POORNIMA
COLLEGE OF ENGINEERING

Affiliated to RTU, Kota • Approved by AICTE & UGC under 2(f) • Accredited by NBA

Brochure of Add-On Courses

SESSION 2023-24

IBM Career Education

Infosys campus connect
An Infosys Industry-Academia Partnership Program

QEEE
Quality Enhancement in Engineering Education

Spoken Tutorial

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TABLE OF CONTENTS

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LIST OF ADD-ON COURSES OFFERED
TERMS AND CONDITIONS FOR ADD-ON COURSE ENROLMENT

1. One Department Course and one Campus Course has to be compulsorily selected by every student for every session.

2. Course enrolment form has to be duly filled and submitted by the declared due date to the Tutor office, failing in which registration will not be accepted.

3. All Courses are free of cost, unless specified explicitly.

4. Minimum 80% attendance in course sessions is one of the mandatory criteria for achieving the certification.

5. A Course will be conducted only after receiving minimum 50 enrolment applications.

6. In case of any conflict or ambiguity the decision taken by the Head of the Department / IQAC will be considered standing and final.

7. In case of any unfair means used in Certification examination by an attendee, the course registration will be immediately cancelled.

8. Certification examination will not be re-conducted in any circumstances.

9. Department may issue additional instructions and criteria for their respective courses.

10. For Additional courses from QEEE and Spoken Tutorials, students may have to explicitly contact department coordinators, for registering them formally on AICTE website.

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NAME OF COURSE	COURSE CODE
DEPARTMENT LEVEL COURSES	
DEPARTMENT OF CIVIL ENGINEERING	
ETABS	**AOC-DEP-CIV-ETABS**
REVIT	**AOC-DEP-CIV-REVIT**
Sketch up Modelling	**AOC-DEP-CIV-SKETCH**
STAAD Pro	**AOC-DEP-CIV-STAAD**
DEPARTMENT OF I YEAR	
Python Programming	**AOC-DEP-FY- PYPR**
Object Oriented Programming using C++	**AOC-DEP-FY- OOPC**
ADVANCE "C"	**AOC-DEP-FY- ADVC**
Skill development program in HTML, CSS, JavaScript including BOOTSTRAP, React JS	**AOC-DEP-FY- HTML**
Logical Reasoning and Technical skill Development	**AOC-DEP-FY- LRTS**
DEPARTMENT OF ELECTRICAL ENGINEERING	
Academic Writing Using Latex	**AOC-DEP-EE-LATEX**
Solar & Renewable Energy Program for Advanced Level	**AOC-DEP-EE-SREAL**
DEPARTMENT OF MECHANICAL ENGINEERING	
Basics of Automobile Engineering	**AOC-DEP-ME- BAE**
Advance Manufacturing	**AOC-DEP-ME- AM**
COMMON TO DEPARTMENT OF COMPUTER ENGINEERING ; ELECTRONICS & COMMUNICATION ENGINEERING; INFORMATION TECHNOLOGY & ADAVANCE COMPUTING	
C Programming	**AOC-3CP5-01**
Dynamic Web Development	**AOC-3DWD4-05**
JAVA	**AOC-4CS4-25**
Python	**AOC-4PY4-02**
Software Testing	**AOC-3CCS4-07**
C++	**AOC-3CPP4-06**
Advanced JAVA	**AOC-4CS5-06**
Mobile Application Development (MAD)	**AOC-4MAD4-05**
Structured Query Language (SQL)	**AOC-CACSQL**
Data structures and algorithms (DSA)	**AOC-3CDS4-05**

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1. DEPARTMENT OF CIVIL ENGINEERING

S. No.	Course ID	Course Name	No. of Modules	Course Duration	Course Facilitator
1.	AOC-DEP-CIV-ETABS	ETABS	10	30 Hours	Mr. Rituraj Singh Rathore
2.	AOC-DEP-CIV-REVIT	REVIT	10	30 Hours	Mr. Prateek Sharma
3.	AOC-DEP-CIV-SKETCH	Sketchup Modelling	10	30 Hours	Mr. Rituraj SingRathore
4.	AOC-DEP-CIV-STAAD	STAADPRO	10	30 Hours	Mr. Rituraj SinghRathore

1.1 COURSE TITLE: ETABS

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1. COURSE DESCRIPTION:

ETABS is widely used software application for structural analysis and design. Developed by Computers and Structures Inc. (CSI) in the year 1993, it is an integrated structural engineering tool that allows engineers and architect to analyse and design various types of structures, especially buildings. The name "ETABS" stands for Extended Three-Dimensional Analysis of Building System. ETABS help engineers and architects design safe and efficient structures that meet the requirements of their projects, making it a valuable tool for anyone in the construction industry.

2. COURSE OUTCOMES:

S.No.	CourseOutcomes
CO1	To understand the basic commands of ETABS.
CO2	To Apply the complex conditions in ETABS software.
CO3	To Analyze the different structural components by using ETABS software

3. MAPPING COURSE OUTCOMES WITH PO AND PSO

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO3	-	-	-	-	-	-	-	-	-	-	-	3	-	2	-

4. COURSE PRE-REQUISITES:

Students learn about recent techniques, case study & innovative outcome based learning to analyze and evaluate the concepts of civil engineering to make his personality competent enough to fulfill the gap

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between academic and industry.

5. **ENROLMENT CRITERIA: Interested Students of III Year (Civil Engineering)**

6. **CERTIFICATION CRITERIA: Mandatory Fulfillments of Criteria 1 and 2**
    Criteria 1: 80% Attendance
    Criteria 2: 80% or above marks in Certification Exam

7. **WEEK-WISE COURSE OUTLINE:**

Civil 3rd Year		
ETABS		
Week	**Description of Program**	**Hours**
1	Basic Overview About The Software, GUI and its meaning.	3
2	Modeling	3
3	Practical Design Approach	3
4	Support conditions loadings	3
5	Loading & Analysis - Loading Patterns	3
6	EQ Loading	3
7	Wind loading	3
8	Analyze and interpretation of results & design of R.C.C members	3
9	Formulate and complex column sections using section designer & varying section.	3
10	Shear Wall modeling and analysis and design a building with Shear wall, its Modeling Analysis and Design.	3

1.2 COURSE TITLE: REVIT

1. **COURSE DESCRIPTION:** Autodesk Revit is powerful BIM software that enables architects, engineers, and construction professionals to design, visualize, and manage building projects digitally. It integrates various aspects of building design into a unified model, allowing for efficient collaboration, detailed documentation, and high-quality outcomes. Revit is widely adopted across the AEC industry, making it a valuable skill for professionals. Revit facilitates seamless collaboration among project stakeholders through its integrated BIM environment. Improved Efficiency: Automate repetitive tasks, streamline workflows, and reduce errors with Revit's intelligent design tools. Proficiency in Revit can open doors to new job opportunities and career growth in the competitive AEC field. This report provides a comprehensive overview of the workshop proceedings, highlighting key insights, learning's, and recommendations gathered from the collective expertise and experiences shared during the sessions.

2. **COURSE OUTCOMES:**

S.No.	Course Outcomes
CO1	Understand the fundamental interface, tools, and commands in Revit to set up and

6

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	navigate through projects effectively.
CO2	Apply various architectural modeling techniques to create building components such as walls, floors, roofs, and stairs in Revit.
CO3	Analyze and modify project parameters, view settings, and schedules to manage project data and documentation effectively.

3. MAPPING COURSE OUTCOMES WITH PO AND PSO

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO3	-	-	-	-	-	-	-	-	-	-	-	3	-	2	-

4. ENROLMENT CRITERIA: Interested Students of III Year (Civil Engineering)

5. CERTIFICATION CRITERIA: Mandatory Fulfillments of Criteria 1 and 2
   Criteria 1: 80% Attendance
   Criteria 2: 80% or above marks in Certification Exam

6. COURSE OUTLINE:

Civil 3rd Year			
Ravit			
Week	**Description of Program**	**Resource Person**	**Hours**
1	Introduction and Basic Modelling	Mr. Rohit	3
2	Developing custom families for architectural elements and using parametric design principles.	Mr. Rohit	3
3	Generating construction documents, including creating and customizing views, schedules, and detailing components.	Mr. Rohit	3
4	Introduction to site design tools, creating topography, and working with site elements and massing studies.	Mr. Rohit	3
5	Creating structural components, such as beams, columns, and slabs, and understanding their integration with architectural elements.	Mr. Rohit	3
6	Basics of Civil, Electrical, and Plumbing (MEP) systems in Revit, including duct, piping, and electrical layouts.	Mr. Rohit	3
7	Using Revit tools and add-ons to conduct energy and lighting analysis for sustainable design.	Mr. Rohit	3
8	Setting up and managing worksets for collaborative project work, linking Revit models, and coordinating changes.	Mr. Rohit	3
9	Working with phasing for renovation projects, and exploring design options to present alternate layouts.	Mr. Rohit	3

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Sitapura, JAIPUR

| 10 | Creating high-quality renderings and walkthroughs to visualize and present architectural designs effectively. | Mr. Rohit | 3 |

1.3 COURSE TITLE Sketchup Modelling

1. COURSE DESCRIPTION: SketchUp is a widely used 3D modeling software application for architectural and design projects. Originally developed by @Last Software in 2000 and now maintained by Trimble Inc., SketchUp provides an intuitive platform for creating detailed 3D models, including buildings, interiors, and landscapes. Known for its user-friendly interface and versatility, SketchUp allows architects, civil engineers, and designers to conceptualize and visualize their ideas efficiently. The software supports everything from basic 3D shapes to complex designs, making it a valuable tool for anyone in the architecture, engineering, and construction (AEC) industry.

2. COURSE OUTCOMES:

S.No.	Course Outcomes
CO1	To understand the basic commands of SketchUp.
CO2	To apply materials, textures, and components in SketchUp models.
CO3	To create and visualize detailed 3D models of architectural structures.

