

Perfect 

We'll proceed **Option A — one course at a time, each as a full 12-week structured curriculum** with:

- Daily schedule (Mon–Fri)
- 6 minor + 6 major + 1 capstone project
- Platform setup instructions
- Deployment plan

Let's start with **Course 1: Artificial Intelligence & Machine Learning (AIML)**. After that, I'll continue with **Data Science**, **Flutter Web**, and **MERN Stack** in sequence.

COURSE 1: Artificial Intelligence & Machine Learning (AIML)

Duration: 12 Weeks (3 Months)

Mode: Online — Google Cloud Platform (GCP), Google Colab, Hugging Face Spaces

Skill Outcome: Build and deploy AI/ML models and applications on cloud platforms.

Tools: Python, NumPy, Pandas, Matplotlib, Scikit-learn, TensorFlow, Hugging Face, Streamlit

Final Goal: Deploy a complete ML web app (e.g., predictive model with UI) on Hugging Face Spaces.

Course Overview

Category	Description
Core Focus	Master AI/ML fundamentals, applied ML, and deployable AI apps
Prerequisites	Basic computer knowledge
Programming Language	Python
Cloud Platform	Google Cloud Platform (GCP), Google Colab
Deployment	Hugging Face Spaces
Project Count	6 Minor + 6 Major + 1 Capstone

Week-by-Week Detailed Curriculum

Week 1 – Environment Setup & Python Foundations

Goal: Build foundational Python knowledge and set up cloud-based environment.

Day	Topic	Activities	Outcome
Mon	Introduction to AIML + GCP + Colab Setup	Create Google Cloud and Colab accounts	Students ready to use cloud-based tools
Tue	Python Basics – Variables, Data Types, Operators	Write scripts in Colab	Understand Python syntax
Wed	Minor Project 1: Simple Calculator using Python	Apply input/output logic	Build first working Python app
Thu	Control Flow & Loops	Solve logic challenges	Strengthen coding skills
Fri	Functions, Modules, and Libraries	Build reusable functions	Write modular code

🔧 **Tools:** Google Colab

⌚ **Outcome:** Environment ready + Python fundamentals mastered.

✿ **Major Project 1:** *Interactive CLI Calculator*

Deploy on: GitHub (public repo link)

📅 Week 2 – Data Handling & Libraries (NumPy, Pandas)

Day	Topic	Activities	Outcome
Mon	NumPy Basics – Arrays, Operations	Array manipulation	Understand numerical computing
Tue	Pandas DataFrames – Import, Clean, Analyze	Work with CSV files	Handle tabular data
Wed	Minor Project 2: Analyze Student Marks Dataset	Compute stats (mean, median, etc.)	Data handling skills
Thu	Data Visualization with Matplotlib & Seaborn	Build graphs and charts	Visual storytelling
Fri	Combining NumPy + Pandas + Visualization	Mini data dashboard	Data exploration

✿ **Major Project 2:** *Exploratory Data Analysis (EDA) on COVID Dataset*

Deploy on: Colab notebook + GitHub link

📅 Week 3 – Intro to Machine Learning (Supervised Learning)

Day	Topic	Activities	Outcome
Mon	Understanding ML Types (Supervised, Unsupervised)	Study ML pipeline	Conceptual clarity

Day	Topic	Activities	Outcome
Tue	Regression Models (Linear, Polynomial)	Train and test models	Build regression pipeline
Wed	Minor Project 3: Predict Housing Prices (Linear Regression)	Use scikit-learn	First ML model
Thu	Evaluation Metrics (MAE, MSE, R ²)	Compare models	Model evaluation
Fri	Classification (Logistic Regression, Decision Tree)	Hands-on coding	Learn classifiers

✿ Major Project 3: Predict Student Performance (Regression + Classification)

Deploy on: Hugging Face (via Streamlit UI)

📅 Week 4 – Advanced ML Algorithms

Day	Topic	Activities	Outcome
Mon	k-NN, Naive Bayes, SVM	Build and compare models	Understand multiple algorithms
Tue	Random Forest, Gradient Boosting	Apply ensemble techniques	Improve accuracy
Wed	Minor Project 4: Iris Flower Classification	Compare multiple models	Ensemble modeling
Thu	Model Optimization & Hyperparameter Tuning	GridSearchCV	Model fine-tuning
Fri	Cross-validation & Regularization	Avoid overfitting	Reliable models

✿ Major Project 4: Customer Churn Prediction System

Deploy on: Hugging Face Spaces (Streamlit)

