

Innovations by the Faculty in Teaching and Learning

Rapid technological advancements have created new opportunities to adopt innovative and student-centric pedagogical practices in higher education. The Department of Computer Science and Engineering actively integrates modern teaching methodologies to enhance students’ conceptual clarity, analytical thinking, and practical competency.

The department implements various innovative teaching–learning strategies under the structured framework of the **Participative, Experiential, and Problem-Solving (PEP) Model**. This model emphasizes active student engagement, hands-on learning, and real-world problem-solving approaches, thereby strengthening both theoretical understanding and technical proficiency.

Through the PEP model, students are encouraged to actively participate in discussions, case studies, coding exercises, simulations, mini-projects, and industry-oriented assignments. This approach significantly improves learning effectiveness, collaborative skills, and application-oriented knowledge.

Participative Learning	Experiential Learning	Problem Solving Learning
Classroom Active Learning	Industrial Visits	Case Studies
Co-Curricular/Extracurricular Activities	Project Based Assignments	Interactive Learning
Student Forum Activities	Technical Competitions	Quizzes and Group Assignments
Guest Lectures and Workshops	Value Added Courses	Research Forums
Flipped classroom	Internships	Technology & Innovation Club
Company-on-campus	Seminars / Workshops	Annual Technical Symposium – Technotsava
Learning Management System (LMS)	Skill Laboratories	Flipped classroom

ICT Platforms & Software Used

Category	Platforms / Software	Purpose
Learning Management System	Alive LMS, Moodle, Google Classroom	Interactive learning, course delivery, assignments, quizzes, e-content repository
Programming & Development Tools	VS Code, Eclipse IDE, IntelliJ IDEA, PyCharm, Jupyter Notebook, Anaconda, Code::Blocks, Dev-C++	Coding, debugging, project and application development
Simulation & Modeling Tools	Simulink, Tinker CAD	Algorithm testing, numerical computing, modeling and simulation
Data Science & AI Tools	Python Libraries (NumPy, Pandas, Scikit-learn, TensorFlow, PyTorch)	Machine learning, AI modeling, data analytics
Database Tools	MySQL, SQLite	Database design, queries, transaction processing
Web & App Development	XAMPP, Angular, Django, Flask	Web and full-stack application development
Networking & Security Tools	NS2/NS3	Network simulation, packet analysis, security testing
Embedded / IoT Tools	Keil, Arduino IDE	Embedded programming and IoT prototyping
Version Control	Git, GitHub,	Version control and collaborative coding
Assessment Platforms	Kahoot, Google Quiz/Forms, HackerRank, LeetCode, MOOC	Online assessment and coding practice



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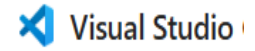
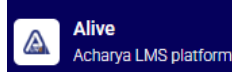





Table below shows Various innovations by faculty in the Teaching Learning Process

Activity	Snapshots
Design Thinking Workshop	
Industrial Visit - BIEC	
Value – Added programs on Python fundamentals	
Collaborative Learning – Students involved in group project	

<p>Students Demonstrating their Practical Work to Faculty</p>	 <p style="text-align: center;">Soladevanahalli, Karnataka, India</p> <p style="text-align: center;">Simulation Based Learning</p>
<p>Students Learning Through Smart Board</p>	 <p style="text-align: center;">Bengaluru, Karnataka, India 46, Bengaluru, Soladevanahalli, Karnataka 560107, India</p> <p style="text-align: center;">Classroom active learning</p>
<p>Flipped Classroom Session</p>	 <p style="text-align: center;">Bengaluru, Karnataka, India 46, Bengaluru, Soladevanahalli, Karnataka 560107, India</p> <p style="text-align: center;">Flipped classroom</p>
<p>Students Presenting Innovative Solutions Through Group Collaboration</p>	 <p style="text-align: center;">Bengaluru, Karnataka, India 46, Bengaluru, Soladevanahalli, Karnataka 560107, India</p> <p style="text-align: center;">Group Presentation</p>

