

# **OPEN ELECTIVE COURSES & JOB ORIENTED COURSES - OFFERED BY IT DEPARTMENT**

## **OPEN ELECTIVE COURSES (OFFERED BY IT DEPARTMENT):**

CODE NO.	SUBJECT NAME	CODE NO.	SUBJECT NAME
ITOL1	DATA STRUCTURES AND ALGORITHMS	ITOL2	WEB TECHNOLOGIES

## **JOB ORIENTED COURSES (OFFERED BY IT DEPARTMENT):**

CODE NO.	SUBJECT NAME	CODE NO.	SUBJECT NAME
JOEL03	JAVA SCRIPT TECHNOLOGIES	JOEL04	CLOUD COMPUTING USING AWS

ITOL01

Data Structures and algorithms

L P C

3 0 3

### Course Objectives

The main objectives of this course are:

1. To design and implement various basic and advanced data structures.
2. To introduce various techniques for representation of the data in the real world.
3. Acquaintance of algorithm design strategies
4. Expertise with a variety of significant algorithms

### Course Outcomes

At the end of the course, the student will be able to

1. **Select** and **Implement** Appropriate Linear data structures as applied to specified problem definition.
2. **Implement** Non-Linear data structures and Develop solutions for complex problem using Divide and Conquer.
3. **Develop** solutions for complex problems using Greedy and Dynamic Programming.
4. **Design** and **Improve** all possible solutions for a problem using Backtracking and Branch and Bound.

### CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	2								2
CO2	2	3	3	3		2						2
CO3	2	3	3	3		2						2
CO4	2	2	3	3								2

### UNIT – I

(14 Periods)

Analysis of an Algorithm, Asymptotic Notations, Singly Linked lists- Representation in Memory, Abstract Data Types (ADTs) –singly linked lists, doubly-linked lists and circularly linked lists. Stack ADT and its operations using array and linked list, Queue ADT and its operations using array and linked list.

### UNIT – II

(12 Periods)

Basic Tree Terminologies, Different types of trees: Binary Tree, Binary Search Tree, tree traversals, Graph representation and traversals. Divide and Conquer- Control Abstraction, Merge sort, Quick sort, Binary Search.

### UNIT – III

(12 Periods)

Greedy Method- Control Abstraction, Knapsack Problem, Minimum Cost Spanning Trees, Single Source Shortest Paths. Dynamic Programming- General Method, Multi-stage Graph, All Pairs Shortest Paths, String Editing, Single Source Shortest Paths (General Weights).

### UNIT – IV

(14 Periods)

Backtracking- General Method, 8-Queens Problem, and Graph Coloring. Branch and Bound- General Method, Travelling Sales Person Problem, Knapsack problem.

**TEXT BOOKS:**

- 1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education, 1997. (Unit- I & Unit II)
- 2 E. Horowitz, S. Sahni and S. Rajsekar, "Fundamentals of Computer Algorithms", Galgotia Publication. (Unit- III & Unit IV)

**Reference Books:**

- 1 Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms", Second Edition, Mc Graw Hill, 2002.
- 2 Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education, 1983.
- 3 Stephen G. Kochan, "Programming in C", 3rd edition, Pearson Education.
- 4 Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, "Fundamentals of Data Structures in C", Second Edition, University Press, 2008
- 5 Reema Thareja, "Data Structures Using C", Second Edition, Oxford University Press, 2011

**ITOL02**

**Web Technologies**

**L P C**

**3 0 3**

**Course Objectives:**

At the end of the course the students will understand

- 1 Basic technologies to develop web documents.
- 2 Dynamic HTML and CSS.
- 3 Dynamic web pages using Java Script.
- 4 XML, XSL and Web Servers.

**Course Outcomes:**

At the end of the course the students will be able to

- 1 Create web pages with HTML and CSS.
- 2 Validate inputs using java script.
- 3 Design and develop dynamic webpages using event handling mechanism.
- 4 Create XML documents and Multitier applications.

**CO-PO MAPPING:**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
<b>CO1</b>	3	3	3	2	3	-	-	1	3	-	-	2
<b>CO2</b>	3	3	3	2	3	-	-	1	3	-	-	2
<b>CO3</b>	3	3	3	2	3	-	-	1	3	-	-	3
<b>CO4</b>	3	3	3	2	3	-	-	1	3	-	-	3

**UNIT I**

**(CO1)12 Periods**

Introduction: Introduction to HTML5 Part-1 and Part-2.

Introduction to Cascading Style Sheets (CSS): Part 1 and Part 2

**UNIT II**

**(CO2)14 Periods**

JavaScript: Introduction to Scripting, Control Statements Part - I & II.

JavaScript: Functions, Arrays

**UNIT III**

**(CO3)12 Periods**

JavaScript: Objects.

DOM Objects and Collections

JavaScript Event Handling

**UNIT IV**

**(CO4)12 Periods**

XML: Introduction, XML Basics, Structuring Data, XML Namespaces, Document Type

Definitions(DTDs), W3C XML Schema, Extensible Style sheet Language and XSL Transformations, Document Object Model (DOM),

Web Servers: Introduction, HTTP Transactions, Multitier Application Architecture, Client-Side Scripting versus Server-Side Scripting, Accessing Web Servers.

