

Estd. 2008.

NSRIT**NADIMPALLI SATYANARAYANA RAJU
INSTITUTE OF TECHNOLOGY****(AUTONOMOUS)**

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUGV, Vizianagaram)
Recognised under Section 2(f) & 12(B) of the UGC Act, 1956) Accredited by NAAC with 'A' Grade

1.3 2. List of value - added courses outside curriculum framework and evidences / Mapping of POs & PSOs

Name of the Value-added Courses (with 30 or more contact hours)	Course code, if any	No of times offered during the year	Duration of Course in hours	No of Students enrolled during the year
Building a road using Civil 3D	NA	1	42	29
ROBOTICS	NA	1	120	50
NX-CAD	NA	1	120	43
P.L.M	NA	1	120	58
MECHATRONICS	NA	1	120	43
Data Science	NA	1	30	111
Program Essentials in Python	NA	1	30	1
CATIA v5	NA	1	42	63
CAM and Mechanical Design	NA	1	40	2
Databases and SQL	NA	1	42	1
Programming with Python	NA	1	38	3
Introduction to electric Vehicles	NA	1	32	1
Java Programming	NA	1	60	216
Python Programming	NA	1	60	66
C Programming	NA	1	60	88
Basics of Power Systems	NA	1	120	68
Basics of Induction Motor	NA	1	120	68
Industrial Automation (PLC & SCADA)	NA	1	120	32
Industrial IOT	NA	1	120	32
PCB Design	NA	1	120	66
Embedded Systems	NA	1	120	66


Director
N.S. Raju Institute of Technology (A)
Sontyam, Vi, akhapatnam-531173

COURSES OFFERED BY CEMS

SOFTWARE DESIGN CAD/CAM/CAE DOMAIN

CAD NX II	CAM Technomatix	CAE Advanced Simulation	PLM TeamCenter	LMS Yiboson Measurement & Analysis	VR Virtual Reality
Essentials for Designers	Manufacturing Fundamentals	Advanced Simulation	TCUA Using TC	Yiboson Measurement & Analysis	Virtual Reality
Sketching Fundamentals	Turning Manufacturing Process	Composite Structure & Assembly	TCUA Installation	Model Testing & Analysis	
Synchronous Modeling Fundamentals	Technomatix Process	Advanced Finite Element Analysis	TCUA Integration for Mx users	Acoustics Measurement & Analysis	
Sheet Metal	Technomatix RobCAD	TCUA Application & Data Model Administration	Acoustics NVH Simulation	Multi Body Dynamics	
Drafting Essentials	Technomatix Flow				
Intermediate Design & Assembly	Nesting Productivity Improvement				
Advanced Assembly Design	Dimensional Accuracy Control				
Class A Flat Form Modeling					
Hull Design					
Engine Design					

(guckehal)
 ① Cyber security
 ② AWS
 M5DC

INDUSTRY 4.0

Product Twin

Process Twin

SI 7434/4
 ALL SOFTWARE

- HARDWARE**
- NX-11
 - TEAMCENTRE-11
 - TECNOMATIX 14.6.2
 - ROBCAD II
 - CADWIN
 - SINUTRAIN
 - PARAMARINE
 - SAMIN
 - TIA-PORTAL
 - STARTER
 - POWERCONFIG
 - SIMOCODE PRO
 - SIMATIC Manager

- HARDWARE**
- LMS SCADA
 - 8400 sl
 - 808D MILLING/TURNING
 - S7 1200 PLC
 - S7 1500 PLC
 - PCS 7
 - KUKA ROBOT
 - MECHATRONICS SYSTEM
 - KEMPPY WELDING
 - PROFIBUSNET
 - SINAMICS
 - SIMOCODE
 - SITRANS
 - BARCO-3D
 - OCULUS-RIFT

ENGINEERING / ELECTRICAL / ELECTRONICS CONTROLS/ DRIVES

AUTOMATION	PROCESS INSTRUMENTATION	ROBOTICS	CNC	MECHATRONICS	ELECTRICAL	PNEUMATICS & HYDRAULICS	PUMPING, PIPING & BLENDING	ELECTRONICS
PLC, Profibus, Profinet	Smart Instrumentation	Use & Programming of Industrial Robots	808D sl	Mechatronics Concept Design	Induction Motors	Pneumatics	Pumping System	Radar Systems
HAZOP & NETWORKING	PCS 7	Robotics Application	MILLING - NC Programming	AC/DC Drives	Hydraulics	Piping System		
SCADA			TURNING - NC Programming	Low Voltage Switchgear		Welding		

www.cemsindia.org



CENTRE OF EXCELLENCE IN MARITIME & SHIPBUILDING
 COMPETENCIES, METHODOLOGY, EMPLOYABILITY & SKILLS
 CREATING COMPETENCIES FOR INDUSTRY 4.0

SKILL DEVELOPMENT INITIATIVE OF GOVT OF INDIA



High end Engg, Software & Hardware Courses in Design & Manufacturing for Students & Industries, with the vision to facilitate transition to Industry 4.0

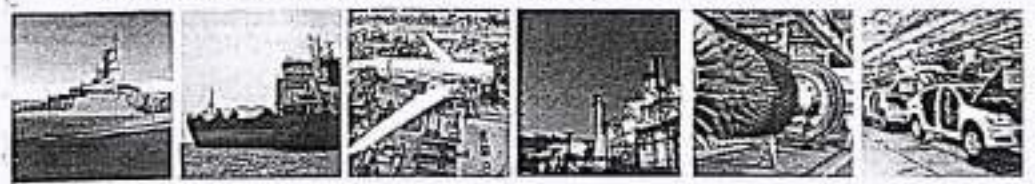
Centre of Excellence in Maritime & Shipbuilding (CEMS) is a dedicated Skill Development Centre in Maritime, Manufacturing, Automobile, Aerospace, Defence Production, Oil & Gas & Heavy Engineering Sectors.

Our Mission is

- To bridge the skill gap between Students & Industry by providing advanced Skill training, facilitating better job opportunities & placements.
- To re-skill the employees to facilitate ready transition to Industry 4.0 & to make Industry more automatized & competitive.

