni channel marketing strategies. Participants gain insights into optimizing campaigns for the mobile-first audience.

Module 5: Integrating Data Analytics in Digital Marketing

Strategies Covering the role of data analytics in digital marketing, this module explores techniques for collecting, analysing, and leveraging data to optimize campaigns, personalize messaging, and measure ROI. Topics include web analytics, A/B testing, customer segmentation, and predictive analytics.

DDM 3 - Make a Website

1. Getting Started with WordPress: This module covers the basics of setting up a WordPress website, including installation, configuration, and navigating the dashboard. Participants will learn how to choose themes, set up plugins, and create their first pages and posts.
2. Advanced Customization: Delving deeper into WordPress, this module explores customization options beyond basic themes and plugins. Participants will learn about custom post types, taxonomies, and how to create their own themes and plugins using PHP and CSS.
3. Managing Content: Focused on content creation and management, this module teaches participants how to organize their content effectively using categories, tags, and menus. They'll also learn about different content types, such as pages, posts, and media, and how to optimize them for search engines.
4. Optimization and Maintenance: This module covers strategies for optimizing WordPress websites for performance and security. Participants will learn about caching, image optimization, and other techniques to speed up their sites, as well as best practices for securing their WordPress installations and performing regular maintenance tasks.
5. Monetization and Growth: Building on the previous modules, this advanced module explores strategies for monetizing WordPress websites and driving growth. Participants will learn about advertising, affiliate marketing, and other revenue streams, as well as techniques for increasing traffic and engagement through SEO, social media, and email marketing.

DDM 4 - Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3- Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

DDM 5 - Email Marketing & Copywriting

Email Copywriting Mastery: Learn to craft persuasive email content tailored to your audience's needs and desires, boosting engagement and conversion rates.

Campaign Design Excellence: Master the art of designing visually appealing and strategically structured email campaigns that captivate recipients and drive desired actions.

Analytics & Optimization Techniques: Dive into advanced tracking and measurement methods to analyze email marketing performance, identify strengths and weaknesses, and refine strategies for continual improvement.

Trendspotting & Best Practices: Stay ahead of the curve with insights into emerging trends, innovations, and proven strategies in the dynamic landscape of email marketing.

Continuous Learning & Development: Equip yourself with resources and strategies to stay informed and adaptable in the ever-evolving realm of email marketing, ensuring sustained success and relevance.

DDM 6- Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Chapter 3 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3- Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5- Common Food Borne Diseases & Infections

Semester – II

DDM 7 – Search Engine Optimization (SEO)

1. SEO Fundamentals:

This module covers the basic principles and strategies of search engine optimization (SEO), including keyword research, on-page optimization, and content creation to improve website visibility and rankings on search engine results pages (SERPs).

2. Technical SEO:

This module focuses on the technical aspects of website optimization, such as website speed, mobile-friendliness, site architecture, and structured data markup, to ensure search engines can crawl, index, and understand the content effectively.

3. Off-Page SEO:

In this module, learners explore off-page optimization techniques, such as link building, social media marketing, and online reputation management, to increase a website's authority, trustworthiness, and relevance in the eyes of search engines.

4. Local SEO:

This module covers strategies and tactics for optimizing a website's visibility in local search results, including local keyword targeting, Google My Business optimization, online reviews management, and local link building to attract potential customers from specific geographic areas.

5. Web Analytics Fundamentals:

This module introduces learners to the basics of web analytics tools and metrics, including Google Analytics, user behavior analysis, conversion tracking, and key performance indicators (KPIs) to measure and analyze website traffic, engagement, and conversions.

Semester – II

DDM 8 - YouTube Marketing

Craft targeted video ads & optimize campaigns: Learn to create compelling video ads tailored to specific audiences and refine campaigns to maximize engagement and conversion rates.

YouTube SEO secrets: Uncover strategies to enhance your video's visibility and rank higher in YouTube search results, increasing organic discovery and viewership.

Measure YouTube channel performance: Dive into analytics tools to track key metrics, understand audience behavior, and make informed decisions to grow your channel effectively.

Analyze YouTube channel data: Gain insights into audience demographics, viewer retention, and engagement metrics to refine content strategies and optimize performance.

Optimize campaigns for audience engagement: Implement tactics to increase viewer interaction, such as CTAs, annotations, and community engagement, to foster a loyal and active subscriber base.

DDM 9 – Facebook Marketing

Targeted Audience Mastery: Craft Facebook ads that precisely target your ideal customers, leveraging advanced demographic and interest-based targeting techniques to reach specific segments rather than casting a wide net.

Visual Storytelling Techniques: Utilize Facebook's diverse ad formats including videos, images, and carousels to create compelling narratives that capture attention and engage viewers, increasing ad effectiveness and driving higher conversion rates.

Data-Driven Optimization Strategies: Learn how to analyze campaign data effectively to identify key insights, optimize ad performance, and maximize return on investment (ROI) through continuous testing, tweaking, and refinement.

Community Engagement Tactics: Develop strategies to interact with your Facebook followers, cultivate meaningful relationships, and nurture a loyal community around your brand, fostering trust and driving long-term customer loyalty.

Advanced Conversion Techniques: Explore advanced tactics for converting Facebook followers into paying customers, including retargeting campaigns, dynamic product ads, and persuasive copywriting techniques tailored to different stages of the customer journey.

DDM 10 - Twitter Marketing

Content Strategy Module: Develop engaging content tailored to your target audience, leveraging Twitter's unique features and trends to drive brand visibility and engagement.

Analytics and Insights Module: Utilize Twitter analytics tools to track campaign performance, understand audience behavior, and optimize digital marketing strategies for maximum impact.

Community Management Module: Foster meaningful interactions with followers, respond to inquiries and feedback promptly, and cultivate a loyal community around your brand on Twitter.

Advertising and Promotions Module: Harness the power of Twitter ads and promoted content to reach a wider audience, amplify your message, and achieve specific marketing objectives effectively.

Influencer Collaboration Module: Collaborate with relevant influencers and thought leaders on Twitter to amplify brand awareness, enhance credibility, and tap into new audience segments through authentic partnerships.

DDM 11 - Introduction to Entrepreneurship

Module 1 - THE CONCEPT, Theory and Growth of Entrepreneurship, Motivation, Leadership

Module 2 - Nature Classification, Types and Importance of Entrepreneurs, Nature and Scope of Management, Communication

Module 3 -Planning (Concept, Process & Types), Concept of Organisation (Significance, Process and Nature)

Module 4- Accounts for Small Enterprise, Entrepreneurship Development Institutions 184

Module 5 - Aisect Model of Entrepreneurship, how to Set Up On Aisect Centre, Training for Self Employment

DDM 12 - Live Project

Counselling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
Semester I								
1	DDM1	Introduction in Digital Marketing	4	120	16	44	24	36
2	DDM2	Market Research	4	120	16	44	24	36
3	DDM3	Make a Website	4	120	16	44	24	36
4	DDM4	Communication Skills & Personality Development	2	60	08	22	12	18
5	DDM5	Email Marketing & Copywriting	4	120	16	44	24	36
6	DDM6	Safety Practices in the Work Environment	2	60	08	22	12	18
Semester II								
7	DDM7	Search Engine Optimization (SEO)	4	120	16	44	24	36
8	DDM8	YouTube Marketing	4	120	16	44	24	36
9	DDM9	Facebook Marketing	4	120	16	44	24	36
10	DDM10	Twitter Marketing	3	90	12	33	18	27
11	DDM11	Introduction to Entrepreneurship	2	60	08	22	12	18
12	DDM12	Live Project	3	90	-	-	90	-

Study Modules & Books Information

S. No	Course Code	Course Name	Module Used
Semester I			
1	DDM1	Introduction in Digital Marketing	**A Road Map to Successful Career in Digital Marketing**, V Venkata Krishna)
2	DDM2	Market Research	Social Media Marketing Essentials You Always Wanted To Know**, Vibrant Publishers (Author), Kavita Kamath (Author)**
3	DDM3	Website Building WordPress	WordPress: Build and Master Professional Looking Website (A Definitive Guide to Building Custom Websites Using Wordpress), Conway C (Author)
4	DDM4	Communication & Personality Development	Effective – 68 Communication & Personality Development
5	DDM5	Email Marketing & Copywriting	Email Marketing Demystified: A Step-By-Step Guide to Building a Massive Mailing List, Writing Copy That Converts and Generating More Sales Through Email Mark, **(Author)** Matthew Paulson
6	DDM6	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
Semester II			
7	DDM7	SEO, Web Analytics	SEO: How to Get On the First Page of Google (Google Analytics, Website Traffic, Adwords, Pay per Click, Website Promotion, Search Engine Optimization) (Seo Bible Book 1), Thomas Clayton (Author) Really Simple SEO's Google Analytics Success Guide: 37 plain speaking tutorials for business people wanting to master this powerful web analytics tool, David Howlett (Author
8	DDM8	YouTube Marketing	YouTube Formula Secrets #1 Guide To Boost Sales, Grow Your Channel, Social Media Marketing And Algorithm Hacks Tony Walker (Author)

9	DDM9	Facebook Marketing	Ultimate Guide to Facebook Advertis, Perry Marshall (Author), Digital Marketing| 3rd Edition,Seema Gupta (Author)
10	DDM10	Twitter Marketing	Social Media Marketing: Turn your Online Presence on Facebook, Instagram, Youtube and Twitter into a Money Printing Machine - Branding Strategies for ... (Social Media Marketing for Beginners) Paperback – Import, 28 September 2021, John Shackelford (Author)
11	DDM11	Introduction to Entrepreneurship	-
12	DDM12	Project/ Internship	-

CERTIFICATE IN DATA ANALYSIS USING EXCEL AND POWER BI (CDAEPB)

Certificate in Data Analysis Using Excel and Power BI (CDAEPB)

सर्टिफिकेट इन डाटा एनालिसिस यूसिंग एक्सेल एण्ड बी आई (CDAEPB)

(A) Duration : 6 Months (D) Courses : 8

(अ) अवधि : 6 माह (द) कोर्सेस : 8

(B) Eligibility : 10th Pass (E) Credit : 20

(ब) पात्रता : 10वीं पास (द) कोर्सेस : 20

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
CDAEPB 1	Data Acquisition	3	100	50	20	20	8	30	12	• Learn to acquire data
CDAEPB 2	Data Cleaning and Pre-processing	3	100	50	20	20	8	30	12	• Finding data to make it ready for analysis, by deep study of each feature
CDAEPB 3	Data Visualization Using Power BI	2	100	50	20	20	8	30	12	• Learn Power BI tool to get proper Visualization
CDAEPB 4	Data Manipulation Using Excel	2	100	50	20	20	8	30	12	• All features of Excel and Data concepts

CDAEPB 5	Safety Practices in the Work Environment	2	100	100	50	20	20	8	30	• Familiarity with safety practices at workplace, • Knowledge about various Hazards and their remedies, • Ensure clean , dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene.
CDAEPB 6	AI- Data Engineer SSC/Q8106	2	100	100	50	20	20	8	30	• Advanced Excel concepts will be learned, Data Analysis and manipulation concepts will be learned
CDAEPB 7	Communication and Personality Development	2	100	70	28	–	–	30	12	• Understand reading and writing skills to be able to read and write various instruction.
CDAEPB 8	Projects	4	100	–	–	100	40	–	–	• Create own model that can find insight from data

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
700	280

Details Syllabus

CDAEPB 1 - Data Acquisition

Unit 1: Introduction to Data Acquisition

Essentials of computer interfacing –configuration and structure –interface systems-interface bus, Data acquisition life cycle: planning, collection, processing, and analysis.

