## Project Objectives

O1: To automate the task of evaluation of hand-written Malayalam answer scripts.

O2: To explore different techniques to improve the accuracy of Malayalam handwriting recognition algorithms.

O3: To improve the scope and usability of the existing automated evaluation systems.

O4: To increase the familiarity with the concepts of optical character recognition and machine learning techniques.

O5: To design and implement a prototype applying the concepts of software engineering and project management.

## Course Outcomes

**CSD 415.CO1:** Model and solve real world problems by applying knowledge across domains Cognitive knowledge level: Apply)

**CSD 415.CO2:** Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).

**CSD 415.CO3:** Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply)

**CSD 415.CO4:** Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply)

**CSD 415.CO5:** Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze)

**CSD 415.CO6:** Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply)

| | CO1 | CO2 | Justification |
|---|---|---|---|
| O1 | 3 | 3 | CO1: Solve real world problem CO2: Social relevance |
| O2 | | | CO1: CO2: |
| O3 | 2 | 1 | CO1: Solve real world problem CO2: Social relevance |
| O4 | | | CO1: CO2: |
| O5 | 2 | 3 | CO1: individual tasks CO2: execute tasks |

| | CO3 | CO4 | Justification |
|---|---|---|---|
| O1 | | | CO3: CO4: |
| O2 | 2 | 2 | CO3: CO4: |
| O3 | | 2 | CO3: CO4: execute tasks |
| O4 | 2 | 3 | CO3: individual tasks CO4: execute tasks |
| O5 | 2 | 3 | CO3: individual tasks CO4: execute tasks |

| | CO5 | CO6 | Justification |
|---|---|---|---|
| O1 | 1 | | CO5: propose solutions CO6: |
| O2 | 3 | | CO5: propose solutions CO6: |
| O3 | | | CO5: CO6: |
| O4 | 1 | 1 | CO5: propose solutions CO6: communicate findings |
| O5 | 1 | 1 | CO5: propose solutions CO6: communicate findings |

## O1: To automate the task of evaluation of hand-written Malayalam answer scripts

CO1 - 3 : It is a monotonous task to evaluate answer sheets manually. Our objective is to build a Machine Learning Model to solve this problem by automating the task of evaluation of handwritten answer papers  in malayalam language and hence it is given higher significance.

CO2 - 3 : The project is sustainable as no harm is done to the environment. By automating the tedious task of manual answer sheet evaluation, productivity increases by eliminating the redundant work of teachers, displaying social relevance and hence it is given higher significance.

CO5 - 1 :  Though research is being actively conducted in automating evaluation of handwritten answer papers commonly in the English language, papers in native languages like Malayalam are not given due importance. By combining the automation of answer sheet evaluation and optical character recognition in malayalam language, the project proves to be innovative.

## O2: To explore different techniques to improve the accuracy of Malayalam handwriting recognition algorithms.

CO1 -1 : The project aims to explore different techniques to increase the accuracy by applying knowledge to solve a real world problem. Though improving accuracy aims at solving problems, its impact in the real world is only made indirectly and hence it is given low significance.

CO2 - 2 : Accurate malayalam handwriting recognition algorithms makes the tiring task of evaluation easier for teachers which improves the mental health of teachers which moderately affects the literacy rate.

CO5 - 3 : By improving the accuracy of malayalam handwriting algorithms, the project aims to fill the research gaps by suggesting better accurate and efficient models accounting for a higher significance.