3. MAPPING COURSE OUTCOMES WITH PO AND PSO

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO3	-	-	-	-	-	-	-	-	-	-	-	3	-	2	-

4. ENROLMENT CRITERIA: Interested Students of II Year (Civil Engineering)

5. CERTIFICATION CRITERIA: Mandatory Fulfillments of Criteria 1 and 2
Criteria 1: 80% Attendance
Criteria 2: 80% or above marks in Certification Exam

6. WEEK-WISE COURSE OUTLINE:

Civil 2nd Year		
SketchUp		
Week	**Description of Program**	**Resource Person**	**Hours**
1	Basic Overview of the Software, GUI, and Navigation Tools	Mr. Rushikesh	3

Dr. Mahesh Bundele
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Sitapura, JAIPUR

2	Fundamentals of 3D Modeling: Creating Basic Shapes and Structures	Mr. Rushikesh	3
3	Developing Architectural Models	Mr. Rushikesh	3
4	Applying Materials, Textures, and Colors	Mr. Rushikesh	3
5	Working with Layers and Components	Mr. Rushikesh	3
6	Importing and Exporting Models	Mr. Rushikesh	3
7	Creating Scenes and Animations	Mr. Rushikesh	3
8	Enhancing Models with Plugins and Extensions	Mr. Rushikesh	3
9	Rendering Techniques and Visual Enhancements	Mr. Rushikesh	3
10	Final Project: Creating a Detailed Architectural Model with Complete Presentation	Mr. Rushikesh	3

1.4 COURSE TITLE: STAADPRO Training Program

1. COURSE DESCRIPTION:

STAAD Pro is a powerful and widely used software application for structural analysis and design. Developed by Bentley Systems, it is a comprehensive and integrated structural engineering tool that allows engineers to analyze and design various types of structures, including buildings, bridges, towers, and industrial structures. The name "STAAD" stands for Structural Analysis and Design, emphasizing its primary functions. This software is renowned for its versatility and efficiency in handling complex structural engineering tasks. It provides a user-friendly interface that enables engineers to model, analyze, and design structures with ease. STAAD Pro supports a wide range of design codes and international standards, making it suitable for projects around the world. One of the key features of STAAD Pro is its advanced analysis capabilities. It employs various methods for structural analysis, including linear and nonlinear static analysis, dynamic analysis, and finite element analysis (FEA). Engineers can simulate real-world conditions and assess the performance of structures under different loads and environmental factors. The software's FEA capabilities enable detailed modeling of complex geometries and material behaviors, allowing for more accurate and realistic simulations. STAAD Pro also excels in its design capabilities, offering comprehensive tools for the design of concrete, steel, and other materials. Engineers can perform code-based design checks, ensuring that structures comply with relevant design codes and safety standards. The software provides automated design optimization features, allowing engineers to iteratively refine their designs for better efficiency and cost-effectiveness. Additionally, STAAD Pro facilitates the generation of detailed and customizable reports, making it easy to communicate design information to project stakeholders. The modeling capabilities of STAAD Pro contribute to its widespread adoption in the engineering community. Engineers can create 3D models of structures using a variety of elements, such as beams, columns, slabs, and foundations.
 The graphical interface enables intuitive modeling and visualization of the entire structure, streamlining the design process. Furthermore, the software supports interoperability with other design and analysis tools, allowing for seamless collaboration and data exchange between different software platforms.

2. COURSE OUTCOMES

S.No.	Course Outcomes
CO1	To understand the basic commands of STADD Pro.
CO2	To Apply the typical loading in STADD Pro software
CO3	To Analyze the different structural components by using of STADD Pro software

3. MAPPING COURSE OUTCOMES WITH PO AND PSO

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO3	-	-	-	-	-	-	-	-	-	-	-	3	-	2	-

4. ENROLMENT CRITERIA: Interested Students of III Year (Civil Engineering)

5. CERTIFICATION CRITERIA: Mandatory Fulfillments of Criteria 1 and 2 Criteria 1: 80% Attendance, and Criteria 2: 80% or above marks in Certification Exam

6. COURSE OUTLINE:

The course outline covered a range of topics, including but not limited to: Introduction to STAADPRO: Understanding the basics of the software, its interface, and its capabilities. Structural Analysis Concepts: Teaching fundamental concepts of structural analysis, including loadings, supports, and reactions. Modeling Structures: Hands-on experience in creating 3D models of various types of structures within STAADPRO. Loading and Boundary Conditions: Learning how to apply different types of loads and constraints to the structural models. Analysis Procedures: Understanding the step-by-step procedures for structural analysis using STAADPRO. Interpretation of Results: Interpreting and analyzing the output results from STAADPRO, including deflections, reactions, and member forces. Design Codes and Standards: Familiarization with the design codes and standards used in STAADPRO for ensuring the safety and adequacy of structures. Optimization and Iterative Design: Exploring techniques for optimizing structural designs and making iterative changes. Dynamic Analysis: Introducing dynamic analysis concepts for structures subjected to dynamic loads such as earthquakes or wind. Documentation and Reporting: Training on generating reports and documentation for the designed structures. Practical Applications: Showcasing real-world applications of STAADPRO in civil engineering projects.

2 DEPARTMENT OF I YEAR

S. No.	Course ID	Course Name	No. of Modules	Course Duration	Course Facilitator
1	AOC-DEP-FY-PYPR	ADD ON course on Python Programming	12	72 Hours	Ms. Priyanka
2	AOC-DEP-FY-OOPC	ADD ON course on Object Oriented Programming using C++	12	72 Hours	Mr. Rahul Dangi

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3	AOC-DEP-FY-ADVC	ADD ON course on ADVANCE "C"	12	72 Hours	Ms. Kajal Sharma
4	AOC-DEP-FY-HTML	ADD ON course on HTML, CSS, JavaScript including BOOTSTRAP, ReactJS	12	72 Hours	Mr. Surya Pratap Singh& Mr. Dhananjay Radanpura
5	AOC-DEP-FY-LRTS	ADD ON course on Logical Reasoning and Technical Skill Development	15	45 Hours	Ms. Anupama

2.1 COURSE TITLE: Program on Python Programming (COURSE CODE: AOC-DEP-FY-PYPR)

1. **COURSE ID: AOC-DEP-FY-PYPR.**
2. **COURSE TITLE: Program on Python programming.**
3. **COURSE DESCRIPTION:** With respect to python programming for the students of Poornima College of Engineering, B. Tech. (1st year, Poornima College of Engineering offers' Program on python programming ' to upgrade the aptitude, knowledge and soft skills of the students to develop their personality and prepare them for various competitive examinations.

4. **COURSE OUTCOMES:**

CO 1: Understand Python syntax and semantics and be fluent in the use of Python flow control and Functions

CO 2: Develop, run and manipulate Python programs using Core data structures like Lists, Dictionaries, and use of Strings Handling methods

CO 3: Develop, run and manipulate Python programs using File Operations and searching pattern using regular expressions.

CO 4: Interpret the concepts of object oriented programming using Python

CO5: Determine the need for scraping websites and working with CSV, JSON and other file formats.

5. **MAPPING COURSE OUTCOMES WITH POs:**
Mapping for Course Outcomes with Program Outcomes.

(3/2/1 indicates strength of correlation, 3-Strong, 2-Medium, 1-weak)

Dr. Mahesh Bundele
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ISI-6, RIICO Institutional Area
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CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	-	2	-	-	-	-	-	-	2
CO2	3	3	3	-	2	-	-	-	-	-	-	2
CO3	3	3	2	-	2	-	-		-	-	-	2
CO4	3	2	3	-	2	-	-	-	-	-	-	2
CO5	3	3	3	-	3	-	-	-	-	-	-	2

6. Pre-requisites of the course:

Participant must be a student of B. Tech. 1st year at Poornima college of Engineering.

7. Enrollment Criteria:

Participant must be a student of B. Tech. 1st year at Poornima College of Engineering.

8. Evaluation Criteria:

Quiz

9. Certification Criteria:

(i)   75% attendance (ii) At least 50% marks in quiz.

10. Course Content with week-wise planning :

Module 1	An Introduction to Python, Beginning Python Basics
Module 2	Python Program Flow, Functions & Modules
Module 3	Exceptions Handling, File Handling
Module 4	Classes In Python, Generators and iterators
Module 5	Data Structures

Dr. Mahesh Bundele
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Poornima College of Engineering
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Module 6	Collections, Writing GUIs in Python
Module 7	Python SQL Database Access
Module 8	Network Programming
Module 9	Date and Time, Some similar topics in-detailed
Module 10	Regular expression, Threads ESSENTIAL
Module 11	Multithreading, Python JSON
Module 12	Python Excel

2.2 COURSE TITLE: Program on Object Oriented Programming using C++ (**COURSE CODE:** AOC-DEP-FY-OOPC)

1. **COURSE ID: AOC-DEP-FY-OOPC.**

2. **COURSE TITLE: Program on Object Oriented Programming using C++.**

3. **COURSE DESCRIPTION:** With respect to Technical Training Program for the students of Poornima College of Engineering, B. Tech. (1st year, Poornima College of Engineering offers Program on 'Object Oriented Programming using C++' to upgrade the aptitude, knowledge and coding skills of the students to develop their coding skills and prepare them for various competitive examinations as well placement.

4. **Course Outcomes:**

   CO 1: students will be able to have knowledge about programming paradigm, characteristics of OOPs, input/output operations, tokens and data types.

   CO 2: Students will be able to analyze the problems related to operators, decision making and branching, iterative and class, objects and solve them.

   CO 3: Students will be able to develop their coding skills to solve the problem using array, string, pointers and file structure.

CO 4: Students will be able to improve their concept of algorithms, structure, using modularization to solve complex problems using C++ programming.

CO5: Students will be able to interpret the data and evaluate the outcomes based on it.

5. MAPPING COURSE OUTCOMES WITH POs:

Mapping for Course Outcomes with Program Outcomes.

