

**Chapter 1 : Introduction to Web X.0**

**1-1 to 1-25**

**Syllabus : Evolution of Web X.0; Web Analytics 2.0 :** Introduction to Web Analytics, Web Analytics 2.0, Clickstream Analysis, Strategy to choose your web analytics tool, Measuring the success of a website; Web 3.0 and Semantic Web : Characteristics of Semantic Web, Components of Semantic Web, Semantic Web Stack, N-Triples and Turtle, Ontology, RDF and SPARQL

**Self-learning Topics :** Semantic Web Vs AI, SPARQL Vs SQL

1.1	What is Web X.0? .....	1-1
1.2	Web Analytics 2.0.....	1-3
1.2.1	Introduction to Web Analytics .....	1-3
1.2.2	Clickstream Analysis.....	1-4
1.2.3	Web Analytics 2.0.....	1-4
1.2.4	Choosing the Right Web Analytics Tool.....	1-6
1.3	Measuring the Success of your Website .....	1-8
1.3.1	Top KPIs.....	1-8
1.3.2	Macro and Micro Website Conversions.....	1-9
1.4	Web 3.0 and Semantic Web.....	1-9
1.4.1	Components of Semantic Web .....	1-9
1.4.2	Semantic Web Stack .....	1-10
1.4.3	Difference between Semantic Web and Artificial Intelligence.....	1-12
1.5	Resource Description Framework (RDF).....	1-12
1.6	N - Triples and Turtle .....	1-13
1.6.1	Turtle.....	1-13
1.6.2	N-Triple .....	1-14
1.7	Web Ontology Language (OWL).....	1-15
1.7.1	OWL Definition .....	1-15
1.7.2	Basic OWL Constructs .....	1-15
1.7.3	OWL Class Relations and Constructors.....	1-16
1.7.4	OWL Property Relations and their Characteristics.....	1-16
1.7.5	OWL Reasoning (Important) .....	1-17
1.7.6	OWL Profiles.....	1-17
1.8	SPARQL.....	1-17
1.8.1	Data .....	1-18
1.8.2	SELECT.....	1-19
1.8.3	TRIPLES.....	1-19
1.8.4	Graph Patterns.....	1-19
1.8.5	Ordering Results .....	1-20
1.8.6	Slicing .....	1-20
1.8.7	Filters .....	1-21
1.8.8	Binding.....	1-22
1.8.9	Deduplication .....	1-22

1.8.10	Aggregation .....	1-23
1.8.11	Grouping .....	1-23
1.8.12	Describe .....	1-24
1.8.13	Update.....	1-24
1.8.14	Ask .....	1-24
1.9	Differences between SQL and SPARQL.....	1-25

## Chapter 2 : TypeScript

**2-1 to 2-24**

**Syllabus** : Overview, TypeScript Internal Architecture, TypeScript Environment Setup, TypeScript Types, variables and operators, Decision Making and loops, TypeScript Functions, TypeScript Classes and Objects, TypeScript Modules Self-learning  
**Topics** : Javascript Vs TypeScript

2.1	TypeScript Overview .....	2-1
2.1.1	Primary TypeScript Features.....	2-1
2.1.2	Advantages of TypeScript.....	2-2
2.2	TypeScript Internal Architecture .....	2-2
2.3	TypeScript Necessary Environment Setup .....	2-3
2.4	TypeScript Data Types.....	2-3
2.5	TypeScript Variables .....	2-5
2.6	TypeScript Operators.....	2-7
2.6.1	Arithmetic Operators.....	2-7
2.6.2	Logical Operators .....	2-8
2.6.3	Relational Operators.....	2-8
2.6.4	Bitwise Operators.....	2-8
2.6.5	Assignment Operators .....	2-9
2.6.6	Ternary / Conditional Operators.....	2-9
2.6.7	String Operators.....	2-9
2.6.8	Type Operators.....	2-10
2.7	TypeScript Decision Making .....	2-10
2.8	TypeScript Loops.....	2-10
2.9	TypeScript Functions .....	2-13
2.9.1.	Function Types .....	2-13
2.9.2	Arrow Functions .....	2-14
2.9.3	Function Overloading.....	2-15
2.9.4	Rest Parameters.....	2-15
2.10	TypeScript Classes and Objects .....	2-16
2.10.1	Classes Recapped.....	2-16
2.10.2	Instance of a Class (Object).....	2-16
2.10.3	Accessing Attributes and Functions via Objects.....	2-17
2.10.4	Inheritance in Classes.....	2-17

