

A Complete Guide To

# FULL-STACK DEVELOPMENT

---



**Diploma Program in  
'Full Stack Development'**

**Duration: 32 weeks (160 hours)**

Sr. No.	Name of the Programme	Details About the Programme	Remarks
1.	Diploma course in 'Full Stack Development'	<p><b>Mission of AIITS:</b> The mission of AIITS is to advance knowledge and educate students in information Technology and other areas that will best serve the nation.</p> <p><b>Vision of AIITS:</b> To position AIITS as a premier institute responsive to emerging needs of industry. To produce high skilled graduates and contribute towards sustainable development of the industry and nation.</p>	
		<p><b>1. Introduction to the Programme:</b> Full stack development refers to the development of both front end (client side) and back end (server side) portions of web application. Full stack developers have the ability to design complete web application and websites. They work on the frontend, backend, database and debugging of web application or websites. Front end is the visible part of website or web application which is responsible for user experience. The user directly interacts with the front end portion of the web application or website. Back end refers to the server-side development of web application or website with a primary focus on how the website works. It is responsible for managing the database through queries and APIs by client-side commands. This type of website mainly consists of three parts front end, back end and database. According to the research, there is a 20% growth in demand for full-stack developer compared to last couple of years.  This diploma course in Full-Stack Development aims at utilizing fully the capabilities of the free and open source software. The participants will get good hands-on training on the contents included in the diploma programme.</p> <p><b>2. Objectives of the Programme:</b> The course aims at developing logics and algorithms, imparting relevant programming abilities and develop web based applications, this program also develop capabilities to manage database and generate queries to extract details from a dataset. It also equips the participants to develop websites, and web based software.</p>	

		<p><b><u>Objectives:</u> the objectives of the proposed course are to impart knowledge on the following:</b></p> <ol style="list-style-type: none"> <li>1. Building concepts of developing web based software and websites.</li> <li>2. Develop capabilities to build front end and back end of web application and to integrate the application with database.</li> <li>3. Developing logics and algorithms and programming skills to develop software and its connectivity with database.</li> <li>4. Developing skills to develop websites.</li> <li>5. Learn skills which can give a very promising career.</li> </ol>	
		<p><b>3. Target Group of Learners:</b></p> <p>Diploma in Full-Stack-Development is meant for anyone who want to make their career in IT and software development. Career options will be there for website development as a database engineer and as a software developer. Any students after completion of this program can get placed in industry as website developer or database engineer or software developer and with experience they can grow in their career path. It also helps to build a promising career in every aspects.</p>	
		<p><b>4. Instructional Design:</b></p> <p>The course will consist of live lectures and assignments for every modules. After every module doubt-clearing sessions will be arranged where students will be free to clear their doubts. After completion of all modules projects will be allotted to students.</p>	
		<p><b>5. Instructional Design:</b></p> <ol style="list-style-type: none"> <li>i. <b><u>Duration of the Programme:</u> 8 months</b></li> <li>ii. <b><u>Course delivery</u></b></li> </ol> <p>The course will be entirely delivered <b><u>online or offline.</u></b> There are six modules in the course which will be conducted online by expert faculties in the respective areas. Each week's menu will cover the following:</p> <ol style="list-style-type: none"> <li>1. <b><u>Interactive lectures:</u></b> This online sessions will be conducted either on Microsoft team or Google meet or Zoom. The session link will be shared with the students.</li> </ol>	

		<p>2. <b><u>Video(s):</u></b> The recording of the live sessions will be there in the drive which students can access any time.</p> <p>3. <b><u>Exercises and data:</u></b> Assignments will be allocated to the participants which they need to complete and submit and assessments on any particular module will be done based on the assignments.</p> <p>4. <b><u>Doubt-clearing:</u></b> There will be an interactive forum as a platform to interact with each other and with the resource persons. Here the participants can discuss their difficulties, can ask questions and get the doubts clarified.</p>	
		<p>6. <b><u>Eligibility:</u></b> Students with any bachelor's/Master's degree in Science/ Information Technology/ Computer Science/ Engineering/ from any recognized universities in India or other countries.</p>	
		<p>7. <b><u>Scheme and Evaluation:</u></b> There would be three types of assessment for evaluating the performance of the participants - short and long answer questions, multiple type questions and practical exercises. Each participant will be given assignments and projects. After completion of the training, online examination will be conducted and Certificate will be jointly issued by Pinnacle Infotrain and Jain University only after completion of all the assignments, project and after qualifying the exam.</p>	

