

Life Science	
(Botany, Chemistry, Microbiology, Molecular Biology, Biotechnology)	
Zoology, etc)	
Microbial Quality Control in Pharma & Food	
Industrial Microbiology	
Molecular Biology	
Advance Molecular Biology	
Food & Dairy Technology	
Immunotechnology	
Enzymology	
Bionformatics & Computational Biology	
Medical Biotechnology	
Agricultural Biotechnology	
Forensic Sciences	
Clinical Research & Clinical Trial Data Management	
AI & ML	
Health Care Analytics & optimization	
Analytical Instruments	

Economics and Health Sciences	
Data Science & Data Analytics	
AI & ML	
Biotech Management	
Public Health - Effective Communication in Health Care	
Health Care Analytics & Optimization	

Computer Sciences		Mathematics
AI & ML		Health Care Analytics & Optimization
Programming Language - Python		
Programming Language - R		

Microbial Quality Control in Pharma & Food		
Module	Hours	
Introduction to Microbial QC	4	
Process of Sterilization & Decontaminaztion	4	
GLP, Principles of Handling Equipments	4	
Media Preparation & Serial Dilution	4	
Pure Culture Isolation Techniques from food sample	4	
Techniques in Microbial Identification, different Staining techniques	4	
Biochemical Tests	4	
Biochemical Tests Continued	4	
Biochemical Tests Continued	4	
Antibiotic Resistance & Control	4	
Sterility Testing of the finished product as per FSSAI and FDA	4	
Continued	4	
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Bioburden Test	4	
Food Adultrant Identification	4	
Presentation, Final Discussion		

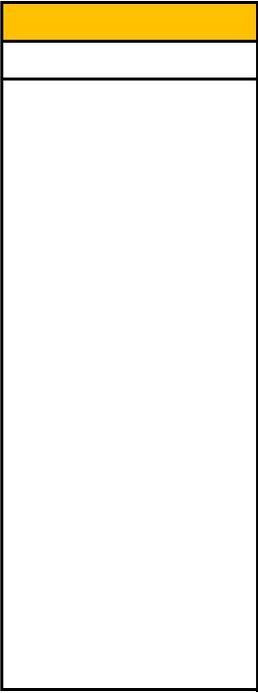
Analytical Instrumentation		
Module	Hour	
Introduction to Analytical Instruments	4	
Basic Calculation, Process of Sterilization & Decontamination	4	
GLP, Principles of handling equipments	4	
Demonstration of Autoclave	4	
Demonstration of Laminar Air Flow	4	
Demonstration of Biosafety Cabinet	4	
Demonstration of PCR	4	
Demonstration of RT-PCR	4	
Demonstration of SDS-PAGE	4	
Demonstration of Western Blotting	4	
Demonstration of Agarose Gel Electrophoresis	4	
Demonstration of HPLC	4	
Demonstration OF uv-vis-Spectrophootometer	4	
Demonstration of Centrifuge	4	
Demonstration of ELISA	4	
Presentation, Final Discussion		

Industrial Microbiology	
Module	Hour
Introduction to Industrial Microbiology	4
Pure Culture Isolation Techniques from different sources	4
Techniques in Microbial Identification, different Staining techniques	4
Biochemical Tests	4
Biochemical Tests Continued	4
Bacterial Growth Curve Analysis	4
Bacterial Growth Curve Analysis Cont.	4
Isolation of Industrially important enzymes from microorganism	4
Isolation and Purification Continued	4
Fermentation and Alcohol Production	4
Evaluation and Determination of Minimum Inhibitory Concentration (MIC).	4
Effect of Physical and Chemical Mutagen on Growth of Microbes.	4
Presentation, Final Discussion	