📅 Week 5 – Unsupervised Learning & Dimensionality Reduction

Day	Topic	Activities	Outcome
Mon	Clustering Concepts – K-Means, Hierarchical	Implement clustering	Pattern discovery
Tue	Dimensionality Reduction – PCA	Visualize reduced data	Learn data compression
Wed	Minor Project 5: Customer Segmentation	Combine PCA + K-Means	Clustering project
Thu	Anomaly Detection	Find outliers	Real-world data filtering
Fri	Feature Engineering	Prepare dataset for ML	Better dataset pipelines

Major Project 5: Mall Customer Segmentation Analysis

Deploy on: Hugging Face Spaces



Week 6 – Intro to Neural Networks

Day	Topic	Activities	Outcome
Mon	Basics of Neural Networks	Understand perceptrons	Intro to Deep Learning
Tue	Building Neural Nets with TensorFlow	Code first NN	Build classification NN
Wed	Minor Project 6: Handwritten Digit Classifier (MNIST)	Train NN	Understand DL workflow
Thu	Activation Functions, Loss Functions	Analyze learning	Deep understanding
Fri	Evaluating Neural Networks	Compare performance	Interpret results

Major Project 6: Digit Recognizer (MNIST) + Streamlit App

Deploy on: Hugging Face Spaces



Week 7–8 – Deep Learning & CNNs

Day	Topic	Activities	Outcome
Mon	CNN Fundamentals	Study image convolutions	Vision basics
Tue	Implement CNN using TensorFlow	Train model	Visual recognition
Wed	Transfer Learning (VGG, ResNet)	Reuse models	Boost accuracy
Thu	Project Integration	Prepare dataset + UI	Hands-on DL
Fri	Review & Assessment	Quiz + Discussion	Reinforce concepts

Major Project: Image Classification App (Cat vs Dog)

Deploy on: Hugging Face Spaces with Streamlit front-end.



Week 9–10 – NLP Fundamentals

Day	Topic	Activities	Outcome
Mon	Text Processing & Tokenization	Clean and preprocess text	NLP foundation
Tue	Bag-of-Words & TF-IDF	Feature extraction	Text representation
Wed	RNN, LSTM Concepts	Learn sequence modeling	Temporal data handling
Thu	Sentiment Analysis with LSTM	Build model	Text classification

Day	Topic	Activities	Outcome
Fri	Hugging Face Transformers Intro	Use pretrained models	Modern NLP
✿ Major Project: Twitter Sentiment Analyzer using LSTM + Hugging Face Transformers			
Deploy on: Hugging Face Spaces			

Week 11 – Model Deployment & MLOps Intro

Day	Topic	Activities	Outcome
Mon	Streamlit & Gradio for UI	Create web app	Interactive deployment
Tue	Exporting Models (Pickle, ONNX)	Save and reuse models	Deployment readiness
Wed	Model Serving via API	FastAPI basics	Backend model API
Thu	Deployment on Hugging Face Spaces	Practice deploy	Cloud app
Fri	Capstone Proposal Review	Pitch idea	Prepare final project

Week 12 – Capstone Project

Capstone Project: AI-Powered Health Risk Prediction System

- Integrates ML + DL + UI + Cloud Deployment
- Takes user input (age, habits, medical stats) → Predicts risk using trained model
- Frontend: Streamlit App
- Backend: Python model
- Deployment: Hugging Face Spaces

Deliverables:

- GitHub repo (code + dataset)
- Hugging Face public demo link
- Documentation & Presentation video (5 mins)

Deployment Instructions

Project Type	Platform	Steps
Python Scripts	GitHub	Push notebook or .py files
ML Apps	Hugging Face Spaces	Create repo → Upload Streamlit app.py + model.pkl
Dashboards	Streamlit Cloud / Hugging Face	Streamlit sharing

Project Type	Platform	Steps
Reports	Kaggle Notebooks	Upload notebooks with outputs

Would you like me to now generate **Course 2: Data Science (3-Month Curriculum)** in the same full structure next?

Perfect 

Continuing with **Course 2: Data Science (3-Month / 12-Week Full Online Curriculum)**

This course follows the same structure (5-day instructional + weekend project cycle) and emphasizes **real-world analytics, visualization, and ML-based insights** using **Kaggle + GCP BigQuery**.



COURSE 2: Data Science

Duration: 12 Weeks (3 Months)

Mode: Online — **Kaggle Notebooks + Google Cloud BigQuery Sandbox + Google Colab**

Skill Outcome: Become industry-ready Data Scientist capable of data cleaning, visualization, model building, and dashboard deployment.

