C:\Users\AITSK~1\AppData\Local\Temp\ksohtml1380\wps1.png

#### ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::KADAPA (AUTONOMOUS)

(Approved by AICTE New Delhi & Affiliated to JNTUA, Anantapuramu)

**B.TECH - CSE (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)**

**II YEAR II SEMESTER COURSE STRUCTURE & SYLLABUS**

|  |  |
| --- | --- |
| **SNO** | **CSE (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)** |
| 1 | Optimization Techniques |
| 2 | Probability & Statistics |
| 3 | Machine Learning |
| 4 | Database Management Systems |
| 5 | Digital Logic and Computer Organization |
| 6 | Machine Learning Lab |
| 7 | Database Management Systems Lab |
| 8 | Full Stack Development-1 |
| 9 | Design Thinking & Innovation |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::KADAPA (AUTONOMOUS)**

**(Approved by AICTE New Delhi & Affiliated to JNTUA, Anantapuramu)**

**Accredited by NAAC with ‘A’ grade, Bangalore**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **B.Tech II Year - II Semester** | **OPTIMIZATION TECHNIQUES**  **(For CSE(AI&ML))** | **L** | **T** | **P** | **C** |
| **2** | **0** | **0** | **2** |

**Course Objectives:** The objectives of the course are

* To provide the basic knowledge about Optimization, importance, application areas of in the industry, Linear Programming.
* To impart different optimization models under typical situations in the business organization like transportation, assignment.
* To understand the process of sequencing in a typical industry.
* To describe different game strategies under cut-throat competitive business environment
* To develop networks of activities of projects and to find out optimal modes of completing projects using network modelling evaluation techniques.

**Course Outcomes:**

|  |  |  |
| --- | --- | --- |
| COs | Statements | Blooms Level |
| CO1 | Understanding Optimization and Formulation of Linear Programing  Models | L1 |
| CO2 | Formulate and Solve Transportation & Assignment Models | L3 |
| CO3 | Sequencing of operations and optimizing | L2 |
| CO4 | Discuss the game theory and strategies | L2 |
| CO5 | Developing networks of activities and finding optimal mode of projects  evaluation. | L3 |

**UNIT-I**

Introduction: Meaning, Nature, Scope & Significance of Optimization - Typical applications. The Linear Programming Problem – Introduction, Formulation of Linear Programming problem, Limitations of L.P.P, Graphical method, Simplex method: Maximization and Minimization model(exclude Duality problems), Big-M method and Two Phase method.

**UNIT-II**

**Transportation Problem:** Introduction, Transportation Model, Finding initial basic feasible solutions, Moving towards optimality, Unbalanced Transportation problems, Transportation problems with maximization, Degeneracy.

**Assignment Problem:** Introduction, Mathematical formulation of the problem, Solution of an Assignment problem, Hungarian Algorithm, Multiple Solution, Unbalanced Assignment problems, Maximization in Assignment Model.

**UNIT-III**

Sequencing – Job sequencing, Johnsons Algorithm for n Jobs and Two machines, n Jobs and Three Machines, n jobs through m machines, Two jobs and m Machines Problems.

**UNIT-IV**

Game Theory: Concepts, Definitions and Terminology, Two Person Zero Sum Games, Pure Strategy Games (with Saddle Point), Principal of Dominance, Mixed Strategy Games (Game without Saddle Point), Significance of Game Theory in Managerial Application.

**UNIT-V**

Project Management: Network Analysis – Definition –objectives -Rules for constructing network diagram- Determining Critical Path– Earliest & Latest Times– Floats-Application of CPM and PERT techniques in Project Planning and Control – PERT Vs CPM. (exclude Project Crashing).