- Strategically located in Vizag & Mumbai
- Section 8 'Not for Profit Organisation'
- Courses in advanced CAD/CAM/CAE, Simulation, Test & Optimisation Software, Digital Manufacturing & Hardware Technology
- Courses Certified by Siemens & IRLCLASS

COURSES ARE RELEVANT FOR THE FOLLOWING INDUSTRIES



DEFENCE SHIPPING AEROSPACE OIL & GAS HEAVY ENGG AUTOMOBILE

Mumbai: 022 7119 9384/ 9385
 Vizag: 0 891 270 4010
 Email: info@cemsindia.org

www.cemsindia.org

facebook.com/CEMSV
 twitter.com/cems_in

OUR PROMOTERS

Director

IRCLASS Indian Register of Shipping

SAGARMALA Ministry of Shipping

SIEMENS Technology partner

Raju Institute of Technology
 Sankhyam, V. akhapatnam

COURSES OFFERED BY CEMS

SOFTWARE DESIGN CAD/CAM/CAE DOMAIN

CAD NX-11	CAM Tecnoma	CAE Advanced Simulation	PLM TeamCloud	LMS	VR
Essentials for Designers	Manufacturing Fundamentals	Advanced Simulation	TCUA Using FC	Vibration Measurement & Analysis	Virtual Reality
Sketching Fundamentals	Tuning Manufacturing Process	Composite Structure & Assembly	TCUA Installation	Modal Testing & Analysis	
Synchronous Modeling Fundamentals	Tecnoma Process	Advanced Finite Element Analysis	TCUA Integration for MX users	Acoustic Measurement & Analysis	
Sheet Metal	Tecnoma RobCAD		TCUA Application & Data Model Administration	Acoustic IEM Simulation	
Drafting Essentials	Tecnoma Flow			Multi Body Dynamics	
Intermediate Design & Assembly	Mixing Productivity Improvement				
Advanced Assembly Design	Dimensional Accuracy Control				
Class A Free Form Modeling					
Hull Design					
Engine Design					

SI 7434/19
ALL SOFTWARE
NX-11
TEAMCENTRE-11
TECNOMATIX 14.0.2

ROBCAD 11
CADWIN
SINUTRAIN
PARAMARINE
SAMIN
TIA-PORTAL
STARTER
POWERCONFIG
SIMOCODE PRO
SIMATIC Manager

(guckebal)
① Cyber Security
② AWS
M & DC



HARDWARE

LMS SCADA
S40D SI
6080 MILLING/TURNING
S7 1200 PLC
S7 1500 PLC
PCS 7
KUKA ROBOT
MECHATRONICS SYSTEM
KEMPI WELDING
PROFIBUSNET
SINAMICS
SIMOCODE
SITRANS
BARCO-3D
OCULUS-RIFT

ENGINEERING / ELECTRICAL / ELECTRONICS CONTROLS/ DRIVES

AUTOMATION	PROCESS INSTRUMENTATION	ROBOTICS	CNC	MECHATRONICS	ELECTRICAL	PNEUMATICS & HYDRAULICS	PUMPING, PIPING & WELDING	ELECTRONICS
PLC Profibus, Profinet	Smart Instrumentation	Use & Programming of Industrial Robots	S40D SI	Mechatronics Concept Design	Induction Motors	Pneumatics	Pumping System	Radar Systems
HMI & NETWORKING	PCS 7	Robotics Application	MILLING NC Programming		ACDC Drives	Hydraulics	Piping System	
SCADA			TURNING-NC Programming		Low Voltage SwitchGear		Welding	

www.cemsindia.org



**CENTRE OF EXCELLENCE
IN MARITIME & SHIPBUILDING**
COMPETENCIES, METHODOLOGY, EMPLOYABILITY & SKILLS
CREATING COMPETENCIES FOR INDUSTRY 4.0

SKILL DEVELOPMENT INITIATIVE OF GOVT OF INDIA



High end Engg. Software & Hardware Courses in Design & Manufacturing for Students & Industries, with the vision to facilitate transition to Industry 4.0

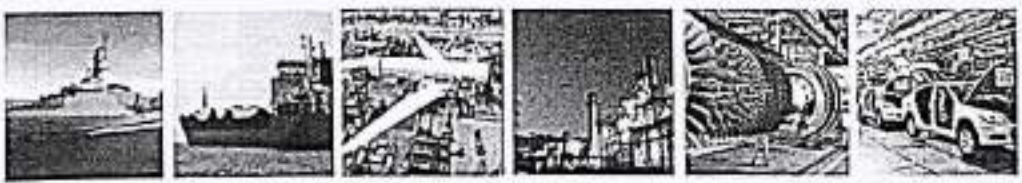
Centre of Excellence in Maritime & Shipbuilding (CEMS) is a dedicated Skill Development Centre in Maritime, Manufacturing, Automobile, Aerospace, Defence Production, Oil & Gas & Heavy Engineering Sectors.

Our Mission is

- To bridge the skill gap between Students & Industry by providing advanced Skill training, facilitating better job opportunities & placements.
- To re-skill the employees to facilitate ready transition to Industry 4.0 & to make Industry more automatized & competitive.

- Strategically located in Vizag & Mumbai
- Section 8 'Not for Profit Organisation'
- Courses in advanced CAD/CAM/CAE, Simulation, Test & Optimisation Software, Digital Manufacturing & Hardware Technology
- Courses Certified by Siemens & IRLCLASS

COURSES ARE RELEVANT FOR THE FOLLOWING INDUSTRIES



DEFENCE SHIPPING AEROSPACE OIL & GAS HEAVY ENGG AUTOMOBILE

Mumbai: 022 7119 9384/ 9385
Vizag: 0 891 270 4010
Email: info@cemsindia.org

www.cemsindia.org

facebook.com/CEMSI/
twitter.com/cems_in

OUR PROMOTERS



PRODUCT DESIGN & VALIDATION LAB



Siemens NX-11

Product Design and Validation Lab would cover courses in Product Design & Validation for Manufacturing. The course will be modular, open, scalable with design and engineering solutions. It includes multi-physics simulations, static and dynamic stress analysis, Computational Fluid Dynamics (CFD), Finite Elements Analysis (FEA), thermal analysis, system-level dynamic analysis and composites.

TEST & OPTIMIZATION LAB



Siemens LMS Test Lab

This lab offers a unique combination of simulation software, enable and lab testing systems & analysis in following areas:
• Vibration Measurement & Modal Testing & Analysis
• NVH Simulation
• Modal Analysis & Structural Dynamics
LMS Test Lab offers you a complete, integrated solution for test based engineering that combines high speed multi-channel data acquisition with full suite of integrated testing analysis, and report generation tools.

NESTING PRODUCTIVITY IMPROVEMENT



CADWIN

Nesting software reduces wastage in steel plants by optimizing use of steel sheets using nesting software in CNC machines, used to cut steel. It helps management of resources and work processes efficiently and by using integrated process for part and steel plate from design to production for manufacturing industries including shipbuilding and plant, bridges and heavy machines, etc.