Tools: Python, NumPy, Pandas, Matplotlib, Seaborn, Scikit-learn, BigQuery, Streamlit, Power BI / Tableau (Public Edition)



Course Overview

Category	Description
Core Focus	End-to-end Data Science workflow — data collection → analysis → ML → visualization → deployment
Prerequisites	Basic Python knowledge
Programming Language	Python
Cloud Platform	Kaggle, GCP BigQuery
Deployment	Streamlit / Hugging Face Spaces
Project Count	6 Minor + 6 Major + 1 Capstone



Detailed Week-by-Week Curriculum



Week 1 – Environment Setup & Python Review

Goal: Set up all tools and review essential Python programming for Data Science.

Day	Topic	Activities	Outcome
Mon	Intro to Data Science + Kaggle + BigQuery Setup	Create Kaggle & GCP accounts	Ready-to-use cloud workspace
Tue	Python Basics – Variables, Loops, Functions	Hands-on coding	Python refresh
Wed	Minor Project 1: Build a Data Summary Tool	Write a Python script that summarizes datasets	Strengthen fundamentals
Thu	Python Libraries Overview	Import and explore numpy/pandas/matplotlib	Tool familiarity
Fri	Real-world data pipeline walkthrough	Use sample CSV	Understand workflow

 **Major Project 1:** *Data Explorer CLI (upload CSV → show shape, columns, types)*

Deploy on: Kaggle Notebook Public Link

 **Week 2 – Data Handling with Pandas & NumPy**

Day	Topic	Activities	Outcome
Mon	NumPy Deep Dive	Practice array ops	Speed in numerical data
Tue	Pandas DataFrames	Handle missing values, merging, groupby	Data manipulation
Wed	Minor Project 2: Sales Data Analysis	Clean & analyze sales.csv	Practice EDA
Thu	Data Cleaning & Preprocessing	Missing, duplicates, scaling	Data readiness
Fri	Case Study: Movie Dataset Analysis	Complete mini-EDA	EDA cycle mastery

 **Major Project 2:** *E-commerce Data Cleaning + Report Generation*

Deploy on: Kaggle Notebook + Public Output

 **Week 3 – Data Visualization & Storytelling**

Day	Topic	Activities	Outcome
Mon	Matplotlib Deep Dive	Plot charts	Build basic plots
Tue	Seaborn & Plotly	Create interactive visuals	Visual storytelling
Wed	Minor Project 3: Company Profit Visualization Dashboard	Visualize time-series data	Data storytelling

Day	Topic	Activities	Outcome
Thu	Dashboard Design in Streamlit	Create UI + Charts	Interactive dashboards
Fri	Color, Design, and Reporting Standards	Improve visualization quality	Presentation skills

 **Major Project 3:** *Interactive Data Dashboard (Streamlit + Kaggle)*
Deploy on: Streamlit Cloud (Public URL)

Week 4 – SQL, BigQuery & Data Extraction

Day	Topic	Activities	Outcome
Mon	SQL Essentials	SELECT, WHERE, JOIN	Query datasets
Tue	BigQuery Introduction	Create project, import data	Handle cloud data
Wed	Minor Project 4: BigQuery Mini Analysis	Query Kaggle public datasets	SQL + GCP
Thu	Integrating SQL + Python	Query → Pandas	Seamless workflow
Fri	Building Query Pipelines	Automate extraction	Full data pipeline

 **Major Project 4:** *Google BigQuery Public Dataset Analysis (e.g., StackOverflow data)*
Deploy on: Kaggle Notebook + Shared GCP Link

Week 5 – Statistics for Data Science

Day	Topic	Activities	Outcome
Mon	Descriptive Statistics	Mean, median, variance	Summary metrics
Tue	Probability & Distributions	Normal, Poisson, Binomial	Concept mastery
Wed	Minor Project 5: Customer Behavior Statistics	Simulate data & analyze	Real-world application
Thu	Hypothesis Testing	t-test, chi-square	Inferential statistics
Fri	Correlation & Covariance	Feature relations	Analytical understanding

 **Major Project 5:** *AB Testing for Marketing Campaigns*
Deploy on: Kaggle Notebook + Report PDF



Week 6 – Intro to Machine Learning for Data Scientists

Day	Topic	Activities	Outcome
Mon	ML Pipeline	Train-test split, model fit	End-to-end flow
Tue	Regression Techniques	Linear & Multiple Regression	Prediction basics
Wed	Minor Project 6: House Price Predictor	Build regression model	ML practice
Thu	Classification Overview	Logistic Regression, SVM	Binary classification
Fri	Model Evaluation	Accuracy, Confusion Matrix	Evaluation mastery