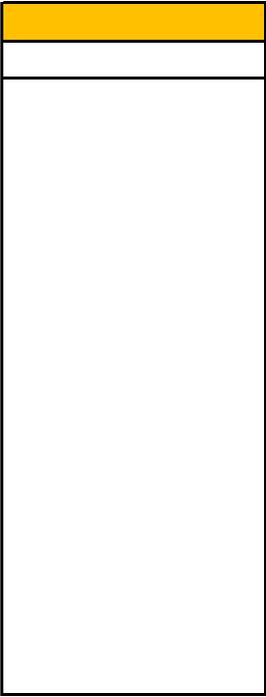
Molecular Biology	
Module	Hour
Introduction to Molecular Biology	4
Basic Calculation, Process of Sterilization & Decontamination	4
GLP, Principles of handling equipments	4
Isolation of Bacterial Genomic DNA	4
Polymerase Chain Reaction (PCR)	4
Agarose Gel Electrophoresis	4
Elution of DNA Fragments from Agarose Gel	4
Restriction Digestion	4
Isolation of Plasmid DNA	4
cDNA Synthesis	4
Isolation of DNA from plant	4
Isolation of DNA from animal cells	4
Isolation of DNA from yeast	4
DNA concentration determination and purity check	4
Karyotyping	4

Presentation, Final Discussion



Advanced Molecular Biology	
Module	Hour
Introduction to Molecular Biology	4
Basic Calculation, Process of sterilization & decontamination	4
GLP, Principles of handling equipments	4
Isolation of Bacterial Plasmid DNA	4
Preparation of Competent cell	4
Transformation	4
Isolation of Bacterial Genomic DNA	4
Polymerase Chain Reaction (PCR)	4
Agarose Gel Electrophoresis	4
Isolation of Bacterial RNA	4
RT-PCR	4
DNA Concentration determination and purity check	4
SDS PAGE	4
Primer Designing for PCR	4
Karyotyping	4

Presentation, Final Discussion



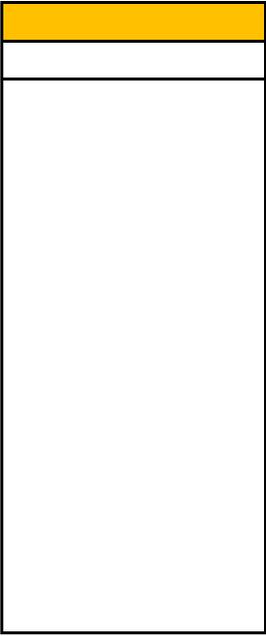
Food & Dairy

Module

Good Laboratory Practices, Basics of Calculations, Weighing and Measurements
Principle and Handling of Laboratory Equipments
Isolation of Fungi from citrus fruits
Isolation of yeast from rotten banana
Quality analysis of Milk - pH determination
Detection of Boric Acid in Milk
Detection of Nitrate in Milk
Detection of Formalin in Milk
Detection of detergent in Milk
Detection of fat in Milk
Detection of starch in Milk
Isolation of microbes from street food
Gram staining
IMVic test
Review & Certification

Hour	
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Immunotechnology	
Module	Hour
Good Laboratory Practices, Basics of Calculations, Weighing and Measurements	4
Principle and Handling of Laboratory Equipments	4
Introduction to Immunotechnology	4
Isolation of Bacteria	4
Isolation of enzyme	4
SDS-PAGE	4
Western Blotting	4
Agglutination and precipitation techniques (Blood Grouping)	4
Blood Typing	4
Ouchterlony Double Immuno-diffusion method	4
ELISA	4
Radial Immuno diffusion technique	4
Human blood group determination	4
Blood film preparation and staining	4
Review & Certification	4

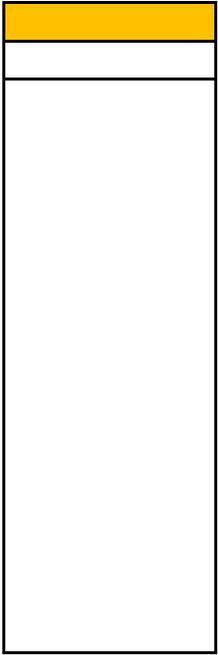


Enzymology	
Module	Hour
Good Laboratory Practices, Basics of Calculations, Weighing and Measurements	4
Principle and Handling of Laboratory Equipments	4
Introduction to Enzymes, Enzyme Kinetics & Mechanisms	4
Screening of Cultures for Enzyme Production	4
Pure Culture Preparation	4
Extraction of Crude Enzyme	4
Partial Purification of Enzyme	4
Precipitation of Enzyme	4
Dialysis	4
Characterization of Purified Enzyme	4
Total Protein Estimation using Bradford's Method	4
SDS PAGE	4
Effect of temperature on Enzyme Activity	4
Effect of pH on Enzyme Activity	4
Review & Certification	4