		<p align="center"><b>8. Procedure for admission, Curriculum transaction and evaluation:</b></p> <p>Admission will be based on prerequisite degree of any recognized universities in India. The Course is affiliated to the Jain University.</p>	
		<p align="center"><b>9. <u>Fee structure:</u></b></p> <p>The fees should be paid in one installment only, before the commencement of the course. Rs. 58,000/-*</p> <p>*Installment options can be provided with additional 8% on the course fees. The students can pay it in 4 easy installments</p>	
		<p align="center"><b><u>10. Syllabus:</u></b></p> <p><b><u>Topic 1: Sql-</u></b> Introduction to Basic Database Concepts, E-R Modelling and Diagram, Normalization, Introduction to SQL, DDL and DML Statements, Working with Queries (DQL), Aggregate Functions, Joins and Set Operations, Implementation of Data integrity, Working with Constraints, Implementing Views, Data Control language (DCL), Working with Indexes, Writing Transact-SQL (T-SQL), Working with Stored Procedures and Functions, Implementing Triggers <b>(Duration-2 Weeks)</b></p> <p><b><u>Topic 2: Web Development-</u></b></p> <p><b>Introduction to WEB</b></p> <ol style="list-style-type: none"> <li>1. What is Web?</li> <li>2. Web Features?</li> <li>3. W3C and W3C Members</li> <li>4. Introduction to What WG</li> </ol> <p><b>HTML-</b> Introduction, Understanding &amp; using HTML, HTML headings, HTML Comment, HTML Paragraphs, HTML Line Breaks &amp; Rules, HTML Tags, HTML Tables, HTML Nesting, HTML Forms</p> <p><b>DHTML-</b></p>	

		<p>Introduction to DHTML, DHTML JavaScript, DHTML, HTML DOM, DHTML Events, DHTML CSS, DHTML Examples</p> <p><b>CSS-</b></p> <p>What is CSS? CSS Comments, Three Ways to Insert CSS, Multiple Style Sheets, CSS properties used for background effects, Text, CSS Font Families, CSS Links, CSS Lists, Table Borders, CSS Padding</p> <p><b>JavaScript-</b></p> <p>Introduction to JavaScript, Statements and Variables, Operators, Conditional Statements, Popup Boxes, Arrays, Events and Functions, JavaScript Form, Validation, JavaScript</p> <p><b>(Duration-4 weeks)</b></p> <p><b>Topic 3: Python-Core Python</b></p> <p>Introduction to Python, What is Python? History of Python, Python Versions, Features of Python, How to Install Python, Install Python with Diff IDEs, Creating Your First Python Program, Printing to the Screen, Reading Keyboard Input, Using Command Prompt and GUI or IDE</p> <p><b>Different Modes in Python</b></p> <p>Execute the Script, Interactive Mode, Script Mode, Python Comments, Working with Python in Unix/Linux/Windows/Mac/Android, Python New IDEs, PyCharm IDE, How to Work on PyCharm, PyCharm Components, Debugging process in PyCharm, SublimeText IDE, What is PIP?</p> <p><b>Variables in Python</b></p> <p>What is Variable? Variables in Python, Constants in Python, Standard Data Types, Operators and Operands, Swap variables, Type Conversion, String Handling</p> <p><b>Python Conditional Statements</b></p> <p>How to use “if condition” in conditional structures, if statement (One-Way Decisions), if .. else statement (Two-way Decisions), How to use “else condition”, if ..elif .. else statement (Multi-way), When “else condition” does not work, How to use “elif” condition, How to execute conditional statement with minimal code, Nested IF Statement</p> <p><b>Python LOOPS</b></p>	
--	--	---	--