(3/2/1 indicates strength of correlation, 3-Strong, 2-Medium, 1-weak)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-
CO4	-	2	-	-	-	2	-	-	2	-	-	-
CO5	-	2	-	-	-	-	-	2	-	-	-	2

6. Pre-requisites of the course:

Participant must be a student of B. Tech. 1st year at Poornima college of Engineering.

7. Enrollment Criteria:

Participant must be a student of B. Tech. 1st year at Poornima College of Engineering.

8. Evaluation Criteria:

Quiz

9. Certification Criteria:

(i) 75% attendance (ii) At least 50% marks in quiz.

10. Course Content with week-wise planning :

Module 1	Programming Paradigm, Characteristics of OOP, Tokens and Data Types

Module 2	Operators, precedence and associativity, Control Flow Statements, if else, goto and switch statement
Module 3	Looping/iteration using for, while and do while loop, break and continue statements.
Module 4	Arrays and its types, character array and string.
Module 5	User defined function, constant function, parameter passing
Module 6	Class and objects, data member and member functions, access specifiers and this pointer
Module 7	Constructors and destructors, friend function, static data member and member function
Module 8	Polymorphism: function overloading, unary and binary operator overloading, operator overloading using friend function
Module 9	Inheritance: types of inheritance, virtual base class, function overriding, abstract class and pure virtual function, constructor in derived class
Module 10	Function template, class template and manipulators
Module 11	File opening modes, text and binary file, random access to file
Module 12	Mini project

2.3. COURSE TITLE: Program on ADVANCE "C" (**COURSE CODE:** AOC-DEP-FY-AVDC)

1. **COURSE ID: AOC-DEP-FY-AVDC.**
2. **COURSE TITLE: ADVANCE "C"**
3. **COURSE DESCRIPTION:** With respect to Technical Training Program for the students of Poornima College of Engineering, B. Tech. (1st year, Poornima College of Engineering offers Program on 'ADVANCE C' to upgrade the aptitude, knowledge and coding skills of the students to develop their coding skills and prepare them for various competitive examinations as well placement.

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4. **Course Outcomes:**

CO 1: students will be able to have knowledge about programming paradigm, characteristics of ADVANCE C, input/output operations, tokens and data types.

CO 2: Students will be able to analyze the problems related to operators, decision making and branching, iterative and class, objects and solve them.

CO 3: Students will be able to develop their coding skills to solve the problem using array, string, pointers and file structure.

CO 4: Students will be able to improve their concept of algorithms, structure, using modularization to solve complex problems using ADVANCE C programming.

CO5: Students will be able to interpret the data and evaluate the outcomes based on it.

5. **MAPPING COURSE OUTCOMES WITH POs:**

   Mapping for Course Outcomes with Program Outcomes.

   (3/2/1 indicates strength of correlation, 3-Strong, 2-Medium, 1-weak)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-
CO4	-	2	-	-	-	2	-	-	2	-	-	-
CO5	-	2	-	-	-	-	-	2	-	-	-	2

6. **Pre-requisites of the course:**

   Participant must be a student of B. Tech. 1st year at Poornima college of Engineering.

7. **Enrollment Criteria:**

Participant must be a student of B. Tech. 1st year at Poornima College of Engineering.

8. **Evaluation Criteria:**

   Quiz

9. **Certification Criteria:**

   (i)75% attendance (ii) At least 50% marks in quiz.

10. **Course Content with week-wise planning :**

Module 1	Introduction of C Language
Module 2	Input/ Output Statements
Module 3	C Tokens, Variables, Constants
Module 4	Data Types and its Modifiers Typecasting or Type Conversion
Module 5	Operators in C language, Operator Precedence and Associativity

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Module 6	Control Statements (if else, switch etc.) in C with programming examples
Module 7	Loops in – For Loop, While Loop, Do While Loop with programming examples
Module 8	Nested Loops with programming examples. Break and Continue statements
Module 9	Introduction to Arrays with programming examples, Strings Manipulation in C with programming examples
Module 10	Pointers in C Language, User Defined Functions – Defining, Calling, Types of Function Arguments with examples
Module 11	File Handling – Reading files, Writing & Appending in files
Module 12	Projects Using Files as a Backend (with Evaluation)

2.4 COURSE TITLE: Program on HTML, CSS, JavaScript including BOOTSTRAP, ReactJS
(COURSE CODE : AOC-DEP-FY-HTM):

1. **COURSE DESCRIPTION:** With respect to Technical Training Program for the students of Poornima College of Engineering, B. Tech. (1st year, Poornima College of Engineering offers Program on 'HTML, CSS & JavaScript including BOOTSTRAP, ReactJS' to upgrade the aptitude, knowledge and coding skills of the students to develop their coding skills and prepare them for various competitive examinations as well placement.

2. **Course Outcomes:**
CO 1: students will be able to have knowledge Design static web pages using HTML and CSS Using internet technologies
CO 2: Students will be able to Create dynamic web pages using JavaScript using internet technologies and services.
CO 3: Students will be able to Develop JDBC programs and server-side scripts using servlets
CO 4: Students will be able to Develop server-side scripts using JSP..
CO5: Students will be able to Apply jQuery methods and events.

3. **MAPPING COURSE OUTCOMES WITH POs:**
Mapping for Course Outcomes with Program Outcomes.
(3/2/1 indicates strength of correlation, 3-Strong, 2-Medium, 1-weak)

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

17

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ISI-6, RIICO Institutional Area
Sitapura, JAIPUR

CO5	-	2	2	-	-	-	-	2	-	-	-	2

4. Pre-requisites of the course:
   Participant must be a student of B. Tech. 1st year at Poornima college of Engineering.

5. Enrollment Criteria:
   Participant must be a student of B. Tech. 1st year at Poornima College of Engineering.

6. Evaluation Criteria:
   Quiz

7. Certification Criteria:
   (i)75% attendance (ii) At least 50% marks in quiz.

8. Course Content with week-wise planning :

Module 1	1. Introduction to HTML-5 2. Basic HTML Documents Structure 3. Anatomy of an HTML Tag
Module 2	1. HTML Content Models 2. Creating Links
Module 3	1. Build table for even more HTML structure 2. Create Forms with in depth form examples and HTML tag explanations 3. Add iframe and more cool HTML elements
Module 4	1. Power of CSS 2. Element, Class and ID Selectors 3. Style Placement
Module 5	1. The Box Model 2. The background Property 3. Responsive Design
Module 6	1. Introduction to Bootstrap 2. The Bootstrap Grid System 3. CSS Positioning 4. CSS Pseudo Class
Module 7	1. Adjusting Development Environment for JavaScript Development 2. Events of JavaScript
Module 8	1. Type of Popup Box 2. Common Language Constructs
Module 9	1. Creating Objects 2. Conditions and Switches to apply logic
Module 10	1. Loops and Iterating through data 2. Array 3. Functions
Module 11	1. DOM Concept of JavaScript 2. Function Constructors, prototype and the 'this' Keyword
Module 12	1. Project using HTML, CSS and JavaScript

18

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2.5 COURSE TITLE: Program on Logical Reasoning and Technical (**COURSE CODE:** AOC-DEP-FY-LRTS)

1. **COURSE ID: AOC-DEP-FY-LRTS.**
2. **COURSE TITLE: Program on Logical Reasoning and technical skill Development.**
3. **COURSE DESCRIPTION:** With respect to Technical Training Program for the students of Poornima College of Engineering, B. Tech. (1st year, Poornima College of Engineering offers' Program on logical reasoning and skill development ' to upgrade the aptitude, knowledge and soft skills of the students to develop their personality and prepare them for various competitive examinations.
4. **Course Outcomes:**

CO 1: students will be able to have knowledge about number system, quadratic equation, percentage, simple interest, compound interest, probability, permutation - combination and Vedic mathematics.

CO 2: Students will be able to analyze the problems related to syllogism, patterns, puzzles and solve them.

CO 3: Students will be able to develop their soft skills like communication skill (both speaking skill and writing skill). They will study about basic rules of English grammar to improve their communication.

CO 4: Students will be able to improve their reasoning and logical thinking and also apply short cut tricks to solve the problems fast.

CO5: Students will be able to interpret the data and evaluate the outcomes based on it.

5. **MAPPING COURSE OUTCOMES WITH POs:**

Mapping for Course Outcomes with Program Outcomes.

(3/2/1 indicates strength of correlation, 3-Strong, 2-Medium, 1-weak)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	2	2	3	-	3
CO4	-	-	-	2	-	-	-	-	-	-	-	3
CO5		3										2

6. **Pre-requisites of the course:**

   Participant must be a student of B. Tech. 1st year at Poornima college of Engineering.
7. **Enrollment Criteria:**

   Participant must be a student of B. Tech. 1st year at Poornima College of Engineering.
8. **Evaluation Criteria:**

   Quiz
9. **Certification Criteria:**

   (i)   75% attendance   (ii)   At least 50% marks in quiz.