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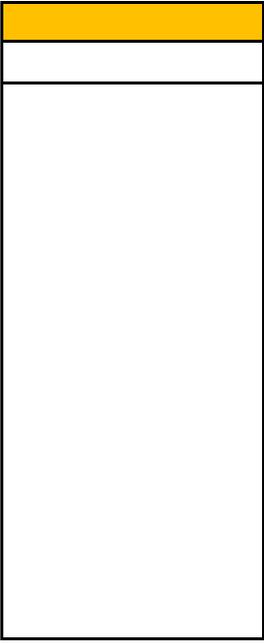
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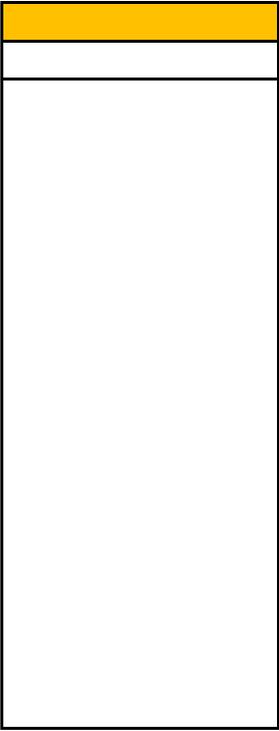


Bioinformatics
Module
Introduction to Bioinformatics and overview of Biological Research
Biological databases and database searching
Data Mining and Sequence Retrieval
Motif & Domain assignment
Proteomics
Pair wise and Multiple Sequence Alignment
Sequence Analysis (BLAST,FASTA, CLUSTAL W)
Ab initio structure prediction,Visualization tools
Introduction to Drug Designing, Disease Identification, Responsible Gene Ontology
Active Site Prediction, Chemical and Drug Database
Chemo-informatics,
Molecular Docking
Homology Modelling
Comparative Phylogenetic Analysis using MEGA and Phylip)
Review & Certification

Medical Biotechnology	
Module	Hours
Good Laboratory Practices, Basics of Calculations, Weighing and Measurements	4
Principle and Handling of Laboratory Equipments	4
Blood Typing	4
DNA Extraction from Blood Cells	4
PCR	4
DNA Quantification Using Spectrophotometry	4
Agarose Gel Electrophoresis	4
Isolation of Bacteria from pathological sample	4
Identification & Staining	4
Antimicrobial Sensitivity Testing (Disk Diffusion)	4
Antimicrobial Sensitivity Testing (Well Diffusion)	4
Enzyme-linked Immunosorbent Assay	4
Urine Culture	4
Isolation of important pathogenic bacteria in different selective media & Identification	4
Review & Certificate	4



Agricultural Biotechnology	
Module	Hours
Good Laboratory Practices, Basics of Calculations, Weighing and Measurements	4
Principle and Handling of Laboratory Equipments	4
Introduction to Agricultural Biotechnology	4
Effect of Bio-Fertilizers on Plant Growth	4
Seed storage Conditions	4
Evaluation of Pesticides	4
Evaluation of Fungicides	4
Alkalinity and Acidity of soil	4
Estimation of Presence of Chlorine and Phosphate in soil	4
Isolation of plant DNA	4
DNA Quantification Using Spectrophotometry	4
Agarose Gel Electrophoresis	4
Sustainable Agricultural Practices, Preparation of Bioplastics	4
Estimation of Flavanoids and phenols in healthy and diseased plants	4
Practical/Case Study Review	4



Forensic Sciences	
Module	Hour
Introduction to forensic sciences	4
Quality Assurance, GLP & GMP	4
Evidence Collection, Preservation & Crime Scene Investigation techniques	4
Handwriting & Document Examination	4
Fingerprint uplifting techniques & Cross Matching	4
Blood Stain Analysis (Presumptive & Confirmatory)	4
Blood Typing and Staining	4
Body Fluid Analysis , Hair sample analysis	4
DNA Extraction from Crime scene Samples	4
PCR	4
Agarose Gel Electrophoresis	4
Toxicology testing	4
Legal Aspects & Ethics in Forensic Sciences	4
Case Studies & Discussion	4
Crime Scene Simulation	4
Presentation & Final Discussion	