✿ Major Project 6: Customer Churn Prediction (Logistic Regression + Visualization)

Deploy on: Streamlit App via Hugging Face Spaces



Week 7 – Feature Engineering & Model Optimization

Day	Topic	Activities	Outcome
Mon	Handling Categorical Data	One-hot encoding	Data prep
Tue	Scaling & Normalization	StandardScaler, MinMax	Model readiness
Wed	Feature Selection	Correlation + PCA	Dimensionality reduction
Thu	Hyperparameter Tuning	GridSearchCV	Optimize models
Fri	Model Comparison	Compare multiple algorithms	Choose best model

✿ Major Project: Heart Disease Prediction using ML Pipeline

Deploy on: Streamlit + Hugging Face Spaces



Week 8 – Ensemble & Advanced ML

Day	Topic	Activities	Outcome
Mon	Decision Trees & Random Forests	Build + visualize trees	Ensemble basics
Tue	Gradient Boosting, XGBoost	Tune and test	Performance models
Wed	Minor Project: Loan Approval Predictor	Ensemble models	Business problem-solving
Thu	Model Stacking & Bagging	Combine multiple models	Improved accuracy
Fri	Case Study Discussion	Compare ensemble vs regression	Understanding tradeoffs

 **Major Project:** *Fraud Detection System (XGBoost + Dashboard)*
Deploy on: Hugging Face Spaces + Streamlit

Week 9 – Time Series & Forecasting

Day	Topic	Activities	Outcome
Mon	Intro to Time Series	Date handling	Sequential data
Tue	ARIMA Models	Build and tune models	Forecasting basics
Wed	Minor Project: Stock Price Forecasting	Predict next week	Practical forecasting
Thu	Exponential Smoothing + Prophet	Advanced models	Comparative results
Fri	Visualization & Evaluation	Plot forecasts	Presentation-ready graphs

 **Major Project:** *Sales Forecasting App (Streamlit + Prophet)*
Deploy on: Streamlit Cloud

Week 10 – NLP for Data Scientists

Day	Topic	Activities	Outcome
Mon	Text Cleaning, Tokenization	Preprocess text	Text data prep
Tue	TF-IDF & Bag of Words	Feature extraction	Convert text to features
Wed	Minor Project: News Category Classifier	Train simple classifier	NLP pipeline
Thu	Sentiment Analysis	Build text model	Sentiment detection
Fri	Visualization of NLP Outputs	Word clouds, polarity graphs	Communicate insights

 **Major Project:** *YouTube Comments Sentiment Analyzer*
Deploy on: Hugging Face Spaces (Streamlit)

Week 11 – Data Visualization & Dashboard Integration

Day	Topic	Activities	Outcome
Mon	Power BI / Tableau Basics	Connect dataset	Create dashboards
Tue	Linking ML Outputs to Dashboards	Use CSV/SQL as data source	Full pipeline

Day	Topic	Activities	Outcome
Wed	Minor Project: Real-time KPI Dashboard	Build interactive BI tool	Visualization mastery
Thu	Streamlit + Plotly Dashboards	Code-based dashboards	Full-stack visualization
Fri	Capstone Project Proposal Review	Plan & design	Finalize topic

Week 12 – Capstone Project

Capstone Project: *End-to-End Business Intelligence System*

- **Description:** Create a full pipeline → extract data (via SQL or CSV) → preprocess → analyze → train ML → visualize KPIs.
 - **Example:** *Sales Intelligence Dashboard with ML-powered forecasting*.
 - **Tools:** Python, Pandas, Streamlit, GCP BigQuery, Tableau Public.
 - **Deliverables:**
 - Public Kaggle Notebook
 - Streamlit app link
 - Dashboard screenshot/report
 - GitHub repository
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Deployment Plan

Project Type	Platform	Steps
Notebook Projects	Kaggle	Publish notebook (public link)
ML Apps	Hugging Face Spaces	Upload Streamlit app + model
Dashboards	Streamlit Cloud / Tableau Public	Generate public dashboard URL
SQL Pipelines	GCP BigQuery	Share query + dataset access link

That completes the **Data Science 12-week full curriculum** 🎓

Would you like me to proceed with **Course 3: Flutter Web Development (3-Month Program)** next?

Excellent 🔥

Now moving to **Course 3: Flutter Web Development (3-Month / 12-Week Full Curriculum)**

This program focuses on building modern, responsive web apps using Flutter and Dart — starting from scratch and progressing to full-scale deployment on **Firebase Hosting** or **CodeSandbox / StackBlitz** (free tiers).