AUTOMATION



57 1208, 57 1508PLC

Automation Lab allows the students to understand the requirement and functioning of Programmable Logic Controllers (PLC). This is the first step toward revision of Things (OT). Here the students learn how to Program Industrial PLCs, work with Industrial Human Machine Interface (HMI), Industrial SCADA (Supervisory Control & Distributed Acquisition) and PLC networking using Profibus and Profinet.

ELECTRICAL & ENERGY LABS



SIMOCODE

Electrical Lab makes students explore fundamentals of Motors, Power Electronics, Electrical Drives & Low Voltage Switchgear. Participants are trained on basics of AC & DC Motors, Power Electronics Components, Speed control of AC/DC drives with Drives/Motor maintenance/troubleshooting. Further selection based on application requirements, Diagnostics & Troubleshooting strategies.

ADVANCED MANUFACTURING LAB



Siemens TeamCentre, Technomatix & RioCAD

Advanced Manufacturing Lab offers courses for process design, simulation & optimization of plant layout. DM allows engineers to create manufacturing process, in a virtual environment, including loading, assembly lines, work centers, facility layout and ergonomics. It helps to create Process Twin.

DIMENSIONAL ACCURACY CONTROL SYSTEM



SAMM

Students/industry personnel will be able to analyze Dimensional accuracy of steel structures, such as girth modules and sheetpiling blocks which are fabricated by modular construction technique and comparing it with 3D design. Dimensional accuracy controls enables to control errors of any in steel construction phase test.

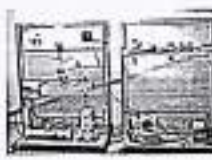
HULL DESIGN



Siemens NX-11, PARAMARINE

Hull Design Software allows students to quickly create hull forms in any geometric shape within the software suite. Hull Generator provides the capability to rapidly define complex surfaces using a minimal number of curves. From these surfaces solid bodies can be formed.

PROCESS INSTRUMENTATION



PCS 7

Process Instrumentation Lab imparts skills & knowledge on complete Process Automation & Process Instrumentation in all types of Process Industries. Students are trained on Distributed Control Systems & Configuration, Measuring Technologies for Pressure, Temperature, Level & Flow, Valve Positioning, selection of smart instrumentation & their integration with automation of systems.

RESEARCH MACHINE SHOP



SINUTRAN, 840D SF

CNC Controller Lab enables students to understand the concept of CNC Programming and work with Sinumerik 840D controller for Turning and Milling applications. The students will also get to work on the Sinumerik 840D M120, which supports programming up to 31 Axis. This would enable students to program complex jobs. The students can then learn to program and test the CNC Program using the Sinumerik software.

MECHATRONICS



Modular Mechatronics System

Mechatronics lab allows students to work on a new building block and an array such as Programmable & RIOs/AES, Sensors, Communication Protocol, PLC programming, H.C Networking using Profibus and Profinet. The Mechatronics Lab imparts expertise in the field of Mechatronics systems/procedures. Students are trained on various Electrical, Mechanical, Pneumatics & E- Protection, and components with shooting techniques with System Approach. It serves students from all streams to build knowledge in multiple domains.

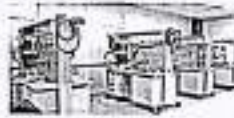
VIRTUAL REALITY



OCULUS- RIFT, BARCO-3D

The capabilities of the Virtual Reality Lab would be:
• Virtual prototyping, Simulation & visualization, multi user, high end 3D visualization, instructor values, Visual Training
The areas where the virtual reality lab would be helpful for visualization are:
• Design Walkthrough
• Manufacturing planning w. Quicking validation
• DFA & DFM
• MRO Analysis (Maintenance, Repair & Overhaul)

PNEUMATICS & HYDRAULICS



PNEUMATICS & HYDRAULICS SYSTEM

Pneumatics Lab is capable of being used to demonstrate the design, construction and application of pneumatic components and systems.
• Design & function of a pneumatic system
• Function & identification of pneumatic components and their symbols

Hydraulic Lab is capable of being used to demonstrate the design, construction and application of Hydraulic components and circuits.

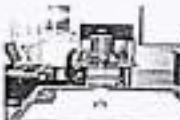
ROBOTICS



KUKA ROBOTIC UNITS

Robotics Lab enables knowledge on:
• Advanced manufacturing techniques & Automation combined with advanced manufacturing technology
• Sequence Planning, Process Planning, Shop Floor Layout generation for robotic applications in Offline / Online sequence execution techniques for robotics
• Monitoring & Virtual simulation generation for sequences
• Offline programming of robotics controller

RADAR LAB



RADAR SYSTEM

Radar Training Lab combines real-world radar with the power of modern surveillance technology. It uses patented technology to detect and track passive targets at very short range in the presence of noise and clutter. The Radio system is fully operational and covers principle of Radar, CW Doppler, PULSED Doppler & MTI Radar etc.

WELDING PUMPING & PIPING



KEMPI WELDING

Welding Lab will enable students to develop a thorough understanding of key welding concepts to design and produce quality welds, safely and economically.
Pump/Piping Training Systems Lab familiarises students with proper operational principles and associated maintenance tasks such as pump/pipe installation, Lubrication, start alignment, inspection, & component replacement.

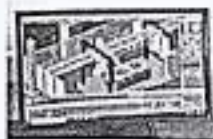
Customers with NX/Teamcenter as PLM backbone





Siemens NX-11

Product Design and Validation Lab would cover courses in Product Design & Validation for Manufacturing. The course will be available, open, scalable with design and engineering solutions. It includes multi-physics simulation, static and dynamic stress analysis, Computational Fluid Dynamics (CFD), Finite Element Analysis (FEA), thermal analysis, system level dynamic analysis and composites.



Siemens TeamCentre, Technomatix & RobCAD

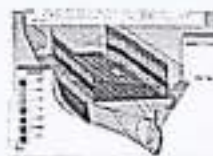
Advanced Manufacturing Lab offers courses for process design, simulation & Optimization of plant layout. DM allows engineers to create realistic layout process, in a virtual environment, including layout, assembly lines, work centers, facility layout and ergonomics. It helps to create Process Flow.

TEST & OPTIMIZATION LAB



Siemens LMS Test Lab

This lab offers a unique combination of simulation software, mobile and lab testing systems & analysis in lab, areas: Vibration Measurement & Model Testing Accessories & NVH Simulation Multibody & Structural Dynamics LMS Test Lab offers you a complete, integrated solution for test based engineering that combines high speed multi-channel data acquisition with full suite of integrated testing, analysis, and report generation tools.



SAMIN

Students/industry personnel would learn to analyze dimensional accuracy of cast structures, such as plant modules and shipbuilding blocks which are fabricated by modular construction technique and comparing it with 3D design. Dimensional accuracy concept enables to correct errors if any in a cast construction phase itself.



