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| **System Roles** | | | | | | |
| **Process** | **Human** | **Non-computing hardware** | **Computing hardware** | **Software** | **Database** | **Communication & Network** |
| Map Course Outcomes(COs) to Program Learning Outcomes(PLOs) | **IEB/UGC/ Ministry of Education:**  1. Send Accreditation Manual with PLOs defined to Heads of Department/Dean of School.  **Head of Department / Dean of School:**  1. Receive Accreditation Manual from IEB.  2. Send the Accreditation manual to Department Staff.  3. Direct Department Staff to tell Course Instructors and Coordinators to design Course Outline and Course Assessment Reports.  **Department:**  1. Send Course Instructors the Accreditation Manual with defined PLOs.  **Course Instructor:**  1. List course content.  2. List Course Outcomes(COs.  3. Map Course Content to Course Outcomes(COs).  4. Map Course Outcomes(COs) to PLOs.  5. Map Course Outcomes(Cos) to specific questions of Mid-term, Final Exams questions and Project Work.  6. Design Course Assessment Report and OBE Marksheet using Course Outline, Course Content and Course Outcomes. | **Pen and paper:**  1. Is used for noting down intermediate brainstorming ideas.  **Board and marker:**  1. Is used for noting down intermediate brainstorming ideas. | **Computer:**  1. Course Coordinators use computers to make softcopies of Course Outcomes(COs) of the specific courses they are experts in.  **Printer:**  1. To print out hardcopies of Course Outcomes(COs). | **MS Word:**  1. Course Coordinators use MS Word to make a detailed course outline and Course Assessment Reports with Course Outcomes(COs) mapping to Program Learning Outcomes(PLOs).  **Excel Sheet:**  1. Excel Sheet is used by Course Coordinators to map specific questions in the Midterm, Final exams and Project work to specific Course Outcomes(COs). | **Computers:**  1. Digital files may be stored in computers.  **Department Office:**  1. Hardcopies may be stored in the department. | **Internet & Email:**  1. Use the internet and emails to communicate with UGC/IEB or other stakeholders to discuss important topics related to mapping Course Outcomes to Program Learning Outcomes.  **Others:**  1. Use phones or physical means with stakeholders to discuss important topics related to mapping Course Outcomes to Program Learning Outcomes. |
| Record Student Assessment Data | **Faculty/ Course Coordinator:**  1. Assign project work and assignments.  2. Take quizzes and exams throughout the semester.  3. Record assessment data of students throughout the semester of each student for every assessment (quizzes, assignments, project, exams) on softcopies and hardcopies.  4. Record marks for each specific question in the midterms and final exams.  5. Calculate total marks of quizzes, assignments and midterm and final exams and assign final grades to each student of specific courses.  6. Convert finals and midterms marks.  7. Bring all the marks of every student for a course into a Marksheet.  8. Grade the student.  9. Upload students’ final grades on IRAS.  10. Send the Marksheet to the Department.  11. Send the Marksheet to the Registrar’s Office. | **Pen & Paper:**  1. Use pen & paper to record assessment data and marks obtained on physical paper in tabular format(hardcopies). | **Computer:**  1. Creating softcopies of records of all assessment data for specific courses are done on computers. | **Excel Sheet:**  1. Record necessary assessment data and final grades on Excel Sheets.  **IRAS:**  1. Upload students' final grades to IRAS for viewing by students or the registrar’s office. | **Department Storage:**  1. Records of students’ assessment data and final grades may be saved in the department office and registrar’s office for future reference.  **IRAS Database server:**  1. IRAS uses a database server to store and maintain student grades’ information. | **Internet:**  1. The Internet is used to communicate with IRAS to store final grades of students. |
| Produce OBE Marksheet & Course Assessment Report | **Faculty:**  1. Calculate total marks received for each CO by calculating the marks received for questions and/or other assessments mapped to COs.  2. Calculate total percentages received for each Course Outcomes(COs) on the OBE Marksheet.  3. Declare if a student has achieved a specific CO(if CO percentage is greater than or equal to 40).  4. Declare if a student has received a PLO for a related CO.  5. Make a table giving the verdict and analysis of how many students were able to receive a certain CO and PLO and other documents containing necessary information and data.  6. Send the final version of the OBE Marksheet to the Department Office.  **Department Office:**  1. Send the OBE marksheet, Course Assessment Report and other reports to the Registrar’s Office.  2. Store the OBE Marksheet and Course Assessment Report in the department.  **Registrar’s Office:**  1. Stores the OBE Marksheet and Course Assessment Reports and other documents and reports in the Registrar's Office. | **Pen and Paper**  1. OBE marksheet stored in hardcopy. Additional markings may be made to further separate between students. | **Computer/ Phone:**  1.Uses computers to make softcopies of the OBE Marksheet and Course Assessment Reports.  **Printer:**  1. Print hardcopies of final versions of the OBE Marksheets and Course Assessment Reports. | **Coded Excel sheet:**  1.Faculty/Course Coordinator uses automated excel sheets to calculate the student’s success/ failure in achieving PLOs.  **MS Word:**  1. Used to make Course Assessment Report softcopies. | **Department Storage:**  1. Records of students’ assessment data and final grades will be saved in the department for future reference.  **Registrar’s Office Storage:**  1. OBE Marksheets, Course Assessment Reports and other documents submitted by the department is stored for future reference. | **Internet/Mail:**  **1.** An Online platform (such as Google Sheets) may be used for processing the OBE assessment data spreadsheet. |
