

MERN Stack Internship – Daily Task Sheets (4 Months)

Daily Format (Recommended)

-  Learning (Theory)
 -  Practice Task
 -  Assignment
 -  Output Expected
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MONTH 1 – JavaScript, TypeScript, HTML, CSS & Web Basics

Week 1 – JavaScript, TypeScript & Git

Day 1 – Orientation & Setup

- **Learning:**
 - Internship overview
 - MERN + TypeScript roadmap
 - Expectations & coding standards
 - **Practice:**
 - Install Node.js
 - Install VS Code
 - Install Git
 - **Assignment:**
 - Create GitHub account
 - **Output:**
 - GitHub profile link
-

Day 2 – JavaScript Fundamentals

- **Learning:**
 - Variables, data types
 - `let, const`
- **Practice:**
 - Write basic JS programs
- **Assignment:**

- Even / Odd number program
 - **Output:**
 - Working JS file committed to GitHub
-

Day 3 – Functions & Arrays (JavaScript)

- **Learning:**
 - Functions
 - Arrays & array methods
 - **Practice:**
 - Array operations
 - **Assignment:**
 - Find max & min from an array
 - **Output:**
 - JS logic with clean functions
-

Day 4 – Introduction to TypeScript

- **Learning:**
 - What is TypeScript & why we use it
 - TypeScript vs JavaScript
 - tsconfig.json
 - **Practice:**
 - Setup TypeScript project
 - **Assignment:**
 - Write first TypeScript program
 - **Output:**
 - Running TypeScript file (.ts)
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Day 5 – Git & GitHub Workflow

- **Learning:**
 - Git clone, commit, push
 - Basic branching
 - **Practice:**
 - Create repository
 - **Assignment:**
 - Push JS & TS code to GitHub
 - **Output:**
 - GitHub repo link
-

Week 2 – TypeScript + HTML + CSS

Day 6 – TypeScript Types & Interfaces

- **Learning:**
 - Primitive types
 - Interfaces & type aliases
 - **Practice:**
 - Create typed objects
 - **Assignment:**
 - Define `User` interface
 - **Output:**
 - Strongly typed TS file
-

Day 7 – TypeScript Functions & Enums

- **Learning:**
 - Typed functions
 - Enums & union types
 - **Practice:**
 - Utility functions
 - **Assignment:**
 - Create reusable typed functions
 - **Output:**
 - Clean TypeScript utilities
-

Day 8 – HTML Basics

- **Learning:**
 - HTML structure
 - Semantic tags
 - **Practice:**
 - Create basic webpage
 - **Assignment:**
 - Profile page
 - **Output:**
 - HTML file
-

Day 9 – CSS & Responsive Design

- **Learning:**
 - Flexbox
 - Media queries

- **Practice:**
 - Responsive layout
 - **Assignment:**
 - Mobile-friendly page
 - **Output:**
 - Responsive UI
-

Day 10 – Mini Project (HTML + CSS + TS)

- **Project:**
 - Static Login Page
 - **Assignment:**
 - Add TypeScript form validation
 - **Output:**
 - Login UI with TS validation
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Week 3 – Advanced TypeScript & Browser APIs

Day 11 – DOM Manipulation with TypeScript

- **Learning:**
 - DOM types
 - Type-safe selectors
 - **Practice:**
 - DOM updates
 - **Assignment:**
 - Dynamic text change
 - **Output:**
 - Typed DOM application
-

Day 12 – Events & Forms (TypeScript)

- **Learning:**
 - Event types
 - Form handling
 - **Practice:**
 - Form submit handling
 - **Assignment:**
 - Client-side validation
 - **Output:**
 - Validated form using TS
-

Day 13 – Async Programming

- **Learning:**
 - Promises
 - `async / await`
 - **Practice:**
 - Fetch API
 - **Assignment:**
 - Fetch and display user list
 - **Output:**
 - Typed API response handling
-

Day 14 – Local Storage with TypeScript

- **Learning:**
 - `localStorage`
 - Typed data persistence
 - **Practice:**
 - Save & retrieve data
 - **Assignment:**
 - Persist to-do list
 - **Output:**
 - Data retained on refresh
-

Day 15 – TypeScript Mini Project

- **Project:**
 - To-Do App using TypeScript
 - **Output:**
 - Fully functional TS app
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Week 4 – Frontend Mini Project

Day 16 – Project Setup

- **Learning:**
 - Project structure
 - **Practice:**
 - Setup dashboard UI
 - **Output:**
 - Base UI layout
-

Day 17 – CRUD Operations

- **Practice:**
 - Create, Read, Update, Delete items
 - **Output:**
 - Typed CRUD functionality
-