Modular Mechatronics System

Mechatronics Lab allows students to work on a fully factory like setup and on areas such as Pneumatics & Hydraulics, Sensors, Communication, Inverter, PLC programming, etc. Involving using Profibus and Profinet. The laboratory Lab aspects explore in the field of Mechatronics system applications. Modules are based on various Electrical Mechatronics, Pneumatics & E. Pneumatics and equipped the state-of-the-art technologies with Systems Approach. It benefits students from all streams to build knowledge in multiple domains.



KUKA ROBOTIC UNITS

Robotics Lab enables knowledge on:
i. Advanced manufacturing techniques
ii. Automation combined with advanced manufacturing technology
iii. Sequence Planning, Process Planning, Shop Floor Layout generation for robotic applications in Office / On-line sequence execution techniques for robotics
iv. Monitoring & Virtual simulation generation for sequences
v. Offline programming of robotics controller

ESTING PRODUCTIVITY IMPROVEMENT



CADWIN

nesting software reduces weightage of steel plates by optimizing size of steel sheets using nesting software in CNC Machines, used in cut steel. It helps management of resources and work processes efficiently and by using integrated process for part and steel plate from design to production for manufacture industries including shipbuilding and plant, bridges and heavy machines, etc.

HULL DESIGN



Siemens NX-11, PARAMARINE

Hull Design Software allows students to quickly create hull forms or any geometric shape within the software suite. Hull Generator provides the capability to rapidly define complex surfaces using a minimal number of curves. From these surface's solid bodies can be formed.



OCULUS-RIFT, BARCO-3D

The capabilities of the Virtual Reality Lab would be Walkthroughs, Ergonomic reachability studies, High end data visualization, Immersive videos, Virtual Training. The area where the virtual reality lab would be helpful for visualization are:
i. Design Walkthroughs
ii. Manufacturing planning in: Cutting validation
iii. DFA & DFH
iv. MRO Analysis (Maintenance, Repair & Overhaul)



RADAR SYSTEM

Radar Training Lab combines the world with the power of modern surveillance technology. It uses patented technology to detect and track passive targets at very short range in the presence of noise and clutter. The radar system is fully compatible and covers principle of Pulse, On Display, PRCW, Display & MTI radar etc.

AUTOMATION



S7 1200, S7 1500 PLC

Automation Lab allows the students to understand the requirement and functioning of Programmable Logic Controllers (PLCs). This is the first step toward Internet of Things (IoT). Here the students learn how to Program Industrial PLCs, work with Industrial Human Machine Interface (HMI), Industrial SCADA (Supervisory Control & Distributed Acquisition) and PLC networking using Profibus and Profinet.

PROCESS INSTRUMENTATION



PCS 7

Process Instrumentation Lab imparts skills & knowledge on complete Process Automation & Process Instrumentation in all types of Process Industries. Students are trained on Distributed Control Systems & Configuration, Measuring Technologies for Pressure, Temperature, Level & Flow, Valve Positioning, selection of smart instrumentation & their integration with automation of systems.



PNEUMATICS & HYDRAULICS SYSTEM

Pneumatic Lab is capable of being used to demonstrate the design, construction and application of pneumatic components and circuits.
i. Design & function of a pneumatic system
ii. Function & identification of pneumatic components and their symbols.
Hydraulic Lab is capable of being used to demonstrate the design, construction and application of hydraulic components and circuits.



KEMPPI WELDING

Welding Lab will enable students to develop a thorough understanding of the welding process to design and produce quality welds, safely and economically. Pumps/Piping Training Systems Lab familiarizes students with purpose, operation, principles and associated maintenance tasks such as pump/pipe installation, lubrication, shut down, inspection, & component replacement.

ELECTRICAL & ENERGY LABS



SIMOCODE

Electrical lab makes students explore fundamentals of Motors, Power Electronics, Electrical Drives & Low Voltage Switchgear. Participants are trained on basics of AC & DC Motors, Power Electronics Components, Speed control of AC/DC motors with Drives, Motor maintenance/servicing, Product selection based on application requirement, Diagnostic & troubleshooting strategies.

RESEARCH MACHINE SHOP



SINUTRAIN, 8400

CNC Computer Lab enables students to understand the concept of CNC Programming and work with Siemens 8400 controller for Turning and Milling applications. The students will also get to work on the SinuTrain 8400 at rack which supports programming up to 31 Axis. This would enable students to program complex jobs. The students can learn how to program and test the CNC Program using the SinuTrain software.

MELBA TRAINING

ROBOTICS

VIRTUAL REALITY

RADAR LAB

PNEUMATICS & HYDRAULICS

WELDING PUMPING & PIPING

Customers with NX/Teamcenter as PLM backbone



4 Wheelers	2 Wheelers	Tractors	Equipment	Others	Supplier	Boeing

HMI ENGINEERING SERVICES

Full Stack Web Development Course Content

Introduction

- UI Developer roles and responsibilities
- UX designer roles
- Technologies needed
- Power of UI
- Current market requirements on UI
- Basic Technologies needed
- Difference between Front end and Backend
- Sample web pages
- Crawling and Meta tags

Basics – HTML

- Exploring existing pages
- Browsers & Editors
- DOM
- Structure of HTML Page
- Mandatory tags in html page (html, head, body)
- Heading tags (H1...H6), Tags and attributes (Class, Id, style...etc.)
- Inline and block level elements

CSS

- What is CSS
- Different ways of applying CSS for elements, and priority chain of CSS
- CSS Properties (color, font, size, border...etc.)
- Box model, Margin & Padding
- Positioning Elements, Floating Elements

More HTML Tags

- Including external page links in a page using anchor tags and its properties
- Working with row & column data using table tags
- Hiding and un-hiding elements using display property
- img tag, p tag, ul&ol tags, li, nobr, hr, br etc
- Layouts, forms, buttons
- Input fields (textbox, radio button, checkbox, dropdown, text area etc.)
- Debugging HTML & CSS (Firebug, IE and Chrome developer tool)
- Creating Tabs and menu lists

More CSS Properties

- Adding borders, font, Pseudo classes & Pseudo Elements
- positioning elements (absolute, relative, fixed & static)
- Image spiting
- Box model (margins, padding)
- Floating elements (float left, right etc.)
- Including external resources
- Absolute and Relative paths
- Including external resources like CSS, images etc.

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321, 7674925609 EMAIL ID: -rchmi.project2022@gmail.com

HMI ENGINEERING SERVICES

- Display Property(inline, block, inline block etc)
- Display none and hidden elements.