Innovation and Best Practices by faculty in TLP- 2024-2025

Course Activity	Student centric Method	ICT usage (Tool used)	Outcome
Group Discussion on recent trending topics	Hands-on activities, demos, or roleplay (Experiential Learning)	Power Point	The forum activities were Successful in promoting engagement and building a supportive class community.
Flipped classroom session on Artificial Intelligent for 5 th sem students	Student Presentation (Experiential learning)	Power Point Google Slides with embedded videos	Students will be able to analyze real-world problems and propose AI-based solutions by applying concepts.
Flipped Classroom on Introduction to Decision Tree and Structure of Decision Tree for 6 th sem students	Student Presentation (Experiential learning)	PowerPoint	Students gained clarity on how decision trees function. Collaborative discussions enhanced conceptual understanding.
Flipped classroom session on Principles of programming using C for 2 nd semester students	Student Presentation (Participative learning)	Power Point	Students will be able to develop and debug basic C programs by applying concepts learned through pre-class study materials and in-class coding activities
Flipped classroom session on Principles of programming using C for 2 nd semester students.	Student Presentation (Participative learning)	Smartboard/PP T	Students will be able to develop and debug basic C programs by applying concepts learned through pre-class study materials and in-class coding activities
UI/UX Project-Based Assignment using Figma	A project-based assignment on UI/UX (Experiential learning)	Figma	Students will be able to design an interactive, user-centered prototype in Figma by applying UI/UX principles to a real-world application scenario.
Case study on “Patents”.	Collaborative Learning (Experiential Learning)	PPT	Students will be able to know about patent awareness, ethical patenting.
Flipped classroom session on OOPS with JAVA conversion for 3 rd semester students.	Student Presentation (Experiential learning)	PPT	This session helped students gain a clearer and more practical understanding of JAVA and improved understanding and retention

Session on ICT integration in the Cloud computing lab.	Hands-on activities, demos, or roleplay (Experiential Learning)	Google cloud console/ Google compute engine	This session helped students to gain a Hands on experience with industry leading cloud services.
Online Quiz	ALIVE quiz (Problem solving)	ALIVE LMS platform	Students were able to comprehend the key concepts of Cloud computing.
Session on ICT tool usage for Microcontrollers	Hands-on activities, demos, or roleplay (Experiential Learning)	KEIL IDE	This session helped students to gain a Hands on experience with KEIL IDE tool.
Session on ICT tool usage for Operating system Lab	Hands-on activities, demos, or roleplay (Experiential Learning)	Power shell & Windows subsystem for Linux(WSL)	Students can able to understand the simulation of real world system environment.

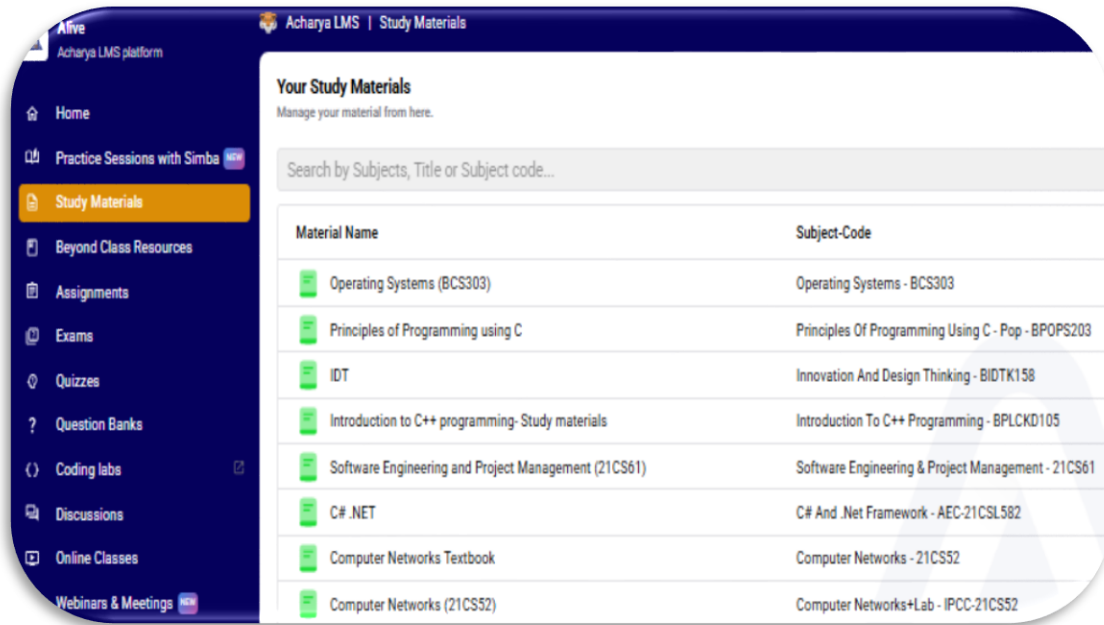
Innovation and Best Practices by faculty in TLP- 2023-2024