2.10.5	Method Overriding.....	2-18
2.10.6	Encapsulation.....	2-19
2.10.7	Interfaces.....	2-19
2.11	TypeScript Modules .....	2-21
2.12	Differences between JavaScript and TypeScript.....	2-23

### Chapter 3 : Introduction to AngularJS

**3-1 to 3-46**

**Syllabus :** Overview of AngularJS, Need of AngularJS in real web sites, AngularJS modules, AngularJS built-in directives, AngularJS custom directives, AngularJS expressions, Angular JS Data Binding, AngularJS filters, AngularJS controllers, AngularJS scope, AngularJS dependency injection, Angular JS Services, Form Validation, Routing using ng-Route, ng-Repeat, ng-style, ng-view, Built-in Helper Functions, Using Angular JS with Typescript

**Self-learning Topics :** MVC model, DOM model, Javascript functions and Error Handling

3.1	Prerequisites .....	3-1
3.1.1	Model-View-Controller.....	3-1
3.1.2	Document Object Model.....	3-2
3.2	AngularJS - An Overview.....	3-3
3.3	Need for AngularJS .....	3-4
3.4	AngularJS Built-In Directives.....	3-5
3.5	AngularJS Expressions.....	3-7
3.6	AngularJS Controllers.....	3-8
3.7	AngularJS Filters .....	3-11
3.8	AngularJS Modules.....	3-14
3.9	AngularJS Data Binding .....	3-17
3.10	AngularJS Custom Directives.....	3-18
3.11	AngularJS Scope .....	3-21
3.12	AngularJS Dependency Injection .....	3-24
3.12.1	Value .....	3-24
3.12.2	Factory .....	3-24
3.12.3	Service.....	3-25
3.12.4	Provider .....	3-25
3.12.5	Constants .....	3-26
3.13	AngularJS Services .....	3-28
3.13.1	The \$location Service.....	3-28
3.13.2	The \$http Service.....	3-29
3.13.3	The \$timeout Service.....	3-30
3.13.4	The \$interval Service.....	3-31
3.13.5	Custom Services .....	3-32
3.14	AngularJS Form Validation .....	3-32
3.15	AngularJS Routing using ng-route.....	3-36

3.16	The ng-style Directive .....	3-38
3.17	AngularJS Built-In Helper Functions.....	3-39
3.17.1	angular.copy.....	3-39
3.17.2	angular.equals.....	3-39
3.17.3	angular.isArray .....	3-40
3.17.4	angular.isDate .....	3-40
3.17.5	angular.merge .....	3-40
3.17.6	angular.isDefined and angular.isUndefined .....	3-41
3.17.7	angular.toJson .....	3-41
3.18	Using AngularJS with TypeScript.....	3-41

## Chapter 4 : MongoDB and Building REST API using MongoDB

4-1 to 4-31

**Syllabus :** MongoDB: Understanding MongoDB, MongoDB Data Types, Administering User Accounts, Configuring Access Control, Adding the MongoDB Driver to Node.js, Connecting to MongoDB from Node.js, Accessing and Manipulating Databases, Manipulating MongoDB Documents from Node.js, Accessing MongoDB from Node.js, Using Mongoose for Structured Schema and Validation.