How to use “While Loop”, How to use “For Loop”, How to use For Loop for set of other things besides numbers, Break statements in For Loop, Continue statement in For Loop, Enumerate function for For Loop

### **Python Lists**

Lists are mutable, Getting to Lists, List indices, Traversing a list, List operations, List slices, List methods, Map, filter and reduce

### **Python TUPLE**

Advantages of Tuple over List, Packing and Unpacking, Comparing tuples, Creating nested tuple, Using tuples as keys in dictionaries, Deleting Tuples, Slicing of Tuple, Tuple Membership Test

### **Python Sets**

How to create a set? Iteration Over Sets, Python Set Methods, Python Set Operations, Union of sets, Built-in Functions with Set, Python Frozenset

### **Python Dictionary**

How to create a dictionary? Python Hashing? Python Dictionary Methods, Copying dictionary, Updating Dictionary, Delete Keys from the dictionary, Dictionary items() Method, Sorting the Dictionary, Python Dictionary in-built Functions

### **Python Functions**

What is a Function? How to define and call a function in Python, Types of Functions, Significance of Indentation (Space) in Python, How Function Return Value? Types of Arguments in Functions, Default Arguments, Non-Default Arguments

### **Keyword Arguments**

Non-keyword Arguments, Arbitrary Arguments, Rules to define a function in Python, Various Forms of Function, Arguments, Scope and Lifetime of variables, Anonymous Functions/Lambda functions, map(), filter(), reduce() functions, What is a Docstring?Advanced Python, Python Exception Handling, Python Errors, Common RunTime Errors in PYTHON, Abnormal termination, Chain of importance Of Exception, Exception Handling, Try ... Except, Try ..Except .. else, Try ... finally

### **Python Class and Objects**

Introduction to OOPs Programming, Object Oriented Programming System, OOPS Principles, Basic concept of Object and Classes, Access Modifiers, How to define Python classes, Self-variable in python, What is



		<p>Inheritance? Types of Inheritance? How Inheritance works?</p> <p><b>Python Regular Expressions</b>          What is Regular Expression? Regular Expression Syntax, Understanding Regular Expressions, Regular Expression Patterns, Literal characters  <b>(Duration-10 Weeks)</b></p> <p><b><u>Topic 4: Bootstrap (Powerful Mobile Front-End Framework)-</u></b></p> <p>What is Responsive Web Designing? Typography Features, Bootstrap Tables, Buttons, Dropdowns, Navbars, Bootstrap Images, Bootstrap Responsive utilities, Bootstrap Glyph icons, Bootstrap Grid System, What is a Grid? What is Bootstrap Grid System?</p> <p><b>MOBILE FIRST STRATEGY</b></p> <p>Working of Bootstrap Grid System, Media Queries</p> <p><b>Grid Options</b></p> <p>Responsive column resets, Offset columns, Nested columns</p> <p><b>(Duration-3 Weeks)</b></p> <p><b><u>Topic 5: Django-</u></b></p> <p><b>Django Web Framework</b>          What is a Framework          Introduction to Django          Django – Design Philosophies          History of Django          Why django and Features          Environment setup          Web Server</p> <p><b>MVC Pattern</b>          MVC Architecture vs MVT Architecture          Django MVC – MVT Pattern</p> <p><b>Getting Started with Django</b>          Creating the first Project          Integrating the Project to sublime text          The Project Structure          Running the server          Solving the issues and Migrations          Database Setup</p>	
--	--	--	--



	<p>Setting Up Your Project</p> <p><b>Create an Application</b> What Django Follows Structure of django framework Model Layer What are models Model fields Querysets</p> <p><b>Django – Admin Interface</b> Starting the Admin Interface Migrations</p> <p><b>Views Layer</b> Simple View Basic view(displaying hello world) Functional views, class based views</p> <p><b>Django – URL Mapping</b> Organizing Your URLs Role of urls in djnago Working urls Forms Sending Parameters to Views Templates layer The Render Function</p> <p><b>Django Template Language (DTL)</b> Role of template layer in django Filters,Tags, Tag if, Tag for, Block and Extend Tags Comment Tag, Usage of templates Extending base template</p> <p><b>Django – Models</b> Creating a Model Manipulating Data (CRUD) Linking Models Django – Page Redirection</p> <p><b>Django – Sending E-mails</b> Sending a Simple E-mail Sending Multiple Mails with send_mass_mail Sending HTML E-mail Sending HTML E-mail with Attachments Django – Form Processing Using Form in a View Usage of forms Crud operations using forms Crispy forms in django</p> <p><b>Django – File Uploading</b></p>	
--	--	--

