# Advanced Diploma in AI-Powered Full Stack Development (.NET + React)

**(September 2025 – July 2026)**

**A Job-Ready Program for Future Full-Stack Developers**

## Mata Sundri College for Women,

## University of Delhi

# Advanced Diploma in AI-Powered Full Stack Development (.NET + React)

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## 🎯 Course Objective

This one-year advanced diploma equips students with **job-ready full-stack development skills** in **C#, SQL Server, ASP.NET Core, React, and Software Engineering**. With the addition of **Web Development with AI**, learners will also master **AI-assisted coding** and integrate **AI APIs** into web applications.

By the end of the program, students will graduate as **future-ready Full Stack .NET + AI Developers**, capable of building **scalable, secure, and intelligent web solutions** that align with **todays and tomorrow's industry demands**.

## 📑 Course Structure

| Module | Hours / Sessions | Key Topics | Skills & Outcomes |
|---|---|---|---|
| **1. C# & OOP with Async Programming** | 26 hrs / 13 sessions | Data types, control flow, arrays, classes, OOP concepts, LINQ, delegates, exception handling, async/await | Strong foundation in C#, writing modular, maintainable, and high-performance code |
| **2. SQL Server** | 18 hrs / 9 sessions | Database design, queries, joins, views, stored procedures, triggers, transactions | Ability to design and query relational databases, build secure data-driven apps |
| **3. ASP.NET Core Fundamentals** | 24 hrs / 12 sessions | MVC architecture, Razor pages, forms, validation, routing, middleware | Develop web apps using ASP.NET Core MVC, handle form data, manage state |
| **4. ASP.NET Core Advanced** | 30 hrs / 15 sessions | Dependency injection, Identity, authentication & authorization, AJAX, APIs, file handling | Build secure, scalable web apps with user management & modern features. |
| **5. Frontend Web Basics (HTML, CSS, JS)** | 8 hrs / 4 sessions | HTML5, CSS3, responsive design, JavaScript ES6, DOM manipulation | Create responsive, user-friendly pages and interactive components |

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|---|---|---|---|
| 6. React Development | 16 hrs / 8 sessions | Components, props, state, hooks, API calls, routing | Build dynamic, interactive UIs and integrate React with .NET APIs |
| 7. EF Core & Advanced Backend | 24 hrs / 12 sessions | EF Core CRUD, LINQ, migrations, repository pattern, JWT authentication | Implement database-driven apps, secure APIs with JWT, optimize performance |
| 8. Software Engineering & Deployment | 12 hrs / 6 sessions | Agile & Scrum, UML diagrams, Git/GitHub, testing, CI/CD, IIS, Azure deployment | Apply SDLC practices, use GitHub for version control, deploy apps on Azure |
| 9. Capstone Project | 12 hrs guided + independent work | Requirement gathering, design, coding, testing, deployment | Industry-level project portfolio on GitHub + final presentation |
| 10. Web Development with AI | 40 hrs / 20 sessions | AI-assisted coding (GitHub Copilot, ChatGPT), AI APIs (Azure Cognitive Services, OpenAI), AI + React integration, Mini AI Web App Project | Build AI-enabled web apps (chatbots, recommendation engines, NLP features) and graduate with a portfolio project showcasing AI integration |

## 🛠 Technologies & Tools You Will Master

- Programming & Frameworks: C#, .NET Core, ASP.NET MVC, ASP.NET Web API, React, EF Core
- Databases: Microsoft SQL Server
- AI Tools: GitHub Copilot, OpenAI API, Azure Cognitive Services
- Version Control & Deployment: GitHub, IIS, Azure, CI/CD pipelines
- Methodologies: Agile, Scrum, Test-Driven Development

## 🚀 Career Outcomes

After successful completion, students can apply for roles such as:

- .NET Full Stack Developer
- ASP.NET Core Developer
- Backend Developer (ASP.NET + SQL)
- Frontend Developer (React)

- AI-Integrated Web App Developer
- Software Engineer (.NET)

*Employers will value your ability to:*

✔ Design and develop scalable web applications

✔ Work on both backend (ASP.NET Core, SQL) and frontend (React)

✔ Build and secure REST APIs

✔ Deploy apps to cloud (Azure)

✔ Showcase real-world projects on GitHub

## ✦ Applied Learning Approach

- **Hands-On Labs**: Every concept taught with coding practice
- **Capstone Project**: Industry-level final project, deployed online & showcased on GitHub
- **AI Integration**: Build smart apps with AI-powered features
- **Career Support**: Resume prep, GitHub portfolio, mock interviews

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