Course Activity	Student centric Method	ICT usage (Tool used)	Outcome
Flipped classroom session on NFA to DFA conversion for 5 th semester students	Student Presentation (Experiential learning)	PPT	This session helped students gain a clearer and more practical understanding of automata theory, preparing them for advanced topics in the Theory of Computation.
Flipped classroom session on NFA, DFA and NFA to DFA conversion.	Student Presentation (Experiential learning)	PPT	This session helped students gain a clearer and more practical understanding of automata theory, preparing them for advanced topics in the Theory of Computation.
Online Quiz	ALIVE quiz (Problem solving)	ALIVE LMS platform	Students were able to comprehend the key concepts of software engineering and project management.
Flipped classroom session on Java thread model and synchronization	Student Presentation (Participative learning)	PPT	Students were able to develop collaborative learning and cognitive skills
Role play Activity on Designing Sorting algorithms.	Role play (Participative learning)	Smartboard/PPT	Improved student's creative thinking, presentation skills, and team building skills.
CGIP mini-project	Student presentation (Experiential Learning)	OpenGL	Students successfully applied computer graphics and image processing concepts to design and implement a mini project.
Case Study on "Applications of IoT in our daily life"	Collaborative Learning (Experiential Learning)	Arduino IDE	The case study highlighted how IoT seamlessly integrates into daily life through applications in smart homes, healthcare, transportation, agriculture, and industry.

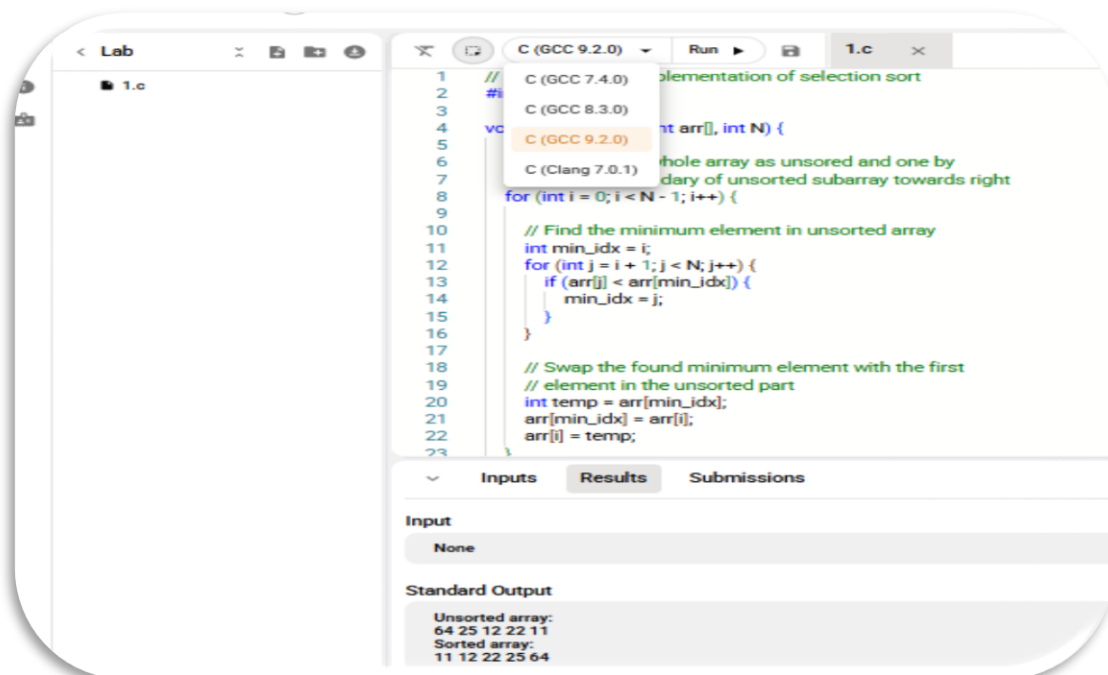
Innovation and Best Practices by faculty in TLP- 2022-2023