Uploading an Image  
Django – Apache Setup

**Django – Cookies Handling**

Django – Sessions  
Django – Comments

**Django Admin**

Creating Super User  
Using admin in Django  
Adding models to admin  
Adding model objects using admin  
Displaying in cmd using querysets

**Static files**

Loading css files into templates  
Loading js files into templates  
Uploading image using models  
User authentication

**(Duration-7 weeks)**

**Topic 6: Angular-X-**

Components, Using Custom Components, Creating Components with the CLI & Nesting Components, Working with Component Templates, Working with Component Style, Practicing Components, What is Databinding, String Interpolation, Property Binding, Property Binding vs String Interpolation, Event Binding, Bindable Properties and Events, Passing and Using Data with Event Binding, Two-Way-Databinding, Important: FormsModule is Required for Two-Way-Binding, Combining all Forms of Databinding, Practicing Databinding, Understanding Directives, Using ngIf to Output Data Conditionally, Enhancing ngIf with an Else Condition, Components & Databinding Deep Dive, Splitting Apps into Components, Property & Event Binding Overview, Binding to Custom Properties, Assigning an Alias to Custom Properties, Binding to Custom Events, Assigning an Alias to Custom Events, Custom Property and Event Binding Summary, Understanding View Encapsulation, More on View Encapsulation, Using Local References in Templates, Getting Access to the Template & DOM with @ViewChild, Understanding the Component Lifecycle Lifecycle Hooks, Practicing Property & Event Binding and View Encapsulation, Directives Deep Dive, ngFor and ngIf, ngClass and ngStyle, How to create a Basic Directive, Using Services & Dependency Injection, Why would you Need Services? Creating a Logging Service, Injecting the Logging Service into Components, Creating

		<p>a Data Service, Understanding the Hierarchical Injector, How many Instances of Service Should It Be? Injecting Services into Services, Using Services for Cross-Component Communication (Duration-6 weeks)</p> <p><b><u>Key Reference Books</u></b></p> <ol style="list-style-type: none"> <li>1. Fundamentals of Information Technology by Deepak Bharihoke.</li> <li>2. SQL the complete reference, 3<sup>rd</sup> Edition by James R Groff and Paul N Weinberg</li> <li>3. Fundamentals of Database systems by Ramez Elmasri</li> <li>4. Ng-book: The complete guide to Angular by Felipe Coury, Ari Lerner, Carlos Taborda</li> <li>5. Django for beginners by William S Vincent</li> <li>6. The full stack developer: Your essential guide to the everyday skills expected of a modern full stack web developer by Chris Northwood</li> </ol>	
		<p><b>11. Quality Assurance:</b> IQAC (Internal Quality Assurance Cell) is in place to oversee the Programme delivery mechanism and suggest changes specific to industry requirements. The quality of the programme will be ensured through strict monitoring by an executive committee including the Co-ordinator of the programme, the subject experts, Director. The Co-ordinator of the programme shall ensure the regular student feedback of courses, teachers and programme in the prescribed format towards the end of the semester and the same shall be analyzed to draw conclusions for effecting improvement. Periodical review meetings on the programme efficacy will be held in which the remarks of teachers on curriculum, syllabi and methods of teaching and evaluation will be given due importance. Moreover, the progress and the quality of the programme will be monitored by the Internal Quality Assurance Cell of Pinnacle Infotrain from the outcome and feedback of the learners as well as the proper documentation maintained in the Centre.</p>	
		<p><b>12. SLM:</b> Self-Learning Material is available in English</p>	