A Report

on

Bootcamp

Dr. S. & S. S. Ghandhy Government Engineering College, Surat

DESIGN THINKING AND ROBOTICS BOOTCAMP– 2023 AT B.A.B.S. HIGH SCHOOL, BARDOLI

The Institute organized a 5 day Boot Camp for school students under the auspicious of Student Startup and Innovation Policy (SSIP 2.o) of Government of Gujarat.

The boot camp aim was to avail the school going students an opportunity to explore creative thinking within themselves through different activities. Activities like   sketching ideas, problem solving and generating ideas through exercise like imagination, game storming, design thinking ideology   by means of practical and experimental approach are conducted. This boot-camp was run and supervised by experts from various domains. Day wise activity schedule and details are summarized as under.

DAY -1 INAUGRAL FUNCTION (Time 8:30 AM to 9:30 AM)

Chief Guest– Dr. Mehul Mangrola, Asst. Prof., ASH Dept., FETR, Bardoli

The workshop commenced with a warm welcome, registration of participants and an inaugural function. A total 84 enthusiastic students were attended the function. Dr. Mehul Mangrola conducted the first session. A few glimpses of the inaugural function are as follows.

Lamp Lighting

Honoring Guest Speaker

Welcoming Principal Mrs. ChetnaAghera,
BABS High School (Gujarati Medium)

Welcoming Principal Mr. Rishit Shah,
BABS High School (English Medium)

Addressing Students

Addressing Students

Session I (Time: 10:00 AM to 11:30 AM)

Importance of Science in Technology (Dr. Mehul Mangrola, Asst. Prof., ASH Dept., FETR, Bardoli)

Science and technology are two closely intertwined domains that have revolutionized the way people live, work, and interact with the world. In this session, experts ensured that students will explore the relationship between science and technology via practical approach and try to understand how science plays a pivotal role in driving technological advancement. A few glimpses of the session are as follows.

Nobel Laureates

Relationship between Science & Tech.

Practical Approach

Practical Approach

Session II (Time: 11:30 AM to 1:00 PM)
Design Thinking & Problem Identification (Prof. Urvesh N. Barot, AMD, DGGEC, Surat)

Problem identification is the first crucial step in problem-solving. In this session, we explore the art and science of problem identification, why it's essential, and how to effectively define and analyze problems.

Session Objectives:

Understanding Problem Identification:

To clarify what problem identification entails and its importance.

Key Techniques:

To introduce proven techniques and strategies for problem identification, specifically observational aspects using AEIOU framework.

Real-World Applications:

To examine how effective problem identification has led to remarkable solutions.

DAY 2 ROBOTICS WORKSHOP
Session 1 & 2 (Time: 8.30 AM to 10:00 AM & 10:15 AM to 11:45 PM)
Introduction to Robotics (Er. Aakash D. Patel, Co-founder, ACDC Tech., Surat)

Robotics is an exciting and interdisciplinary field that combines engineering, computer science, and artificial intelligence to create machines capable of performing tasks autonomously or semi-autonomously. In this session, we provided an overview of robotics, its history, key components, and real-world applications. A few glimpses of the session are as follows.

Welcoming Guest Speaker   Addressing students regarding robotics

Explaining fundamentals   Types of Robots

Session Objectives:

Understanding Robotics:

 To gain a fundamental understanding of what robotics is and its significance in today's world.

Historical Perspective:

To explore the history and evolution of robotics, from ancient automata to modern robots.

Key Components:

To introduce the essential components and technologies that make up a robot.

Real-World Applications:

To showcase how robots are used in various industries and daily life.

Session 3 (Time: 11:45 PM to 1:15 PM)

Coding skills for robotics (Er. Aakash D. Patel, Co-founder, ACDC Tech., Surat)

Arduino is a versatile open-source platform used in robotics for its simplicity and flexibility. In this session, we will explore the basics of coding for robotics using the Arduino Integrated Development Environment (IDE) and learn how to program and control robots for various applications.

Session Objectives:

Introduction to Arduino:

To understand the Arduino platform and its significance in robotics.

Getting Started with Arduino IDE:

To learn how to set up the Arduino IDE and write your first code.