Unit 2: Data Acquisition Hardware and Software

Overview of data acquisition hardware: data loggers, sensors, and interfaces, Introduction to data acquisition software: LabVIEW, Python libraries.

Unit 3: Data Sources and Collection Methods

Primary data collection techniques: surveys, interviews, observations, and experiments, Secondary data collection: accessing existing datasets, public data repositories, and APIs.

Unit 4: Real-time Data Acquisition

Real-time data streaming: challenges and solutions, Synchronization and timestamping of data streams, Introduction to IoT (Internet of Things) and data acquisition from IoT devices.

Unit 5: Virtual Instrumentation

Virtual instrument and traditional instrument, Hardware and software for virtual instrumentation, Virtual instrumentation for test, control, and design, Graphical system design.

CDAEPB 2 - Data Cleaning and Pre-Processing

Course Objective:

- The Data Manipulation using Microsoft Excel course aims to equip students with the knowledge and skills to effectively manage and manipulate data.
- Students will learn various techniques to clean, transform, analyze, and summarize data to derive valuable insights and support decision-making processes.

Unit 1: Introduction to Data Cleaning and Preprocessing

What is data cleaning and preprocessing? The importance of data quality in data science, Overview of data cleaning and preprocessing pipeline, Common data quality issues and challenges

Unit 2: Data Exploration and Data Cleaning Techniques

Exploratory data analysis techniques, Identifying and handling missing data, Outlier detection and treatment, removing duplicate records, Handling inconsistent data and errors.

Unit 3: Data Transformation

Feature scaling and normalization, Dealing with categorical data, Encoding techniques: one-hot encoding, label encoding.

Unit 4: Dealing with Outliers:

Identifying outliers and understanding their impact on data analysis. Exploring techniques such as statistical methods (e.g., z-score, modified z-score), visualization (e.g., box plots, scatter plots).

Unit 5: Data Integration and Dealing with Noisy Data

Combining data from multiple sources, aggregating data for analysis, Techniques to handle noisy data, Data smoothing and filtering methods.

CDAEPB 3 - Data Visualization Using Power Bi

Course Objective:

- The Data Visualization using Power BI course aims to equip students with the knowledge and skills to create compelling and interactive visualizations from raw data using Microsoft Power BI.
- Students will learn to design insightful dashboards, reports, and interactive charts to effectively communicate data-driven insights.

Unit 1: Introduction to Data Visualization and Power BI

Introduction to Microsoft Power BI and its features, Power BI Desktop (Power Query, Power Pivot, Power View), Connecting to data sources and importing data.

Unit 2: Data Preparation in Power BI

Data shaping and cleaning using Power Query Editor, Data transformation techniques, Handling missing data and data types.

Unit 3: Basic Visualizations in Power BI

Creating bar charts, line charts, and pie charts, Formatting and customizing visual elements, Using data hierarchies and drill-down features.

Unit 4: Advanced Visualizations in Power BI

Stacked and clustered column charts, Area charts and scatter plots, Waterfall and funnel charts. Visualizing location data on maps, Customizing map visualizations, creating data-driven storytelling with Power BI reports.

Unit 5: Interactive Dashboards

Designing interactive dashboards with multiple visualizations, using slicers and filters to control data views, Adding dynamic visualizations with bookmarks.

CDAEPB 4 - Data Manipulation Using Excel

Course Objective:

- The Data Manipulation using Microsoft Excel course aims to equip students with the essential skills to manipulate, clean, and analyze data efficiently using Microsoft Excel.
- Students will learn various data manipulation techniques to extract insights, prepare data for analysis, and make data-driven decisions.

Unit 1: Introduction to Data Manipulation using excel

Introduction to Microsoft Excel and its features, Excel data types and formats,

Entering and managing data in Excel, Importing data from external sources.

Unit 2: Data Cleaning in Excel

Identifying and handling missing data, Removing duplicates and redundant records, Data sorting and filtering.

Unit 3: Excel Functions for Data Manipulation

Using basic Excel functions (SUM, AVERAGE, COUNT), Logical functions (IF, AND, OR) for data categorization, VLOOKUP and HLOOKUP for data retrieval.

Unit 4: Advanced Data Transformations

PivotTables and Pivot Charts for data summarization, Grouping and subtotaling data, Combining data from multiple sheets with consolidation

Unit 5: Conditional Formatting and Data Visualization

Highlighting data based on conditions, Data bars, color scales, and icon sets, Creating interactive data visualizations with Excel

CDAEPB 5 - Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, Ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Chapter 3 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3- Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5- Common Food Borne Diseases & InfectioNS

CDAEPB 6 - AI- Data Engineer SSC/Q8106

Module 1: Introduction to AI Data Engineering

- Overview of data engineering in the context of AI
- Importance of data quality and reliability
- Ethical considerations in AI data engineering

Module 2: Data Storage and Processing Technologies

- Relational databases and SQL
- NoSQL databases (e.g., MongoDB, Cassandra)
- Distributed file systems (e.g., Hadoop HDFS)
- Introduction to cloud-based storage solutions (e.g., AWS S3, Google Cloud Storage)

Module 3: Data Pipeline Design and Implementation

- Understanding data pipeline architecture
- Extract, Transform, Load (ETL) processes
- Introduction to workflow management tools (e.g., Apache Airflow)
- Hands-on exercises in designing and implementing data pipelines

Module 4: Data Integration and Transformation

- Techniques for data integration from multiple sources
- Data cleansing and pre-processing
- Introduction to data wrangling tools (e.g., Pandas, Apache Spark)
- Case studies and practical examples

Module 5: AI Infrastructure Deployment and Management

- Introduction to AI infrastructure components (e.g., GPUs, TPUs)
- Containerization and orchestration (e.g., Docker, Kubernetes)
- Deployment strategies for AI models (e.g., on-premises, cloud-based)
- Monitoring and scaling AI infrastructure

CDAEPB 7 - Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

CDAEPB 8 - Project/ Internship

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CDAEP B 1	Data Acquisition	3	90	12	33	18	27
2	CDAEP B 2	Data Cleaning and Pre-processing	2	60	08	22	12	18
3	CDAEP B 3	Data Visualization Using Power BI	2	60	08	22	12	18
4	CDAEP B 4	Data Manipulation Using Excel	2	60	08	22	12	18
5	CDAEP B 5	Safety Practices in the Work Environment	1	30	04	11	06	09
6	CDAEP B 6	AI- Data Engineer SSC/Q8106	2	60	08	22	12	18
7	CDAEP B 7	Communication and Personality Development	1	30	04	11	06	09
8	CDAEP B 8	Projects	5	150	-	-	150	-

Study Modules & Books Information

S.No	Course Code	Course Name	Module Used
1	CDAEPB 1	Data Acquisition	Data Acquisition and Signal Processing for Smart Sensors" by Francisco Falcone, Teresa Donateo, and Alessandro Ferrero. published by Springer
2	CDAEPB 2	Data Cleaning and Pre-processing	Data Wrangling with Python: Tips and Tools to Make Your Life Easier" by Jacqueline Kazil and Katharine Jarmul. published by O'Reilly Media
3	CDAEPB 3	Data Visualization Using Power BI	Beginning Power BI by Dan Clark published by Apress
4	CDAEPB 4	Data Manipulation Using Excel	Excel 2019 Power Programming with VBA" by Michael Alexander and Richard Kusleika. published by Wiley
5	CDAEPB 5	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
6	CDAEPB 6	AI- Data Engineer SSC/Q8106	-
7	CDAEPB 7	Communication and Personality Development	Effective – 68 Communication & Personality Development
8	CDAEPB 8	Project/Internship	-

CERTIFICATE DATA SCIENCE (CDS)

Certificate Data Science (CDS)

सर्टिफिकेट डाटा साइंस (CDS)

(A) Duration : **6 Months** **(D) Courses** : **8**

(अ) अवधि : 6 माह (द) कोर्सेस : 8

(B) Eligibility : **10th Pass** **(E) Credit** : **20**

(ब) पात्रता : 10वीं पास (द) कोर्सेस : 20

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
CDS1	Introduction to Data Science	3	100	50	20	20	8	30	12	Introduce the concepts of Data Science
CDS2	Mathematical Foundation for Data Science	3	100	50	20	20	8	30	12	Introduction of mathematical concepts for Data Science
CDS3	Storytelling with data	2	100	50	20	20	8	30	12	Basic Probability Concepts will be learned
CDS4	Python Essentials, Data Manipulation and Visualization	2	100	50	20	20	8	30	12	Basic Python Programming, Data Analysis and manipulation concepts
CDS5	Safety Practices in the Work Environment	2	100	50	20	20	8	30	12	Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, Ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation , understand about personal health and hygiene

CDS6	Communication and Personality Development	2	100	70	28	–	–	30	12	Understand reading and writing skills to be able to read and write various instructions
CDS7	SSC/N8101 AI -Data Quality Analyst	2	100	50	20	20	8	30	12	aim to equip learners with the knowledge, skills, and competencies required to effectively assess, improve, and maintain data quality in AI-driven environments as Data Quality Analysts.
CDS8	Projects/Internship	4	100	–	–	100	40	–	–	Practical experience through project/internship

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
800	320

Details Syllabus

Semester-1

CDS 1 - Introduction to Data Science

Module 1:

Introduction to core concepts and technologies: Introduction Terminology, data science process, Data science toolkit, Types of data, Example applications, Data formats, Parsing and transformation, Scalability and real-time issues. Tableau, Excel, Matplotlib, NumPy, Pandas.

Module 2:

Data collection and management: Introduction, Sources of data, Data collection and APIs. Exploring and fixing data. Data storage and management, using multiple data sources.

Module 3:

Data analysis: Introduction, Terminology and concepts. Introduction to statistics Variance, Distribution properties and arithmetic Samples/CLT, Basic machine learning algorithms, linear regression, SVM, Naive Bayes.

Module 4:

Data Visualization: Introduction, Types of data visualization, Data for visualization, Data types, Data encodings, Retinal variables, mapping variables to encodings. Visual encodings.

Module 5:

Applications of Data Science Technologies for visualization, Bokeh (Python) Recent trends in various data collection and analysis techniques various visualization techniques, application development methods of used in data science.

CDS 2 - Mathematical Foundations for Data Science

Module 1:

Descriptive and Inferential Statistics, Measures of central tendency: Arithmetic Mean, Median and Mode, Geometric mean, Harmonic Mean and Partition values.

Module 2:

Measures of dispersion: Dispersion, Range, Quartile Deviation, Mean deviation, Standard Deviation, Variance and Coefficient of Dispersion.

Module 3:

Skewness, Kurtosis, Moments, Measure of skewness and kurtosis, Introduction and definition of Probability, Event, Sample Space, Law of addition and multiplication of Probabilities and Conditional Probability. Independent and Dependent events, Bayes' theorem, Mathematical Expectations and Moment generating functions.

Module 4:

Theoretical Distribution: Discrete Distribution- Binomial Distribution and Poisson distribution. Continuous Distribution –Rectangular and Normal distribution. Curve fitting: Curve fitting and Methods of Least square, fitting a Straight line and a Parabola.