# **Textbooks:**

1. Operations Research by S.D.Sharma-Kedarnath
2. Operations Research by R.Pannerselvam, PHI Publications.

# **Reference Books:**

1. Quantitative Techniques in Management by N D Vohra, Tata Mc Graw Hill, 4th Edition, 2011.
2. Introductionto O.R by Hiller & Libermann (TMH).
3. Operations Research: Methods & Problems by Maurice Saseini, Arhur Yaspan & Lawrence Friedman. Pearson
4. Quantitative Analysis For Management by Barry Render, Ralph M. Stair, Jrand Michael E.Hanna.
5. Operations Research by Wagner, PHI Publications.

**Online Learning Sources**

https://onlinecourses.swayam2.ac.in/cec20\_ma10/preview https://onlinecourses.nptel.ac.in/noc20\_ma23/preview https://onlinecourses.nptel.ac.in/noc19\_ma29/preview

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::KADAPA (AUTONOMOUS)**

**(Approved by AICTE New Delhi & Affiliated to JNTUA, Anantapuramu)**

**Accredited by NAAC with ‘A’ grade, Bangalore**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **B.Tech. II Year - II Semester** | **PROBABILITY & STATISTICS**  **(Common to CSE, CSE (AI &ML))** | **L** | **T** | **P** | **C** |
| **3** | **0** | **0** | **3** |

**Course Outcomes:**

## After successful completion of this course, the students should be able to:

|  |  |  |
| --- | --- | --- |
| **COs** | Statements | Blooms level |
| **CO1** | Acquire knowledge in finding the analysis of the data quantitatively or categorically and various statistical elementary tools. | L2, L3 |
| **CO2** | Develop skills in designing mathematical models involving probability, random  variables and the critical thinking in the theory of probability and its applications in real life problems. | L3, L5 |
| **CO3** | Apply the theoretical probability distributions like binomial, Poisson, and Normal in the relevant application areas. | L3 |
| **CO4** | Analyze to test various hypotheses included in theory and types of errors for large samples. | L2, L3 |
| **CO5** | Apply the different testing tools like t-test, F-test, chi-square test to analyze the relevant real life problems. | L3, L5 |

**UNIT I: Descriptive statistics**

Statistics Introduction, Population vs Sample, Collection of data, primary and secondary data, Measures of Central tendency, Measures of Variability (spread or variance) Skewness, Kurtosis, correlation, correlation coefficient, rank correlation, regression coefficients, method of least squares, regression lines.

## UNIT II: Probability and Random variables

**Probability:** Sample space and events, axioms of probability, some elementary theorems (addition and multiplicative law) of probability, conditional probability, Bayes’ Theorem.

**Random variables:** Introduction, discrete and continuous, probability density functions, properties, mathematical expectation.

## UNIT III: Probability distributions

Probability distributions: Binomial, Poisson and Normal-their properties (Chebyshevs inequality). Approximation of the binomial distribution to normal distribution.

## UNIT IV: Estimation and Testing of hypothesis, large sample tests

Estimation-parameters, statistics, sampling distribution, point estimation, Formulation of null hypothesis, alternative hypothesis, the critical and acceptance regions, level of significance, two types of errors and power of the test. Large Sample Tests: Test for single proportion, difference of proportions, test for single mean and difference of means. Confidence interval for parameters in one sample and two sample problems.

## UNIT V: Small sample tests

Student t-distribution (test for single mean, two means and paired t-test), testing of equality of variances (F-test), χ2 - test for goodness of fit, χ2 - test for independence of attributes.

## 

## Textbooks:

1. Miller and Freunds, Probability and Statistics for Engineers,7/e, Pearson, 2008.
2. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand & Sons Publications, 2012.

## Reference Books:

1. S. Ross, a First Course in Probability, Pearson Education India, 2002.
2. W. Feller, an Introduction to Probability Theory and its Applications, 1/e, Wiley, 1968.
3. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education.