Programming Robots:

To explore the fundamental concepts and coding techniques for controlling robots using Arduino.

Teamwise Explanation of Arduinoide

Arduino ide overview

DAY 3 ROBOTICS WORKSHOP

Session 1 & Session 2, 3 (8.30 AM to 10:00 AM & 10:15 AM to 1:15PM)

Handson Experience in robotics (Er. Aakash D. Patel, Co-founder, ACDC Tech., Surat)

In this session, students have an interactive and hands-on experience to build a simple robot under the guidance of the speaker. This workshop aims to provide students with practical exposure to robotics, enhancing their problem-solving and technical skills. A few glimpses of the session are as follows.

Set of Instructions

Students doing Handson Practice

Students doing Handson Practice

Students doing Handson Practice

DESIGN THINKING & ROBOTICS BOOTCAMP AT B.A.B.S. HIGH SCHOOL BARDOLI 16th Oct to 20th Oct 2023

Students doing Handson Practice

Students doing Handson Practice

Session Objectives:

Hands-on Experience: To provide students with practical experience in building a simple robot.

Understanding Components: To learn about the essential components used in robotics.

Team Collaboration: To encourage team work and collaboration among students.

Problem Solving: To develop problem-solving skills by troubleshooting and adjusting as needed.

Following steps are explained on how to make a robot as per the instructions of a speaker:

Define the robot's purpose and design.

What do you want your robot to do? What are its features and functionality? Once you have a good idea of what you want your robot to do, you can start designing it.

Gather components and materials.

What materials and components will you need to build your robot? This will depend on the design of your robot. Some common components include motors, sensors, actuators, and microcontrollers.

Assemble the hardware.

Once you have gathered all your components, you can start assembling the hardware. This may involve soldering, connecting wires, and mounting components on a breadboard.

Program the robot.

Once the hardware is assembled, you need to program the robot. This will involve writing code that tells the robot what to do. You can use a variety of programming languages to program a robot, such as Python, C++, or Java.

Test and debug.

Once the robot is programmed, you need to test it and debug it. This involves testing the robot to make sure that it works as intended and fixing any problems that you find.

Iterate and improve.

Once the robot is working, you can start iterating on it and improving it. This may involve making changes to the design, hardware, or software.

Testing of Robot

Fixing the errors

Day 4 DESIGN THINKING WORKSHOP

Session 1 (8.30 AM to 10:00 AM)

Steps of Design Thinking (Prof. Hiren B. Tamboli, Asst. Prof., Mech. Dept., SNPITRC, Umrakh)

Design thinking is a human-centered approach to problem-solving that places empathy, creativity, and innovation at its core. In this session, Students had explored the principles of design thinking and how it can help in identifying and framing simple or complex problems effectively.

Session Objectives:

Understanding Design Thinking:

To provide a comprehensive overview of what design thinking is and its key principles.

Problem Identification:

To learn how design thinking can be used as a powerful tool to identify and frame problems.

Real-World Applications:

To examine real-world examples of design thinking in action to solve complex problems.

The Design Thinking Process Covered up to Ideation Canvas:

Empathize (Understand):

Research and understand the problem by empathizing with end-users. Gather insights, conduct interviews, and observe to uncover needs and pain points.

Define (Define the Problem):

Synthesize the information gathered during the empathy phase. Clearly define the problem by creating a problem statement.
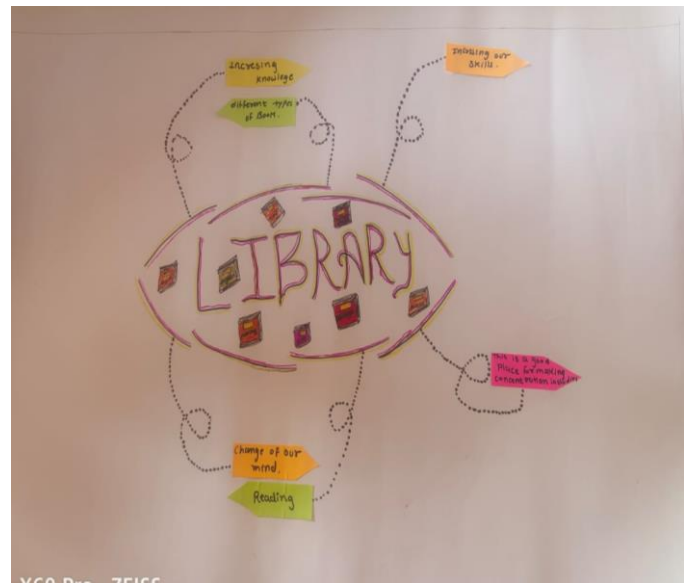
Ideate (Generate Ideas):