COURSE 3: Flutter Web Development

Duration: 12 Weeks (3 Months)

Mode: Online — CodeSandbox / StackBlitz / Firebase Hosting (Free Tier)

Skill Outcome: Design, develop, and deploy full-featured Flutter Web Applications.

Tools: Flutter, Dart, Visual Studio Code, Firebase, REST APIs, GitHub, StackBlitz



Course Overview

Category	Description
Core Focus	Flutter Web fundamentals → UI/UX design → State Management → API Integration → Deployment
Programming Language	Dart
Cloud Platform	Firebase Hosting, StackBlitz / CodeSandbox
Deployment	Firebase Hosting (Free Tier)
Project Count	6 Minor + 6 Major + 1 Capstone
Final Outcome	Fully responsive, deployed Flutter Web App with live demo link



Detailed Week-by-Week Curriculum



Week 1 – Environment Setup & Dart Basics

Goal: Get familiar with Flutter Web setup and the Dart programming language.

Day	Topic	Activities	Outcome
Mon	Introduction to Flutter & Web Setup	Setup StackBlitz or CodeSandbox Flutter env	Ready workspace
Tue	Dart Basics – Syntax, Data Types, Functions	Write small scripts	Language foundation
Wed	Minor Project 1: Dart-based Calculator	Console app	Basic Dart programming
Thu	Control Flow & Collections	Build Dart exercises	Learn loops, lists, maps
Fri	OOP in Dart (Classes & Objects)	Practice mini-examples	Understand Dart OOP

 **Major Project 1:** *Interactive Unit Converter Web Tool*
Deploy on: StackBlitz Public Link

 **Week 2 – Flutter Fundamentals**

Day	Topic	Activities	Outcome
Mon	Flutter Architecture	Learn widget tree	Understand structure
Tue	Basic Widgets (Text, Image, Button, Column, Row)	Create first UI	Widget understanding
Wed	Minor Project 2: Personal Profile Card	UI layout	Build static webpage
Thu	Styling, Themes & Custom Fonts	Style components	UI aesthetics
Fri	Container, Padding, Margin, Decoration	Build mini landing page	Layout mastery

 **Major Project 2:** *Portfolio Website (Static, Responsive UI)*
Deploy on: Firebase Hosting (Free Tier)

 **Week 3 – Navigation & Layouts**

Day	Topic	Activities	Outcome
Mon	Layout Widgets – Stack, ListView, GridView	Create layouts	Design complex UIs
Tue	Navigation – Routes, Named Routes	Add page navigation	Multi-page apps
Wed	Minor Project 3: Multi-page Blog Template	Basic routing	Navigation mastery
Thu	Forms & Input Fields	Create input UI	Handle user data
Fri	Gesture Detection & Buttons	Add interactivity	UX enhancement

 **Major Project 3:** *Interactive Blog Web App UI*
Deploy on: Firebase Hosting + GitHub

 **Week 4 – State Management Basics**

Day	Topic	Activities	Outcome
Mon	Understanding State	Stateful vs Stateless Widgets	App state basics
Tue	setState() and Lifecycle	Interactive app building	State practice

Day	Topic	Activities	Outcome
Wed	Minor Project 4: Counter + Theme Switcher	Manage UI state	setState mastery
Thu	Provider / Riverpod Intro	Implement Provider	State management intro
Fri	Using Provider in App	Practical exercise	Clean state handling

✿ Major Project 4: To-Do List Web App (Local State + Provider)

Deploy on: Firebase Hosting

Week 5 – API Integration & Networking

Day	Topic	Activities	Outcome
Mon	REST APIs & JSON Parsing	Connect to API	Data fetching
Tue	HTTP Package Usage	Handle requests/responses	Backend integration
Wed	Minor Project 5: Weather App using OpenWeather API	Fetch & display data	Networking
Thu	Error Handling & Async/Await	Add loaders/errors	App reliability
Fri	UI + Data Integration	Combine data + visuals	Practical API app

✿ Major Project 5: News Reader Web App (API Integrated)

Deploy on: Firebase Hosting

Week 6 – Firebase Integration

Day	Topic	Activities	Outcome
Mon	Firebase Project Setup	Connect web app	Cloud integration
Tue	Firebase Authentication	Login/Signup system	User auth
Wed	Minor Project 6: Simple Auth Page	Build login screen	Firebase basics
Thu	Firebase Database	CRUD operations	Cloud data
Fri	Firebase Storage	Store and fetch media	Cloud storage