**TEXT BOOK:**

1. Harvey M. Deitel and Paul J.Deitel, "Internet & World Wide Web How to Program", 4/3, Pearson Education.

**REFERENCE BOOKS:**

1. Jason Cranford Teague "Visual Quick Start Guide CSS, DHTML & AJAX", 4/ e, "Perason Education".
2. Tom NerinoDoli Smith "JavaScript & AJAX for the Web" Pearson Education, 2007.
3. Web Technology - UttamK.Roy, Oxford University Press, 2010.

**WEB REFERENCES:**

- [www.deitel.com](http://www.deitel.com)
- [www.w3schools.com](http://www.w3schools.com)
- [www.tutorialspot.com](http://www.tutorialspot.com)

**Course Objectives:**

The objectives of the course are:

1. To introduce basic concepts of JavaScript Objects and Arrays.
2. To demonstrate functions, classes and modules.
3. To explain JSTL and Asynchronous JavaScript.
4. To introduce Server-Side Programming with Node.

**Course Outcomes:**

At the end of the course the students will be able to

1. Apply Objects and Arrays to advanced JavaScript programs.
2. Design applications using Procedure and Object Oriented concepts.
3. Develop applications using JSTL and Asynchronous JavaScript.
4. Develop Server Side applications using Node.

**CO-PO Mapping:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	-	-	1	-	-	-	2
CO2	3	3	3	3	2	-	-	1	-	-	-	2
CO3	3	3	3	3	2	-	-	1	-	-	-	3
CO4	3	3	3	3	2	-	-	3	-	-	-	3

**Unit-1****CO1(12 Periods)**

**Introduction to JavaScript:** Exploring JavaScript, Hello World, A Tour of JavaScript.

**Objects:** Introduction to Objects, Creating Objects, Querying and Setting Properties, Object Methods.

**Arrays:** Creating Arrays, Reading and Writing Array Elements, Sparse Arrays, Array Length, Adding and Deleting, Array Elements, Iterating Arrays, Multidimensional Arrays, Array Methods.

**Unit-2****CO2(14 Periods)**

**Functions:** Defining Functions, Invoking Functions, Function Arguments and Parameters, Functions as Values, Functions as Namespaces, Closures, Function Properties, Methods, and Constructor.

**Classes:** Classes and Prototypes, Classes and Constructors, Classes with the class Keyword, Adding Methods to Existing Classes, Subclasses.

**Modules:** Modules with Classes, Objects, and Closures, Modules in Node, Modules in ES6.

**Unit -3****CO3(12 Periods)**

**The JavaScript Standard Library:** Sets and Maps, Typed Arrays and Binary Data, Dates and Times.

**Iterators and Generators:** How Iterators Work, Implementing Iterable Objects, Generators, Advanced Generator Features.

**Asynchronous JavaScript:** Asynchronous Programming with Callbacks, Promises, async and await.

**Unit-4****CO4(12 Periods)**

**Server-Side JavaScript with Node:** Node Programming Basics, Node Is Asynchronous by Default, Buffers, Events and EventEmitter, Streams, Working with Files, HTTP Clients and Servers.

**TEXT BOOK:**

1. JavaScript :The Definitive Guide by David Flanagan, Seventh Edition, Published by O'Reilly Media, Inc.

**REFERENCE BOOKS:**

1. Eloquent JavaScript by Marijn Haverbeke, Third Edition, No Starch Press, 2018.
2. Node.js in Practice by Alex Young and Marc Harter, Manning Publications, 2015.

**COURSE OBJECTIVES:**

1. Configure and use AWS authentication services.
2. Understand the different services using S3, DB and Lambda
3. Understand the user login using Amazon Cognito.
4. Understand the AWS Lambda to generate Thumbnails.

**Course Outcomes:** Students will be able to:

1. Implementation of key concepts of AWS called Identity management and EC2.
2. Demonstrate and use S3, Dynamo DB and Lambda in the AWS ecosystem
3. Implementation of Amazon Cognito.
4. Implementation of AWS Lambda.

**CO-PO Mapping:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			1	2	3							
CO2			3	3	3							
CO3			3	3	3							
CO4			3	3	3							

**UNIT -- I:**

Cloud Computing: Introduction to cloud computing and Amazon Web Services, Regions and Availability Zones and Edge Locations. AWS Identity and Access Management. Amazon EC2.

**UNIT -- II:**

Amazon Web Service Storage: AWS S3, Amazon Dynamo DB, AWS Lambda

**UNIT -- III:**

AWS for Android Developers: Integrating the AWS SDK for Android with Android Studio, Implementing user signup and login using Amazon Cognito User Pools, Accessing Amazon Dynamo DB

**UNIT – IV:**

Adding AWSChat Support with Amazon Dynamo DB and Amazon S3, Using AWS Lambda to Generate Thumbnails.

**Text Books:**

1. Abhishek Mishra, Amazon Web Services for Mobile Users, John Wiley Publications, 2018.

**References:**

1. John Chapin and Mike Roberts, Programming AWS Lambda: Build and Deploy Serverless Applications with Java 1st Edition, O'Reilly Media, 2020.
2. Mark Wilkins, Learning Amazon Web Services (AWS): A Hands-On Guide to the Fundamentals of AWS Cloud, 1st Edition, Addison-Wesley Professional, 2019