Course Activity	Student centric Method	ICT usage (Tool used)	Outcome
software development methodologies, emerging programming frameworks, AI tools, and cybersecurity trends for 3rd semester students	Group discussion (Peer learning)	PPT	This session helped students gain 1. Enhanced Technical Knowledge: 2. Improved Communication and Collaboration Skills: 3. Increased Confidence in Technical Topics
Applications of Data Structures in Real-World Systems trends for 3rd semester students	Brainstorming Session (Problem solving)	Data Structure Visualizations – Classic visual tool.	Students were able to comprehend the importance of choosing appropriate data structures in system design.
UI/UX Workshop for 6th semester students	Presentations (participative learning)	Real-time collaboration (like Google Docs for design).	The students learnt some basic working of UI/UX designs.
Flipped classroom session on Map Reduce” for the students of 7 th	Students Presentation (Participative learning)	Smartboard/PPT	Improved Understanding of MapReduce Concepts. Strengthened Ability to Implement MapReduce in Real-World Applications
Latest Industry Trends in AI	Guest lecture (Participative learning)	Smartboard/PPT	Awareness of students on AI and ML applications.

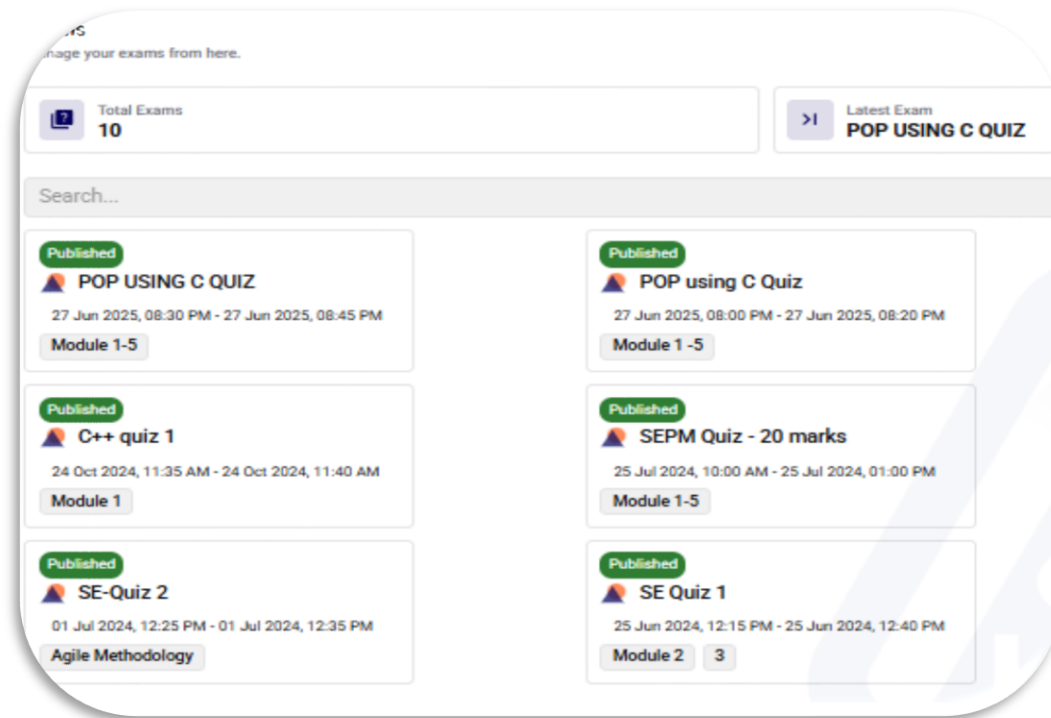
Indigenous Online TLP Platform-Alive



Study materials uploaded to Alive