Module 5:

Correlation and Regression: Correlation, Coefficient of Correlation, Rank Correlation, Lines of Regression. Multiple and Partial Correlation. Null and Alternative hypothesis, two types of errors, level of significance and power of the test.

CDS 3 - Storytelling with data

Module 1:

Probability spaces, conditional probability, independence; Discrete random variables, Independent random variables, Expectation of Discrete Random Variables, Moments, Variance of a sum, Correlation coefficient, Chebyshev's Inequality.

Module 2:

the multinomial distribution, Poisson approximation to the binomial distribution, infinite sequences of Bernoulli trials, sums of independent random variables, Data Cleaning: Consistency checking, Heterogeneous and missing data, Data Transformation and Segmentation

Module 3:

Probability mass density and cumulative distribution functions. Parametric families of distributions, expected value, Time series, Geo located data, Correlations and Connections, Hierarchies and networks, interactivity.

Module 4:

Variance, conditional expectation, Applications of the univariate and multivariate Central Limit Theorem, Probabilistic inequalities, Markov chains.

Module 5:

Continuous Probability Distributions: Continuous random variables and their properties, distribution functions and densities, normal, exponential and gamma densities.

CDS 4 - Python Essentials, Data Manipulation and Visualization

Module 1:

Introduction to python language, Basic syntax, Literal Constants, Numbers, Variable and Basic data types, String, Escape Sequences, Operators and Expressions, Evaluation Order, Indentation, Input, Output, Functions, Comments.

Module 2:

Data Structure: List, Tuples, Dictionary, DataFrame and Sets, constructing, indexing, slicing and content manipulation.

Module 3:

Control Flow: Conditional Statements - If, If-else, Nested If-else. Iterative Statement - For, While, Nested Loops. Control statements - Break, Continue, Pass.

Module 4:

Object oriented programming: Class and Object, Attributes, Methods, Scopes and Namespaces, Inheritance, Overloading, Overriding, Data hiding, Exception: Exception Handling, except clause, try finally clause, User Defined Exceptions.

Module 5:

Modules and Packages: Standard Libraries: File I/0, Sys, logging, Regular expression, Date and Time, Network programming, multi-processing and multithreading.

CDS 5 - Safety Practices in the Work Environment

Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 -- Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3- Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5- Common Food Borne Diseases & Infections

CDS 6 - Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

CDS 7 SSC/N8101 AI -Data Quality Analyst

Module 1 Introduction to Data Quality Analysis and AI

- Understanding the significance of data quality in AI applications
- Overview of data quality dimensions and metrics
- Introduction to AI technologies for data quality analysis

Module 2Data Profiling and Assessment Techniques

- Techniques for data profiling and exploratory data analysis
- Identification of data quality issues and anomalies
- Utilizing statistical methods and visualization tools for data assessment

Module 3Data Cleansing and Preprocessing

- Strategies for data cleansing and preprocessing
- Handling missing values, outliers, and inconsistencies
- Implementing data transformation techniques for improving data quality
- Module 4AI Approaches to Data Quality Assurance
- Application of machine learning algorithms for data quality assessment
- Automated data validation and error detection using AI models
- Integration of AI-driven data quality solutions into existing workflows

Module 5Advanced Topics in Data Quality Analysis

- Addressing data quality challenges in big data and real-time environments
- Exploring emerging trends and technologies in data quality assurance
- Case studies and practical projects demonstrating the application of AI in data quality analysis

CDS 8 - Projects/Internship

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CDS1	Introduction to Data Science	3	90	12	33	18	27
2	CDS2	Mathematical Foundation for Data Science	2	60	08	22	12	18
3	CDS3	Storytelling with data	2	60	08	22	12	18
4	CDS4	Python Essentials, Data Manipulation and Visualization	2	60	08	22	12	18
5	CDS5	Safety Practices in the Work Environment	1	30	04	11	06	09
6	CDS6	Communication and Personality Development	1	30	04	11	06	09
7	CDS7	SSC/N8101 AI -Data Quality Analyst	2	60	08	22	12	18
8	CDS8	Projects/Internship	5	150	-	-	150	-

STUDY MODULES & BOOKS INFORMATION

S.No	Course Code	Course Name	Module Used
1	CDS 1	Introduction to Data Science	"Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython" by Wes McKinney. The book is published by O'Reilly Media.
2	CDS 2	Mathematical Foundation for Data Science	Statistics for Machine Learning, Himanshu Singh, BPB Publications
3	CDS 3	Storytelling with Data	"Storytelling with Data: A Data Visualization Guide for Business Professionals" by Cole Nussbaumer Knaflic. The book is published by Wiley.
4	CDS 4	Python Essentials, Data Manipulation and Visualization	Python Data Science Handbook, Jake VanderPlas, O'Reilly Media
5	CDS 5	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
6	CDS 6	Communication and Personality Development	Effective – 68 Communication & Personality Development
7	CDS 7	SSC/N8101 AI -Data Quality Analyst	-
8	CDS 8	Projects/Internship	-

CERTIFICATE IN CYBER SECURITY (CCS)

Certificate in Cyber Security (CCS)

सर्टिफिकेट इन सायबर सिक्यूरिटी (CCS)

(A) Duration : 6 Months (D) Courses : 8

(अ) अवधि : 6 माह (द) कोर्सेस : 8

(B) Eligibility : 10th Pass (E) Credit : 20

(ब) पात्रता : 10वीं पास (द) कोर्सेस : 20

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
CCS1	Introduction to Cyber Security & Computer Programming	2	100	50	20	20	8	30	12	• Knowledge of Cyber Security
CCS2	Digital Communication & Computer Networks	3	100	50	20	20	8	30	12	• Knowledge of Data Communications, Understanding of Data, Transmission Modes
CCS3	Fundamentals of Windows NT & Linux Operating System	3	100	50	20	20	8	30	12	• Knowledge of Windows NT, Understanding of Networking with Windows NT Server 4.0 Windows NT System Architecture
CCS4	SSC/N0925 QP_IT_Penetration-Tester	3	100	50	20	20	8	30	12	• Deep understanding of IT security concepts and technologies, as well as a strong ability to identify and

										exploit vulnerabilities in IT systems and applications.
CCS5	Python Programming for Cyber Security	3	100	50	20	20	8	30	12	• Knowledge of Python Programming Why Python is Better for Cybersecurity
CCS6	Digital and Financial Literacy	2	100	50	20	20	8	30	12	• Get familiar with major financial schemes of government
CCS7	Safety Practices in the Work Environment	2	100	70	28	–	–	30	12	• Familiarity with safety practices at workplace, • Knowledge about various Hazards and their remedies, • Ensure clean , dust free and organized working environment, knowledge of primary first aid for any accidental situation , understand about personal health and hygiene.
CCS8	Project/ Internship	2	100	–	–	100	40	–	–	• Practical experience through project/internship

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
800	320

Details Syllabus

Semester – I

CCS 1 - Introduction to Cyber Security and Computer Programming

Acquaint with cyber security and computer programming basic concepts

Module 1: Cyber Security Fundamentals

What is cyber space?, what is cyber security?, concepts of cyber security ,OSI/TCP-IP model, Layers of cyber security (Mission critical assets, data security, application security, endpoint security, network security, perimeter security, the human layer)

Module 2: Cyber Threats

Understanding of cyber threats, know about governance idea about CIA triad and crimes, motive of attackers, understanding different attacks, what is cybercrime, knowledge of cyber security policies.

Module 3: Cyber Law and Regulation

Regulation of cyber space, what is the need for regulation of cyber space, how cyberspace can be regulated, legal and self-regulatory framework, understanding of international cyber law, other legislation like UETA, UCITA, HIPPA, GDPR, regulation of cyberspace in India, IT Act 2000, OECD

Module 4: Computer Programming Basics

What is computer?, What is program?, Variables & Syntax, Data types, flow control structures, why do we need to learn any programming language?, Programming methods, what is an algorithm?, Most popular programming language.

Module 5: Cyber Forensics

The cyber security policies, history of cyber forensics, what is forensics science?, Understanding of forensics analysis, the digital forensics lifecycle, idea of forensics investigation, knowing challenges in computer forensics. Data recovery.

CCS 2 - Digital Communication & Computer Networks

Module 1: Digital Communications

Knowledge of data communication, understanding of data, Transmission modes, simplex, half-duplex, full duplex, knowledge of network categories, LAN, WAN, MAN, PAN, Understanding of physical structures, Knowledge of network topology, Bus topology, ring topology, star topology, tree topology etc.

Module 2: Analog and Digital Communication

Understanding of analog and digital transmission impairment, Data rate limits, Multiplexing, knowledge of transmission media, understanding of switching, data transmission and modes, OSI model, TCP/IP protocol suite (Application layer, Presentation layer, Session layer, Transport layer, Network layer, Data link layer, Physical layer)

Module 3: Internet Infrastructure and Protocols

Infrastructure of internet (technical overview), Computer network building blocks, node identifier, network interface controller, media, interconnected devices, network areas of coverage, ISP technologies, Design goal of DNS, overview of internet governance, networking protocols, IP, Ethernet, http, smptp, tcp, udp, pop3, imap.

Module 4: Network Attacks and Vulnerabilities

What is network attacks?, Types of attacks, malware, worm, DoS, DDoS, bandwidth flooding, connection flooding, Packet sniffing, IP spoofing, ARP poisoning, Man-in-the-Middle Attack, compromised-key attack, phishing, DNS spoofing, network vulnerabilities & threats, unpatched software, weak passwords, open ports, unsecured API, misconfigurations

Module 5: Network Security

Understanding of connecting devices internet protocol address, know common network applications, knowledge of computer security concepts, OSI security architecture, knowledge of security attacks, understanding of model for network security

CCS 3 - Fundamentals of Windows and Linux OS

Module 1: OS Basics

Introduction to Operating Systems, Functionalities of OS, memory management, processor management, device management, file management, other important activities, Difference between applications and OS, Difference between 32-bit and 64-bit OS, Different types of mobile OS, Compatibility between Oss,

Module 2: Windows Essentials

Origin of windows, different versions of windows, prerequisites, network sharing, windows deployment services, Types of installation, different boot options in windows, Basic commands you should know, understanding file types, File allocation table, NTFS, Basic network configuration, Account settings, Understanding windows security basics

Module 3: Linux Essentials

Exploring different Linux distributions, Prerequisites and compatibility, understanding different boot process, BIOS, MBR, GRUB, Kernel Init, Runlevel, Knowledge of basic terminal and bash commands, Repositories and packages of Linux, rpm and dpkg, understanding file system, walkthrough basic network configuration, Linux NFS server, running a simple local HTTP server, understanding users and permissions, Network connectivity & troubleshooting

Module 4: Virtualization Basics

Basics of virtualization, what is hypervisor, Types of hypervisor, what is cloud hypervisor, how does hypervisor work, container vs hypervisor, need & benefits of virtualization, disadvantages of virtualization, hands on Vitualbox workstation

Module 5: Basic Concept of Web

Overview of web technology, mark-up languages, the internet and world wide web, terminology of web technology, web page, HTML, Web Server, URL, Protocol, IP address, HTTP, XML gateway API etc, Web components, Different web technologies, XML, CSS, JavaScript, PHP, ASP.net Perl

CCS 4 - SSC/N0925 QP_IT_Penetration-Tester

Module 1: Understanding Customer Requirements and Project Scope

Consult with customers to evaluate functional requirements for network security

Define project scope and objectives based on customer requirements

Confirm availability of complete and accurate details of the security objectives

Module 2: Assessing Existing Network Infrastructure and Security Measures

Evaluate the existing network protocols and topology of users

Review the usage of existing network security measures and assess risks with respect to security objectives

Consult with engineering teams engaged in IT networking and network security to identify network security vulnerabilities and requirements

Module 3: Technical Risk Analysis and Solution Identification

Conduct technical risk analysis and threat identification of the existing network security measures

Identify the level of risk acceptable for business requirements by discussing with business and technical leads

Research relevant information required to meet the security objectives based on the evaluation of assets, threats, vulnerabilities, and security risks

Module 4: Security Solutions Evaluation and Recommendation

Identify and record details of constraints that may impact the business and security options

Explore potential vulnerabilities and categorize them based on their extent and root cause

Research options of network security solutions that match productivity and security requirements and gather sufficient accurate information on potential costs, benefits, and effectiveness

Module 5: Solution Implementation, Evaluation and Maintenance

Determine the cost, potential benefits, and effectiveness of recommended security solutions

Prepare recommendations to meet the security objectives of the organization and provide details of costs, benefits, effectiveness, limitations, and constraints

Coordinate with equipment manufacturers or solution providers for troubleshooting and enhancements to existing solutions

Evaluate ways and means of closing weaknesses in the network and maintain logs for all activities performed

CCS 5 -Python Programming for Cyber Security

To make learners understand and implement python in cyber security, which libraries needed for hacking?