✿ Major Project 6: User Notes App with Firebase Firestore

Deploy on: Firebase Hosting + Firestore

Week 7 – Advanced UI/UX Design

Day	Topic	Activities	Outcome
Mon	Animations – Implicit & Explicit	Add transitions	Enhance UX
Tue	Responsive Design	Handle screen sizes	Adaptive UIs
Wed	Minor Project: Animated Landing Page	Animate hero sections	Modern UI
Thu	Custom Widgets & Reusability	Refactor UIs	Clean code
Fri	Material Design Standards	Implement Material 3	UI polish

Major Project: *Animated Landing Page for Startup Website*

Deploy on: Firebase Hosting

Week 8 – Intermediate Projects & API + UI Fusion

Day	Topic	Activities	Outcome
Mon	Integrating Multiple APIs	Combine datasets	Advanced logic
Tue	Search & Filter Functionality	Create filters	Data control
Wed	Minor Project: Movie Browser Web App	Fetch + display API data	Composite UI
Thu	Pagination + Scroll Controllers	Handle large data	Optimized UI
Fri	Deployment & Debugging	Fix errors	Reliable builds

Major Project: *Recipe Finder Web App (API + Search + Filters)*

Deploy on: Firebase Hosting

Week 9 – Authentication & Routing Advanced

Day	Topic	Activities	Outcome
Mon	Secure Routes	Role-based routing	Auth security
Tue	Auth Guards & Redirects	Conditional navigation	Auth logic
Wed	Minor Project: Admin Panel	Protected pages	Auth management
Thu	Password Reset & Error Screens	Implement recovery	Usability
Fri	Integration Testing	Validate logic	Stable app

Major Project: *Role-Based Dashboard Web App (Admin + User)*

Deploy on: Firebase Hosting

Week 10 – State Management with Bloc / Riverpod

Day	Topic	Activities	Outcome
Mon	BLoC Architecture	Understand streams	State management

Day	Topic	Activities	Outcome
Tue	Implement BLoC	Convert existing project	Advanced state
Wed	Minor Project: Counter + Theme BLoC App	Bloc state	Reactive apps
Thu	Riverpod Integration	Compare Provider vs Riverpod	Choice understanding
Fri	Final Comparison & Optimization	Benchmark	Scalable architecture

Major Project: E-Commerce Cart System (Bloc Managed)

Deploy on: Firebase Hosting

Week 11 – Testing, Optimization & Deployment

Day	Topic	Activities	Outcome
Mon	Flutter Testing	Unit & Widget tests	Quality assurance
Tue	Code Optimization	Reduce build time	Performance
Wed	Minor Project: Test-driven Mini App	Implement tests	Reliability
Thu	Firebase Deployment Process	Configure and deploy	Live hosting
Fri	Capstone Proposal Discussion	Review ideas	Project planning

Week 12 – Capstone Project

Capstone Project: Full-Stack Flutter Web Application (with Firebase Backend)

Example Ideas:

- Online Learning Dashboard
- Expense Tracker with Auth + Charts
- Social Media Mini Platform

Requirements:

- Minimum 5 screens (Home, Auth, CRUD, Settings, Profile)
- Deployed on Firebase Hosting
- Authentication + Firestore + Responsive UI

Deliverables:

- Firebase live link
 - GitHub repository
 - Demo video (2–3 mins)
 - Documentation (PDF)
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Deployment Plan

Project Type	Platform	Steps
Flutter Web Apps	Firebase Hosting	<code>flutter build web → firebase deploy</code>
Practice Apps	StackBlitz / CodeSandbox	Export project link
Auth Apps	Firebase Auth + Firestore	Connect project to Firebase console
UI Showcases	GitHub Pages / Firebase	Deploy static builds

That completes the **Flutter Web Development (12-Week)** program 

Would you like me to now continue with **Course 4: MERN Stack Development (Final 3-Month Program)?**

Perfect  — this is the **final course: MERN Stack Development (12 Weeks)**. Here's the **full detailed, instructor-ready curriculum**, following the same 5-day + weekend project system.

MERN Stack Development — 12-Week Full Curriculum

Course Overview

Goal:

To train students in building full-stack web applications using MongoDB, Express.js, React, and Node.js — from front-end fundamentals to backend API development and deployment on Vercel & MongoDB Atlas.

