	NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

Assignment 1: CSPC61 - Embedded Systems Architectures

Maximum Marks: 20 **Submission Date : 03.04.2022**

The students are asked to submit interim paper part 1 in the following topics through this assignment. Interim paper part 2 submission will be done through assignment 2. The team formation guidelines, details about paper content, and evaluation guidelines are given in the following sections. It is a team assignment. The teams are asked to submit the theoretical methodologies in developing automated systems for any one of the following topics using ARM Board/RFID Technology/Raspberry Pi board/other embedded boards. Team details with leader name should be submitted on 25.03.2022.

List of topics

1. Long-term monitoring of physical activity, behavior in farmed fish.
2. Long-term monitoring of respiratory frequency in farmed fish.
3. Designing workplace clothing for coal mine workers to improve safety overall.
4. Development of easy operating systems for persons with locomotor disability.
5. Automatic bird feeder for wild bird populations.
6. Smart water feeder for wild bird and animal populations.
7. Development of automatic sensing of carbon monoxide emission from vehicle/industries.
8. Automation in energy metering system for corporate industries or organizations.
9. Automatic imaging of seeds and shoots to quantify plant height.
10. Smart dustbin for wet and dry waste.
11. Smart device for monitoring plant root system growth.
12. Develop a special plant growth cabinet that controls light quality, intensity and photoperiod to optimize speed breeding parameters.
13. Development of smart risk monitoring system in cold supply chain.
14. Smart and automatic system for garbage pickup.
15. Smart school bags for kids.

Team formation guidelines:

Team size should be 5. A team may have members from A and B sections and it should

be led by a team leader. The team leader will get 1 mark extra based on his/her coordination and reporting to course faculty. Team details with the leader name should be submitted on 25.03.2022.

Topic selection procedures:

To get a one topic among 15, sort all (5 students) your register numbers (For eg.1902, 1920, 1936, 1971, 1991). Take the first register number from the sorted one (1902). Calculate register number modulo 15 (1902 modulo 15=2) and consider that topic (2nd topic) for your team.

Expected contents in the interim paper 1

- Problem definition and objectives (200-250 words) *(3 Marks)*
- Scope of the system and beneficiaries/end user (100-110 words) *(2 Marks)*
- Literature survey (minimum of 5 latest journal papers - Proposed methodology, advantage and disadvantage) (500-600 words) *(5 Marks)*
- Board and components identification and justification *(5 Marks)*
- Challenges and constraints in developing such system (75-100 words) *(2 Marks)*

Paper format *(2 Marks)*

- IEEE Paper format - https://www.ieee.org/conferences/publishing/templates.html

Team contribution summary sheet submission (Should not be disclosed to other team members. Individual submission is required) *(1 Mark)* **-** All members of the team should submit it. Each team member should submit all your team members' contribution percentage in the submission of this assignment.