10. **Course Content with week-wise planning :**

Module 1	Awareness about different Competitive Exams SWOT Analysis: Self Awareness,
Module 2	Basic Calculation & Simplification: Addition & Subtraction, Divisible & Multiplication, Square & Cube root
Module 3	Ice Breaking Session: Self- Introduction, Team Building and Group Dynamics, Vocabulary Building
Module 4	Number System: Numbers, HCF & LCM, Cyclicity, Algebraic Formulae

Module 5	Public Speaking, Word & Sentence Formation, Basic Usage of Grammar, Environmental Awareness
Module 6 (a)	Ratio & Proportion: Types & Problems
Module 6 (b)	Time Management & Goal Setting, Stress Management, Assertiveness
Module 7	Creative & Analytical skills, Language Skills, Basic Usage of Grammar
Module 8	Percentage & Partnership: Explanation & Conditions
Module 9	Social & Business Etiquettes- Dealing in Social &Business Environment
Module 10	Profit & Loss: Basic Formulae & Problems
Module 11	Time & Work: Conditions, Pipes & Cisterns, Concept of Efficiency, Problems
Module 12 (a)	Letter Writing, Business Comm. E-mail Etiquettes, Telephonic Etiquettes
Module 12 (b)	Inter & Intra Personal Skills, Group Communication
Module 13 (a)	Leadership Skills, Pro-activeness, News Paper Reading
Module 13 (b)	Time, Speed & Distance: Units of Measurements, Cases or Conditions, Boat and Streams, Problems
Module 14 (a)	Listening with Understanding, Memory Enhancement, Resume & CV Writing
Module 14 (b)	Video/ Case Study Analysis, Article/Film/Book Review
Module 15 (a)	Logistics: Analogy, Coding/ decoding, Venn Diagrams, Seating Arrangements, Syllogism
Module 15 (b)	Interview Skills, Personal Grooming

3 DEPARTMENT OF ELECTRICAL ENGINEERING

S. No.	Course ID	Course Name	No. of Modules	Course Duration	Course Facilitator
1	AOC-DEP-EE-SREAL	Solar & Renewable Energy Program for Advanced Level	4	36	Mr.Vineet Sharma & Mr.Rachit Saxena
2	AOC-DEP-EE-LATEX	Academic Writing Using Latex			Dr. Pravin M. Sonwane Dr. Hemant Kaushik

3.1 COURSE TITLE: Solar & Renewable Energy Program for Advanced Level **(COURSE CODE:** AOC-DEP-EE-SREAL**)**

Course Summary:

This course offers you advanced knowledge within the field of photovoltaic system technology. The students will learn about the solar resource and how photovoltaic energy conversion is used to produce electric power. From this fundamental starting point we'll cover the design and fabrication of different solar cell and module technologies, the various photovoltaic system components, how to design a photovoltaic

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plant and carry out energy yield simulations, essentials in energy economics, O&M and reliability assessment, as well as the role of photovoltaic energy in sustainable energy systems.

Enrollment Criteria:

Participants must be interested and engineering student (II/III Yr Only)

Course Outcomes:

1. Students will be able to understand the principle of direct solar energy conversion to power using PV .
2. Students will be able to Contrast the performance measures of PV.
3. Students will be able to Infer on various solar cells & design aspects of solar PV.
4. Students will be able to Develop ideas for working on solar PV systems & associated safety practices

Mapping course outcomes with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1				3		3						3			
CO2				3						3		3			
CO3					3	3			3			3			
CO4				3		3									
CO5															
Target				3	3	3			3	3		3			

COURSE PREREQUISITES: Basic Electrical Engineering, Power System, Control System

Course Duration: 36 Hours
Course Outline:

Module	Contents	Hours
1	Overview of renewable energy sources (solar, wind, hydro, geothermal, biomass) Overview of Power development Global overview of renewable energy Solar Energy Fundamentals Wind Energy Hydroelectric and Ocean Energy Geothermal and Biomass Energy Principles of solar power (solar, photovoltaic, solar thermal). • Photovoltaic (PV) Solar Power • Photovoltaic Effect • Solar Cells • Conversion of Sunlight to Electricity. • Efficiency • Orientation and Tilt • Grid-Tied Systems	9 Hours

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2	Principles of solar power (solar, photovoltaic, solar thermal). • Off-Grid Systems • Solar Thermal Power • Concentrating Solar Power (CSP) • Solar Water Heaters heat to water. • Storage Systems Energy Scenario. • Energy Sources • Energy Consumption • Energy Production and Infrastructure • Environmental Impact • Energy Efficiency • Energy Policy and Regulation • Energy Security • Technological Advances • International Cooperation • Economic Factors	9 Hours
3	Non-Conventional Energy • Solar Energy • Wind Energy • Hydropower (Hydroelectric Energy) • Geothermal Energy • Biomass Energy • Tidal and Wave Energy • Hydrogen Energy • Nuclear Energy MPPT Controller. • Maximizing Solar Panel Efficiency • Dynamic Adjustment • Increased Energy Production • Compatibility with Battery Systems • Multiple PV Array Compatibility • Enhanced Flexibility	9 Hours

4	Radiation Energy.	9 Hours
	• Electromagnetic Radiation	
	• Gamma Rays and X-rays	
	• Visible Light	
	• Infrared and Microwaves	
	• Radio Waves	
	• Nuclear Radiation	
	• Solar Radiation	
	• Thermal Radiation	
	• Cosmic Radiation	
	• Ionizing Radiation	
	• Non-Ionizing Radiation	
	• Electromagnetic Radiation Sources	
	Converters:	
	• Boost Convertor.	
	• Buck Convertor.	
	Hands on Practice / Projects Preparation	

3.2 COURSE TITLE: Academic Writing Using Latex (**COURSE CODE:** AOC-DEP-EE-LATEX)

Course Summary

This workshop aims to provide a comprehensive theoretical and hands on practice with LaTeX for preparing research articles, thesis writing and oral presentation. It will be useful for beginners and also who are using it on a regular basis.

LaTeX is a high-quality typesetting system which is widely used for document preparation in academics. Though it was invented for writing mathematics "beautifully" during 1985, nowadays, LaTeX is used not only to write documents in mathematics but also physics, computer science, engineering, economics, psychology, social and political sciences. LaTex is preferably used for technical/scientific papers writing for journals by researchers, engineers and mathematicians at large. Over a period, LaTeX has evolved, and now it can draw complicated molecules in organic chemistry, list bibliography in various ways at the stroke of a feather. In contrast to Microsoft Word, LaTeX can handle large documents very easily. Some useful features of LATEX are:

> • Typesetting of journal articles, technical reports, thesis, books, and slide presentations.
> • Simpler to handle large documents containing sections, cross-references, tables, mathematical equations, footnotes and figures.
> • Typesetting of complex mathematical formulae.
> • Automatic generation of table of contents, bibliographies and indexes.

Enrolment Criteria:
1. Participants must be interested and engineering student (II/III/IV Yr Only)
2. Must provide the NOC if from other department.

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Course Outcome
1. Participant will be able to understand various features of LaTeX.
2. Participant will be able to include packages, content formatting, inserting figures and equations.
3. Participants will be able to write the conference paper, journal-manuscript and thesis in LaTeX.
4. Participants will be able to prepare the resume or prepare resume using Latex

Mapping course outcomes with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1					3	3		2	2	3	2			2	
CO2	2	1			3	2		2	2	3	2			2	
CO3	2	2			3	2		2	2		3			2	
CO4					2	2		2	2					2	
Target	2	1.5			2.75	2.25		2	2	3	1.75			2	

4 DEPARTMENT OF MECHNICAL ENGINEERING

S. No.	Course ID	Course Name	No. of Modules	Course Duration	Course Facilitator
1	AOC-DEP-ME-BAE	Basics of Automobile Engineering	9	30 Hours (3 hours per week for 10 weeks)	Dr. Mukesh Didwania
2	AOC-DEP-ME-AM	Advance Manufacturing	10	30 Hours (3 hours per week for 10 weeks)	Baba Automobile Pvt. Ltd.

4.1 COURSE TITLE: Basics of Automobile Engineering (**COURSE CODE:** AOC-DEP-ME-BAE)

1. COURSE ID: AOC-DEP-ME-BAE

2. COURSE TITLE: Basics of Automobile Engineering

3. COURSE DESCRIPTION: Automobile engineering is a branch that deals with the designs, manufacture, as well as operation of mechanical mechanisms of automobiles. It is also an introduction to vehicle engineering, which includes cars, motorcycles, trucks & buses, etc. Automobile engineering has gained recognition & importance ever since motor vehicles capable of carrying passengers have been in vogue. Now due to the rapid development of auto component manufacturers and automobile industries, automobile engineers are in great demand. This includes understanding the vehicle chassis, the mechanism

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of the internal combustion engine. Automobile Engineer is mainly classified into three-stream, namely Product or Design Engineers, Development Engineers & Manufacturing Engineers.

4. COURSE OUTCOMES

S. No.	Course Outcomes
CO1	Explain the working of different parts of an automobile.
CO2	Apply the knowledge of engine, transmission, clutch and brakes for smooth functioning of vehicles
CO3	Analyze the study of an angle for steering and the suspension systems.
CO4	Design and develop a strong base for understanding future developments in the automobile industry.

5. MAPPING COURSE OUTCOMES WITH PO AND PSO

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	2	-	2	3
CO2	3	-	-	-	-	-	-	-	-	-	-	2	-	2	3
CO3	-	2	-	-	-	-	-	-	-	-	-	2	-	2	3
CO4	-	3	-	-	-		-	-	-	-	-	2	-	2	3

6. COURSE PRE-REQUISITES:

The first and foremost requirement to become an Automobile Engineer is "passion and interest" in cars and other automotive products. Students should also have an aptitude for resolving mechanical problems. Creativity and innovative solutions in drawing, designing and repairs are few essential skill-sets for this course.