Form Elements

- Get & Post Communication
- Validating input values in a form.
- Form action and type

JavaScript

- Data types and data structures in Js
- Control structures, if, if-else, while, for, switch case statements
- Hoisting & type casting

JavaScript Supported Data Structures

- Arrays and Predefined methods.
- Working on logical programs using Arrays.
- Predefined methods in arrays
- Strings and predefined methods
- Objects
- JSON, SET, MAP
- Iterating through Dynamic JSON Object.
- Exploring Predefined Date object.

Advanced JavaScript

- Inheriting Static Object using proto.
- Inheritance using Object.create()
- Java Script Classes
- Prototyping
- Inheritance using prototyping.
- Global and local variables
- Securing Data using Closures
- Exception Handling
- Handling Predefined and user defined exceptions
- Exploring try, catch, finally and throws.

jQuery

- History and version explore
- Difference between Minified and non-minified JS files.
- On load and on ready difference
- jQuery selectors
- Multiple ways of referring DOM elements using jQuery selectors
- jQuery methods
- Adding dynamic properties for DOM elements
- Toggling elements
- Creating dynamic elements using jQuery

jQuery Traversing methods

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321,7674925609 EMAIL ID: -rchmi.project2022@gmail.com

HMI ENGINEERING SERVICES

- Traversing Siblings, Children's & Parent Elements.
- Traversing Ancestors.
- Finding elements using jQuery techniques
- Filtering elements

Events using jQuery

- Binding events, Dynamic binding
- List of events been supported in jQuery (blur, change, click, dblclick....etc.)s

AJAX

- Advantages with AJAX and its limitations
- Samples working with AJAX
- Different data formats used in AJAX (string, xml, JSON, etc.)
- XML and JSON difference
- Cross domain interactions using JSONP
- jQuery Promises with multiple conditions
- Handling Multiple AJAX Calls using jQuery Promises.

jQuery Animations

- Animation Effects using
- Hide, Show
- Sliding up and down, Fading, Animate Method.

jQuery Templating

- Loading DOM dynamically using jQuery templates
- loading templates using AJAX

HTML 5

- Difference between HTML5 and HTML 4
- List of Browsers support HTML5
- Doc type & Semantic Tags
- Multithreading Using Web Workers.
- Media Support (audio and video tags)
- Graphics using Canvas tag and SVG Tags.
- Drag and Drop features
- Offline Application using Application Cache
- Exploring Navigator Object
- Working on locations lat and lng using Geolocation
- Storing user preferences using Local storage & Session Storage

CSS 3

- Difference between CSS 2 and CSS 3
- Adding borders and backgrounds
- Advanced text effects(shadow)
- 2D and 3D Transformations
- Adding Transitions to elements
- Adding animations to text and elements

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321,7674925609 EMAIL ID: -rchmi.project2022@gmail.com

HMI ENGINEERING SERVICES

Responsive Design

- Difference between multiple devices, making a page to work on multiple devices
- Media queries
- Introduction to Bootstrap CSS API

Bootstrap-4 along with components

- Basic-Typography
- Text-Alignments, Floats-Positions
- Colors-Backgrounds, Margins-Paddings
- Sizings, Breakpoints, Buttons, Navbars
- List-Groups,Forms, Input-Groups
- Alerts-Progress
- Tables, Cards, Carousel, Collapse, Modal
- Grid-System, Grid-Alignments,FlexBoxes

ECMA 6 (Latest JavaScript)

- Const and let keywords
- Arrow functions, advantages
- Extended parameter handling, default parameters
- Template literals
- Enhanced object parameters
- Creating direct classes, inheritance
- Implementing promises
- new data structures sets and maps
- New string built-in methods
- Using iterators

NODE JS

- Introduction to Server-Side Scripting
- Node JS Features and Drawbacks
- Setup Environment for Node.js
- Node JS Program architecture
- Node JS Web Server
- Node JS Global Objects
- Node JS OS Objects
- Node JS Error Handling
- Node JS Event Loop
- Node JS File System
- Async and Sync
- Connecting with Database
- Handling CRUD Operations
- Express
- Routing in Express
- Response Methods in Express
- Serving Static Files
- Express JSON Parser
- Express CORS
- Creating Web API

Express JS

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321,7674925609 EMAIL ID: -rchmi.project2022@gmail.com

HMI ENGINEERING SERVICES

- Exploring Express module
- Setting up express environment
- Creating http server using express

Express Sessions

Data Communication

- Sending and receiving Post & GET Data
- Reading data from GET/POST requests

Templates

- Creating templates using PUG/JADE
- Generating Dynamic html pages from server
- Responding a template for a client request

File System

- Exploring File system, Reading and writing to files

REST API & WebServices

- Introduction to REST API
- REST Architecture

Clustering

- Creating and handling multiple clusters in Node js

DB Connection

- Connecting to Mongo DB & Connecting to SQL

WebService with DB Interactions

- Creating web services which communicate with Database

MONGO DB

- Introduction to MongoDB
- Configuring Server and Client
- MongoDB Compass
- Creating Database
- MongoDB Commands
- MongoDB CRUD Operations

Angular-13 Introduction

ReactJS Introduction

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321, 7674925609 EMAIL ID: -rchmi.project2022@gmail.com

C Training Course Overview Duration :- 150hrs

Fundamentals in C

- Program
- Programming
- Programming Languages
- Types of software
- Introduction to C
- History of C
- Features of C
- Applications of C
- Character set, ASCII Table
- Tokens
- Keywords
- Identifiers & Naming Rules
- constants
- Data Types
- Type Qualifiers
- How does the data stored in Computers Memory
- Variables
- Variable Declaration
- Variable Assignment
- Variable Initialization
- Comments
- Defining Constants
- MCQs

Operators and Expressions

- Arithmetic operators
- Arithmetic expressions
- Evaluation of expressions
- Relational operators
- Logical operators
- Assignment operators
- Increment & decrement operators
- Conditional operator
- Bitwise operators
- Type casting
- Sizeof operator
- Comma operator
- Operators Precedence and Associativity
- Expressions
- Evaluation of Expressions
- MCQs

Input-Output Functions

- Input-Output Library Functions
- Non-formatted Input and Output
- Character oriented Library functions
- Compiler, Linker and Loader
- Program execution phases
- Formatted Library Functions
- Mathematical Library Functions
- Structure of a C Program
- IDE
- Basic programs
- MCQs

Control Statements

- Conditional Control Statements
 - if
 - if-else
 - nested if-else
 - if-else-if ladder
- Multiple Branching Control Structure
- switch-case
- Loop Control statements
 - while
 - do-while
 - for
- Nested Loops
- Jump Control structures
 - break
 - continue
 - goto
 - return
- Programs
- MCQs