Brainstorm and generate a wide range of creative solutions. Encourage wild ideas and innovative thinking.

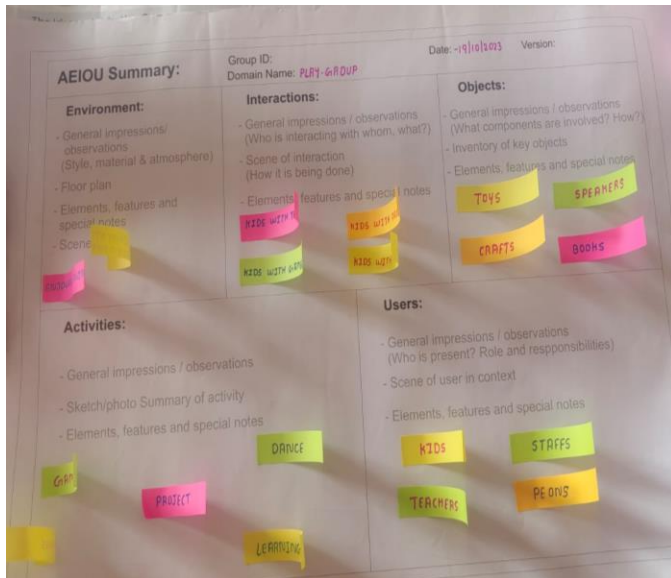**Session 2, 3 (8.30 AM to 10:00 AM & 10:15 AM to 1:15PM)**

Hands on with Design Thinking (Prof. Hiren B. Tamboli, Asst. Prof., Mech. Dept., SNPITRC, Umrakh)

Mind Mapping

Student AEIOU Summary Sheet

Student AEIOU Summary Sheet

Mind Mapping

Day 5 GREEN INNOVATIONS

Session 1 & 2 (Time: 8.30 AM to 10:00 AM & 10:15 AM to 11:45 PM)

Innovation and We (Prof. Mihir Vyas, Head, Env. Engg. Dept., DGGEC, Surat)

Green innovation, often referred to as sustainable innovation, is a critical aspect of addressing environmental challenges while promoting economic growth. In this session, concept of green innovation, its significance, and how it relates to the concept of "We" – collective action for a sustainable future is covered. A few glimpses of the session are as follows.

Short Film on Carbon negative nation Bhutan

Innovation and we

Importance of Green Innovation

Glimpse of Green Innovation

Session Objectives:

Understanding Green Innovation:

To define and understand the concept of green innovation.

The "We" Approach:

To emphasize the importance of collective action in driving sustainable technology and innovation.

Key Areas of Green Innovation:

To explore real-world examples of green innovations in various sectors.

Challenges and Future Trends:

To discuss the challenges and prospects in green innovation.

Session III (Time: 11:45 PM to 1:15 PM)

3D Printing Technologies (Er. Ram Kumar, make3D.in, Surat)

3D printing is a transformative technology that has opened new avenues for creativity and innovation. In this session, we explored the fascinating world of 3D printing, from the basics of technology to the practical aspects of creating 3D-printed objects. A few glimpses of the session are as follows.

Session Objectives:

Introduction to 3D Printing:

To provide an overview of 3D printing technology and its significance.

The 3D Printing Process:

To explain the key steps involved in 3D printing, from design to printing.

Hands-On Demonstration:

To showcase a live 3D printing demonstration.

Applications and Future Trends:

To explore the diverse applications of 3D printing and its potential impact on various industries.