Day 18 – Validation & Error Handling

- **Learning:**
 - Error handling best practices
 - **Output:**
 - Stable UI
-

Day 19 – Refactor to Strict TypeScript

- **Practice:**
 - Convert loose JS to strict TS
 - **Output:**
 - Clean & safe codebase
-

Day 20 – Review & Demo

- **Activity:**
 - Project demo
 - Code review
 - **Output:**
 - Reviewed & approved frontend project
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MONTH 2 – React + TypeScript (Frontend Development)

Week 5 – React + TypeScript Fundamentals

Day 21 – React + TypeScript Setup

- **Learning:**

- Why React with TypeScript
 - Vite + React + TS setup
 - Folder structure
 - **Practice:**
 - Create React TS project
 - **Assignment:**
 - Run first React TS app
 - **Output:**
 - React app running on localhost
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Day 22 – Components, Props & State

- **Learning:**
 - Functional components
 - Typed props
 - useState with types
 - **Practice:**
 - Create reusable components
 - **Assignment:**
 - Counter app with TypeScript
 - **Output:**
 - Typed React components
-

Day 23 – useEffect & API Integration

- **Learning:**
 - useEffect
 - API calling with types
 - **Practice:**
 - Fetch data from API
 - **Assignment:**
 - Display user list
 - **Output:**
 - Typed API response rendering
-

Day 24 – React Router

- **Learning:**
 - React Router setup
 - Typed route params
- **Practice:**
 - Multi-page navigation
- **Assignment:**
 - Dashboard & Profile routes

- **Output:**
 - Working routing system
-

Day 25 – Forms & Validation

- **Learning:**
 - Controlled components
 - Typed form handling
 - **Practice:**
 - Login & Signup forms
 - **Assignment:**
 - Client-side validation
 - **Output:**
 - Validated forms in React TS
-

Week 6 – State Management & UI Patterns

Day 26 – Context API

- **Learning:**
 - Context API with TypeScript
 - **Practice:**
 - Global auth state
 - **Assignment:**
 - Auth context provider
 - **Output:**
 - Typed global state
-

Day 27 – Error Handling

- **Learning:**
 - Error boundaries
 - **Practice:**
 - Fallback UI
 - **Assignment:**
 - Global error handler
 - **Output:**
 - Stable React application
-

Day 28 – Tables & Pagination

- **Learning:**
 - Table components
 - Pagination logic
 - **Practice:**
 - Paginated table
 - **Assignment:**
 - User list with pagination
 - **Output:**
 - Paginated data display
-

Day 29 – Filters & Search

- **Learning:**
 - Search & filter patterns
 - **Practice:**
 - Client-side filtering
 - **Assignment:**
 - Searchable table
 - **Output:**
 - Filtered UI results
-

Day 30 – React Mini Project (Admin Panel – Phase 1)

- **Project:**
 - Admin Panel UI
 - **Output:**
 - Base Admin UI with routing
-

Week 7 – Advanced React + TypeScript

Day 31 – Custom Hooks

- **Learning:**
 - Writing custom hooks with TS
 - **Practice:**
 - Reusable data hook
 - **Assignment:**
 - `useFetch` hook
 - **Output:**
 - Clean reusable hook
-

Day 32 – Performance Optimization

- **Learning:**
 - useMemo, useCallback
 - **Practice:**
 - Optimize re-renders
 - **Assignment:**
 - Performance tuning
 - **Output:**
 - Optimized React app
-

Day 33 – Advanced Forms

- **Learning:**
 - Complex forms
 - Validation patterns
 - **Practice:**
 - Multi-step form
 - **Assignment:**
 - Form with validations
 - **Output:**
 - Robust form handling
-

Day 34 – Code Refactoring

- **Learning:**
 - Clean code principles
 - **Practice:**
 - Convert loose TS to strict
 - **Output:**
 - Clean, strict TypeScript code
-

Day 35 – Admin Panel (Phase 2)

- **Project:**
 - Complete Admin Panel UI
 - **Output:**
 - Feature-complete frontend
-

Week 8 – Testing, Deployment & Review

Day 36 – Testing Basics

- **Learning:**
 - React testing fundamentals
 - **Practice:**
 - Component tests
 - **Output:**
 - Basic test cases
-

Day 37 – Documentation

- **Learning:**
 - Writing README
 - **Practice:**
 - Project documentation
 - **Output:**
 - Well-documented frontend
-

Day 38 – Frontend Deployment

- **Learning:**
 - Vercel deployment
 - **Practice:**
 - Deploy Admin Panel
 - **Output:**
 - Live frontend URL
-