Arrays

- Arrays
- One dimensional arrays
 - Declaration of 1D arrays
 - Initialization of 1D arrays
 - Accessing element of 1D arrays
 - Reading and displaying elements
 - Programs on 1D Arrays
- Two dimensional arrays
 - Declaration of 2D arrays

- Initialization of 2D arrays
- Accessing element of 2D arrays
- Reading and displaying elements
- Programs on 2D Arrays
- Three dimensional arrays
- MCQs

Strings

- String Concept
- Introduction to String in C
- Storing Strings
- The string Delimiter
- String Literals (String Constants)
- Strings and Characters
- Declaring Strings
- Initializing Strings
- Strings and the Assignment Operator
- String Input Functions / Reading Strings
- String Output Functions / Writing Strings
- String Input-Output using fscanf() and printf() Functions
- Single Character Library Functions / Character Manipulation in the String
- String Manipulation Library Functions
- Programs Using Character Arrays
- Array of Strings (2D Character Arrays)
- Programs Using Array of Strings
- MCQs

Pointers

- Understanding Memory Addresses
- Pointer Operators
- Pointer
- Pointer Advantages and Disadvantages
- Declaration of Pointer Variables
- Initialization of Pointer Variables
- Dereferencing / Redirecting Pointer Variables
- Declaration versus Redirection
- Void Pointer
- Null Pointer
- Compatibility
- Array of Pointers
- Pointer to Pointer
- Pointer Arithmetic
- Dynamic Memory Allocation Functions

Functions

- Functions
- Advantages of using functions
- Defining a function
- Calling a function
- Return statement
- Function Prototype
- Basic Function Designs
- Programs Using Functions
- Scope
- Recursion
- Iteration vs Recursion
- Nested functions
- Variable Length Number of Arguments
- Parameter Passing Techniques – Call by value & Call by Address
- Functions Returning Pointers
- Pointers and One-Dimensional Arrays
- Pointers and Two-Dimensional Arrays
- Passing 1D arrays to Functions
- Passing 2D arrays to Functions
- Pointers and Strings
- Passing Strings to Functions
- Pointer to Function
- MCQs

Storage Classes

- Object Attributes
- Scope
- Extent
- Linkage
- auto
- static
- extern
- register
- MCQs

Preprocessor Directives

- The #include Preprocessor Directive & User defined header files
- The #define Preprocessor Directive: Symbolic Constants
- The #define Preprocessor Directive: Macros
- Conditional Compilation Directives
- #if
- #else
- #elif
- #endif
- #ifdef

- #ifndef
- #undef
- #error
- #line
- #pragma
- MCQs

Structures, Unions, Enumerations and Typedef

- Structures
- Structure Type Declaration
- Structure Variable Declaration
- Initialization of Structure
- Accessing the members of a structure
- Programs Using Structures
- Operations on Structures (Copying and Comparing Structures)
- Nested structures (Complex Structures)
- Structures Containing Arrays (Complex Structures)
- Array of Structures (Complex Structures)
- Pointer to Structure
- Accessing structure member through pointer using dynamic memory allocation
- Pointers within Structures
- Self-referential structures
- Passing Structures to Functions
- Functions returning Structures
- Unions
- Differences between Structures & Unions
- Enumerated Types / enum keyword
- The Type Definition / typedef keyword
- Bit fields
- MCQs

Command Line Arguments

Files

- Concept of a file
- Streams
- Text File and Binary Files
- State of a File
- Opening and Closing Files
- File Input / Output Functions
- Formatted Input-Output Functions
- Character Input-Output Functions
- Line Input-Output Functions
- Block Input-Output Functions
- File Status Functions (Error Handling)

- Positioning Functions
- System File Operations
- MCQs

HMI ENGINEERING SERVICES

Python Syllabus

Core Python

Introduction

- ✓ History
- ✓ Features
- ✓ Setting up path
- ✓ Working with Python
- ✓ Basic Syntax
- ✓ Variable and Data Types
- ✓ Operator

Conditional Statements

- ✓ If
- ✓ If- else
- ✓ Nested if-else

Looping

- ✓ For
- ✓ While
- ✓ Nested loops

Control Statements

- ✓ Break
- ✓ Continue
- ✓ Pass

String Manipulation

- ✓ Accessing Strings
- ✓ Basic Operations
- ✓ String slices
- ✓ Function and Methods

Lists

- ✓ Introduction

- ✓ Accessing list
- ✓ Operations
- ✓ Working with lists
- ✓ Function and Methods

Tuple

- ✓ Introduction
- ✓ Accessing tuples
- ✓ Operations
- ✓ Working
- ✓ Functions and Methods

Dictionaries

- ✓ Introduction
- ✓ Accessing values in dictionaries
- ✓ Working with dictionaries
- ✓ Properties
- ✓ Functions

Functions

- ✓ Defining a function
- ✓ Calling a function
- ✓ Types of functions
- ✓ Function Arguments
- ✓ Anonymous functions
- ✓ Global and local variables

Modules

- ✓ Importing module
- ✓ Math module
- ✓ Random module
- ✓ Packages
- ✓ Composition

Input-Output

- ✓ Printing on screen
- ✓ Reading data from keyboard
- ✓ Opening and closing file
- ✓ Reading and writing files
- ✓ Functions

Exception Handling

- ✓ Exception
- ✓ Exception Handling
- ✓ Except clause
- ✓ Try ? finally clause
- ✓ User Defined Exceptions

Advance Python

OOPs concept

- ✓ Class and object
- ✓ Attributes
- ✓ Inheritance
- ✓ Overloading
- ✓ Overriding
- ✓ Data hiding

Regular expressions

- ✓ Match function
- ✓ Search function
- ✓ Matching VS Searching
- ✓ Modifiers
- ✓ Patterns

CGI

- ✓ Introduction
- ✓ Architecture
- ✓ CGI environment variable
- ✓ GET and POST methods
- ✓ Cookies
- ✓ File upload

Database

- ✓ Introduction
- ✓ Connections
- ✓ Executing queries
- ✓ Transactions
- ✓ Handling error

Networking

- ✓ Socket
- ✓ Socket Module
- ✓ Methods
- ✓ Client and server
- ✓ Internet modules

Multithreading

- ✓ Thread
- ✓ Starting a thread
- ✓ Threading module
- ✓ Synchronizing threads
- ✓ Multithreaded Priority Queue