## Online Learning Resources:

1. https://onlinecourses.nptel.ac.in/noc21\_ma74/preview
2. https://onlinecourses.nptel.ac.in/noc22\_mg31/preview

C:\Users\AITSK~1\AppData\Local\Temp\ksohtml1380\wps1.png

#### ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::KADAPA (AUTONOMOUS)

(Approved by AICTE New Delhi & Affiliated to JNTUA, Anantapuramu)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **B.Tech II Year - II Semester** | **MACHINE LEARNING**  **(23HPC3301)** | **L** | **T** | **P** | **C** |
| **3** | **0** | **0** | **3** |

**Course Objectives:** The objectives of the course are

* Understand the basic concepts of machine Learning
* Apply different machine learning algorithms
* Implement clustering techniques

# ,

**Course Outcomes**:

* Identify machine learning techniques suitable for a given problem. (L3)
* Solve the problems using various machine learning algorithms(L3)
* Apply data processing techniques (L3)
* Apply the design of intelligent machines (L3)
* Evaluate different clustering techniques(L5)

**UNIT-I: Introduction to Machine Learning:**

Evolution of Machine Learning, Paradigms for ML, Learning by Rote, Learning by Induction, Reinforcement Learning, Types of Data, Matching, Stages in Machine Learning, Data Acquisition, Feature Engineering, Data Representation, Model Selection, Model Learning, Model Evaluation, Model Prediction, Search and Learning, Data Sets.

**UNIT-II: Nearest Neighbor-Based Models:**

Introduction to Proximity Measures, Distance Measures, Non-Metric Similarity Functions, Proximity Between Binary Patterns, Different Classification Algorithms Based on the Distance Measures ,K-Nearest Neighbor Classifier, Radius Distance Nearest Neighbor Algorithm, KNN Regression, Performance of Classifiers, Performance of Regression Algorithms.

**UNIT-III: Models Based on Decision Trees**:

Decision Trees for Classification, Impurity Measures, Properties, Regression Based on Decision Trees, Bias–Variance Trade-off, Random Forests for Classification and Regression.

**The Bayes Classifier:** Introduction to the Bayes Classifier, Bayes’ Rule and Inference, The Bayes Classifier and its Optimality, Multi-Class Classification | Class Conditional Independence and Naive Bayes Classifier (NBC)

**UNIT-IV: Linear Discriminants for Machine Learning**:

Introduction to Linear Discriminants, Linear Discriminants for Classification, Perceptron Classifier, Perceptron Learning Algorithm, Support Vector Machines, Linearly Non-Separable Case, Non-linear SVM, Kernel Trick, Logistic Regression, Linear Regression, Multi-Layer Perceptrons (MLPs), Back propagation for Training an MLP.

**UNIT-V: Clustering** :

Introduction to Clustering, Partitioning of Data, Matrix Factorization | Clustering of Patterns, Divisive Clustering, Agglomerative Clustering, Partitional Clustering, K-Means Clustering, Soft Partitioning, Soft Clustering, Fuzzy C-Means Clustering, Rough Clustering, Rough K-Means Clustering Algorithm, Expectation Maximization-Based Clustering, Spectral Clustering.

# **Text Books:**

1.“Machine Learning Theory and Practice”, M N Murthy, V S Ananthanarayana, Universities Press (India), 2024

# **Reference Books:**

1.“Machine Learning”, Tom M. Mitchell, McGraw-Hill Publication, 2017 2.“Machine Learning in Action”,Peter Harrington, DreamTech

3.“Introduction to Data Mining”, Pang-Ning Tan, Michel Stenbach, Vipin Kumar, 7th Edition, 2019.