Day 39 – Review & Assessment

- **Activity:**
 - Demo
 - Code review
 - **Output:**
 - Reviewed frontend project
-

Day 40 – UI/UX Improvements

- **Activity:**
 - Polish UI
- **Output:**
 - Improved user experience

MONTH 3 – Backend (Node.js + Express + MongoDB + TypeScript)

Week 9 – Backend Foundations

Day 41 – Node.js + TypeScript Setup

- **Learning:**
 - Node + TS architecture
 - **Practice:**
 - Setup backend project
 - **Output:**
 - Running TS server
-

Day 42 – Project Structure

- **Learning:**
 - MVC / Service-layer pattern
 - **Practice:**
 - Folder structure
 - **Output:**
 - Clean backend structure
-

Day 43 – Express Routes & Controllers

- **Learning:**
 - Typed controllers
 - **Practice:**
 - Create CRUD APIs
 - **Output:**
 - Working APIs
-

Day 44 – Middleware

- **Learning:**
 - Middleware concepts
- **Practice:**

- **Output:**
 - Logger middleware
 - Logged API requests
-

Day 45 – MongoDB & Mongoose

- **Learning:**
 - Schemas & models
 - **Practice:**
 - Typed models
 - **Output:**
 - Connected database
-

Week 10 – Authentication & Business Logic

Day 46 – Database Relationships

- **Learning:**
 - References & relations
 - **Output:**
 - Linked collections
-

Day 47 – Service Layer

- **Learning:**
 - Business logic separation
 - **Output:**
 - Maintainable backend
-

Day 48 – Authentication (JWT)

- **Learning:**
 - JWT flow
 - **Output:**
 - Secure login API
-

Day 49 – Role-Based Access

- **Learning:**
 - RBAC
 - **Output:**
 - Role-protected APIs
-

Day 50 – Backend Mini Project

- **Project:**
 - Secure CRUD backend
 - **Output:**
 - Feature-complete backend
-

Week 11 – MERN Integration

Day 51 – Frontend + Backend Integration

- **Output:**
 - Full-stack auth flow
-

Day 52 – CORS & Config

- **Output:**
 - Stable integration
-

Day 53 – Pagination

- **Output:**
 - Scalable APIs
-

Day 54 – Search

- **Output:**
 - Searchable APIs
-

Day 55 – Validation

- **Learning:**
 - Zod / Joi
 - **Output:**
 - Safe input handling
-

Week 12 – Stability & Performance

Day 56 – File Uploads

- **Output:**
 - Image upload API
-

Day 57 – Logging

- **Output:**
 - Winston logging
-

Day 58 – Performance

- **Output:**
 - Indexed queries
-

Day 59 – Security

- **Output:**
 - Hardened backend
-

Day 60 – Review

- **Output:**
 - Stable backend system

MONTH 4 – Final Full-Stack TypeScript Project & Deployment

Week 13 – Project Design & Build

Day 61 – Project Planning

- **Output:**
 - ERD & architecture
-

Day 62 – Backend Development

- **Output:**
 - CRUD APIs
-

Day 63 – Frontend Development

- **Output:**
 - UI screens
-

Day 64 – Authentication Integration

- **Output:**
 - Secure full-stack app
-

Day 65 – End-to-End Integration

- **Output:**
 - Working application
-

Week 14 – Features & Deployment

Day 66 – Filters & Search

- **Output:**
 - Enhanced UX
-

Day 67 – Reports

- **Output:**
 - CSV exports
-

Day 68 – Backend Deployment

- **Output:**
 - Live APIs
-

Day 69 – Frontend Deployment

- **Output:**
 - Live application
-

Day 70 – Testing

- **Output:**
 - Stable production app
-

Week 15 – Hardening & Review

Day 71 – Documentation

- **Output:**
 - API docs (Swagger)
-

Day 72 – Code Review

- **Output:**
 - Clean codebase

Day 73 – Security Audit

- **Output:**
 - Secure system
-

Day 74 – Performance Optimization

- **Output:**
 - Optimized app
-

Day 75 – Demo Preparation

- **Output:**
 - Demo-ready project
-

Week 16 – Closure

Day 76 – Final Demo

- **Output:**
 - Project presentation
-

Day 77 – Technical Evaluation

- **Output:**
 - Assessment scores
-

Day 78 – Feedback & Improvements

- **Output:**
 - Final enhancements
-

Day 79 – Knowledge Transfer

- **Output:**
 - Documentation & handover
-

Day 80 – Internship Closure

- **Output:**
 - Final report & certificate