Module 1: Python Basics for Hacking

Basics of python programming, Python syntax, data types, control structures, and functions, why python is better for cyber security, knowledge of environment setup data structures in python

Module2: Setting Up the Development Environment

Installing anaconda or visual studio code, set up git hub, setup windows environment, sample python scripts, debugging python scripts

Module 3: Python Libraries for Hacking

Some useful python libraries for hacking, Scapy, Nmap and Metasploit, knowledge of python libraries for data analysis, pandas, understanding of accessing code samples Installing packages scanning networks with scapy, to know performing a DNS scan in scapy

Module 4: More Python Libraries for Advance Hacking

Understanding of network scanning for defenders offensive DNS exploration, know the handling of DNS requests, discovering default accounts, starting SSH connections in python, Account monitoring for defenders, understanding requests library, IMpacket, pwntools, Faker, twisted, pylibnet

Module 5: Practice with Python Hacking Tools

Black hat python, penetration testing with python, Violent python, creating port scanner with python, participate in different hacking platforms, TryHackMe, VulnHub etc.

CCS 6- Digital and Financial Literacy

Module 1: Introduction to Digital and Financial Literacy

Understanding the importance of digital and financial literacy in today's world

Basic concepts of digital technology and financial management

Exploring digital tools and resources for financial management

Module 2: Digital Tools and Skills for Financial Management

Introduction to digital banking services and online financial platforms

Basic skills for managing bank accounts, transactions, and online payments securely

Using budgeting apps and digital tools to track expenses, set financial goals, and manage personal finances effectively

Module 3: Understanding Financial Products and Services

Overview of different types of financial products and services (e.g., savings accounts, credit cards, loans)

Understanding interest rates, fees, and terms associated with financial products

Evaluating and comparing financial products to make informed decisions

Module 4: Financial Planning and Goal Setting

Importance of financial planning in achieving short-term and long-term financial goals

Creating a personal budget and managing income and expenses effectively

Setting SMART (Specific, Measurable, Achievable, Relevant, Time-bound) financial goals and developing a plan to achieve them

Module 5: Responsible Financial Behavior and Risk Management

Understanding the risks associated with financial decisions and investments

Practicing responsible financial behavior, including saving, budgeting, and avoiding debt

Identifying common financial scams and frauds and practicing online security measures to protect personal and financial information

CCS 7 - Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Chapter 3 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3- Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5- Common Food Borne Diseases & Infections

CCS 8 - Project/ Internship

Counselling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CCS1	Introduction to Cyber Security & Computer Programming	3	90	12	33	18	27
2	CCS2	Digital Communication & Computer Networks	2	60	08	22	12	18
3	CCS3	Fundamentals of Windows NT & Linux Operating System	2	60	08	22	12	18
4	CCS4	SSC/N0925 QP_IT_Penetration-Tester	3	90	12	33	18	27
5	CCS5	Python Programming for Cyber Security	3	90	12	33	18	27
6	CCS6	Digital and Financial Literacy	2	60	08	22	12	18
7	CCS7	Safety Practices in the Work Environment	1	30	04	11	06	09
8	CCS8	Project/ Internship	5	150	-	-	150	-

Study Modules & Books Information

S.No	Course Code	Course Name	Module Used
1	CCS 1	Introduction to Cyber Security & Computer Programming	**Hacking: The Art of Exploitation,** Jon Erickson, No Starch Press
2	CCS 2	Digital Communication & Computer Networks	**Advanced Penetration testing,** Wil Allsopp, Wiley
3	CCS 3	Fundamentals of Windows NT & Linux Operating System	**The Art of Invisibility,** Kevin Mitnick, Little, Brown and Company
4	CCS 4	SSC/N0925 QP_IT_Penetration-Tester	-
5	CCS 5	Python Programming for Cyber Security	**Ghost in the wires**, Kevin Mitnick, Back Bay Books; Illustrated edition
6	CCS 6	Digital and Financial Literacy	**Digital Literacy for Dummies" by Faithe Wempen**
7	CCS 7	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
8	CCS 8	Project/ Internship	-

CERTIFICATE IN APP DEVELOPMENT (CAD)

Certificate in App Development (CAD)

सर्टिफिकेट इन एप डेवलपमेंट (CAD)

(A) Duration : **6 Months** **(D) Courses** : **9**

(अ) अवधि : 6 माह (द) कोर्सेस : 9

(B) Eligibility : **10th Pass** **(E) Credit** : **20**

(ब) पात्रता : 10वीं पास (द) क्रेडिट : 20

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
CAD1	Fundamentals of Website design	2	100	50	20	30	8	30	12	• Basic knowledge of Web designing and Market value
CAD 2	Basics of HTML	2	100	50	20	30	8	30	12	• All tags and structure of HTML
CAD 3	CSS	2	100	50	20	30	8	30	12	• Styling on HTML tags ,about inline, internal or external CSS Styling Processes
CAD 4	BOOTSTRAP	2	100	50	20	30	8	30	12	• Bootstrap use for making quick website components
CAD 5	JAVASCRIPT	2	100	50	20	30	8	30	12	• Understanding of JavaScript Platform backend programming, Event handling, DOM, BOM
CAD 6	Web developer 1DWD6 - SSC/Q0503	2	100	50	20	30	8	30	12	• Understanding JavaScript Platform backend programming, Learn Event handling, DOM, BOM
CAD 7	React Java script library	2	100	50	20	30	8	30	12	• Learn React to master latest frontend using single page application.

CAD 8	Communication and Personality Development	2	100	70	28	–	–	30	12	• Understand reading and writing skills to be able to read and write various instruction.
CAD 9	Project/ Internship	4	100	–	–	100	40	–	–	• Practical experience through project/internship

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
900	360

Details Syllabus

Semester I

CAD 1 - Fundamental of Website design

Module 1

Introduction to Website Design: What is website design?, The importance of website design, Historical perspectives on website design, Trends and best practices in website design, Principles of design theory, including balance, contrast, unity, and proportion, Layout design, including the use of grids, columns, and modules, Visual hierarchy, including the use of size, colour, and contrast to guide the user's eye, Composition, including the use of whitespace, proximity, and alignment to create effective layouts.

Module 2

Typography: Typography principles, including font families, sizes, and styles, choosing fonts for different types of content, including body text, headlines, and navigation, Web typography best practices, including the use of web-safe fonts and font pairing techniques. Colour Theory: Colour theory principles, including colour harmony, contrast, and saturation, choosing colour schemes for different types of websites, including monochromatic, complementary, and analogous schemes, Colour psychology and the use of colour to create emotional impact.

Module 3

User Experience Design: User-centered design principles, including the use of personas and user stories, Effective navigation design, including the use of menus, breadcrumbs, and search Information architecture, including the use of site maps and wireframes Accessibility and usability, including the use of alt tags, semantic HTML, and responsive design principles.

Module 4

Responsive Design: Principles of responsive design, including fluid grids, flexible images, and media queries, creating flexible layouts and images that adjust to different screen sizes Designing for different devices, including desktop, tablet, and mobile, Mobile-first design and the use of progressive enhancement and graceful degradation techniques.

Module 5

Design Tools and Technologies: HTML and CSS basics, including the use of selectors, properties, and values, Design tools, including Adobe Creative Suite, Sketch, and in Vision, Web design frameworks and libraries, including Bootstrap, Foundation, and Material Design.

CAD 2 - Basics of HTML

Module 1

Introduction to HTTP, HTML, Basic HTML Tags, Body Tags, Coding Style, Modifying & formatting Text.

Module 2

Lists – Unordered, Ordered, Definition, Insert Links -Linking to another Document, Internal Links, Email Links, Relative and Absolute Links.

Module 3

Insert Images - Referencing Images, Clickable Images, Image Placement and Alignment, Image Size, Image Margins, Image Formats, Image Maps- Defining an Image Map, Advanced Coloring Body Content.

Module 4

Working with tables - Basic Tables, Table Attributes, Table Cell Attributes, Table Row Attributes, Tables Inside of Tables.

Module 5

Working with Frame-Based Pages Creating Windows, Single Window Frames, Creating Column Frames, Creating Row Frames, Creating Complex Frames.

CAD 3 - CSS

Module 1

Introduction to CSS**,** what is CSS? History and evolution of CSS. How CSS works with HTML and web browsers. Basic syntax and structure of CSS code. CSS selectors and properties.

Module 2

CSS Box Model and Layout, Understanding the box model. Box model properties (padding, border, margin). Block-level and inline-level elements. Display and positioning properties. CSS layout techniques (float, flexbox, grid).

Module 3

Typography and Colours in CSS, Font properties (font-family, font-size, font-style, etc.). Text properties (colour, text-align, text-decoration, etc.). CSS units of measurement (px, em, rem, %, etc.). Understanding colour in CSS (colour values, colour schemes). Background properties.

Module 4

Responsive Web Design with CSS, understanding responsive design, Media queries and viewport meta tag, Responsive units (vw, vh, vmin, vmax), Responsive images (srcset, sizes), Mobile-first design approach.

Module 5

Advanced CSS Topics, CSS preprocessors (Sass, Less, Stylus). CSS frameworks (Bootstrap, Foundation, Bulma), CSS animations and transitions, CSS variables (custom properties), CSS methodologies (BEM, SMACSS, OOCSS).

CAD 4 - Bootstrap

Module 1

Introduction to Bootstrap, what is Bootstrap? History and evolution of Bootstrap, Advantages of using Bootstrap in web development, Basic setup and installation of Bootstrap, Understanding the Bootstrap grid system.

Module 2

Bootstrap Components, Typography and text utilities, Buttons and forms, Navigation and menus, Images and media, Cards and alerts.