C:\Users\AITSK~1\AppData\Local\Temp\ksohtml1380\wps1.png

#### ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::KADAPA (AUTONOMOUS)

(Approved by AICTE New Delhi & Affiliated to JNTUA, Anantapuramu)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **B.Tech II Year - II Semester** | **DATABASE MANAGEMENT SYSTEMS**  **(23HES0504)** | **L** | **T** | **P** | **C** |
| **3** | **0** | **0** | **3** |

**Course Objectives:** The main objectives of the course is to

* Introduce the fundamental concepts of database management systems
* Introduce the basic concepts of SQL
* Demonstrate the principles of logical design through normalization
* Provide knowledge on concurrency control and indexing techniques

**Course Outcomes:** After completion of the course, students will be able to

* Understand the basic concepts of database management systems (L2)
* Analyze a given database application using ER model (L4)
* Utilize SQL proficiently to address diverse query challenges (L3)
* Employ normalization methods to enhance database structure (L3)
* Implement concurrency control and indexing techniques (L3)

**UNIT I: Introduction:**

Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications. Brief introduction of different Data Models; Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure, environment, Centralized and Client Server architecture for the database.

**Entity Relationship Model:** Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.

**Unit II: Relational Model:**

Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values, constraints (Domain, Key constraints, integrity constraints) and their importance, Relational Algebra, Relational Calculus. BASIC SQL: Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).

**UNIT III: SQL:**

Basic SQL querying (select and project) using where clause, arithmetic & logical operations, SQL functions(Date and Time, Numeric, String conversion).Creating tables with relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, view(updatable and non-updatable), relational set operations.

**UNIT IV: Schema Refinement (Normalization):**

Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency Lossless join and dependency preserving decomposition, (1NF, 2NF and 3 NF), concept of surrogate key, Boyce-Codd normal form(BCNF), MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).

**UNIT V: Transaction Concept:**

Transaction State, ACID properties, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability, lock based, time stamp based, optimistic, concurrency protocols, Deadlocks, Failure Classification, Storage, Recovery and Atomicity, Recovery algorithm.

**Introduction to Indexing Techniques:** B+ Trees, operations on B+Trees, Hash Based Indexing:

# **Text Books:**

1. Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2. Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

# **Reference Books:**

1. Introduction to Database Systems, 8thedition, C J Date, Pearson.
2. Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

# **Web-Resources:**

1. <https://nptel.ac.in/courses/106/105/106105175/>

[2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex\_auth\_0127580666728202](https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01275806667282022456_shared/overview) [2456\_shared/overview](https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01275806667282022456_shared/overview)

C:\Users\AITSK~1\AppData\Local\Temp\ksohtml1380\wps1.png

#### ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::KADAPA (AUTONOMOUS)

(Approved by AICTE New Delhi & Affiliated to JNTUA, Anantapuramu)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **B.Tech II Year - II Semester** | **(23A30402) DIGITAL LOGIC & COMPUTER ORGANIZATION** | **L** | **T** | **P** | **C** |
| **3** | **0** | **0** | **3** |

**Course Objectives:** The main objective of the course is to

* Provide students with a comprehensive understanding of digital logic design principles and computer organization fundamentals
* Describe memory hierarchy concepts
* Explain input/output (I/O) systems and their interaction with the CPU, memory, and peripheral devices

**Course Outcomes:** After completion of the course, students will be able to

* Differentiate between combinational and sequential circuits based on their characteristics and functionalities. (L2)
* Demonstrate an understanding of computer functional units.(L2)
* Analyze the design and operation of processors, including instruction execution, pipelining, and control unit mechanisms, to comprehend their role in computer systems.(L3)
* Describe memory hierarchy concepts, including cache memory, virtual memory, and secondary storage, and evaluate their impact on system performance and scalability. (L3)
* Explain input/output (I/O) systems and their interaction with the CPU, memory, and peripheral devices, including interrupts, DMA, and I/O mapping techniques. (L3)
* Design Sequential and Combinational Circuits(L6)

# **UNIT–I:**

**Data Representation:** Binary Numbers, Fixed Point Representation, Floating Point Representation, Number base conversions, Octal and Hexadecimal Numbers, Complements**,** Signed binary numbers

**Digital Logic Circuits-I:** Basic Logic Functions, Logic gates, universal logic gates, Minimization of Logic expressions. K-Map Simplification, Combinational Circuits, Decoders, Multiplexers