7. ENROLMENT CRITERIA: Interested Students of I Year and II Year (All Branches)

8. CERTIFICATION CRITERIA: Mandatory Fulfilment of Criteria 1 and 2
Criteria 1: 80% Attendance, and
Criteria 2: 70% or above marks in Certification Exam

9. WEEK-WISE COURSE OUTLINE:

WEEK	MODULE-WISE CONTENTS
WEEK – 1 (3 Hours)	**MODULE – 1: An Introduction of Automobile Engineering** ● What is Automobile? ● Types of Automobiles ● Vehicle Construction and Components ● Components of Engine

WEEK – 2 (3 hours)	**MODULE – 2: IC Engine** ● Types of I.C Engines ● 2- Stroke Engines ● 4 Stroke Engines ● CVT Engines
WEEK – 3 (3 hours)	**MODULE – 3: New Technology in Automobile Engines** ● Automobile New Technologies. ● CRDI Engines ● MPFI Engines ● S.I Engines ● C.I Engines
WEEK – 4 (3 hours)	**MODULE – 3: Layout of Automobile** ● Frame & Body ● Clutches ● Brakes ● Gear Boxes ● Drives
WEEK – 5 (3 hours)	**MODULE – 4: Steering and Suspension Systems** ● Wheels and Tyres ● Steering system ● Suspension system ● Fuel System
WEEK – 6 (3 hours)	**MODULE –6: Automobile Engine Servicing-I** ● Checking Engine Compression ● Checking Engine Vacuum ● Removing Timing Chain ● Dismantling cylinder head
WEEK-7 (3 Hours)	**MODULE –7: Automobile Engine Servicing -II** ● Decarbonizing ● Testing valve, valve seat and valve guide ● Reassembling cylinder head ● Adjusting valve clearance
WEEK - 8	**MODULE-8: Dismantling and Assembly of Two Wheelers** ● Dismantling and Assembling Bajaj Pulsar DTSI Engine ● Dismantling and Assembling TVS Apche RTR Engine ● Dismantling and Assembling Honda Activa CVT Engine
WEEK - 9	**MODULE-9: Dismantling and Assembly of Four Wheelers** ● Dismantling and Assembling Maruti Suzuki Petrol Engine ● Dismantling and Assembling Maruti Suzuki Car

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Sitapura, JAIPUR

	Transmission
WEEK - 10	1. **CERTIFCATION EXAMINATION** 2. **CLOSING AND VALEDICTORY CEREMONY**

4.2 COURSE TITLE: Advance Manufacturing (**COURSE CODE:** AOC-DEP-ME-AM)

1. COURSE TITLE: ADVANCE MANUFACTURING

2. COURSE DESCRIPTION: Advance Manufacturing is the up gradation of traditional manufacturing to overcome the limitation of materials processing, and processes. In advance manufacturing processes, cutting tool materials properties do not affect the process and excellent dimensional accuracy. Frontiers of manufacturing like additive manufacturing, computer aided engineering and automation providing better push to manufacturing in industries. Therefore, manufacturing is the integral pillar of the country economy.

3. COURSE OUTCOMES:

S.No.	Course Outcomes
CO1	Remember the different types of basic materials and manufacturing processes
CO2	Understand the various advance machining processes, planning and design tools
CO3	Investigate the machining forces, material removal rate, surface finish of advance machining processes
CO4	Apply the advance casting, welding, 3D printing and digital manufacturing approach in to industrial applications.

4. MAPPING COURSE OUTCOMES WITH PO AND PSO

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	1	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	1	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-

5. COURSE PRE-REQUISITES:
Students should already be learning materials name, properties of materials, cutting tools, machine tools and manufacturing processes.

6. ENROLMENT CRITERIA: Interested Students of I Year and II Year (All Branches)

7. CERTIFICATION CRITERIA: Mandatory Fulfilment of Criteria 1 and 2
Criteria 1: 80% Attendance, and
Criteria 2: 70% or above marks in Certification Exam

8. WEEK-WISE COURSE OUTLINE:

WEEK	MODULE-WISE CONTENTS
WEEK – 1 (3 Hours)	**MODULE – 1** o What is manufacturing processes o Need of advance materials

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	o Need of advance manufacturing processes o Introduction of additive manufacturing
WEEK – 2 **(3 hours)**	**MODULE – 2** o Thermal Energy based advanced manufacturing processes o Laser beam machining, Electron beam machining o Electric discharge machining
WEEK – 3 **(3 hours)**	**MODULE – 3** o Mechanical Energy based advanced manufacturing processes o Ultrasonic machining process o Electric discharge machining
WEEK – 4 **(3 hours)**	**MODULE-4** o Electrochemical energy based manufacturing processes
WEEK – 5 **(3 hours)**	**MODULE-5** o Advance casting processes and forming processes
WEEK – 6 **(3 hours)**	**MODULE-6** o Digital manufacturing and industrial fourth revolution
WEEK-7 **(3 Hours)**	**MODULE-7** o 3D printing and additive manufacturing
WEEK – 8 **(3 Hours)**	**MODULE-8** o Computer aided design, computer aided process planning and computer aided manufacturing
WEEK – 9 **(3 Hours)**	**MODULE-9** Overview of manufacturing industries
WEEK – 10 **(3 Hours)**	**MODULE 10** o CERTIFCATION EXAMINATION o CLOSING AND VALEDICTORY CEREMONY

5 COMMON TO DEPARTMENT OF COMPUTER ENGINEERING ; ELECTRONICS & COMMUNICATION ENGINEERING; INFORMATION TECHNOLOGY & ADAVANCE COMPUTING

S. No.	Course ID	Course Name	No. of Modules	Course Duration	Course Facilitator
1	AOC-3CP5-01	C Programming	6	36 Hrs	Mr Mohit Byadwal
2	AOC-3CDS4-05	Dynamic Web Development	12	36 Hours (6 hours per day for 1 weeks)	Ms. Neha Shrotriya & Ms. Geeta Tiwari
3	AOC-4CS4-25	JAVA	12	36 Hours (6 hours per day for 1 week)	Archana Soni & Dr. Jameel Qureshi
4	AOC-4PY4-02	Python	6	36 Hours	Ms. Neetu

					Joshi
5	AOC-3CCS4-07	Software Testing	6	36 Hours	Ms. Reena Sharma Ms. Ritu Sharma
6	3CPP4-06	C++	11	36 Hours (6 hours per day for 1 week)	Shazia Haque
7	AOC-4CS5-06	Advanced JAVA	7	36 Hrs	Mr Dhananjay
8	AOC-4MAD4-05	Mobile Application Development (MAD)	6	36 Hrs	Mr Surya Pratap Singh
9	AOC-CACSQL	Structured Query Language (SQL)	12	36 Hours (6 hours per day for 1 week)	Ms. Neetu Joshi
10	3CDS4-05	Data structures and algorithms (DSA)	12	36 Hours (6 hours per day for 1 weeks)	Sonam Gour

5.1 COURSE TITLE: C Programming (COURSE CODE: AOC-3CP5-01)

1. **Course Description:** C programming course provides a comprehensive introduction to the ANSI C language, emphasizing portability and structured design. Students are introduced to all major language elements including fundamental data types, flow control, and standard function libraries. Thorough treatment is given to the topics of string and character manipulation, dynamic memory allocation, standard I/O, macro definition, and the C runtime library. The C training course explains the use of aggregate structures, unions, and pointers early on so the students can practice extensively in the hands on labs. The course also includes coverage of portability tips drawn from experienced programmers working in production environments. Comprehensive hands on exercises are integrated throughout to reinforce learning and develop real competency.

2. **Course Outcomes**:

S.No.	Course Outcomes
CO1	Illustrate and explain the basic computer concepts and programming principles of C language.
CO2	Develop C programs to solve simple mathematical and decision making problems.
CO3	Develop C programs to solve simple engineering problems using looping constructs
CO4	Develop C programs to demonstrate the applications of derived data types such as arrays, pointers, strings and functions

3. **Mapping Course Outcomes with PO and PSO**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	1	-	-	-	-	-	-	-	3	-	-
CO2	3	2	-	-	2	-	-	-	-	-	-	-	3	-	2

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CO3	2	2	2	-	1	-	-	-	-	-	-	-	2	-	-
CO4	-	-	-	2	-	-	-	-	-	-	-	-	2	2	-

5. Course pre-requisites:

The prerequisites for learning C Programming include: Basic understanding of computer systems and operations. Familiarity with fundamental programming concepts and logic. Interest and motivation to learn and practice programming.

6. **Enrolment criteria:** Interested Students of III Year (B.Tech. CS and Allied, ECE,IT)

7. **Certification criteria: Mandatory Fulfilment of Criteria 1 and 2**
   Criteria 1: 70% Attendance, and Criteria 2:
   Completion of Project

8. **Day-wise course outline:**

Day	Module Wise Contents
Day1	Introduction and C/C++ Basics *Introduction to C/C++ *Setting up a development environment (IDE, compiler) *Data types and variables *Input and output in C++ *Basic operators *Control structures (if statements, loops) Functions and function overloading *Arrays/Strings and vectors
Day2	Advanced C/C++ Features *Pointers and references *Dynamic memory allocation (new and delete) *C++ Standard Library *Pointer & macros *Pointers in context of Array/string/Function *Object-oriented programming (OOP) concepts *Classes and objects *Constructors and destructors *Inheritance and polymorphism *Abstract classes and interfaces *Operator overloading *Structure & Link-list

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Day3	Advanced C/C++ Programming Techniques *Exception handling (try-catch blocks) *Smart pointers (shared_ptr, unique_ptr) *C/C++ Standard Template Library (STL) overview *STL containers (vectors, lists, maps) *Iterators and algorithms *Lambda expressions *File handling in C/C++ *Streams (fstream, ifstream, ofstream) *Error handling with exceptions
Day4	Advanced Standard Template Library (STL) and File Handling *Advanced STL Containers *Advanced STL Algorithms *STL Priority Queue *File Handling and Streams *Introduction to templates *Function templates *Class templates *Template specialization *Template met programming
Day5	C++11/14/17 Features *C++11 and its features *Auto and decltype *Range-based for loops *C++14 and C++17 features overview
Day6	Final Recap *Real-world examples and projects *Q&A session *Recap and final assessment *Project making *Evaluation

5.2 COURSE TITLE: Dynamic Web Development (**COURSE CODE:** AOC-3CDS4-05)

1. **COURSE DESCRIPTION:** This course is designed to start you on a path toward future studies in web development and design, no matter how little experience or technical knowledge you currently have. The web is a very big place, and if you are the typical internet user, you probably visit several websites every day, whether for business, entertainment or education.

2. **COURSE OUTCOMES:**

S.NO	Course Outcomes
CO1	To Understanding and applying Web Networking basics including TCP/IP, HTTP(S), URLs, and DNS.
CO2	To Understanding the role and functions of Web servers and server frameworks.
CO3	To develop basic Security concepts, threats and mitigation techniques for web developers.
CO4	To create create a multi-user website/app utilizing password based authentication with role based access control for authorization and understand the security issues associated with such a website.

