K2-A (PRACT)

Maharashtra State Board of Technical Education, Mumbai

LABORATORY PRACTICAL PLANNING

Institute Name: K. K. Wagh Polytechnic, Nashik **Date:** 15/12/2025
Academic Year: 2025-26 (EVEN)
Program: Information Technology (IF) **Course: Internet of things** **Course code:**314006
Semester: Fourth **Scheme:** K **Name of Faculty:** Mr. T.G.Uphade
Class: SYIF-Cray **Batch:**A/B/C

● Teaching-Learning & Assessment Scheme:

Course Code	Course Title	Abbr	Course Category	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH			Theory				Based on LL & TSL Practical				Based on SL		
											FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
				CL	TL	LL					Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
314006	INTERNET OF THINGS	IOT	SEC	1	-	4	1	6	3	-	-	-	-	-	25	10	25@	10	25	10	75

Abbreviations: CL- Class Room Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS – Indian Knowledge System, SLA - Self Learning Assessment
Legends: @ Internal Assessment, # External Assessment, *# On Line Examination, @$ Internal Online Examination

● **COURSE LEVEL LEARNING OUTCOMES (COS)**

By learning course **INTERNET OF THINGS (IOT-314006)** Second Year students will be able to achieve & demonstrate the following COs on completion of course based learning.

- CO1 - Integrate hardware and software for simple IoT applications.
- CO2 - Create IoT applications by interfacing various sensors and embedded boards.
- CO3 - Create IoT applications by interfacing various actuators and embedded boards.
- CO4 - Develop IoT applications using IoT networking devices.
- CO5 - Develop database based IoT application by integrating sensors with single board computer.

● COs, Practical Laboratory Learning Outcome (LLOs) and Mapping:

Sr. No	LLO	Practical Title	Planned Date	Performance Date	Remarks	Related self-learning (if any)
1	LLO 1.1 LLO 1.2	* Install any one embedded system(ex- Arduino IDE)and execute program to turn LED ON/OFF using delay	A-17/12/2025 B-19/12/2025 C-17/12/2025	A- B- C-		
2	LLO 2.1 LLO 2.2	Change the color of LED	A-17/12/2025 B-19/12/2025 C-20/12/2025	A- B- C-		
3	LLO 3.1 LLO 3.2	Control the brightness of LED using PWM Techniques	A-17/12/2025 B-19/12/2025 C-27/12/2025	A- B- C-		
4	LLO 4.1 LLO 4.2	* Detect the presence or absence of Light using LDR Sensor	A-22/12/2025 B-26/12/2025 C-31/12/2025	A- B- C-		

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- **COs, Practical Laboratory Learning Outcome (LLOs) and Mapping:**

Sr. No	LLO	Practical Title	Planned Date	Performance Date	Remarks	Related self-learning (if any)
5	LLO 5.1 LLO 5.2	Measure the temperature of the object	A-24/12/2025 B-26/12/2025 C-07/01/2025	A- B- C-		
6	LLO 6.1 LLO 6.1	Sense the touch of finger when it is placed on board	A-29/12/2025 B-02/01/2026 C-10/01/2026	A- B- C-		
7	LLO 7.1 LLO 6.1	Detect the obstacle using IR sensor	A-31/12/2025 B-02/01/2026 C-17/01/2025	A- B- C-		
8	LLO 8.1 LLO 6.1	* Measure the Distance between sensor and object using ultrasonic sensor	A-05/01/2026 B-09/01/2026 C-21/01/2025	A- B- C-		
9	LLO 11.1 LLO 11.2	Change the status of Buzzer ON/OFF	A-07/01/2026 B-09/01/2026 C-24/01/2025	A- B- C-		
10	LLO 12.1 LLO 12.2	* Display Humidity and Temperature on LCD using DHT11 sensor	A-12/01/2026 B-16/01/2026 C-31/01/2025	A- B- C-		
11	LLO 13.1 LLO 13.2	* Display the message as per detection of motion of object	A-14/01/2026 B-16/01/2026 C-04/01/2025	A- B- C-		
12	LLO 14.1 LLO 14.2	* Control relay state based on input from IR sensor	A-19/01/2026 B-23/01/2026 C-07/02/2025	A- B- C-		
13	LLO 15.1 LLO 15.2	* Switch the LED ON/OFF on detection of obstacles using PIR sensor	A-19/01/2026 B-23/01/2026 C-11/02/2025	A- B- C-		
14	LLO 16.1 LLO 16.2	* Measure the Distance between sensor and object and ring the buzzer when obstacle is	A-02/02/2026 B-06/02/2026 C-14/02/2025	A- B- C-		