# **UNIT–II:**

**Digital Logic Circuits-II**: Sequential Circuits, Flip-Flop Conversions, Binary counters, Ripple counters

**Basic Structure of Computers:** Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Computer Generations, Von- Neumann Architecture

# **UNIT– III:**

**Computer Arithmetic** : Addition and Subtraction, Multiplication Algorithms**,** Design of Fast Adders, Multiplication of Positive Numbers, Signed-operand Multiplication, Fast Multiplication, Integer Division, Floating-Point Numbers and Operations

**Processor Organization:** Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control and Multi programmed Control

# **UNIT–IV:**

**The Memory Organization:** Basic Concepts, Semiconductor RAM Memories, Read-Only Memories, Speed, Size and Cost, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements, Secondary Storage

# **UNIT–V:**

**Input /Output Organization:** Accessing I/O Devices, Interrupts, Processor Examples, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces

# **Textbooks:**

1. Computer Organization, Carl Hamacher,ZvonkoVranesic,Safwat Zaky,6thedition, McGraw Hill, 2023.
2. DigitalDesign,6thEdition,M.Morris Mano,PearsonEducation,2018.
3. ComputerOrganizationandArchitecture,WilliamStallings,11thEdition,Pearson, 2022.

# **Reference Books:**

1. Computer Systems Architecture,M.Moris Mano,3rdEdition,Pearson,2017.
2. Computer Organization and Design, David A. Paterson, John L. Hennessy, Elsevier,2004.
3. FundamentalsofLogicDesign,Roth,5thEdition,Thomson,2003.

# **OnlineLearningResources:**

https://nptel.ac.in/courses/106/103/106103068/

C:\Users\AITSK~1\AppData\Local\Temp\ksohtml1380\wps1.png

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **B.Tech II Year - II Semester** | **MACHINE LEARNING LAB**  **(23HPC3302)** | **L** | **T** | **P** | **C** |
| **0** | **0** | **3** | **1.5** |

#### ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::KADAPA (AUTONOMOUS)

(Approved by AICTE New Delhi & Affiliated to JNTUA, Anantapuramu

**Course Objectives:**

* To learn about computing central tendency measures and Data preprocessing

techniques.

* Implement machine learning algorithms in any suitable language of choice.

**Course Outcomes:**

* Understand the statistical perspectives of machine learning algorithms(L2)
* Evaluate different machine learning algorithms(L5)

**Software Required: Python/R/Weka**

*Lab should cover the concepts studied in the course work, sample listof Experiments:*

1. Compute Central Tendency Measures: Mean, Median, Mode Measure of Dispersion: Variance, Standard Deviation.

2. Apply the following Pre-processing techniques for a given dataset.

a. Attribute selection

b. Handling Missing Values

c. Discretization

d. Elimination of Outliers

3. Apply KNN algorithm for classification and regression

4. Demonstrate decision tree algorithm for a classification problem and perform parameter tuning for better results

5. Demonstrate decision tree algorithm for a regression problem

6. Apply Random Forest algorithm for classification and regression

7. Demonstrate Naïve Bayes Classification algorithm.

8. Apply Support Vector algorithm for classification

9. Demonstrate simple linear regression algorithm for a regression problem

10. Apply Logistic regression algorithm for a classification problem

11. Demonstrate Multi-layer Perceptron algorithm for a classification problem

12. Implement the K-means algorithm and apply it to the data you selected. Evaluate performance by measuring the sum of the Euclidean distance of each example from its class center. Test the performance of the algorithm as a function of the parameters K.