Clinical Research & Clinical Trial Data Management
Module
Foundations of Clinical Research
Understanding Placebo Effects in Clinical Trials
The Role of Randomized Controlled Trials (RCTs) in Clinical Research
Basics of Informed Consent in Clinical Research
Clinical Research Ethics: Protection of Human Subjects
Understanding Clinical Trial Phases (I)
Understanding Clinical Trial Phases (II)
Understanding Clinical Trial Phases (III)
Understanding Clinical Trial Phases (IV)
The Role of Epidemiology in Clinical Research
The Impact of Bias in Clinical Research
Patient-Centered Outcomes in Clinical Research
Introduction to Data Collection in Clinical Trials
The Role of Clinical Research Coordinators
Basic Statistical Methods in Clinical Research
Navigating Clinical Research Regulations
Crafting a Clinical Trial Protocol Course
The Role of Pharmacovigilance in Clinical Research
An Overview of the SAS System
Getting familiar with the SAS Data Sets
Creating SAS Data Sets
Data Step Programming
Introduction to Data Step Manipulation
Data Transformations
Combining SAS Data Sets1
Retrieving Data from a Single Table
Retrieving Data from Multiple Tables
Develop effective communication strategies for technical concepts
Build collaboration skills for cross-functional teams
Enhance problem-solving approaches beyond coding

Artificial Intelligence & Machine Learning (Online)	
Module	Hour
Introduction to AI/ML	2
Python for AI/ML	2
Probability & Statistics for ML	2
Linear Algebra & Calculus Basics	2
Exploratory Data Analysis (EDA)	2
Feature Engineering	2
Supervised Learning Basics Part 1	2
Supervised Learning Basics Part 2	2
Model Evaluation	2
Performance Metrics	2
Advanced Supervised Learning	2
Unsupervised Learning	2
Introduction to Deep Learning	2
Neural Networks	2
Deep Learning with TensorFlow	2
Deep Learning with PyTorch	2
Convolutional Neural Networks	2
Recurrent Neural Networks (RNNs) & LSTMs	2
Optimization Techniques in Deep Learning	2
Natural Language Processing (NLP) Basics	2
Sentiment Analysis	2
Chatbot Development	2
Reinforcement Learning Basics	2
AI in Industry	2
Explainable AI & AI Ethics	2
AI Deployment & MLOps	2
Generative AI & Large Language Models	2
Computer Vision & Object Detection	2
Time Series Forecasting & Anomaly Detection	2
Real-Time AI Inference on Edge Devices	2

60 Hours

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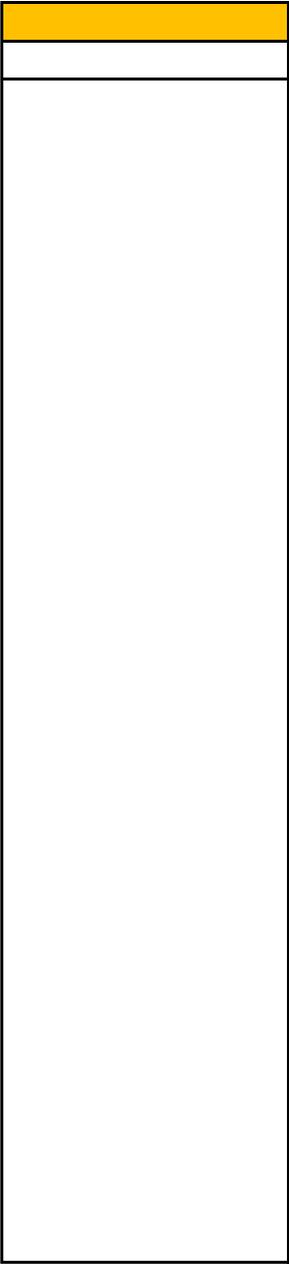
Healthcare Analytics & Optimization