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3. MAPPING COURSE OUTCOMES WITH PO AND PSO

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO	2	2	3	2	-	-	-	-	-	-	-	-	2	2	-
CO 1	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
CO 2	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO 3	-	-	3	-	-	-	-	-	-	-	-	-	-	-	2
CO 4	-	-	-	3	-	-	-	-	-	-	-	-	-	-	2

4. **COURSE PRE-REQUISITES:** Basic knowledge of one programming language (C Fundamental, Internet, and Computer basic Knowledge)
5. **ENROLMENT CRITERIA: Interested Students of II Year (All Branches)**
6. **CERTIFICATION CRITERIA: Mandatory Fulfilment of Criteria Criteria 1: 75% Attendance**

7. WEEK-WISE COURSE OUTLINE:

Days	MODULE-WISE CONTENTS
Day 1 (6 Hours)	**Introduction to web development** • Architecture of web applications, client-server • Protocol stack TCP/IP • HTTP • Client and server technology • Architecture of the MPA and SPA • Web services, RESTful services • Development tools and debugging
Day 2 (6 Hours)	**Technology team development** • The version control system Git and the GitHub platform • Teamwork in the Azure DevOps (TFS/VSTS)
Day 3 (6 Hours)	**Dive into JavaScript development** • Key concepts of JavaScript and setting up the environment for projects • Single page application (SPA) architectural pattern MVC • Object-oriented programming (OOP) in JavaScript, prototypical inheritance • The call context, scope, closures • The interaction with the server

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Day 4 (6 Hours)	**Flexberry ORM**
	• The concept of ORM, characteristics, advantages and disadvantages of using
	• The basics Flexberry ORM
	• CRUD methods
	• Masters and detaily
	• Proofreading of objects
Day 5 (6 Hours)	**Development**
	• Mnogoletnei
	• Business servers
	• Cascade delete
	• Working with data from a web application
Day 6 (6 Hours)	**Practice on Website Modules**

(Top row before Day 4): • Modules and project structure, package managers

5.3 COURSE TITLE: JAVA (COURSE CODE: AOC-4CS425)

1.COURSE DESCRIPTION: The JAVA programming language used to create software programs and applications. In short Java programming language originated as part of a research project to develop advanced software for wide variety of network devices and embedded systems.

2.COURSE OUTCOMES:

S.NO	Course Outcomes
CO1	To understand the basic concepts of java.
CO2	To eleborate the concept of file handling, multithreading and applets.
CO3	To analyze the terms of the packages & Interfaces.
CO4	To design the steps for creating the project using major concept.

3. MAPPING COURSE OUTCOMES WITH PO AND PSO

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO	2	2	2	-	-	-	-	-	-	-	-	-	2	2	2
CO 1	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
CO 2	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
CO 3	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2
CO 4	-	-	-2	-	-	-	-	-	-	-	-	-	-	-	2

4. COURSE PRE-REQUISITES: Basic knowledge of one programming language (C, C++).Basic knowledge of common programming concepts, OOPS concepts. Basic knowledge of mathematics.

5. ENROLMENT CRITERIA: Interested Students of II Year (All Branches)

6. CERTIFICATION CRITERIA: Mandatory Fulfilment of Criteria Criteria 1: 75% Attendance

7. WEEK-WISE COURSE OUTLINE:

Days	MODULE-WISE CONTENTS
Day 1 (6 Hours)	**MODULES 1: JAVA: INTRODUCTION TO JAVA, IMPORTANCE OF JAVA** o Data types, variables o operators **MODULE 2: PROBLEM SOLVING IN JAVA** o program to add two numbers using command line argument. o Print all numbers 1 to 50. o program prime or not o Calculate simple interest and input by the user.
Day 2 (6 Hours)	**MODULES 3: JAVA: DECISION AND CONTROL STATEMENTS** o Decision and control statements o Arrays, Switch Statement, Iteration statement o Jump Statement, using continue, continue and break. o Strings **MODULE – 4: PROBLEM SOLVING IN JAVA** o Program to multiply two given matrices o Program for sorting a given list of names in ascending order o Java program that reads a line of integers and then displays each integer and the sum of all integers o Program that checks whether a given string is a palindrome or not
Day 3 (6 Hours)	**MODULES 5: JAVA: OOPS CONCEPT** o Objects, class constructors o Inheritance o Overloading & Overriding methods o Abstract Classes o Exception Handling with try, catch and multiple catch statements o **MODULE – 6: PROBLEM SOLVING IN JAVA** o o Programs of inheritance o Method overloading :Changing numbers of arguments o Method overloading : Changing data types of arguments o Exception handling with multiple catch blocks.

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Day 4 (6 Hours)	MODULES -7: JAVA: File Handling:I/O Streams,File I/O **MODULE – 8: PROBLEM SOLVING IN JAVA** o Demonstrate string handling. o Program to create a package which has classes and methods. o Program to create multiple threads for different calculator operations. o Discussion about Projects
Day 5 (6 Hours)	**MODULES 9: JAVA: Conceptsof Advancejava** o Swing o AWT o Discussion on JAVA projects. **MODULE – 10: PROBLEM SOLVING IN JAVA** o Demonstrate custom layout in java. o GUI program to accept two numbers from the user and calculate the sum, difference ,multiplication & division on the clicks of specific button. o Change the background colors when you click on buttons. o Demonstrates the use of combobox, checkboxes.
Day 6 (6 Hours)	**MODULE-11:** JAVA Database Connectivity Practice and discussion on JAVA Projects

5.4 COURSE TITLE: Python (COURSE CODE: AOC-4PY4-02)

1. **Course Description:** In this Python course, students learn fundamental programming concepts such as variables, data types, control structures, and functions. They also gain practical experience in writing and executing Python scripts, handling files, and using libraries. By the end, students will have the skills to solve basic problems and continue learning Python independently.

2. **Course Outcomes**:

S.No.	Course Outcomes
CO1	Students grasp Python syntax and manipulate integers, floats, strings, lists, tuples, and dictionaries effectively.
CO2	Students excel in Python's control structures (if, for, while) for effective program flow control..
CO3	Students master defining functions, passing arguments, and using return statements.
CO4	Students grasp file handling: read/write data, manage contents, handle errors, and follow best practices.

3. **Mapping course outcomes with PO and PSO:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	2	-	-	2	-	-	-	-	-	-	-	3	-	2

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CO3	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-
CO4	-	-	-	2	-	-	-	-	-	-	-	-	2	2	-

4. **Course pre-requisites**

    1. Basic Computer Skills: Students should have a basic understanding of computer operations such as using a keyboard, mouse, and navigating file systems.
    2. Logical Thinking: Familiarity with logical reasoning and problem-solving techniques is beneficial for understanding programming concepts.
    3. English Proficiency: Since many programming resources and tutorials are in English, a basic understanding of the English language is recommended

5. **Enrolment criteria:** Interested Students of III Year (B.Tech. CS and Allied,ECE,IT)
6. **Certification criteria:** Mandatory Fulfilment of Criteria 1 and 2
   Criteria 1: 70% Attendance, and Criteria 2: Completion of Project

7. **Day-wise course outline:**

Day	Module Wise Contents
Day1	Introduction to Python • Python history and features • Setting up Python environment • Basic syntax and data types (integers, floats, strings) • Variables and basic operations
Day2	Control Structures • Conditional statements (if, else, elif) • Logical operators (and, or, not) • Looping structures (for loops) • Using loops for iteration and pattern printing
Day3	Advanced Data Types • Lists and list manipulation (slicing, appending, extending) • Tuples and tuple operations • Dictionaries and dictionary manipulation (keys, values, items)
Day4	Functions and Modules • Defining functions with parameters and return statements • Scope of variables (global vs. local) • Importing and using modules in Python

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Day5	File Handling
	• Opening and closing files • Reading from and writing to files • File modes and error handling
Day6	Advanced Topics (Optional)
	• Introduction to object-oriented programming (OOP) concepts • Classes and objects • Inheritance and polymorphism Project Day

5.5 COURSE TITLE: Software Testing (**COURSE CODE:** AOC-3CCS4-07)

1. **COURSE DESCRIPTION:** Courses in software testing encompass a range of subjects related to the creation, design, and upkeep of software. While the specific content may differ among course providers, common topics often include the software development life cycle and optimal approaches to software design and web development.

2. **COURSE OUTCOME:**

CO1: To demonstrate Software Life Cycle models with respect to Software Engineering Principles.

CO2: To Analyses Cost Estimation Technique and risk analysis techniques in Software Testing Projects.

CO3: Design Software requirement documents (SRS).

CO4: To Synthesize UML diagrams using the concept of object oriented analysis in software development process.

3. **MAPPING COURSE OUTCOMES WITH PO AND PSO:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	-	-	-	-	-	-	-	-	-	-	-	3	-	2
CO 2	-	2	-	-	-	-	-	-	-	-	-	-	2	3	-
CO 3	-	-	3	-	-	-	-	-	-	-	-	-	2	3	-
CO 4	-	-	-	3	-	-	-	-	-	-	-	-	3	-	-

4. **COURSE PREREQUISITES** Software Testing is considered to be one of the most rewarding fields in the domain of IT and in order to learn software development. In this course, we consider the Strong knowledge of Mathematics, Good command over programming languages, Good Analytical Skills, Ability to understand complex algorithms and Basic knowledge of Statistics and modelling .