Module 3

Layout with Bootstrap, understanding containers, rows, and columns, building responsive layouts with Bootstrap, understanding breakpoints and media queries, creating fluid and fixed layouts, Working with the Bootstrap grid system.

Module 4

Customizing Bootstrap**,** Theming Bootstrap with CSS, Customizing colors and fonts, Overriding Bootstrap default styles, Using Sass with Bootstrap, Customizing and extending Bootstrap components.

Module 5

Advanced Bootstrap Topics**,** Bootstrap JavaScript components (carousel, modal, accordion, etc.), Working with Bootstrap icons and typography, Integrating Bootstrap with other frameworks and libraries, Best practices for using Bootstrap in web development, building a responsive website using Bootstrap.

CAD 5 - JavaScript

Module 1

Introduction to JavaScript, what is JavaScript? History and evolution of JavaScript. How JavaScript works with HTML and web browsers Basic syntax and structure of JavaScript code. Variables, data types, and operators

Module 2

Control Flow and Functions in JavaScript, Conditional statements (if, else, switch). Loop statements (for, while, do-while). Functions and function calls. Parameters and arguments. Scope and closures.

Module 3

Working with the DOM and Events, Understanding the Document Object Model (DOM). Selecting and manipulating elements with JavaScript. Responding to user events (click, hover, submit). Event listeners and handlers. Creating dynamic content with JavaScript.

Module 4

Advanced JavaScript Topics, Object-oriented programming (OOP) in JavaScript. Prototypes and inheritance. Error handling and debugging. Asynchronous programming with callbacks, promises, and async/await. JavaScript libraries and frameworks (jQuery, React, Vue)

Module 5

JavaScript for Web Development, Ajax and fetch requests. Working with JSON data. Browser storage (cookies, local storage, session storage). Working with APIs. JavaScript and modern web development tools (Webpack, Babel, ESLint).

CAD 6 – Web Developer 1DWD6 - SSC/Q0503

Module 1: Introduction to Web Development

- Understanding the Internet and the World Wide Web
- Basics of HTML: Structure, Tags, and Elements
- Introduction to CSS: Styling HTML Elements
- Basics of JavaScript: Variables, Data Types, and Operators

Module 2: Frontend Development

- Advanced HTML: Forms, Tables, Semantic HTML
- Advanced CSS: Flexbox, Grid Layout, Responsive Design
- JavaScript DOM Manipulation: Selecting Elements, Event Handling
- Introduction to Frontend Frameworks: React.js or Vue.js

Module 3: Backend Development

- Introduction to Backend Development: Server, Client, Request, Response
- Setting Up a Development Environment: Node.js, Express.js
- Working with Databases: MySQL, MongoDB
- Building RESTful APIs: Routing, Middleware, Authentication

Module 4: Full Stack Development

- Integrating Frontend and Backend: Consuming APIs
- Authentication and Authorization: User Authentication, JWT
- Deployment Basics: Hosting Options, Server Configuration
- Version Control with Git: Branching, Merging, Pull Requests

Module 5: Advanced Topics in Web Development

- Performance Optimization: Minification, Compression, Caching
- Testing and Debugging Strategies: Unit Testing, Integration Testing
- Security Best Practices: XSS, CSRF, SQL Injection
- Introduction to Progressive Web Apps (PWAs) and Single Page Applications (SPAs)

CAD 7- React Java Script Library

Module 1: Introduction to React

- Overview of React and its role in web development
- Setting up development environment with Node.js and npm
- Understanding JSX syntax
- Creating your first React component
- Handling events and state in React components

Module 2: Component Architecture in React

- Deeper dive into React components and props
- Working with component lifecycle methods
- Managing component state effectively
- Composing complex UIs with reusable components
- Best practices for component architecture and organization

Module 3: React Router and Navigation

- Introduction to React Router for client-side routing
- Setting up routes and navigation in React applications
- Nested routes and dynamic route matching
- Programmatic navigation and URL parameters
- Implementing protected routes and authentication flows

Module 4: State Management with Redux

- Understanding the need for state management in complex applications
- Introduction to Redux and its core principles
- Setting up Redux store and reducers
- Managing application state with actions and selectors
- Integrating Redux with React components

Module 5: Advanced React Topics

- Performance optimization techniques in React applications
- Server-side rendering with React

- Testing React components with Jest and React Testing Library
- Working with React Hooks for functional components
- Exploring advanced topics like context API, error boundaries, and suspense

CAD 8- Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

CAD 9 - Project/ Internship

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CAD1	Fundamentals of Website design	2	60	08	22	12	18
2	CAD 2	Basics of HTML	2	60	08	22	12	18
3	CAD 3	CSS	2	60	08	22	12	18
4	CAD 4	BOOTSTRAP	2	60	08	22	12	18
5	CAD 5	JAVASCRIPT	2	60	08	22	12	18
6	CAD 6	Web developer 1DWD6 - SSC/Q0503	2	60	08	22	12	18
7	CAD 7	React Java script library	2	60	08	22	12	18
8	CAD 8	Communication and Personality Development	2	60	08	22	12	18
9	CAD 9	Project/ Internship	4	120	-	-	120	-

Study Modules & Books Information

S.No	Course Code	Course Name	Module Used
1	CAD1	Fundamentals of Website Design	**Learning Web Designing,** Jennifer Niederst Robbins, O'Reilly Media
2	CAD 2	Basics of HTML	HTML and CSS: Design and Build Websites**, Jon Duckett, John Wiley & Sons**
3	CAD 3	CSS	"CSS: The Definitive Guide" by Eric Meyer and Estelle Weyl, published by O'Reilly Media.
4	CAD 4	BOOTSTRAP	"Bootstrap 4: Exploring Basic Concepts, Techniques, and Templates" by Aravind Shenoy, published by Packt Publishing**.**
5	CAD 5	JAVASCRIPT	"JavaScript: The Definitive Guide" by David Flanagan, published by O'Reilly Media**.**
6	CAD 6	Web developer 1DWD6 - SSC/Q0503	Eloquent JavaScript" by Marijn Haverbeke
7	CAD 7	React Java script library	React Up and Running" by Stoyan Stefanov
8	CAD 8	Communication and Personality Development	Effective – 68 Communication & Personality Development
9	CAD 9	Project/ Internship	-

CERTIFICATE IN COMPUTER PROGRAMMING (CCP)

Certificate in Computer Programming (CCP)

डिप्लोमा इन कम्प्यूटर प्रोग्रामिंग (CCP)

(A) Duration : 6 Months (D) Courses : 7

(अ) अवधि : 6 माह (द) कोर्सेस : 7

(B) Eligibility : 10th Pass (E) Credit : 16

(ब) पात्रता : 10वीं पास (द) केडिट : 16

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
CCP1	Fundamental of Programming	3	100	50	20	20	8	30	12	• Basics of Programming and Structures
CCP 2	C Language	2	100	50	20	20	8	30	12	• Learn C programming structure basics commands
CCP 3	C++Language	2	100	50	20	20	8	30	12	• Understand Data and structure for programming structure
CCP 4	Python Language	2	100	50	20	20	8	30	12	• Understand Object Programming Structure, programs to create instances
CCP 5	Safety Practices in the Work Environment	1	100	50	20	20	8	30	12	• Familiarity with safety practices at workplace, • Knowledge about various Hazards and their remedies,

										• Ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene.
CCP 6	Communication and Personality Development	1	100	70	28	–	–	30	12	• Understand reading and writing skills to be able to read and write various instruction.
CCP 7	Project/ Internship	5	100	–	–	100	40	–	–	• Practical experience through project/internship

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
700	280

Details Syllabus

Semester I

CCP 1 - Fundamental of Programming

Module 1:

Basic Understanding of Programming Methodology, Introduction, Algorithm, Stepwise Refinement Techniques, Programming Style, Procedural Programming, Modular Programming, Top- down modular programming, Bottom-Up modular programming, Structured Programming, Object Oriented Programming, Analysis of Algorithm, Space Complexity, Time Complexity, Frequency Count, Growth of Functions and Asymptotic Notation, Big-O Notation, Big-Ω notation, Big-Θ notation

Module 2:

Algorithm Instructions, Flowchart Symbols, and Pseudocode, The Sequential Logic Structure, Problem Analysis

Module 3:

Problem Solving with Decisions, The Decision Logic Structure, Multiple If/Then/Else Instructions, Using Straight-Through Logic, Using Positive Logic, Using Negative Logic, Logic Conversion, The Case Logic Structure

Module 4:

Problem Solving with Loops, The Loop Logic Structure, Incrementing, Accumulating, While/While End, Repeat/Until, Automatic-Counter Loop, Indicators, Recursion.

Module 5:

Processing Arrays, Arrays, One-Dimensional Arrays, Two-Dimensional Arrays, Multidimensional Arrays

CCP 2 - C Language

Module 1:

Introduction, Characteristics of C, Current Uses of C, Format of C Program, Character Set, C tokens, Keywords and identifiers, Constants, Variables, Data types, Declaration of variables. Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expression, Evaluation of Expression, Precedence of Arithmetic Operators, Type Conversion in Expressions, Operators Precedence and Associatively.

Module 2:

Decision Making with If Statements, Simple If Statements, The If Else Statements, Nesting of Else Statements, The Else If Ladder, The Switch Statement, The?: Operator, The Goto Statement. The While Statement, The Do Statement, The for Statement, Jumps in Loops.

Module 3:

One Dimensional Arrays, Declaration of One Dimensional Array, Initialization of One Dimensional Array, Two-Dimensional Arrays, Declaration of Two Dimensional Arrays, Initialization of Two Dimensional Arrays, Example Programs.

Module 4:

Category of Functions, No Arguments and No Return Values, Arguments but No Return Values, Argument with Return Values, No Argument but Returns a Value, Function that Return Multiple Values. Need for User-Defined Function, A Multi-Function Program, Elements of User Defined

Functions, Definition of Functions, Return Values and Their Types, Function Calls, Function Declaration.

Module 5:

Understanding Pointers, Accessing the Address Space of a Variable, Declaring and Initialization Pointer Variables, Accessing a Variable through its Pointers, Structure and Unions. Different File Management Operations in C.

CCP - 3 C++Language

Module 1:

Basic concepts: Introduction to data structures, classification of data structures, operations on data structures, abstract data type, algorithms, different approaches to design an algorithm, recursive algorithms; Searching techniques: Linear search, binary search and Fibonacci search; Sorting techniques: Bubble sort, selection sort, insertion sort, quick sort, merge sort, and comparison of sorting algorithms.

Module 2:

Linear Data Structures: Stacks: Primitive operations, implementation of stacks using Arrays, applications of stacks arithmetic expression conversion and evaluation; Queues: Primitive operations; Implementation of queues using Array, applications of linear queue, circular queue and double ended queue (DEQUE).

Module 3:

Linked lists: Introduction, singly linked list, representation of a linked list in memory, operations on a Single linked list; Applications of linked lists: Polynomial representation and sparse matrix manipulation. Types of linked lists: Circular linked lists, doubly linked lists; Linked list representation and operations of Stack, linked list representation and operations of queue.

Module 4:

Non Linear Data Structures: Trees: Basic concept, binary tree, binary tree representation, array and linked representations, binary tree traversal, binary search tree, tree variants, application of trees; Graphs: Basic concept, graph terminology, graph implementation, graph traversals, Application of graphs, Priority Queue.