Module

Introduction to IBM SPSS, interface overview, and key functionalities
Importing healthcare datasets into SPSS (CSV, Excel, SQL).
Understanding Data View and Variable View in SPSS.
Assigning Value Labels, Variable Labels, and Data Coding.
Performing Descriptive Statistics (mean, median, standard deviation).
Creating Charts & Diagrams (bar charts, histograms, box plots).
Descriptive Statistics and Anomaly Detection for patients using different anesthetic drugs.
Introduction to Inferential Statistics & Hypothesis Testing.
Testing for Normality (Kolmogorov-Smirnov & Shapiro-Wilk Tests).
Conducting t-tests (Independent & Paired Sample t-tests).
Performing ANOVA to compare multiple groups.
Understanding and applying Non-Parametric Tests (Mann-Whitney U, Kruskal-Wallis).
Compare Hemodynamic Stability of patients using different anesthetic drugs during surgery.
Analyze drug effectiveness using hypothesis testing techniques.
Understanding Correlation Coefficients (Pearson & Spearman).
Conducting Chi-square tests for categorical variable relationships.
Find associations between patient demographics and adverse events.
Introduction to Regression Analysis in Healthcare Analytics.
Performing Linear Regression to predict health outcomes.
Conducting Binary Logistic Regression for classification tasks.
Predict maximum mean arterial pressure (MAP) during surgery based on drug type and patient demographics
Understanding ROC Curves and their role in healthcare predictions.
Generating ROC Curves in SPSS for classification models.
Interpreting the Area Under the Curve (AUC) and determining model performance.
Finding the Optimum Cut-off point using Sensitivity & Specificity.
Determine the best blood parameter cut-off for predicting adverse events.
Capstone Project Part 1: Define the problem, collect data, and preprocess it.
Capstone Project Part 2: Perform analysis, apply hypothesis testing, and build predictive models.
Capstone Project Part 3: Interpret results, generate reports, and present findings.
Final assessment, project submission, and certification.

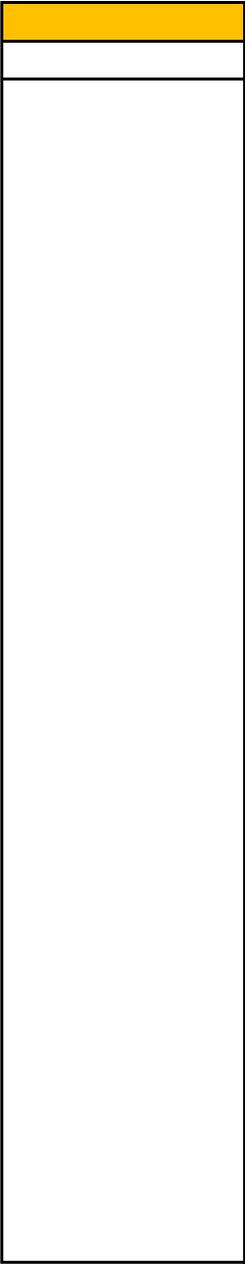
Data Science & Data Analytics (Online)
Module
Introduction to Data Science & Data Analytics
Collect and extract data from various sources like CSV, JSON, and APIs.
Clean and preprocess data by handling missing values and outliers.
Perform exploratory data analysis (EDA) using visualization techniques.
Learn basic Python for data manipulation with Pandas and NumPy.
Execute SQL queries to retrieve and manipulate structured data.
Conduct an end-to-end data cleaning and EDA on a real dataset.
Apply statistical concepts like mean, variance, and probability distributions.
Perform hypothesis testing using statistical methods in Python.
Understand supervised and unsupervised machine learning techniques.
Build and evaluate a simple linear regression model.
Implement decision trees and ensemble learning techniques.
Apply clustering techniques like K-Means for pattern recognition.
Train and evaluate an ML model on a business dataset.
Perform time series forecasting for trend analysis.
Analyze text data using NLP techniques like sentiment analysis.
Explore big data concepts and cloud platforms for data science.
Understand the basics of deep learning and neural networks.
Create interactive dashboards using Power BI or Tableau.
Conduct A/B testing and analyze marketing data for decision-making.
Derive business insights by analyzing a real-world dataset.
Learn data engineering concepts like data pipelines and MLOps.
Understand ethical AI practices and responsible data science.
Prepare resumes and practice job interview questions for data roles.
Define the capstone project, select a dataset, and outline the approach.
Build and analyze a machine learning model for the capstone project.
Create visualizations and reports to present capstone results.
Deploy the model using Flask or Streamlit for real-world application.
Present the capstone project and receive feedback.
Final Assessment & Certification