5. **ENROLMENT CRITERIA:** Interested Students of II Year (CSE , IT , EC)
6. **CERTIFICATION CRITERIA: Mandatory Fulfilment of Criteria 1 and 2 Criteria 1:** 80% Attendance

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Criteria 2: Completion of Project

7. DAY-WISE COURSE OUTLINE:

Day 1	Introduction to Testing QA Overview and Its Responsibilties Types of Testing Manual Testing Process Test Planning Hands on on test planning Defect Tracking process Bug report structure Hands on Manual Testing
Day 2	Defect Triaging Introduction to Defects Triaing Types of Defect Triaging Hands on Defect Triaging Introduction to Defects Triaging Tools Hands on Defect Triaging Tools Writing Test Scripts Understanding Test Scenarios Writing Test Scenarios - Positive and Negative Working on Application to test Test Case Review and Improvemnet
Day 3	Defect Tracking Tools Introduction to Defect Tracking Tools Introduction to Devops Introduction to JIRA Understanding JIRA and its features Creation of defect on JIRA Creation of User Story Hands on -on JIRA and defect tracking Foarming the Test scenarios anding the Priority and Adding the Priority to Defects Undesratnding The Funtional Defect
Day 4	Manual Testing Techniques and Test Design Exploratory Testing Conducting Usability Test Test Environment Setup Creation of defect and tracking on ALM tools Real time hand on -on website to find bugs Security Testing Basics Test Execution Usability Testing Principle Conducting Test Working on Positive and Negative cases
	Salesforce QA

5.6 COURSE TITLE: C++ (COURSE CODE: AOC-3CPP4-06)

1. **COURSE DESCRIPTION:** The C++ course is designed to teach Object Oriented Concepts to students using C++ language. The objective is to teach C++ in depth and focus on developing programming skills of students.
2. **COURSE OUTCOMES:**

S.NO	Course Outcomes
CO1	Explain basic object oriented programming concepts and principles through C++ language.
CO2	Apply the concepts of classes and objects while designing applications.
CO3	Identify the need to use memory handling and pointer concepts in various applications.
CO4	Assess the types of Inheritance according to the need of application designing.

3. MAPPING COURSE OUTCOMES WITH PO AND PSO

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO	**3**	**3**	-	-	-	-	-	-	-	-	-	**2**	**3**	**3**	**3**
CO 1	3	3	-	-	-	-	-	-	-	-	-	2	-	-	-
CO 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 3	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO 4	-	3	-	-	-	-	-	-	-	-	-	2	-	3	-

4. **COURSE PRE-REQUISITES:** Basic knowledge of C programming language. Basic knowledge of common programming concepts, including loops, arrays, stacks, and recursion. Basic knowledge of mathematics, including proof by induction and contradiction
5. **ENROLMENT CRITERIA:** Interested Students of II Year (All Branches)
6. **CERTIFICATION CRITERIA:** Mandatory Fulfilment of Criteria Criteria 1: 75% Attendance
7. **WEEK-WISE COURSE OUTLINE:**

Days	MODULE-WISE CONTENTS
Day 1 (6 Hours)	**MODULE 1: DSA: Introduction to OOP** o Object Oriented paradigms, Data abstraction/control abstraction, OOP principles, Origin of C++, Sample C++ program, dynamic initialization of variables , new and delete operators, C++ keywords, General form of C++ program, Type casting **MODULE – 2: C++ Classes and Objects** o Introducing C++ classes, Difference between class and structure, Defining Classes in C++, accessing class members, access specifiers (Public and Private),defining member functions, static data members, static member functions, friend functions, friend classes, inline functions, nested classes, passing objects to functions, returning objects, object assignment, Array of objects, Constructor and Destructors
Day 2 (6 Hours)	**MODULES 3: DSA: Inheritance** o Base-class access control, access specifier (Protected), scope rules, Inheriting Multiple Base classes, constructors, destructors & inheritance passing parameters to base class constructors. Virtual base class. String class-Usage of standard library string class with example programs. **MODULE – 4: Polyorphism** o Polymorphism: Pointers: Pointers to objects, 'this' Pointer, Pointers to derived types. Operator Overloading: Overloading Unary Operators, and Overloading Binary Operators using friend functions, Function Overloading, Virtual functions: Pure Virtual Functions, Abstract classes, generic function, simple example programs. STL-List

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Day 3 (6 Hours)	MODULES 5: Templates and File Handling
	o Templates: Introduction, simple generic classes & Exception Handling: Fundamentals, exception handling options. C++ I/O Systems Basics: C++ Streams, C++ Stream classes, Unformatted I/O Operations, Formatted I/O Operations, Formatting using Manipulators. C++ File I/O: Introduction, Classes for file stream Operations, Opening and closing a file, detecting end-of-file **MODULE – 6: Exception Handling** o Exceptions and Errors, try-catch block. Predefined exceptions, user defined exceptions
Day 4 (6 Hours)	MODULES 7: Review and Balanced Binary Trees
	o Review and catch up, topics from weeks 1 to 6. Balanced Binary Trees. **MODULE – 8: C++ List, stack, queue, BST** o The C++ list class; stacks and queues, Binary Trees and Binary Search Trees
Day 5 (6 Hours)	MODULES 9: Recursion
	o Recursion o Dynamic memory allocation o Dynamic vs Static Binding **MODULE – 10: PROBLEM SOLVING IN C++** o Print last row of generic tree o Maximum score after applying operations on a tree o Fibonacci numbers recursive and iterative. o Minimum sum path from(0,0) to (n-1,m-1) o Find largest sum of sub array o Longest palindrome substrings
Day 6 (6 Hours)	MODULE-11: Practice on C++ questions

5.7 COURSE TITLE: Advanced Java (COURSE CODE: AOC-3CPP4-06)

1. **Course Description:** Advanced Java is the collection of technologies and tools that enable developers to create dynamic and secure applications, including features such as JDBC (Java Database Connectivity), Servlets, and JSP (Java Server Page) are being used for generating and making interactive dynamic content, the most important feature of advanced Java is JPA (Java Persistence API),

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that is used for managing relational databases, Spring Framework that encompasses the modules for dependency injection, Spring MVC Framework, and AOP (Aspect-Oriented Programming), and Spring Security that ensures the authentication, and authorization of the application..

2. Course Outcomes:

S. No.	Course Outcomes
CO1	Create a Swings application with GUI components and design Java Applet programs.
CO2	Connect a web application to a database using JDBC drivers, and construct Client Server programs.
CO3	Apply Java RMI to write distributed applications, and incorporate JNDI lookup and Object serializations.
CO4	Analyze J2EE Architecture and develop programs to implement Java Servlets and Session Handling.
CO5	Design an application using JSP pages with XML tab library and integration of SQL functions.

3. Mapping course outcomes with PO and PSO

CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	-	3	-	-	2	-	-	-	-	-	-	2	-	3	-
CO 2	-	3	-	-	2	-	-	-	-	-	-	2	-	3	-
CO 3	-	-	3	-	3	-	-	2	-	-	-	-	-	-	3
CO 4	-	-	3	2	3	-	-	2	-	-	-	2	-	-	3
CO 5	-	-	3	2	3	-	-	2	-	-	-	2	-	-	3

4. Course pre-requisites:

To learn Advanced Java, it's important to understand prerequisites thoroughly before deep diving into the more complex topics, as prerequisites will provide a strong foundation for Java, following are some key prerequisites:
   a) Core Java Proficiency
   b) Object-Oriented Programming (OOP)
   c) Web Development Basics
   d) Database Fundamentals
   e) Java Standard Libraries
   f) Basic Programming Logic
   g) Understanding of Networking

5. Enrolment criteria: Interested Students of II and III Year (B. Tech. CS and Allied, ECE, IT)

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Sitapura, JAIPUR

6. **Certification criteria: Mandatory Fulfilment of Criteria 1 and 2**
   Criteria 1: 70% Attendance, and Criteria 2: Completion of Project
7. **Day-wise course outline:**

Day	Module Wise Contents
Day- 1	Objects, Classes constructors, returning and passing objects as parameter, Inheritance, Access Control, Using super, final with inheritance Overloading and overriding methods, Abstract classes, Extended classes. Packages & Interfaces in Java: Package, concept of CLASSPATH, access modifiers, importing package, Defining and implementing interfaces.
Day 2	Introduction To Swing, MVC Architecture, Applets, Applications and Pluggable Look and Feel, Basic swing components : Text Fields, Buttons, Toggle Buttons, Checkboxes, and Radio Buttons
Day 3	J2EE architecture, Enterprise application concepts, n-tier application concepts, J2EE platform, HTTP protocol, web application, Web containers and Application servers Server side programming with Java Servlet, HTTP and Servlet, Servlet API, life cycle, configuration and context, Request and Response objects, Session handling and event handling, Introduction to filters with writing simple filter application

Day 4	Spring Core (Basic Concepts)
	
	•What is a Core Container
	
	    • Introduction to IOC
	    • Types of DI
	    • Setter VS Constructor
	    • Collection DI
	    • Bean Inheritance
	    • Collection Merging
	    • Inner Beans
	    • Bean Aliasing
	    • Bean Scopes
	    • Inner Beans
	    • Null String
	    • Bean Auto wiring

Day 5	Spring Core (Advanced Concepts) P – Namespace
	
	    • C– Namespace
	    • Dependency Check
	    • Depends On

	• Factory Beans • Static Factory Method • Instance Factory Method • Bean Lifecycle
Day 6	Spring MVC Spring 3.0 features • Introduction to Spring MVC • Handler Mapping • Controllers • Validations • Handler Interceptors • Views • Form tags
Day 7	Spring AOP AOP Concepts • Programmatic VS Declarative AOP • Programmatic AOP i. Types of Advices ii. Types of Pointcuts iii. Working with proxies • Declarative AOP i. Using AOP 2.0 Config element ii. OGNL Expressions

5.8 COURSE TITLE: Mobile Application Development **(COURSE CODE:** AOC-4MAD4-05)

1. **Course Description:** The Mobile Application Development course provides students with the knowledge and skills required to design, develop, and deploy mobile applications for various platforms such as iOS and Android. Through a combination of theoretical concepts and hands-on practical sessions, students will learn the fundamentals of mobile application development, including user interface design, data management, and application lifecycle management.