Module 5:

Binary search trees: Binary search trees, properties and operations; Balanced search trees: AVL trees; Introduction to M - Way search trees, B trees; Hashing and collision: Introduction, hash tables, hash functions, collisions, applications of hashing.

CCP 4 - Python Language

Module 1:

Introduction to object oriented programming: procedure oriented programming(pop) vs object oriented programming(OOP), Object oriented programming paradigm, Basic concepts of object oriented programming, Benefits of object oriented programming, Applications of OOP.

Module 2:

Basics of C++ language, about C++, structure of C++ program, C++ data types, datatype modifiers, variables in C++, Types of variables, basic input / output in C++, loops in C++, Decision making in C++ (if, if. Else, nested if, if-else-if, switch), Break, continue and goto statements, C++ environment setup, Operators in C++, operator precedence chart, specifying a class, defining member functions, types of member functions Static data members and static member's functions, Object as function arguments, friendly functions.

Module 3:

Constructors, destructors, Operator overloading-operator and function overloading, Inheritance in C++, types of inheritance Ambiguity in multiple inheritance (diamond problem in C++) Pointers in C++, pointers expression and pointer arithmetic Using pointers with arrays and strings, C++ pointers and strings, Pointers to derived classes.

Module 4:

Array in C++, Why Do We Need Arrays? Declaring an Array in C++, Initializing Arrays, C++ Array with Empty Members, Accessing Array Elements, Advantages of an Array in C++, Disadvantages of an Array in C++, Multidimensional Arrays, how are Pointers Related to Arrays? Vector in C++, Advantages of Vector over Array in C++, String in C++, Different Ways of Defining a String, Taking String Input, Concatenation of Strings.

Module 5:

File handling in C++, classes for file stream operators, Opening and closing a file, checking for eof(), file modes- get( ) and put( ) functions, Binary files – write( ) and read( ) functions, error handling, Exception handling in C++.

CCP 5– Safety Practices in the Work Environment

Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Chapter 3 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3 - Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5 - Common Food Borne Diseases & Infections

CCP 6 - Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

CCP 7 - Project/Internship

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CCP1	Fundamental of Programming	3	90	12	33	18	27
2	CCP 2	C Language	2	60	08	22	12	18
3	CCP 3	C++Language	2	60	08	22	12	18
4	CCP 4	Python Language	2	60	08	22	12	18
5	CCP 5	Safety Practices in the Work Environment	1	30	04	11	06	09
6	CCP 6	Communication and Personality Development	1	30	04	11	06	09
7	CCP 7	Project/ Internship	5	150	-	-	150	-

STUDY MODULES & BOOKS INFORMATION

S.No	Course Code	Course Name	Module Used
1	CCP1	Fundamental of Programming	"Code Complete" by Steve McConnell, published by Microsoft Press
2	CCP 2	C Language	"The C Programming Language" by Brian W. Kernighan and Dennis M. Ritchie. Publisher: Prentice Hall
3	CCP 3	C++Language	C++ Primer" by Stanley B. Lippman, Josée Lajoie, and Barbara E. Moo, published by Addison-Wesley Professional.
4	CCP 4	Python Language	"Learning Python, 5th Edition" by Mark Lutz, published by O'Reilly Media.
5	CCP 5	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
6	CCP 6	Communication and Personality Development	Effective – 68 Communication & Personality Development
7	CCP 7	Project/ Internship	-

CERTIFICATE IN BIG DATA (CBD)

Certificate in Big Data (CBD)

सर्टिफिकेट इन बिग डाटा (CBD)

(A) Duration : 6 Months **(D) Courses : 8**

(अ) अवधि : 6 माह (द) कोर्सेस : 8

(B) Eligibility : 10th Pass **(E) Credit : 20**

(ब) पात्रता : 10वीं पास (द) क्रेडिट : 20

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
CBD1	Data Introduction	3	100	50	20	20	8	30	12	Data Introduction
CBD2	Apache Spark	3	100	50	20	20	8	30	12	Introduction to Apache Spark
CBD3	Introduction to Scala for Apache Spark	2	100	50	20	20	8	30	12	Introduction to Scala for Apache Spark
CBD4	What is Big Query?	2	100	50	20	20	8	30	12	What is Big Query?
CBD5	Safety Practices in the Work Environment	2	100	50	20	20	8	30	12	Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, Ensure clean , dust free and organized working environment, knowledge of primary first aid for any accidental situation ,

										understand about personal health and hygiene.
CBD6	AI- Data Engineer SSC/Q8106	2	100	50	20	20	8	30	12	-
CBD7	Communication and Personality Development	2	100	70	28	–	–	30	12	Understand reading and writing skills to be able to read and write various instruction.
CBD8	Projects / Internship	4	100	–	–	100	40	–	–	Practical experience through project/internship

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
800	320

Details Syllabus

CBD 1 - Data Introduction

Module 1:

Introduction to Big Data and Data Analytics, Introduction to Excel: About Excel & Microsoft, Uses of Excel, Excel software, Spreadsheet window pane, Title Bar, Menu Bar, Standard Toolbar, Formatting Toolbar, the Ribbon, File Tab and Backstage

Module 2:

Big Data Storage and Management, Selecting Columns & Rows, Changing Column Width & Row Height, Autofitting Columns & Rows, Hiding/Unhiding Columns & Rows, Inserting & Deleting Columns & Rows, Cell, Address of a cell, Components of a cell – Format, value, formula, Use of paste and paste special. Data Mining Techniques and Tools.

Module 3:

Data Visualization and Reporting, Using Ranges, Selecting Ranges, Entering Information into a Range, Using AutoFill, Using Formulas, Formula Functions – Sum, Average, if, Count, max, min, Proper, Upper, Lower, Using AutoSum

Module 4:

Concatenate, Vlookup, Hlookup, Match, Countif, Text, Trim, Creating Charts, Different types of chart, Formatting Chart Objects, Changing the Chart Type, Showing and Hiding the Legend, Showing and Hiding the Data Table.

Module 5:

Statistical Analysis and Modeling, Data Analysis: Sorting, Filter, Text to Column, Data Validation, Changing DataField, Properties, Displaying a PivotChart, Data between Spreadsheets, Hiding, Protecting worksheets, Data Cleaning and Preprocessing.

CBD 2 - Apache Spark

Module 1:

Introduction to Spark: What is Spark and what is its purpose, Components of the Spark unified stack, Resilient Distributed Dataset (RDD), Downloading and installing Spark standalone, Scala and Python overview.

Module 2:

Resilient Distributed Dataset and DataFrames: Understand how to create parallelized collections and external datasets, Work with Resilient Distributed Dataset (RDD) operations, Utilize shared variables and key-value pairs.

Module 3:

Spark application programming: Understand the purpose and usage of the SparkContext, Initialize Spark with the various programming languages, Describe and run some Spark examples, Pass functions to Spark, Create and run a Spark standalone application, Submit applications to the cluster.

Module 4:

Introduction to Spark libraries: Understand and use the various Spark libraries.

Module 5:

Spark configuration, monitoring and tuning: Understand components of the Spark cluster, Configure Spark to modify the Spark properties, environmental variables, or logging properties,

Monitor Spark using the web UIs, metrics, and external instrumentation, understand performance tuning considerations.

CBD 3 - Introduction to Scala for Apache Spark

Module 1:

Introduction to Apache Spark, History and evolution of Spark, Key features and benefits of Spark, Spark vs Hadoop.

Module 2:

Scala basics: Introduction to Scala, Scala data types and variables, Control structures, Functions and methods, Collections and arrays.

Module 3:

Spark Core: RDD in Spark, RDD transformations and actions, Caching and persistence, Spark SQL and DataFrames, Introduction to Spark Streaming, Streaming concepts and architecture, DStreams.

Module 4:

Spark MLlib: Introduction to Spark MLlib, Machine learning concepts, Supervised and unsupervised learning, Clustering, classification, and regression algorithms, Introduction to Spark GraphX.

Module 5:

Spark Performance Tuning: Understanding Spark performance, Bottlenecks and performance issues, Spark configuration and tuning Building Spark applications, Running Spark on a cluster, Deploying Spark applications to a production environment, Monitoring and debugging Spark applications.

CBD 4 - What is Big Query

Module 1:

Introduction to MongoDB, and advanced concepts of SQL.

Module 2:

Features of MongoDB: Support ad hoc queries, Indexing, Replication, Duplication of data, Load balancing, supports map reduce and aggregation tools.

Module 3:

Data Modelling, Create Database, Drop Database, Create Collection, Drop Collection, Datatypes, Insert Document, Query Document, Update Document, Delete Document, Projection, Limit Records, Sort Records, Indexing, Aggregation, Replication, Shading.

Module 4:

Advanced MongoDB: Relationships, Database References, Covered Queries, Analysing Queries, Atomic Operations, Advanced Indexing, Indexing.

Module 5:

Limitations, ObjectId, MapReduce, Text Search, Regular Expression, RockMongo, GridFS, Capped Collections, Auto-Increment Sequence.

CBD 5 - Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3- Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5- Common Food Borne Diseases & Infections

CBD 6 AI- Data Engineer SSC/Q8106

CBD 7 - Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

CBD 8 - Project/Internship

Counselling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CBD1	Data Introduction	3	90	12	33	18	27
2	CBD2	Apache Spark	2	60	08	22	12	18
3	CBD3	Introduction to Scala for Apache Spark	2	60	08	22	12	18
4	CBD4	What is Big Query?	2	60	08	22	12	18
5	CBD5	Safety Practices in the Work Environment	1	30	04	11	06	09
6	CBD6	AI- Data Engineer SSC/Q8106	2	60	08	22	12	18
7	CBD7	Communication and Personality Development	1	30	04	11	06	09
8	CBD8	Projects / Internship	5	150	-	-	150	-

STUDY MODULES & BOOKS INFORMATION

S.No	Course Code	Course Name	Module Used
1	CBD 1	Data Introduction	Oracle Big Data Handbook (Oracle Press)" by Tom Plunkett, Brian Macdonald, and Bruce Nelson, published by McGraw-Hill Education.
2	CBD 2	Apache Spark	Learning Spark: Lightning-Fast Big Data Analysis, by Holden Karau, Andy Konwinski, Patrick Wendell, and Matei Zaharia. published by O'Reilly Media
3	CBD 3	Introduction to Scala for Apache Spark	Scala for Spark in Production: Fast distributed computing in the enterprise" by Mark Lewis is a highly recommended book for learning Scala for Apache Spark. published by Packt Publishing
4	CBD 4	What is Big Query?	Google Big Query Analytics, Jordan Tigani Publisher- O/Reilly
5	CBD 5	Safety Practices in the Work Environment	S 69 : Safety Practices, Primary Health & Personal Hygiene
6	CBD6	AI- Data Engineer SSC/Q8106	-
7	CBD 6	Communication and Personality Development	Effective – 68 Communication & Personality Development
8	CBD 7	Projects / Internship	-

CERTIFICATE IN IOT (CIOT)

Certificate in IOT (CIOT)

सर्टिफिकेट इन आईओटी

(A) Duration : 6 Months (D) Courses : 7

(अ) अवधि : 6 माह (द) कोर्सेस : 7

(B) Eligibility : 10th Pass (E) Credit : 20

(ब) पात्रता : 10वीं पास (द) क्रेडिट : 20

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
CIOT1	Introduction to IOT	3	100	50	20	20	8	30	12	• Basics of IOT, features, Importance in today's world
CIOT2	Fundamental components of IOT system	3	100	50	20	20	8	30	12	• Learn different components and its capacity
CIOT3	Basic Architecture and Networking	4	100	50	20	20	8	30	12	• Understanding the architecture behind the network
CIOT4	Design Methodology	3	100	50	20	20	8	30	12	• Device design and planning
CIOT5	IoT- Test Analyst SSC/Q8206	2	100	50	20	20	8	30	12	• Gain knowledge and skills in testing IoT devices and systems, as well as an understanding of the underlying technologies and principles

CIOT6	Digital and Financial Literacy	2	100	70	28	–	–	30	12	
CIOT7	Project/ Internship	5	100	–	–	100	40	–	–	• Create IOT device complete working project

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
700	280

Details syllabus

CIOT 1 - Introduction to IoT

Introduction to IoT and familiarizing in embedded concepts and programming.