13. Demonstrate the use of Fuzzy C-Means Clustering

14. Demonstrate the use of Expectation Maximization based clustering algorithm

C:\Users\AITSK~1\AppData\Local\Temp\ksohtml1380\wps1.png

#### ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::KADAPA (AUTONOMOUS)

(Approved by AICTE New Delhi & Affiliated to JNTUA, Anantapuramu

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **B.Tech II Year - II Semester** | **DATABASE MANAGEMENT SYSTEMS LAB**  **(23HPC0510)** | **L** | **T** | **P** | **C** |
| **0** | **0** | **3** | **1.5** |

**Course Objectives:** This Course will enable students to

* Implement the basic knowledge of SQL queries
* Practice PL/SQL Programs using triggers ,procedures and cursors
* Develop connection to a database using JDBC

**Course Outcomes:** After completion of the course, students will be able to

* Define and execute SQL queries(L1)
* Implement PL/SQL programs (L3)
* Establish database connectivity through JDBC(L3)

# **Experiments covering the topics:**

* DDL, DML, DCL commands
* Queries, nested queries, built-in functions,
* PL/SQL programming- control structures
* Procedures, Functions, Cursors, Triggers,
* Database connectivity- ODBC/JDBC

# **Sample Experiments:**

1. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example:- Select the roll number and name of the student who secured fourth rank in the class.
3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. Queries using Conversion functions (to\_char, to\_number and to\_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next\_day, add\_months, last\_day, months\_between, least, greatest, trunc, round, to\_char, to\_date)

5.

* 1. Create a simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
  2. Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

1. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
2. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE- APPLICATION ERROR.
3. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
4. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
5. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
6. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers
7. Create a table and perform the search operation on table using indexing and non- indexing techniques.
8. Write a Java program that connects to a database using JDBC
9. Write a Java program to connect to a database using JDBC and insert values into it
10. Write a Java program to connect to a database using JDBC and delete values from it

# **Text Books/Suggested Reading:**

1. Oracle: The Complete Reference by Oracle Press
2. Nilesh Shah, "Database Systems Using Oracle”, PHI, 2007
3. Rick F Vander Lans, “Introduction to SQL”, Fourth Edition, Pearson Education, 2007

C:\Users\AITSK~1\AppData\Local\Temp\ksohtml1380\wps1.png

#### ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::KADAPA (AUTONOMOUS)

(Approved by AICTE New Delhi & Affiliated to JNTUA, Anantapuramu

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **B.Tech II Year - II Semester** | **FULL STACK**  **DEVELOPMENT – 1**  (Skill Enhancement Course)  **(23HSC0503)** | **L** | **T** | **P** | **C** |
| **0** | **1** | **2** | **2** |

**Course Objectives** :- The main objectives of the course are to

* Learn the concepts of both front end and back end Programming Course.
* To get familiar with the latest web development technologies.
* By applying appropriate Cascading Style Sheets styles to HTML elements.
* To Develop Dynamics web pages and validate application forms

**Course Outcomes** :- After completion of the course, students will be able to

* Understand a fully functioning Websites (L2)
* Design styling to Webpages (L6)
* Create web pages interactive (L6)
* Create forms of applications (L6)
* Apply Java Scripts- internal and external (L4)
* Analyze HTML tags, Attributes and Cascading style sheets Properties (L2)

# **Experiments covering the Topics:**

* Lists, Links and Images
* HTML Tables, Forms and Frames
* HTML 5 and Cascading Style Sheets, Types of CSS
* Selector forms
* CSS with Color, Background, Font, Text and CSS Box Model
* Applying JavaScript - internal and external, I/O, Type Conversion
* JavaScript Conditional Statements and Loops, Pre-defined and User-defined Objects
* JavaScript Functions and Events
* Node.js

# **Sample Experiments:**

1. **Lists, Links and Images**
   1. Write a HTML program, to explain the working of lists.

Note: It should have an ordered list, unordered list, nested lists and ordered list in an unordered list and definition lists.