GUI Programming

- ✓ Introduction
- ✓ Tkinter programming
- ✓ Tkinter widgets

Web Programming

D-jango

Data Science Applications development

Numpy

Scipy

Machine learning frameworks

Tensor Flow

C Language

Contents

- 1 About C-Language Training**
- 2 C Training Course Objective**
- 3 Why This Course is Required**
- 4 C Training Course Overview**
 - 4.1 Fundamentals in C**
 - 4.2 Operators and Expressions**
 - 4.3 Input-Output Functions**
 - 4.4 Control Statements**
 - 4.5 Arrays**
 - 4.6 Strings**
 - 4.7 Pointers**
 - 4.8 Functions**
 - 4.9 Storage Classes**
 - 4.10 Preprocessor Directives**
 - 4.11 Structures, Unions, Enumerations and Typedef**
 - 4.12 Command Line Arguments**
 - 4.13 Files**
 - 4.14 Graphics**

About C-Language Training

C is an basic building block for every languages. It is a general-Purpose Language. To develop the programming skills 'C' is the only platform for to develop programming techniques for any type languages. It is an Mid-level programming language for systems programming very widely used, relatively low-level, weakly typed, systems programming language associated with Unix and through that with Linux and the open source movement Performance becomes somewhat portable. Many Applications Like System Software, Application Software, Embedded Systems, Cool Games, Mobile applications, Device Drivers Programming etc of the World applications written in C and the List continues...C Designed and implemented by Dennis Ritchie 1972.

C Training Course Objective

This Course main objective for the student to develop primary programming skills up to the higher end in order solve the different programming logics. The student can able write different type of logics at the end of the sessions. After learning the C course the student can able get all the fundamental knowledge in all the languages. After Completion the student can able to attend any MNC Company interview and can solve the technical rounds both theoretically and practically. We Provide lot of logical examples to make as good as.

Why This Course is Required

One thing we can speak without C Knowledge there is no Programming Logics to learn any language. There is no interviews for a Fresher without C language. To learn Java, .Net, Databases the list continues so many we require "C"

**Knowledge for a student Finally to tell many languages are internally
Programmed by only C Language.**

C Training Course Overview

Fundamentals in C

Program

Programming

Programming Languages

Types of software

Introduction to C

History of C

Features of C

Applications of C

Character set, ASCII Table

Tokens

Keywords

Identifiers & Naming Rules

constants

Data Types

Type Qualifiers

How does the data stored in Computers Memory

Variables

Variable Declaration

Variable Assignment

Variable Initialization

Comments

Defining Constants

MCQs

Operators and Expressions

Arithmetic operators

Arithmetic expressions

Evaluation of expressions

Relational operators

Logical operators

Assignment operators

Increment & decrement operators

Conditional operator

Bitwise operators

Type casting

Size of operator

Comma operator

Operators Precedence and Associativity

Expressions

Evaluation of Expressions

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321, 7674925609 EMAIL ID: -rchmi.project2022@gmail.com

MCQs

Input-Output Functions

Input-Output Library Functions

Non-formatted Input and Output

Character oriented Library functions

Compiler, Linker and Loader

Program execution phases

Formatted Library Functions

Mathematical Library Functions

Structure of a C Program

IDE

Basic programs

MCQs

Control Statements

Conditional Control Statements

if

if-else

nested if-else

if-else-if ladder

Multiple Branching Control Structure

switch-case

Loop Control statements

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321, 7674925609 EMAIL ID: -rchmi.project2022@gmail.com

while

do-while

for

Nested Loops

Jump Control structures

break

continue

goto

return

Programs

MCQs

Arrays

Arrays

One dimensional arrays

Declaration of 1D arrays

Initialization of 1D arrays

Accessing element of 1D arrays

Reading and displaying elements

Programs on 1D Arrays

Two dimensional arrays

Declaration of 2D arrays

Initialization of 2D arrays

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321, 7674925609 EMAIL ID: rchmi.project2022@gmail.com

Accessing element of 2D arrays

Reading and displaying elements

Programs on 2D Arrays

Three dimensional arrays

MCQs

Strings

String Concept

Introduction to String in C

Storing Strings

The string Delimiter

String Literals (String Constants)

Strings and Characters

Declaring Strings

Initializing Strings

Strings and the Assignment Operator

String Input Functions / Reading Strings

String Output Functions / Writing Strings

String Input-Output using fscanf() and fprintf() Functions

Single Character Library Functions / Character Manipulation in the String

String Manipulation Library Functions

Programs Using Character Arrays

Array of Strings (2D Character Arrays)

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321,7674925609 EMAIL ID: -rchmi.project2022@gmail.com

Programs Using Array of Strings

MCQs

Pointers

Understanding Memory Addresses

Pointer Operators

Pointer

Pointer Advantages and Disadvantages

Declaration of Pointer Variables

Initialization of Pointer Variables

Dereferencing / Redirecting Pointer Variables

Declaration versus Redirection

Void Pointer

Null Pointer

Compatibility

Array of Pointers

Pointer to Pointer

Pointer Arithmetic

Dynamic Memory Allocation Functions

Functions

Functions

Advantages of using functions

Defining a function

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321, 7674925609 EMAIL ID: -rchmi.project2022@gmail.com

Calling a function

Return statement

Function Prototype

Basic Function Designs

Programs Using Functions

Scope

Recursion

Iteration vs Recursion

Nested functions

Variable Length Number of Arguments

Parameter Passing Techniques – Call by value & Call by Address

Functions Returning Pointers

Pointers and One-Dimensional Arrays

Pointers and Two-Dimensional Arrays

Passing 1D arrays to Functions

Passing 2D arrays to Functions

Pointers and Strings

Passing Strings to Functions

Pointer to Function

MCQs

Storage Classes

Object Attributes

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321,7674925609 EMAIL ID: -rchml.project2022@gmail.com

Scope

Extent

Linkage

auto

static

extern

register

MCQs

Preprocessor Directives

The #include Preprocessor Directive & User defined header files

The #define Preprocessor Directive: Symbolic Constants

The #define Preprocessor Directive: Macros

Conditional Compilation Directives

#if

#else

#elif

#endif

#ifdef

#ifndef

#undef

#error

#line

#pragma

MCQs

Structures, Unions, Enumerations and Typedef

Structures

Structure Type Declaration

Structure Variable Declaration

Initialization of Structure

Accessing the members of a structure

Programs Using Structures

Operations on Structures (Copying and Comparing Structures)

Nested structures (Complex Structures)

Structures Containing Arrays (Complex Structures)

Array of Structures (Complex Structures)

Pointer to Structure

Accessing structure member through pointer using dynamic memory allocation

Pointers within Structures

Self-referential structures

Passing Structures to Functions

Functions returning Structures

Unions

Differences between Structures & Unions

Enumerated Types / enum keyword

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321, 7674925609 EMAIL ID: -rchmi.project2022@gmail.com