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		detected in some specified range of distance				

- **COs, Practical Laboratory Learning Outcome (LLOs) and Mapping:**

Sr. No	LLO	Practical Title	Planned Date	Performance Date	Remarks	Related self-learning (if any)
15	LLO 17.1 LLO 17.2	Play the Burglar Alarm if smoke detected	A-04/02/2026 B-06/02/2026 C-18/02/2026	A- B- C-		
16	LLO 18.1 LLO 18.2	* Display percentage of moisture in soil using soil moisture sensor	A-09/02/2026 B-13/2/2026 C-21/02/2026	A- B- C-		
17	LLO 20.1 LLO 20.2	* Display temperature value on serial monitor	A-11/02/2026 B-13/02/2026 C-25/02/2025	A- B- C-		
18	LLO 21.1 LLO 21.2	* Play Melody sound with a Piezo speaker.	A-11/02/2026 B-20/02/2026 C-28/02/2026	A- B- C-		
19	LLO 22.1 LLO 22.2	* Control action using Relay based on temperature value	A-23/02/2026 B-20/02/2026 C-04/03/2026	A- B- C-		
20	LLO 23.1 LLO 23.2	* Display 0 to 9 numbers continuously on seven segment display	A-25/02/2026 B-27/02/2026 C-07/03/2026	A- B- C-		
21	LLO 25.1 LLO 25.2	* Display POT value of potentiometer on LCD	A-02/03/2026 B-06/03/2026 C-11/03/2026	A- B- C-		
22	LLO 26.1 LLO 26.2	* Transfer sensor collected data to smartphone using Bluetooth	A-09/03/2026 B-27/02/2026 C-14/03/2026	A- B- C-		
23	LLO 28.1 LLO 28.2	* Create Web based IoT application using Node MCU/Raspberry Pi to display Temperature on Web Browser	A-18/03/2026 B-13/03/2026 C-18/03/2026	A- B- C-		

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- **COs, Practical Laboratory Learning Outcome (LLOs) and Mapping:**

Sr. No	LLO	Practical Title	Planned Date	Performance Date	Remarks	Related self-learning (if any)
24	LLO 29.1 LLO 29.2	* Setup Raspberry Pi as an Single board computer b with following accessories: a display a cable to connect Raspberry Pi to display a keyboard a mouse SD card	A-23/03/2026 B-20/03/2026 C-25/03/2026	A- B- C-		
25	LLO 30.1 LLO 30.2	* Install MariaDB database in Raspberry Pi and execute basic SQL queries	A-25/03/2026 B-27/03/2026 C-28/03/2026	A- B- C-		
*	Create an app for controlling device		A-25/03/2026 B-27/03/2026 C-28/03/2026	A- B- C-		

ASSESSMENT METHODOLOGIES/TOOLS

A. Formative assessment (Assessment for Learning) (FA-TH)

- Continuous assessment based on process and product related performance indicators. Each practical will be assessed considering
  - 60% weightage is to process
  - 40% weightage to product

B. Summative Assessment (Assessment of Learning) (SA-TH)

- End semester examination, Lab performance, Viva voce

SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING /SKILLS DEVELOPMENT (SELF LEARNING)

Self-Learning

Complete any one course related to "Internet of Things" freely available on Infosys Springboard /NPTEL / Spoken Tutorial.

Assignment

Solve Assignment covering all COs given by Course Teacher.

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Micro project

- Automatic Street Light- Street Light should automatically ON at evening and automatically OFF at morning. LCD and Serial Monitor shows Light Intensity value on First Line and Status of Street Light on Second Line. USE RGB LED for street Light and use orange color.

- Home Automation through PC- Design and develop project to control 8 home devices through PC serial monitor, LCD connected on project will shows Status of Devices is on or off. Also show the status of all devices on serial monitor.

- Motion enabled Room Light- Light present in Room should automatically ON when human motion is detected and automatically OFF in the absence of human motion. LCD and Serial monitor shows appropriate message as “Motion detected! Light ON” and “No Motion! Light OFF” when particular condition fulfilled.

- Electronic Smart Blind Stick- If someone is in front of blind person, LED and Buzzer should on and LCD will show the message” Obstacle. Be Alert” otherwise LED and Buzzer will remain off and LCD show the message “Safe Keep Walking”.

- Electronic Notice Board- Any Message send from Serial Monitor should get displayed on LCD. When new message sends, previous message gets automatically erased and replaced with new message.

Mr. T. G. Uphade
(Name & Signature of Staff)

Ms. M. S. Karande
(Name & Signature of HOD)