Duration: 12 Weeks (5 instructional days + weekend project each week)

Core Skills:

- HTML, CSS, JavaScript (Core Frontend)
- React (Component-based frontend development)
- Node.js + Express.js (Backend APIs)
- MongoDB + Mongoose (Database)
- Git, GitHub, Deployment (Vercel, Render)
- Full-Stack Integration & Authentication

Tools & Platforms:

- **Code Editor:** VS Code / Replit
- **Version Control:** Git + GitHub
- **Database:** MongoDB Atlas (Free Tier)

- **Deployment:** Vercel / Render
 - **API Testing:** Postman
 - **Cloud Storage:** Firebase / Cloudinary (for optional media uploads)
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Weekly Curriculum Breakdown



Week 1 — Web Fundamentals Setup

Goal: Learn HTML, CSS, GitHub, and hosting basics.

Day	Topic	Activities	Expected Outcome
Mon	Intro to Web & HTML	Structure pages with semantic tags	Create basic HTML page
Tue	CSS Basics	Inline, internal, external styling	Build styled portfolio section
Wed	Minor Project 1: Personal Profile Page	HTML + CSS project	Static responsive web page
Thu	Version Control with Git & GitHub	Initialize repo, push project	Hosted portfolio via GitHub Pages
Fri	Responsive Design & Flexbox	Layout creation using Flexbox	Responsive 2-column layout
Weekend	Major Project 1: Mini Portfolio Website	Combine HTML + CSS + GitHub Hosting	Live GitHub Pages link



Week 2 — JavaScript Fundamentals

Goal: Understand JS core syntax and DOM manipulation.

Day	Topic	Activities	Expected Outcome
Mon	JS Syntax & Variables	Practice operators & loops	Basic console-based programs
Tue	Functions, Arrays, Objects	Build simple utilities	Hands-on mini functions
Wed	Minor Project 2: To-Do List (JS Only)	DOM manipulation	To-Do List app with localStorage
Thu	Events & DOM Manipulation	Handle user inputs & events	Dynamic webpage interactivity
Fri	ES6 Concepts	Learn arrow functions, destructuring	Modern JavaScript syntax mastery

Day	Topic	Activities	Expected Outcome
Weekend	Major Project 2: Interactive To-Do App (with Storage)	DOM + Events + localStorage	Deployed JS app

Week 3 — React Fundamentals

Goal: Introduce React basics and component structure.

Day	Topic	Activities	Expected Outcome
Mon	React Setup + JSX	Setup via Vite / Create React App	Working React environment
Tue	Components & Props	Build reusable components	Modular component system
Wed	Minor Project 3: React Info Card	Create card component	Card renders via props
Thu	State & Events	Learn useState, event handlers	Stateful React app
Fri	Conditional Rendering & Lists	Map & filter rendering	Dynamic list rendering
Weekend	Major Project 3: Task Tracker App	Use state & props for tasks	Task tracker hosted on Vercel

Week 4 — React Routing & Styling

Goal: Enable navigation and enhance UI/UX.

Day	Topic	Activities	Expected Outcome
Mon	React Router	Multi-page navigation	Route setup between pages
Tue	Styling with Tailwind / CSS Modules	Setup Tailwind	Consistent UI
Wed	Minor Project 4: Multi-Page Portfolio	React Router practice	Two-page React site
Thu	Forms & Controlled Inputs	Build input-based forms	Form validation logic
Fri	Component Reusability Patterns	Higher-order & common components	Modular codebase
Weekend	Major Project 4: React Blog UI (Frontend Only)	Blog listing UI	Deployed on Vercel

Week 5 — Node.js & Express Backend

Goal: Create APIs and backend structure.

Day	Topic	Activities	Expected Outcome
Mon	Node.js Basics	Run local scripts	Understand Node runtime
Tue	Express.js Setup	Create REST endpoints	Simple Express server
Wed	Minor Project 5: Basic REST API	CRUD for static data	JSON API
Thu	Middleware & Error Handling	Add logging and validation	Reusable middleware
Fri	Environment Variables	Configure .env setup	Secure API credentials
Weekend	Major Project 5: Notes API with Express	Full CRUD backend	Tested with Postman



Week 6 — MongoDB & Mongoose

Goal: Connect database to backend APIs.

Day	Topic	Activities	Expected Outcome
Mon	MongoDB Atlas Setup	Create free cluster	Connect using Mongoose
Tue	CRUD Operations in Mongoose	Build DB schema	Data persistence
Wed	Minor Project 6: Contact API	CRUD + MongoDB	Contact form backend
Thu	Data Validation & Models	Schema validations	Optimized database models
Fri	RESTful Routing	Follow REST API conventions	Professional-grade routes
Weekend	Major Project 6: Task Manager API (Mongo + Express)	Database-backed API	Fully working backend



Week 7 — Full Stack Integration

Goal: Combine React frontend with Node backend.

