

Functionalities Description

In a university a student gets admitted under a specific Degree Program. Each program belongs to a department and the related departments are kept under schools. Students usually take courses as per the curriculum of their respective programs. Courses are taught by instructors, departments are run by department heads and schools are run by deans. You are requested to explore the information required for the schools and the departments of IUB for this purpose. Please find out the information that is related to the degree programs as well. Also identify the student information needed for monitoring their PLO achievement and the information you may need to keep track of for the students themselves.

Students are graded based on their performance in assessments in each course they take by the instructors who teach that corresponding course to them. The weight of the assessments are determined based on a marks distribution scheme that is prepared at the start of each semester. PLO achievement in a course is calculated based on the performance of the students in the assessments mapped to PLOs via COs. Courses may be retaken by students if they wish to improve their grade.

Each program consists of many courses. There are different categories of the courses (e.g., foundation, major, minor). Students are required to complete the courses associated with the programs to fulfil the requirement of the degree. Please find out the related information regarding courses and categories.

Under the OBE model for each program there will be a set of program learning outcomes (PLO). To fulfil the requirement of a degree program a student must achieve the PLOs associated with that program. To evaluate the students in each course, there are a set of course outcomes that are mapped with the PLOs of the degree program. Under each course, the COs are measured through different assessment techniques. The faculty members evaluate the COs achieved and mapped PLOs achieved by each student in a course. Please find related information regarding PLOs, COs and Faculty members.

All the COs and the mapped PLOs are stored in the system and finally compared with each other so that we can generate the result of PLO fulfilment. Please note that a student may fail to fulfil a PLO in a course but they can fulfil the requirement by achieving the PLO from another course higher than the previous course. However, in case a student can't fulfill a PLO that they already fulfilled in the previous course, it can

be misleading, and the decision on how to handle such cases might be reserved by the faculty members of the courses. Also, take into consideration the comparison of performance between two students who possibly took the same set of courses, where one might have achieved a certain PLO in all courses that had it, and the other achieved it in fewer courses. Needless to say, all COs and PLOs need to be tracked regardless of whether they have already been achieved or not. Try to consider many such use cases that would be necessary for future analyses for the purposes of a student performance monitoring system. Think of the evaluation technique, assessment plan and storing mechanism of the result.

Following is a list of scenarios w.r.t output reports that should be fulfilled in order to build a system that enables users to monitor student performance based on PLO achievement and analyse relevant metrics. **Please note that input forms should be available to enter the data required to generate each of the output reports. System should be implemented first using dummy data and then tested on sample data.**

- PLO achievement stats of an individual student:
 - A chart showing percentage score in each PLO in a selected course against the average score (from the students in the same course).
 - A chart showing percentage score in each PLO against the program average (from the students in the same program).
 - A table showing the PLOs achieved and failed to achieve (with percentage score) for a selected student in all the courses taken by that student so far.
- PLO performance trend of selected course/s:
 - For chosen semester/s, a chart comparing the PLO achieved percentage for each PLO among the instructors who have taken the course.
 - For selected PLO/s, within the timeframe of chosen semester/s, a comparison of PLO achievement percentage among courses which have the same PLO/s that was/were selected.
 - For chosen semester/s, a chart showing the percentage of students who achieved each of the PLOs and that of those who failed.
- PLO performance trend of selected program/s:
 - For chosen semester/s, a chart showing the count of students who attempted each PLO against that of those who achieved.
 - For chosen semester/s, a chart showing the count of students who achieved each PLO, segmented with color-code into the percentage of the

count that came from the courses that have that PLO. Alternative view with segmentation based on CO instead of course.

- Upon clicking on any one of the PLOs from the previous chart, a pie chart showing a clearer segmentation should be displayed.
- PLO performance trend of selected university/s:
 - For a selected program, a radar chart showing the PLO achieved count comparison for each PLO within a chosen time frame.
 - For chosen programs, a radar chart comparing the percentage of graduates who have achieved all PLOs of the chosen programs.
 - For a selection of one/more PLO/s, a comparison of the percentage of students who achieved that/those chosen PLO/s (percentage derived from total attempted vs achieved).
- Miscellaneous PLO performance trend:
 - For selected departments/schools, a chart comparing the percentage count of students who achieved all the PLOs they have attempted within a chosen time frame.
 - For selected departments/schools, a chart comparing the average count of PLOs achieved within a chosen time frame.
 - For a selected instructor, a chart showing the percentage of students who achieved each PLO in the course/s taught by that instructor within a chosen time frame. Upon selecting a specific PLO from that chart, a further comparison of PLO achievement percentage w.r.t. other instructors for that chosen PLO should be displayed within the same time frame that was already selected for the source chart.