* 1. Write a HTML program, to explain the working of hyperlinks using <a> tag and href, target Attributes.
  2. Create a HTML document that has your image and your friend’s image with a specific height and width. Also when clicked on the images it should navigate to their respective profiles.
  3. Write a HTML program, in such a way that, rather than placing large images on a page, the preferred technique is to use thumbnails by setting the height and width parameters to something like to 100\*100 pixels. Each thumbnail image is also a link to a full sized version of the image. Create an image gallery using this technique

# **HTML Tables, Forms and Frames**

* Write a HTML program, to explain the working of tables. (use tags: <table>, <tr>, <th>,

<td> and attributes: border, rowspan, colspan)

* Write a HTML program, to explain the working of tables by preparing a timetable. (Note: Use <caption> tag to set the caption to the table & also use cell spacing, cell padding, border, rowspan, colspan etc.).
* Write a HTML program, to explain the working of forms by designing Registration form. (Note: Include text field, password field, number field, date of birth field, checkboxes, radio buttons, list boxes using <select>&<option> tags, <text area> and two buttons ie: submit and reset. Use tables to provide a better view).
* Write a HTML program, to explain the working of frames, such that page is to be divided into 3 parts on either direction. (Note: first frame image, second frame paragraph, third frame 🡪 hyperlink. And also make sure of using “no frame” attribute such that frames to be fixed).

# **HTML 5 and Cascading Style Sheets, Types of CSS**

* 1. Write a HTML program, that makes use of <article>, <aside>, <figure>, <figcaption>,

<footer>, <header>, <main>, <nav>, <section>, <div>, <span> tags.

* 1. Write a HTML program, to embed audio and video into HTML web page.
  2. Write a program to apply different types (or levels of styles or style specification formats)

- inline, internal, external styles to HTML elements. (identify selector, property and value).

# **Selector forms**

* 1. Write a program to apply different types of selector forms
     + Simple selector (element, id, class, group, universal)
     + Combinator selector (descendant, child, adjacent sibling, general sibling)
     + Pseudo-class selector
     + Pseudo-element selector
     + Attribute selector

# **CSS with Color, Background, Font, Text and CSS Box Model**

* 1. Write a program to demonstrate the various ways you can reference a color in CSS.
  2. Write a CSS rule that places a background image halfway down the page, tilting it horizontally. The image should remain in place when the user scrolls up or down.
  3. Write a program using the following terms related to CSS font and text:

i. font-size ii. font-weight iii. font-style

iv. text-decoration v. text-transformation vi. text-alignment

* 1. Write a program, to explain the importance of CSS Box model using

i. Content ii. Border iii. Margin iv. padding

# **Applying JavaScript - internal and external, I/O, Type Conversion**

* 1. Write a program to embed internal and external JavaScript in a web page.
  2. Write a program to explain the different ways for displaying output.
  3. Write a program to explain the different ways for taking input.
  4. Create a webpage which uses prompt dialogue box to ask a voter for his name and age. Display the information in table format along with either the voter can vote or not

# **JavaScript Pre-defined and User-defined Objects**

* 1. Write a program using document object properties and methods.
  2. Write a program using window object properties and methods.
  3. Write a program using array object properties and methods.
  4. Write a program using math object properties and methods.
  5. Write a program using string object properties and methods.
  6. Write a program using regex object properties and methods.
  7. Write a program using date object properties and methods.
  8. Write a program to explain user-defined object by using properties, methods, accessors, constructors and display.

# **JavaScript Conditional Statements and Loops**

* 1. Write a program which asks the user to enter three integers, obtains the numbers from the user and outputs HTML text that displays the larger number followed by the words “LARGER NUMBER” in an information message dialog. If the numbers are equal, output HTML text as “EQUAL NUMBERS”.
  2. Write a program to display week days using switch case.
  3. Write a program to print 1 to 10 numbers using for, while and do-while loops.
  4. Write aprogram to print data in object using for-in, for-each and for-of loops
  5. Develop a program to determine whether a given number is an ‘ARMSTRONG NUMBER’ or not. [Eg: 153 is an Armstrong number, since sum of the cube of the digits is equal to the number i.e.,13 + 53+ 33 = 153]
  6. Write a program to display the denomination of the amount deposited in the bank in terms of 100’s, 50’s, 20’s, 10’s, 5’s, 2’s & 1’s. (Eg: If deposited amount is Rs.163, the output should be 1-100’s, 1-50’s, 1- 10’s, 1-2’s & 1-1’s)