2. **Course Outcomes**:

S.No.	Course Outcomes
CO1	Discuss the components and different Layout for mobile application development framework for android.
CO2	Apply essential Android Programming concepts.
CO3	Analyze various Android applications related to layouts & rich uses interactive interfaces.
CO4	Develop Android applications related to mobile related server-less database like SQLITE.

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3. Mapping course outcomes with PO and PSO:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	2	-	-	2	-	-	-	-	-	-	-	3	-	2
CO3	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-
CO4	-	-	-	2	-	-	-	-	-	-	-	-	2	2	-

4. Course pre-requisites
- Basic programming knowledge (preferably in a high-level language such as Java, Swift, or JavaScript)
- Familiarity with software development concepts (variables, functions, control structures)
- Understanding of object-oriented programming concepts (classes, objects, inheritance)

5. Enrolment criteria: Interested Students of III Year (B.Tech. CS and Allied,ECE,IT)

6. Certification criteria: Mandatory Fulfilment of Criteria 1 and 2
Criteria 1: 70% Attendance, and Criteria 2: Completion of Project

7. Day-wise course outline:

Day	Module Wise Contents
Day1	Introduction to Mobile Development Overview of mobile platforms (iOS, Android) Mobile development tools and frameworks
Day2	User Interface Design Principles of mobile UI/UX design Layouts, widgets, and navigation components Responsive design for different screen sizes
Day3	Mobile Application Architecture: Model-View-Controller (MVC) architecture Client-server communication Handling asynchronous tasks
Day4	Data Management Storing data locally using databases (SQLite, Realm) Consuming data from web services (RESTful APIs) Caching and offline data access
Day5	Mobile Application Development Platforms: Android Development: Android Studio IDE Java/Kotlin programming languages Android SDK and libraries iOS Development: Xcode IDE Swift programming language iOS SDK and frameworks

Day6	Application Lifecycle Management: App lifecycle events Handling configuration changes Background processing and services

5.9 COURSE TITLE: Structured Query Language (SQL) **(COURSE CODE: AOC- CACSQL)**

1. **COURSE DESCRIPTION:** This course will introduce the learner to the basics of the data base system specially to design an entity relationship diagram and structured query language. The course will introduce creation, manipulation and fetching of data using structured query language. By the end of this course, students will be able to create a database system for a given problem.

2. **COURSE OUTCOMES:**

S.No.	Course Outcomes
CO1	To apply SQL on Complex Problems.
CO2	To analyse database management system concepts to convert raw data into relation database schema.
CO3	To Design effective database Schema using refinement and Normalization technique
CO4	To Judge Reason of Database filler and best recovery mechanism.

3. **MAPPING COURSE OUTCOMES WITH PO AND PSO**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	2	3	-
CO2	-	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-	2	-	-
CO4	-	-	-	2	-	-	-	-	-	-	-	-	-	2	-

4. **COURSE PRE-REQUISITES:**

Students should already have knowledge of databases. A database is a collection of structured data or information, commonly stored in a computer system. Database management systems generally control databases, and the data stored in a database is usually modeled in columns and rows in tables so it is easy to access, organize, and manage. Most relational databases rely on SQL to query this data. The more you are familiar with the structure of relational databases, the easier it likely will be to learn SQL.

5. **ENROLMENT CRITERIA:** Interested Students of III Year (ALL Engineering Branch)

6. **CERTIFICATION CRITERIA:** Mandatory Fulfilment of Criteria 1 and 2

Criteria 1: 70% Attendance, and Criteria 2: Project submission

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7. DAY-WISE COURSE OUTLINE

DAY	MODULE-WISE CONTENTS
DAY – 1 (6 Hours)	**MODULE – 1: An Overview of DBMS** o Overview and History of DBMS o File System v/s DBMS o Advantage of DBMS o Describing and Storing Data in a DBMS o Entity Relationship model: Overview of Data Design Entities **MODULE – 2: Entity Relationship Model** o Attributes and Entity Sets, Relationship and Relationship Sets o Features of the ER Model- Key Constraints, Participation Constraints, Weak Entities o Class Hierarchies, Aggregation, Conceptual Data Base o Conceptual Design for a Large Enterprise o Normalization
DAY – 2 (6 Hours)	**MODULE – 3: An Overview of SQL** o The Forms of a Basic SQL Query o SQL Query Types o SQL Data Types o Select statement, Insert, Update o Truncate, Delete, Drop Command o Union, Intersection, Minus operator **MODULE – 4: SQL Comparison Operator** o Equal, Not Equal, Greater Than o Less Than, IN, NOT o Between, Null, NOT NULL o LIKE o Exists
DAY – 3 (6 Hours)	**MODULE – 5: SQL Joins & Aliases** o SQL INNER JOIN o LEFT OUTER JOIN o RIGHT OUTER JOIN o FULL OUTER JOIN o Aliases **MODULE – 6: SQL Clauses** o Distinct Clause o From Clause o Where Clause o ORDER BY Clause o GROUP BY Clause o HAVING Clause

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DAY – 4 (6 Hours)	**MODULE – 7: SQL Functions & Conditions** ○ COUNT ○ SUM ○ MAX ○ MIN ○ AVG ○ AND ○ OR **MODULE – 8: SQL Keys, Constraints and Indexes** ○ Primary Key ○ Constraints- Check, Not NULL, Unique ○ Indexes
DAY – 5 (6 Hours)	**MODULE-9: SQL Tables and Views** ○ Create Table ○ Alter Table ○ Drop Table ○ SQL VIEW **MODULE-10: Practical Implementation of Project** ○ How industry works on a project? ○ How a database designed for an organization?
DAY – 6 (6 Hours)	**MODULE-11: Project presentation by students** ○ Each and every student allotted a project in the first class. ○ In this session students present there project. **CLOSING AND VALEDICTORY CEREMONY**

5.10 COURSE TITLE: Data structures and algorithms (**COURSE CODE:** AOC- 3CDS4-05)

1. **COURSE DESCRIPTION:** The Azure AI Fundamentals course is designed for anyone interested in learning about the types of solution artificial intelligence (AI) makes possible, and the services on Microsoft Azure that you can use to create them.

2. **COURSE OUTCOMES:**

S.NO	Course Outcomes
CO1	To explain data structures and their use in daily life.
CO2	To analyze the Linear and non-Linear data structures like stack, Queues, link list, Graph, Trees to solve real time problems.
CO3	To develop searching and sorting algorithms on predefined data.
CO4	To create the data structures in specific areas like DBMS ,Compiler, Operating system.

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3. MAPPING COURSE OUTCOMES WITH PO AND PSO

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO	2	2	3	2	-	-	-	-	-	-	-	-	2	2	-
CO 1	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
CO 2	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO 3	-	-	3	-	-	-	-	-	-	-	-	-	-	-	2
CO 4	-	-	-	3	-	-	-	-	-	-	-	-	-	-	2

4. **COURSE PRE-REQUISITES:** Basic knowledge of one programming language (C, C++, C#, Haskell, Java, JavaScript, Python2/3, Ruby, Scala).Basic knowledge of common programming concepts, including loops, arrays, stacks, and recursion. Basic knowledge of mathematics, including proof by induction and contradiction
5. **ENROLMENT CRITERIA:** Interested Students of II Year (All Branches)
6. **CERTIFICATION CRITERIA:** Mandatory Fulfilment of Criteria Criteria 1: 75% Attendance
7. **WEEK-WISE COURSE OUTLINE**

Days	MODULE-WISE CONTENTS
Day 1 (6 Hours)	**MODULES 1: DSA: Introduction to DSA, Importance of DSA** o Big o occasions o Arrays o Strings o Hashmap o Pros and cons of each data structure **MODULE – 2: PROBLEM SOLVING IN DSA** o Find majority elements in array o Print array after updates o Problem on contribution technique and prefix sum o Sort 0,1,2 without internal sorting over any custom sorting o Find first missing number in range of [L, R] o Check if two strings are isomorphic. o Rotate 2D matrix by 90 degrees o Given n find a,b,c in expression $a^b + b^c + a^c = n$
Day 2 (6 Hours)	**MODULES 3: DSA: Introduction to DSA** o Stack o Queues o Linked list o Priority queue **MODULE – 4: PROBLEM SOLVING IN DSA** o Reverse linked list o Asteroid collision o Balanced parenthesis o Check for isomorphic strings o Problem on bit manipulation o Container with most water, trapping rainwater

Day 3 (6 Hours)	**MODULES 5: DSA: Searching and Graphs**
	   o Searching
	   o Linear and binary search
	   o Graph DFS and BFS
	   o Sorting techniques
	MODULE – 6: PROBLEM SOLVING IN DSA
	   o Container with Max water trapped
	   o Searching for aggressive cow next
	   o cocoa eating bananas
	   o Square with binary search
	   o Container with most water, trapping rainwater
	   o Max area of island
	   o Making a large island
	   o Frequency of X in sorted array

Day 4 (6 Hours)	**MODULES 7: DSA**
	   o Sliding window technique
	   o DFS implementation
	   o Lower bound and upper bound functions
	   o BFS Implementation
	MODULE – 8: PROBLEM SOLVING IN DSA
	   o Longest substring without repeating character.
	   o Frequency of the number through Binary search and C++ s+1 functions
	   o Number of connected components in a graph or generic tree
	   o Diameter of a tree
	   o Print the last level of tree
	   o The sibling of a given binary tree
	   o The longest path in the binary tree

Day 5 (6 Hours)	**MODULES 9: DSA:**
	   o Recursion
	   o Dynamic programming
	   o Memoization
	MODULE – 10: PROBLEM SOLVING IN DSA
	   o Print last row of generic tree
	   o Maximum score after applying operations on a tree
	   o Fibonacci numbers recursive and memoized.
	   o Minimum sum path from(0,0) to (n-1,m-1)
	   o Find largest sum of sub array
	   o Longest increasing subsequence
	   o Longest palindrome substrings

Day 6 (6 Hours)	**MODULE-11:** Practice on Data Structure Algorithms

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