Biotechnology Management	
Module	Hour
Introduction to Biotechnology & Biotech Business Models	2
Key Sectors in Biotechnology (Pharmaceuticals, Agriculture, Industrial, Environmental)	2
Biotech Research & Development Process (From Lab to Market)	2
Biotech Startups & Entrepreneurship	2
Market Trends & Emerging Technologies in Biotech	2
Case Study: Success & Failure of Biotech Companies	2
Market Analysis of a Biotech Product Using Online Databases	2
Introduction to Global Regulatory Frameworks (FDA, EMA, ICH)	2
Clinical Trials & Approval Process	2
Good Manufacturing Practices (GMP) in Biotech Production	2
Intellectual Property Rights (IPR) & Patent Filing in Biotech	2
Biosafety & Bioethics in Biotech Research	2
Quality Control & Quality Assurance in Biotech Firms	2
Case Study on a Biotech Product Recall	2
Financial Planning for Biotech Companies	2
Funding Sources for Biotech Startups (VC, Grants, IPOs)	2
Cost Management & Budgeting in Biotech Projects	2
Business Development & Marketing Strategies in Biotech	2
Supply Chain & Logistics in the Biotech Industry	2
Risk Management & Crisis Handling in Biotech Business	2
Drafting a Business Plan for a Biotech Startup	2
Product Development Lifecycle in Biotechnology	2
Technology Transfer & Commercialization of Biotech Innovations	2
Career Paths in Biotech Management (Corporate, R&D, Regulatory, Consulting)	2
Leadership & Team Management in Biotech Organizations	2
Ethical Decision-Making in Biotech Management	2
Future Trends & Challenges in the Biotech Industry	2
Virtual Biotech Product Pitch Presentation	2
Course Wrap-up & Q&A Session	2
Final Assessment & Certification	2

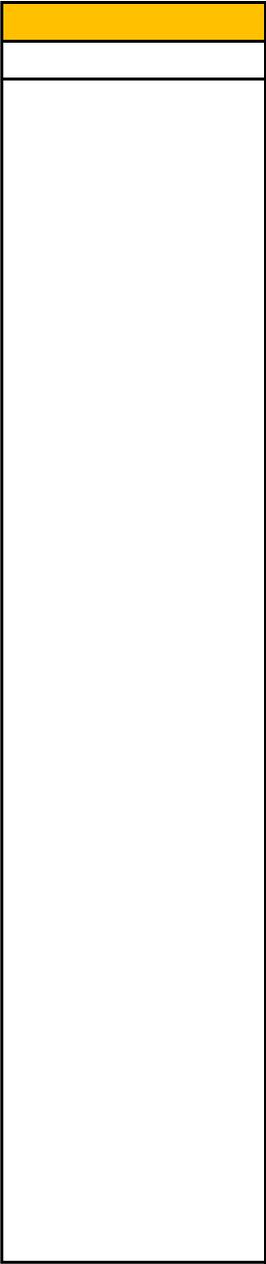


Public Health - Effective Communication in Healthcare
Module
Introduction to Healthcare Communication & Its Role in Public Health
Principles of Effective Communication in Healthcare.
Verbal & Non-Verbal Communication in Healthcare Settings
Active Listening & Empathy in Patient Interactions.
Health Literacy & Patient Education Strategies.
Cultural Sensitivity & Inclusive Communication in Healthcare.
Role-playing exercise on doctor-patient communication.
Communicating with Patients & Families (Clear, Compassionate Conversations).
Effective Communication with Healthcare Teams & Professionals.
Public Health Messaging & Community Engagement Strategies.
Crisis Communication in Healthcare (Emergencies & Outbreaks).
Dealing with Difficult Conversations (Bad News & End-of-Life Discussions).
Case study analysis on public health crisis communication.
Handling patient complaints & conflict resolution.
Introduction to Health Communication Campaigns.
Using Social Media & Digital Platforms for Health Awareness.
Writing Clear & Impactful Health Messages (Posters, Brochures, Emails)
Ethical Considerations in Health Communication (Privacy, Misinformation).
Telemedicine & Remote Patient Communication Best Practices.
Case Study: <i>Successful Public Health Campaigns & Lessons Learned.</i>
Hands-on Practical: <i>Design a health awareness social media post or flyer.</i>
Advocacy & Policy Communication in Public Health.
Motivational Interviewing for Behavior Change in Healthcare.
Conflict Resolution & Negotiation Skills in Healthcare.
Capstone Project Part 1: Identify a healthcare communication challenge.
Capstone Project Part 2: Develop a communication strategy.
Capstone Project Part 3: Create messaging materials & an action plan.
Capstone Project Part 4: Present findings and recommendations.
Feedback & Review Session on Communication Strategies.
Final Assessment, Course Wrap-up, and Certification.