REST API: Examining the rules of REST APIs, Evaluating API patterns, Handling typical CRUD functions (create, read, update, delete), Using Express and Mongoose to interact with MongoDB, Testing API endpoints

**Self-learning Topics :** MongoDB vs SQL DB

4.1	MongoDB Overview .....	4-1
4.1.1	MongoDB Introduction.....	4-1
4.1.2	MongoDB Features/Essentials.....	4-1
4.1.3	Differences between RDBMS and MongoDB.....	4-2
4.1.4	Sample MongoDB Document .....	4-3
4.1.5	MongoDB Data Types .....	4-3
4.1.6	MongoDB User Accounts & Access Control .....	4-4
4.2	Setting up MongoDB .....	4-5
4.2.1	Adding MongoDB Driver to Node.js.....	4-5
4.2.2	Connecting to MongoDB from Node.js .....	4-6
4.2.3	Accessing and Manipulating Data (Documents) using Node.js .....	4-8
4.2.3(A)	Create a Database.....	4-8
4.2.3(B)	Create a Collection .....	4-8
4.2.3(C)	Insert into Collection .....	4-9
4.2.3(D)	Find in Collection.....	4-9
4.2.3(E)	Query the Result.....	4-10
4.2.3(F)	Delete a Record/Collection.....	4-11
4.2.3(G)	Update the Record .....	4-11
4.2.3(H)	Limit the Collection .....	4-12
4.2.3(I)	Join Collections .....	4-13
4.3	Using Mongoose for Structured Schema and Validation.....	4-14

4.3.1	Advantages of Mongoose .....	4-14
4.3.2	Disadvantages of Mongoose.....	4-15
4.3.3	New Objects Introduced by Mongoose.....	4-15
4.3.4	Connecting to the MongoDB Database.....	4-15
4.4	REST API.....	4-19
4.4.1	Overview of REST API .....	4-19
4.4.2	REST API Standards .....	4-20
4.4.2(A)	Request URLs.....	4-20
4.4.2(B)	Request Methods .....	4-21
4.4.2(C)	Response and Status Codes .....	4-21
4.5	Evaluating API Patterns .....	4-22
4.6	CRUD .....	4-23
4.6.1	POST.....	4-23
4.6.2	GET .....	4-24
4.6.3	PUT .....	4-24
4.6.4	DELETE.....	4-24
4.7	Using Express and Mongoose to Interact with MongoDB .....	4-25
4.8	Testing API Endpoints .....	4-30
4.8.1	Functional API Endpoint Testing.....	4-30
4.8.2	Non-functional (Performance) Testing.....	4-30
4.8.3	API Endpoint Load Testing .....	4-30

**Chapter 5 : Flask**

**5-1 to 5-21**

**Syllabus :** Introduction, Flask Environment Setup, App Routing, URL Building, Flask HTTP Methods, Flask Request Object, Flask cookies, File Uploading in Flask  
**Self-learning Topics :** Flask Vs Django

5.1	Flask Introduction .....	5-1
5.2	Flask Environment Setup .....	5-2
5.3	First Basic Flask Application.....	5-3
5.4	Flash App Routing.....	5-4
5.5	URL Building.....	5-6
5.6	Flask HTTP Methods.....	5-8
5.6.1	HTTP POST Method.....	5-8
5.6.2	HTTP GET Method.....	5-9
5.7	Flask Request Object .....	5-11
5.8	Flask Cookies.....	5-14
5.8.1	Drawbacks of Using Cookies .....	5-18
5.9	File Uploading in Flask .....	5-19

**Chapter 6 : Rich Internet Application**

**6-1 to 6-34**

**Syllabus : AJAX** : Introduction and Working, Developing RIA using AJAX Techniques : CSS, HTML, DOM, XML HTTP Request, JavaScript, PHP, AJAX as REST Client Introduction to Open Source Frameworks and CMS for RIA: Django, Drupal, Joomla

**Self-learning Topics** : Applications of AJAX in Blogs, Wikis and RSS Feeds

6.1	AJAX Introduction and Working .....	6-1
6.2	Using AJAX with HTML/DOM Client and PHP Server .....	6-2
6.3	Developing a Rich Internet Application Using AJAX Client.....	6-4
6.4	Introduction to Open Source Frameworks and CMS for a Rich Internet Application.....	6-11
6.4.1	Django .....	6-12
6.4.2	Drupal .....	6-16
6.4.3	Joomla .....	6-25
➤	Multiple Choice Questions .....	M-1 to M-17