Module 1: Introduction to IoT

Introduction to IoT, Characteristics of IoT, Advantages and Disadvantages of IoT, Applications of IoT, Components of IoT Ecosystem

Module 2: IoT Architecture and Design

Physical Design of IoT, IoT Conceptual and Architectural Framework, Logical design of IoT, IoT Devices and IoT Protocols, IoT communication Models.

Module 3: Functional Blocks of IoT Ecosystem

Fundamental Blocks – Sensors, Actuators, Smart Objects and Connecting Objects.

Module 4: Basics of IoT

Simplified IoT Architecture and Core IoT Functional Stack- Fog, Edge, and Cloud in IoT

Module 5: IoT Communication Models

IoT communication models and APIs, REST based communication API, IoT and M2M, Difference between IoT and M2M, Software define Network.

CIOT - 2 - Fundamental components of IOT System

Learn different components and its capacity

Module1: Fundamentals of IoT

Evolution of IoT, Enabling Technologies, IoT Architectures: one M2M, IoT World Forum (IoTWF) and Alternative IoT models.

Module 2: IoT Protocols

IoT Access technologies, Physical and MAC layers, topology, Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFIDProtocols – Issues with IoT Standardization – Unified Data Standards – Protocols – IEEE802.15.4–BACnet Protocol– Modbus – KNX – Zigbee– Network layer – APS layer – Security

Module 3: IoT Architecture

-IoT Open source architecture (OIC)- OIC Architecture & Design principles- IoT Devices and deployment models- IoTivity : An Open source IoT stack - Overview- IoTivity stack architecture- Resource model and Abstraction.

Module 4: Web of Things

Web of Things versus Internet of Things – Two Pillars of the Web – Architecture Standardization for WoT– Platform Middleware for WoT – Unified Multitier WoT Architecture – WoT Portals and Business Intelligence.

Module 5: IoT Applications

IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications. Study of existing IoT platforms /middleware, IoT- A, Hydra etc.

CIOT 3 - Basic Architecture and Networking.

Module I: IoT Networking Core

Technologies involved in IoT development, Internet web and Networking technologies, Infrastructure, Overview of IoT supported Hardware platforms such as: Raspberry pi, ARM Cortex Processors, Arduino and Intel Galileo boards, Wireless networking equipment and configurations, accessing hardware and device file interactions.

Module 2: M2M to IoT

Role of M2M in IoT, M2M Value Chains, IoT Value Chains, an emerging industrial structure for IoT, the international driven global value chain and global information monopolies. Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.

Module 3: IoT Architecture -State of the Art

IoT reference Model and Architecture- Functional View, Information View, Deployment and Operational View, Other Relevant architectural views, Middleware Introduction-FiWare etc., Remote monitoring and sensing, remote controlling and performance analysis, layering concepts, communication pattern, 6LoWPAN, Sensors and sensor Node and interfacing using any Embedded target boards (Raspberry Pi / Intel Galileo/ARM Cortex/ Arduino)

Module 4: IoT Application Development

Application protocols: MQTT, REST/HTTP, CoAP, MySQL, Back-end Application Designing Apache for handling HTTP Requests, MongoDB Object Type Database, HTML, CSS & jQuery for UI Designing, JSON lib for data processing, Security & Privacy during development

Module 5: IoT Security and case studies

Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities.

CIOT - 4 Design Methodology

Module 1: Design and Development

Design Methodology – Embedded Computing Logic, Microcontroller, System on Chips-IoT system building blocks- Arduino – Board details.

Module 2: WOT and Sensors

WOT- Web of Things, IoT vs WoT, Sensors and its properties, Characteristics of Sensors

Module 3: Sensors and Device

Sensors and Components of Sensor node, Classification of Sensors-Analog and Digital Sensors, Analog Sensors Vs Digital Sensors, Scalar vs Vector Sensors, Sensor Types, Sensor Errors

Module 4: Programming

IDE programming - Raspberry Pi - Interfaces and Raspberry Pi with Python Programming

Module 5: Python Programming

Python scope and Applications of Python, Python Data Types and Data Structure, Python control statements, Python functions, in-build function and user-defined functions, Object-Oriented Programming, Principles of OOP, Python Programs, Python packages, libraries

CIOT 5 - IoT- Test Analyst SSC/Q8206

Module 1: Internet of Things, evolution of IoT, Possible impact on IoT and Trends, IoT use cases and application across industries.

Module 2: IoT Security and Privacy, security and privacy risks, Technologies and Methods to mitigate security risks to IoT solutions, privacy standards and regulations, social and privacy impacts.

Module 3: Product Engineering Basics, product ideas based on business needs, stages of development, execution of product plans, products building, product cost models and forecasts

Module 4: Development Tools and Usage, Coding Best Practices, and Documentation, Automate tasks with Scripting language, tools for debugging, building, testing, tuning and maintaining, OS configuration, Software Development needs and Changes.

Module 5: End-to-End Testing, various tests device, gateway, platform and integration tests, technical requirements to solutions, test cases, scripts, and tools, Selenium to design automated tets scripts, Functional Testing, Unit Testing, Non-functional testing, Load Testing, Stress Testing, Spike Testing, Scalability Testing, Chaos Testing.

CIOT 6 – Digital & Financial Literacy

CIOT - Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3- Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5- Common Food Borne Diseases & Infections

CIOT 7 - Project/ Internship

Counselling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CIOT1	Introduction to IOT	3	90	12	33	18	27
2	CIOT2	Fundamental components of IOT system	2	60	08	22	12	18
3	CIOT3	Basic Architecture and Networking	4	120	16	44	24	36
4	CIOT4	Design Methodology	3	90	12	33	18	27
5	CIOT5	IoT- Test Analyst SSC/Q8206	2	60	08	22	12	18
6	CIOT6	Digital and Financial Literacy	2	60	08	22	12	18
7	CIOT7	Project/ Internship	5	150	-	-	150	-

Study Modules & Books Information

S.No	Course Code	Course Name	Module Used
1	CIOT 1	Introduction to IOT	**"Getting Started with IoT" by Cuno Pfister, published by O'Reilly Media.**
2	CIOT 2	Fundamental Components of IOT System	"Internet of Things: Principles and Paradigms" by Rajkumar Buyya, Amir Vahid Dastjerdi, and Sriram Venugopal.published by Morgan Kaufmann
3	CIOT 3	Basic Architecture and Networking	-
4	CIOT4	Design Methodology	A Designer's Art - Paul Rand, published - Yale University Press
5	CIOT 5	IoT- Test Analyst SSC/Q8206	-
6	CIOT 6	Digital and Financial Literacy	Digital Literacy: A Primer on Media, Identity, and the Evolution of Technology" by Susan Wiesinger
7	CIOT 7	Project/ Internship	-

CERTIFICATE IN DIGITAL MARKETING (CDM)

Certificate in Digital Marketing (CDM)

सर्टिफिकेट इन डिजिटल मार्केटिंग (CDM)

(A) Duration : 6 Months (D) Courses : 9

(अ) अवधि : 6 माह (द) कोर्सेस : 9

(B) Eligibility : 10th Pass (E) Credit : 20

(ब) पात्रता : 10वीं पास (द) क्रेडिट : 20

(C) Content and Scheme of Examination

(स) पाठ्यक्रम विषय सूची एवं परीक्षा योजना

Course code	Title of the Course	Credit	Total marks	Theory		Practical Marks		Assignments		Key learning Outcome
				Max	Min	Max	Min	Max	Min	
CDM1	Understanding Digital Marketing Fundamentals	3	100	50	20	20	8	30	12	• Define digital marketing and its significance in modern business • Explore the evolution of digital marketing • Identify the core components of digital marketing strategy • Analyze the benefits and challenges of digital marketing
CDM 2	Digital Marketing Channels and Platforms	3	100	50	20	20	8	30	12	• Examine key digital marketing channels • Explore emerging trends in digital marketing platforms

										• Understand the role of content in digital marketing • Discuss the importance of mobile marketing
CDM 3	Consumer Behavior and Targeting	3	100	50	20	20	8	30	12	• Analyze consumer behavior in the digital age. • Explore methods for audience segmentation and targeting. • Understand the role of data in digital marketing • Discuss the ethical considerations in digital marketing
CDM 4	Digital Marketing Strategies and Campaign Management	2	100	50	20	20	8	30	12	• Outline the process of developing a digital marketing strategy • Explore integrated marketing communications (IMC) in the digital context • Understand the concept of the customer journey • Introduce digital marketing campaign management
CDM 5	Communication & Personality Development	1	100	70	28	-	-	30	12	• Basic communication skills • Personality grooming
CDM 6	Website Building WordPress	3	100	50	20	20	8	30	12	• Getting Started • Advanced Customization

										• Managing Content • Optimization and Maintenance
CDM 7	SEO, Web Analytics	2	100	50	20	20	8	30	12	• SEO Fundamentals • Technical SEO • Off-Page SEO • Web Analytics Fundamentals
CDM 8	Safety Practices in the Work Environment	1	100	50	20	20	8	30	12	• Familiarity with electrical safety, fire safety, first aid, food safety, primary health and basic hygiene
CDM 9	Live Project	2	100	50	20	20	8	30	12	• Leads for Admissions • Social Presence • Sell Online Product

Note: For a PASS – A student would require to secure 40% for both Theory and Practical.

Grand Total	**Pass**
900	360

Details Syllabus

Semester – I

CDM1 - Understanding Digital Marketing Fundamentals

Module 1: Definition and Significance of Digital Marketing

- This module defines digital marketing as the promotion of products or services using digital channels and explores its significance in modern business, highlighting its ability to reach a vast audience, target specific demographics, and track ROI effectively.

Module 2: Evolution of Digital Marketing

- This module delves into the historical development of digital marketing, from its early days of email marketing and banner ads to the current landscape dominated by social media, SEO, content marketing, and data-driven strategies, showcasing how it has adapted to technological advancements and changing consumer behaviour.

Module 3: Core Components of Digital Marketing Strategy

- This module identifies the essential elements of a digital marketing strategy, including website optimization, content creation, social media management, email marketing, search engine optimization (SEO), pay-per-click (PPC) advertising, and analytics, emphasizing the importance of a holistic approach to achieve marketing objectives.