The Type Definition / typedef keyword

Bit fields

MCQs

Command Line Arguments

Files

Concept of a file

Streams

Text File and Binary Files

State of a File

Opening and Closing Files

File Input / Output Functions

Formatted Input-Output Functions

Character Input-Output Functions

Line Input-Output Functions

Block Input-Output Functions

File Status Functions (Error Handling)

Positioning Functions

System File Operations

MCQs

Graphics

Initialization of graphics

Drawing shapes using pre-defined functions

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321, 7674925609 EMAIL ID: -rchmi.project2022@gmail.com

Finding the resolution of screen

Setting colors to text and window

Font settings

Fill styles

Basic GUI applications

Data Structure

Contents

- 1 About Data Structure Training**
- 2 Data Structure Training Course Objective**
- 3 Data Structure Training Course Duration**
- 4 Data Structure Training Course Content Overview**
 - 4.1 Introduction to Data Structure**
 - 4.2 Algorithms**
 - 4.3 Performance Analysis**
 - 4.4 Asymptotic Notations-**
 - 4.5 Arrays**
 - 4.6 Structures**
 - 4.7 Pointers**
 - 4.8 Dynamic Memory allocation**
 - 4.9 Stacks**
 - 4.10 Stack Implementation using pointer (dynamic)**
 - 4.11 Expression**
 - 4.12 Queues**
 - 4.13 Circular queues**

- 4.14 Double Ended queue (Deque)
- 4.15 Single linked list
- 4.16 Stack implementation using linked list
- 4.17 Queue implementation using linked list
- 4.18 Doubly linked list
- 4.19 Circular linked list
- 4.20 Circular Doubly Linked List
- 4.21 Binary Tree
- 4.22 Binary Search Tree
- 4.23 Graph
- 4.24 Searching Algorithms
- 4.25 Sorting Algorithms

About Data Structure Training

Data Structures is a concept a means of storing a collection of data. Computer Science is a concern with study of methods for effectively using a computer to solve problems. These can be solve by algorithms and data structures. Data Structures tells you what way the data as to store in computer memory and how to access the data efficiently. Many Applications are designed by data structures stack applications like page visited history in a web-browser, chain of method calls in the Java virtual machine or C++ Run-time environment etc Queue Application Like Waiting Lines, Multi-programming etc For many applications the choice of proper data structure is the only major decision involving the implementation. Majorly the database designing and internal implementation is done only by using Data Structures techniques.

Data Structure Training Course Objective

This Course main objective for the student to understand Analysis and Designing of the Algorithms and how the different data structures are used for efficient accessing of the data and Manipulation of the data at the end of the session we can able to Know different Kinds of data structures and we can able to provide different algorithms for time and space complexity.

Data Structure Training Course Content

Overview

Introduction to Data Structure

Algorithms

Performance Analysis

- Time complexity
- Space complexity

Asymptotic Notations-

- Big O
- Omega
- Theta notations

Arrays

Structures

Pointers

Dynamic Memory allocation

- Malloc()
- calloc()
- realloc()
- free()

Stacks

- Stack Operations
 - push()
 - pop()
 - peek()
 - distzay()
 - isEmpty()
 - isFull()
- Stack implementation using arrays
- Applications

- Decimal to Binary
- String reverse
- Number reverse
- Recursion – Towers of Hanoi
- Balanced Parentheses
- Expressions

Stack Implementation using pointer (dynamic)

Expression

- Introduction to Notations
- Importance of Notations in expression evaluation
- Conversion Algorithms
 - Infix to prefix
 - Infix to postfix
 - Prefix to infix
 - Prefix to postfix
 - Postfix to infix
 - Postfix to prefix
- Implementation of all the conversions

Queues

- Operations on Queue – enqueue(), dequeue()
- Queue implementation using static arrays
- Applications
- Queues Implementations using pointer (dynamic)

Circular queues

Double Ended queue (Deque)

Single linked list

- Introduction
- Construction
- Length
- Insertion
- Deletion
- Sort
- Reverse list

- Swap node data
- Swap nodes
- Applications

Stack implementation using linked list

Queue implementation using linked list

Doubly linked list

Circular linked list

Circular Doubly Linked List

Binary Tree

- Terminology
- Differences between Tree and Binary Tree
- Binary Tree Representations
- Expression Trees
- Traversals
 - In-order
 - pre-order
 - post-order

Binary Search Tree

- Introduction to BST
- Insertion
- Deletion
- Search
- Implementation

Graph

- Introduction & Terminology
- Graph Representations
- Traversal
 - BFS (Breadth First Search)
 - DFS (Depth First Search)

Searching Algorithms

- Linear search

FLAT NO: -101, SRINAGAR, RAISEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321,7674925609 EMAIL ID: -rchmi.project2022@gmail.com

- **Binary search**

Sorting Algorithms

- **Bubble sort**
- **Selection sort**
- **Insertion sort**
- **Heap sort**
- **Merge sort**
- **Quick sort**

AVL Trees

- **Introduction**
- **BST v/s AVL**
- **Rotations**
 - **L-L-Rotation**
 - **R-R-Rotation**
 - **L-R-Rotation**
 - **R-L-Rotation**
- **Insertion**
- **Deletion**
- **Traversal**

Red Black Trees

- **Introduction**
- **BST v/s AVL v/s RBT**
- **Rotations**
 - **L-L-Rotation**
 - **R-R-Rotation**
 - **L-R-Rotation**
 - **R-L-Rotation**
- **Insertion**
- **Deletion**

B trees

- **M-way Search Tree**
- **Search**

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321,7674925609 EMAIL ID: -rchmi.project2022@gmail.com

- Insertion
- Deletion

Hashing

- Hash Table representation
- Hash function-Division Method
- Collision
- Collision Resolution Techniques
 - Separate Chaining
 - open addressing
 - linear probing
 - quadratic probing
 - double hashing
 - Rehashing

Priority Queue-Definition

- Operations-Insertion, Deletion,

Heap

- Definition
- Max Heap
- Min Heap
- Insertion and deletion

Pattern matching algorithms

- Brute force
- Boyer –Moore algorithm
- Knuth-Morris-Pratt algorithm

Tries

- Standard Tries
- Compressed Tries
- Suffix tries

Dynamic Programming

FLAT NO: -101, SRINAGAR, RAJSEKHAR RESIDENCY, SRINAGAR, VISHAKHAPATNAM
CONTACT NO: -9347225321,7674925609 EMAIL ID: -rchml.project2022@gmail.com

Greedy Method

Divide and conquer method