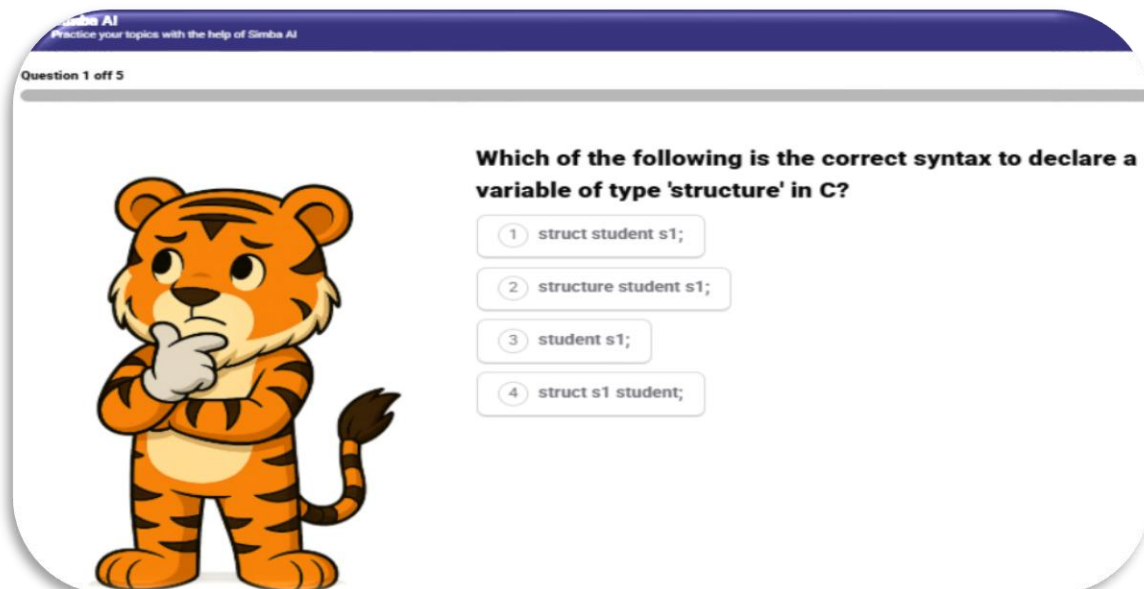
Coding labs feature of Alive



The screenshot shows a dashboard for managing exams. At the top, it says "Manage your exams from here." Below this, there are two summary boxes: "Total Exams 10" and "Latest Exam POP USING C QUIZ". A search bar is present. The main area displays a grid of six quiz cards, each with a "Published" status, a title, a date range, and a module label.

Quiz Title	Date Range	Module
POP USING C QUIZ	27 Jun 2025, 08:30 PM - 27 Jun 2025, 08:45 PM	Module 1-5
POP using C Quiz	27 Jun 2025, 08:00 PM - 27 Jun 2025, 08:20 PM	Module 1 -5
C++ quiz 1	24 Oct 2024, 11:35 AM - 24 Oct 2024, 11:40 AM	Module 1
SEPM Quiz - 20 marks	25 Jul 2024, 10:00 AM - 25 Jul 2024, 01:00 PM	Module 1-5
SE-Quiz 2	01 Jul 2024, 12:25 PM - 01 Jul 2024, 12:35 PM	Agile Methodology
SE Quiz 1	25 Jun 2024, 12:15 PM - 25 Jun 2024, 12:40 PM	Module 2 3

Quizzes in Alive



The screenshot shows a quiz question from Simba AI. On the left is a cartoon tiger character. The question asks for the correct C syntax to declare a variable of type 'structure'. Four options are provided in a list.

Question 1 of 5

Which of the following is the correct syntax to declare a variable of type 'structure' in C?

- 1) `struct student s1;`
- 2) `structure student s1;`
- 3) `student s1;`
- 4) `struct s1 student;`

Practice with Simba – AI tool