Day	Topic	Activities	Expected Outcome
Mon	API Integration in React	Axios fetch data	Display API data in UI
Tue	React Hooks for API Calls	Custom hooks	Modular fetch logic

Day	Topic	Activities	Expected Outcome
Wed	Minor Integration Demo	Connect backend + frontend locally	Working full stack
Thu	Proxy Setup & CORS	Fix cross-origin issues	Stable local integration
Fri	Component-Level Testing	Jest basics	Unit test components
Weekend	Major Project 7: Full Stack Task Manager	React + Node + MongoDB	Live full stack app

Week 8 — Authentication & Authorization

Goal: Add secure login system.

Day	Topic	Activities	Expected Outcome
Mon	JWT Authentication	User token generation	Secure API routes
Tue	Login & Register Frontend	React forms for auth	Working login/register
Wed	Minor Project 7: Auth Dashboard	Protected routes	Login-based UI
Thu	Password Hashing & Middleware	Use bcrypt	Secure password storage
Fri	Auth Context / Redux	Central auth state	Persistent login
Weekend	Major Project 8: Secure Notes App	Auth + DB + React	Deployed on Render/Vercel

Week 9 — Advanced React (Hooks, Context, Redux)

Day	Topic	Activities	Expected Outcome
Mon	Custom Hooks	Reusable logic functions	Clean, modular React code
Tue	Context API	Global state setup	Simplify prop drilling
Wed	Minor Project 8: Dark Mode Toggler	Context example	Global theme system
Thu	Redux Toolkit	Centralized state management	Complex app state control
Fri	Middleware & Thunks	Async data flow	Advanced state operations
Weekend	Major Project 9: Blog Manager (Redux + Backend)	CRUD + Auth + Redux	Production-grade app

Week 10 — Deployment & Optimization

Day	Topic	Activities	Expected Outcome
Mon	Frontend Deployment (Vercel)	Deploy React	Live frontend
Tue	Backend Deployment (Render)	Deploy Express API	Live backend
Wed	Minor Project 9: CI/CD Setup	Auto deploy from GitHub	Automated deployment
Thu	Environment Configurations	Set API URLs securely	Env-based production config
Fri	Performance Optimization	Lazy loading, compression	Faster builds
Weekend	Major Project 10: Full Stack Blog App (Deployed)	Live deployed MERN app	Publicly accessible link

Week 11 — Real-World Patterns & Scalability

Day	Topic	Activities	Expected Outcome
Mon	MVC Architecture	Folder structuring	Scalable backend
Tue	REST vs GraphQL	Optional GraphQL intro	API design awareness
Wed	Minor Project 10: Modular Express App	Apply MVC	Clean architecture
Thu	File Uploads	Integrate Cloudinary	Handle user uploads
Fri	Error Tracking & Logging	Add Winston / Morgan	Production debugging
Weekend	Major Project 11: Image Gallery App	Upload + Auth + DB	Media-rich app on Vercel

Week 12 — Capstone Development & Showcase

Goal: Build a complete full-stack deployable app with authentication, database, and hosting.

Day	Topic	Activities	Expected Outcome
Mon	Project Planning	Ideation + ERD + API planning	Defined capstone scope
Tue	Backend Setup	API routes + DB models	Working backend
Wed	Frontend Integration	React + API	Connected UI
Thu	Testing & Deployment	Final deploy to Vercel/Render	Production-ready
Fri	Demo Presentation	Showcase to peers	Final feedback session
Weekend	Capstone Project: “Smart Task Hub”	Full MERN project with Auth, CRUD, Hosting	Public live link on Vercel + MongoDB Atlas

Project Summary

Type	Project	Description	Deployment
Minor 1	Profile Page	HTML + CSS portfolio	GitHub Pages
Minor 2	JS To-Do	JS DOM app	Replit
Minor 3	React Info Card	Component props	Vercel
Minor 4	Portfolio Router	React Router multi-page	Vercel
Minor 5	REST API	Node + Express basic	Render
Minor 6	Contact API	Mongo + Express	Render
Minor 7	Auth Dashboard	Login system	Vercel
Minor 8	Dark Mode	Context API	Vercel
Minor 9	CI/CD Setup	GitHub → Vercel automation	GitHub Actions
Minor 10	Modular Express App	MVC architecture	Render
Major 1–10	See above (each weekend)	Full-stack milestone apps	Vercel + Render
Capstone	Smart Task Hub	Auth + CRUD + DB + Deployment	Live Vercel link

Would you like me to generate the **deployment guide + demo link instructions** (step-by-step hosting setup for all projects on Vercel, Render, and MongoDB Atlas) next? It would complete the final deliverable section of the MERN curriculum.