Module 4: Benefits and Challenges of Digital Marketing

- This module analyzes the advantages of digital marketing, such as cost-effectiveness, global reach, real-time communication, and precise targeting, while also examining the challenges, such as information overload, privacy concerns, fierce competition, and evolving algorithms, highlighting the need for continuous adaptation and innovation.

Module 5: Case Studies and Best Practices in Digital Marketing

- This module showcases real-world examples of successful digital marketing campaigns across various industries, drawing insights from case studies and highlighting best practices, innovative strategies, and lessons learned, providing practical guidance for implementing effective digital marketing initiatives.

CDM2 - Digital Marketing Channels and Platforms

Module 1: Examining Key Digital Marketing Channels

This module delves into the various digital marketing channels such as social media, email, SEO, PPC, and content marketing, providing insights into their effectiveness, target audiences, and best practices.

Module 2: Exploring Emerging Trends in Digital Marketing Platforms

Participants in this module explore cutting-edge trends in digital marketing platforms, including AI-driven personalization, voice search optimization, immersive technologies like AR and VR, and the impact of block chain on advertising and data privacy.

Module 3: Understanding the Role of Content in Digital Marketing

Focusing on the significance of content, this module covers content creation, distribution, and optimization strategies across different digital channels, emphasizing the importance of engaging, valuable content in driving audience engagement and conversions.

Module 4: Discussing the Importance of Mobile Marketing

This module highlights the growing importance of mobile devices in digital marketing, discussing mobile-friendly website design, app marketing, location-based targeting, and the role of mobile in

Omni channel marketing strategies. Participants gain insights into optimizing campaigns for the mobile-first audience.

Module 5: Integrating Data Analytics in Digital Marketing

Strategies Covering the role of data analytics in digital marketing, this module explores techniques for collecting, analysing, and leveraging data to optimize campaigns, personalize messaging, and measure ROI. Topics include web analytics, A/B testing, customer segmentation, and predictive analytics.

Top of Form

Top of Form

CDM3 - Consumer Behaviour and Targeting

Module 1: Analyzing Consumer Behavior in the Digital Age Description:

This module delves into the various factors influencing consumer behavior online, including social media, search engines, and e-commerce platforms. It examines how digital technologies have reshaped purchasing decisions and consumer interactions with brands.

Module 2: Exploring Methods for Audience Segmentation and Targeting Description:

This module explores the strategies and tools marketers use to segment audiences based on demographics, behaviors, and interests in the digital realm. It covers techniques such as psychographic profiling, retargeting, and personalized content delivery.

Module 3: Understanding the Role of Data in Digital Marketing Description:

This module examines the significance of data in digital marketing campaigns, from collecting and analyzing consumer data to leveraging insights for targeted advertising, content optimization, and performance measurement.

Module 4: Discussing Ethical Considerations in Digital Marketing Description:

This module addresses the ethical dilemmas and challenges marketers face in the digital landscape, including issues related to privacy, data security, transparency, and the manipulation of consumer behavior through targeted advertising and persuasive techniques.

Module 5: Implementing Effective Digital Marketing Strategies Description:

This module focuses on practical strategies for designing and implementing successful digital marketing campaigns, including content marketing, SEO, social media engagement, email marketing, and influencer partnerships, while considering consumer behavior and ethical guidelines.

Top of Form

CDM4 - Digital Marketing Strategies and Campaign Management

1. **Module 1: Developing a Digital Marketing Strategy:**

This module outlines the step-by-step process of crafting a comprehensive digital marketing strategy, covering aspects such as market analysis, goal setting, target audience identification, channel selection, budget allocation, and performance measurement.

2. **Module 2: Integrated Marketing Communications (IMC) in the Digital Context:**

This module explores how digital channels can be integrated with traditional marketing tactics to create a cohesive and unified brand message across various touchpoints. It discusses strategies for aligning messaging, imagery, and branding across online platforms for maximum impact.

3. **Module 3: Understanding the Customer Journey:**

This module delves into the concept of the customer journey, examining the various stages a customer goes through when interacting with a brand online. It explores techniques for mapping

the customer journey, identifying key touchpoints, and optimizing the user experience to drive conversions and foster customer loyalty.

4. **Module 4: Digital Marketing Campaign Management:**

This module introduces the fundamentals of managing digital marketing campaigns, including planning, execution, optimization, and analysis. It covers topics such as setting campaign objectives, selecting appropriate channels, creating compelling content, monitoring performance metrics, and making data-driven adjustments to maximize ROI.

5. **Module 5: Measuring and Evaluating Digital Marketing Effectiveness:**

This module focuses on the importance of tracking and analyzing key performance indicators (KPIs) to assess the effectiveness of digital marketing efforts. It discusses various metrics for measuring success across different channels, such as website traffic, engagement rates, conversion rates, and return on ad spend (ROAS).

CDM5 - Communication and Personality Development

Understand reading and writing skills to be able to read and write various instruction

Module 1 - The Parts of speech, The Noun, Pronoun, The Adjective, The Article, The Verb, Active and Passive Voice

Module 2 - Tenses and their uses, The Gerund, The Adverb, The Preposition, The Conjunctions, The Interjection, Analysis, Transformation, Synthesis and Direct Indirect Speech

Module 3 - Transformation of Sentences, The Infinitive, Direct and Indirect Speech, Picture Composition, how to write a short story, Letter Writing, Situational Communication

Module 4 - Communication Skills, Body Language, Positive Attitude, Etiquette and Manners, Decision Making, Team Building

Module 5 - SWOT Analysis, Goal Setting, Positive Thinking, Self Confidence, Motivation, Time Management, Anger Management, Stress Management, Leadership, Essential Life Skills

CDM6 - Website Building in WordPress

1. Getting Started with WordPress: This module covers the basics of setting up a WordPress website, including installation, configuration, and navigating the dashboard. Participants will learn how to choose themes, set up plugins, and create their first pages and posts.
2. Advanced Customization: Delving deeper into WordPress, this module explores customization options beyond basic themes and plugins. Participants will learn about custom post types, taxonomies, and how to create their own themes and plugins using PHP and CSS.
3. Managing Content: Focused on content creation and management, this module teaches participants how to organize their content effectively using categories, tags, and menus. They'll also learn about different content types, such as pages, posts, and media, and how to optimize them for search engines.
4. Optimization and Maintenance: This module covers strategies for optimizing WordPress websites for performance and security. Participants will learn about caching, image optimization, and other techniques to speed up their sites, as well as best practices for securing their WordPress installations and performing regular maintenance tasks.
5. Monetization and Growth: Building on the previous modules, this advanced module explores strategies for monetizing WordPress websites and driving growth. Participants will learn about advertising, affiliate marketing, and other revenue streams, as well as techniques for increasing traffic and engagement through SEO, social media, and email marketing.

CDM7 – SEO and Web Analytics,

1. **SEO Fundamentals:**

   This module covers the basic principles and strategies of search engine optimization (SEO), including keyword research, on-page optimization, and content creation to improve website visibility and rankings on search engine results pages (SERPs).

2. **Technical SEO:**

   This module focuses on the technical aspects of website optimization, such as website speed, mobile-friendliness, site architecture, and structured data markup, to ensure search engines can crawl, index, and understand the content effectively.

3. **Off-Page SEO:**

   In this module, learners explore off-page optimization techniques, such as link building, social media marketing, and online reputation management, to increase a website's authority, trustworthiness, and relevance in the eyes of search engines.

4. **Local SEO:**

   This module covers strategies and tactics for optimizing a website's visibility in local search results, including local keyword targeting, Google My Business optimization, online reviews management, and local link building to attract potential customers from specific geographic areas.

5. **Web Analytics Fundamentals:**

   This module introduces learners to the basics of web analytics tools and metrics, including Google Analytics, user behavior analysis, conversion tracking, and key performance indicators (KPIs) to measure and analyze website traffic, engagement, and conversions.

CDM8- Safety Practices in the Work Environment

Familiarity with safety practices at workplace, Knowledge about various Hazards and their remedies, ensure clean, dust free and organized working environment, knowledge of primary first aid for any accidental situation, understand about personal health and hygiene

Module 1 - Safety Signs, First Aid & Artificial Respiration

Module 2 - Safe Lifting & Carrying Techniques, Fire & Fire Extinguishers

Module 3 - Managing Health & Safety at Work, Safe Working Measures

Module 4 - Public & Home Safety, Personal Hygiene

Module 5 - Common Food Borne Diseases & Infections

CDM9 - Project/Internship

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CDM1	Understanding Digital Marketing Fundamentals	3	90	12	33	18	27
2	CDM 2	Digital Marketing Channels and Platforms	3	90	12	33	18	27
3	CDM 3	Consumer Behavior and Targeting	3	90	12	33	18	27
4	CDM 4	Digital Marketing Strategies and Campaign Management	2	60	8	22	12	18
5	CDM 5	Communication & Personality Development	1	30	4	11	6	9
6	CDM 6	Website Building WordPress	3	90	12	33	18	27
7	CDM 7	SEO, Web Analytics,	2	60	8	22	12	18
8	CDM 8	Safety Practices in the Work Environment	1	30	4	11	6	9
9	CDM 9	Live Project	2	60	-	-	60	-

Study Modules & Books Information

S.No	Course Code	Course Name	Module Used
1	CDM1	Understanding Digital Marketing Fundamentals	**A Road Map to Successful Career in Digital Marketing**, V Venkata Krishna)
2	CDM2	Digital Marketing Channels and Platforms	Social Media Marketing Essentials You Always Wanted To Know**, Vibrant Publishers (Author), Kavita Kamath (Author)**
3	CDM3	Consumer Behavior and Targeting	Digital Marketing Essentials You Always Wanted to Know (Self-Learning Management Series)**, Vibrant Publishers (Author)**
4	CDM4	Digital Marketing Strategies and Campaign Management	Digital Marketing| 3rd Edition, Seema Gupta (Author)
5	CDM5	Communication & Personality Development	Effective – 68 Communication & Personality Development
6	CDM6	Website Building WordPress	WordPress: Build and Master Professional Looking Website (A Definitive Guide to Building Custom Websites Using Wordpress), Conway C (Author) SEO: How to Get On the First Page of Google (Google Analytics, Website Traffic, Adwords, Pay per Click, Website Promotion, Search Engine Optimization) (Seo Bible Book 1), Thomas Clayton (Author) Really Simple SEO's Google Analytics Success Guide: 37 plain speaking tutorials for business people wanting to master this powerful web analytics tool, David How left (Author)
7	CDM7	SEO, Web Analytics	-
8	CDM8	Safety Practices in the Work Environment	S69: Safety Practices, Primary Health & Personal Hygiene
9	CDM9	Project/ Internship	-

SHORT TERM CERTIFICATE PROGRAMS

1	Certificate in Ethical Hacking (CEH)	3 Months	10th Pass
2	Certificate in Python Programming (CPP)	3 Months	10th Pass
3	Certificate in Junior Software Developer (CJSD)	3 Months	10th Pass

Short terms programs are listed separately along with Academy Programs. The respective Academy can conduct relevant Short Term programs choosing from a list of short term courses. The exam scheme of each program is:

(1) Theory Paper : 70 Marks

(2) Assignment : Not Applicable for short term certificate programmes

(3) Practical/Project : 30 Marks

Thus, Every Short Term Program Evaluation Shall Be Done On the Basis of 100 Marks

Note : For Short Term Certificate Programs, only Certificates are provided by the University after conducting examination.