Programming Language - Python (online)	
Module	Hour
Introduction to Python	2
Variables, Data Types & Operators	2
Control Flow	2
Functions and Modules	2
Data Structures - Lists & Tuples	2
Data Structures - Sets & Dictionaries	2
Object-Oriented Programming (OOP) - Part 1	2
OOP - Part 2	2
Working with Libraries & Virtual Environments	2
Regular Expressions	2
Advanced Data Structures	2
Database Interaction with SQLite	2
Functional Programming	2
Multithreading and Multiprocessing	2
Web Scraping with BeautifulSoup & Selenium	2
APIs & JSON Handling	2
Data Analysis with Pandas	2
Data Visualization with Matplotlib & Seaborn	2
Introduction to Flask and Web Development	2
Building REST APIs with Flask	2
Working with Machine Learning	2
Introduction to Django	2
GUI Development with Tkinter	2
Automation with Python	2
Performance Optimization & Debugging	2
Blockchain & Cryptocurrency with Python	2
Cybersecurity & Ethical Hacking with Python	2
Natural Language Processing (NLP) with Python	2
IoT & Hardware Control with Python	2
Computer Vision with OpenCV	2



Programming Language - R (online)	
Module	Hour
Introduction to R and Setup	2
Variables, Data Types & Operators	2
Control Flow	2
Functions and Packages	2
Vectors & Lists	2
Data Frames & Tibbles	2
Data Import and Export	2
Data Cleaning & Manipulation with dplyr	2
Regular Expressions & String Manipulation	2
Working with Dates & Times	2
Working with Factors & Categorical Data	2
Exploratory Data Analysis (EDA)	2
Data Visualization with ggplot2	2
Advanced Data Visualization	2
Introduction to Probability & Statistics	2
Hypothesis Testing in R	2
Correlation & Regression Analysis	2
Time Series Analysis	2
Introduction to Machine Learning with R	2
Classification Algorithms	2
Clustering & Unsupervised Learning	2
Web Scraping with R	2
API Integration & Working with JSON	2
Automating Reports with R Markdown	2
Performance Optimization & Debugging	2
Geospatial Data Analysis with R	2
Financial & Economic Data Analysis	2
Bioinformatics & Genomic Data Analysis	2
Social Network Analysis with R	2
Building Predictive Models with Caret	2



Management		
Module	Hour	
Principles of Management and Organizational Behavior	4	
Business Communication and Professional Etiquette	4	
Leadership and Emotional Intelligence	4	
Marketing Management	4	
Financial Management for Non-Finance Managers	4	
Human Resource Management (HRM)	4	
Strategic Management and Business Policy	4	
Operations and Supply Chain Management	4	
Entrepreneurship Development and Start-Up Management	4	
Corporate Governance and Business Ethics	4	
Project Management and Decision-Making Tools	4	
Business Analytics and Data-Driven Decision Making	4	
Innovation Management and Design Thinking	4	
Global Business Environment and Cross-Cultural Management	4	
Review and Certification	4	

Statistics		
Module	Hour	
Introduction to Statistics and Data Types	4	
Collection, Classification, and Tabulation of Data	4	
Measures of Central Tendency (Mean, Median, Mode)	4	
Measures of Dispersion (Range, Variance, Standard Deviation)	4	
Skewness, Kurtosis, and Moments	4	
Correlation and Regression Analysis	4	
Time Series Analysis and Forecasting	4	
Index Numbers and Cost of Living Index	4	
Probability Theory and Random Variables	4	
Probability Distributions (Binomial, Poisson, Normal)	4	
Sampling Methods and Sampling Distributions	4	
Hypothesis Testing and Confidence Intervals	4	
Chi-Square, t-Test, and ANOVA Applications	4	
Introduction to Statistical Software and Data Visualization (Excel/SPSS/R)	4	
Review and Certification	4	