# **Java script Functions and Events**

* 1. Design a appropriate function should be called to display
     + Factorial of that number
     + Fibonacci series up to that number
     + Prime numbers up to that number
     + Is it palindrome or not
  2. Design a HTML having a text box and four buttons named Factorial, Fibonacci, Prime, and Palindrome. When a button is pressed an appropriate function should be called to display

1. Factorial of that number
2. Fibonacci series up to that number
3. Prime numbers up to that number
4. Is it palindrome or not
   1. Write a program to validate the following fields in a registration page
5. Name (start with alphabet and followed by alphanumeric and the length should not be less than 6 characters)
6. Mobile (only numbers and length 10 digits)
7. E-mail (should contain format like [xxxxxxx@xxxxxx.xxx](mailto:xxxxxxx@xxxxxx.xxx))

# **Text Books:**

1. Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
3. Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, 2nd edition, APress, O’Reilly.

# **Web Links:**

* 1. <https://www.w3schools.com/html>
  2. <https://www.w3schools.com/css>
  3. <https://www.w3schools.com/js/>
  4. <https://www.w3schools.com/nodejs>
  5. <https://www.w3schools.com/typescript>

C:\Users\AITSK~1\AppData\Local\Temp\ksohtml1380\wps1.png

#### ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::KADAPA (AUTONOMOUS)

(Approved by AICTE New Delhi & Affiliated to JNTUA, Anantapuramu

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **B.Tech II Year - II Semester** | **DESIGN THINKING FOR INNOVATION**  **(23HBS9916)** | **L** | **T** | **P** | **C** |
| **1** | **0** | **2** | **2** |

# **Course Objectives:**

* To familiarize students with design thinking process as a tool for breakthrough innovation.
* To equip students with design thinking skills and ignite the minds
* To create innovative ideas, develop solutions for real-time problems.

# **Course Outcomes:**

* Define the concepts related to design thinking. (L1, L2)
* Explain the fundamentals of Design Thinking and innovation (L1, L2)
* Apply the design thinking techniques for solving problems in various sectors. (L3)
* Analyze to work in a multidisciplinary environment (L4)
* Evaluate the value of creativity (L5)
* Formulate specific problem statements of real time issues (L3, L6)

# **UNIT I : Introduction to Design Thinking:**

Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry.

# **UNIT II : Design Thinking Process:**

Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development.

**Activity:** Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

# **UNIT III : Innovation:**

Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations- Creativity to Innovation- Teams for innovation- Measuring the impact and value of creativity.

**Activity:** Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.

# **UNIT IV :Product Design**

Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications- Innovation towards product design- Case studies.

**Activity:** Importance of modelling, how to set specifications, Explaining their own product design.

# **UNIT V : Design Thinking in Business Processes**

Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs- Design thinking for Startups- Defining and testing Business Models and Business Cases- Developing & testing prototypes.

**Activity:** How to market our own product, About maintenance, Reliability and plan for startup.

# **Textbooks:**

1. Tim Brown,Change by design, Harper Bollins (2009)
2. Idris Mootee, Design Thinking for Strategic Innovation, 2013, John Wiley & Sons.

# **Reference Books:**

1. David Lee, Design Thinking in the Classroom, Ulysses press
2. Shrutin N Shetty, Design the Future, Norton Press
3. William Lidwell,Universal Principles of Design- Kritinaholden, Jill Butter.
4. Chesbrough.H, The Era of Open Innovation – 2013

**Online Learning Resources:**

https://nptel.ac.in/courses/110/106/110106124/ https://nptel.ac.in/courses/109/104/109104109/ <https://swayam.gov.in/nd1_noc19_mg60/preview>