| View grades and download Transcripts | **Students**:  1. Log into IRAS.  2. Search semester wise result for intended semester.  3. See grades for specific semesters.  3. Download transcript through browser into hard disk.  **Registrar’s Office:**  1. Access IRAS.  2. View students’ grades if and when necessary.  3. Download their transcripts. | **Pen and Paper**  1. Tabulated transcripts may be printed onto paper. Hardcopy is used as the primary source of truth during applications and other paperwork. | **Computer/**  **Phone:**  1. Used for accessing IRAS.  **Printer:**  1. Used to print the tabulated transcript. Prints tabulated transcripts. | **IRAS:**  1. **Stores** letter grades of each completed course  2. Provides the online user **interface** for viewing grades and transcripts. | **Registrar’s Office Storage:**  1. Student information is kept in admin in hardcopies for future reference.  **IRAS Database Server:**  1. A Database Management Service is used to store, maintain, edit and receive student grades information in IRAS.  **Web Server:**  1. User interface and website pages are served using a remote web server. | **Internet/ Email** 1. The **Internet** is used to communicate with IRAS to store final grades of students.  2. Softcopies may be **mailed**. |
| Create student/faculty account and enter/customize necessary data | **Admin**:  1. New students’ information is collected from registration processes.  2. New faculty information is received from HR.  3. Creates an account for students and faculties.    4. Customize some account details when necessary for students or faculty. | **Pen and Paper:**  1. May be used for writing/ copying student/ faculty’s vital login information for account creation. | **Computer:**  1. Used for accessing and adding/editing data to IRAS. | **IRAS:** 1. User interface is provided to interact with student/faculty data. | **Registrar’s Office Storage:**  1. Student/ Faculty information is kept in admin in hardcopies for future reference.  **IRAS Database Server:**  1. A Database Management Service is used to store, maintain, edit and receive student/faculty information in IRAS.  **Web Server:**  1. User interface and website pages are served using a remote web server. | **Internet:** 1. The internet is needed to interact with IRAS to store account information on a remote database server.  2. User interface and website pages are served using internet access. |
| View Records OBE Marksheets, Course  Assessment Reports over a time period for inspection and analysis of student performance trend | **IEB/ UGC/ Ministry of Education:**  1. Inform the university head of a deadline within which OBE Marksheets, Course Assessment Reports and other documents are needed for quality inspection to make necessary improvements to degree programs.  2. Inform the university head if an IEB personnel will visit the campus or softcopies will suffice.  3. Visit university heads and relevant schools to receive the necessary documents and reports if that is what was informed.  **Head of Dept/Dean of School:**  1. Direct Department Staff to gather necessary documents, OBE Marksheets and Course Assessment report for a given time period specified by IEB/UGC/Ministry of Education.  2. Receive the necessary documents gathered by the Department of softcopies if it is to be emailed to an IEB/UGC/MofEdu personnel or hardcopies if the IEB/UGC/MofEdu personnel come for a visit.  3. Evaluate the need to change/ improve the department’s educational resources based on students’ performance trends.  **VC/Board Of Trustees:**  1. Request to view records of OBE Marksheets, Course Assessment Reports to analyze students’ performance trends.  **Department Staff:**  1. Gather necessary OBE Marksheets, Course Assessment Reports and other documents from Department Storage.  2. Send all the necessary documents to IEB Personnel if wanted in softcopies or hand over hardcopies to the department head otherwise. | **Pen and Paper:**  1. May be used for noting/marking down key points of the report.  2. Hardcopies of reports may be used. | **Computer:**  1. Used to display OBE Marksheet and Course Assessment Reports softcopies.  2. Send OBE and Course Assessment Reports to other computers. |  | **Department Records**  1. Retrieval of OBE marksheets and Course Assessment reports when needed.  2. Stores records on stakeholders’ interpretation of student performance trends. | **The internet:**  1. OBE marksheets and course assessment reports may be **mailed** online.  2. Online platforms such as Google Docs/Sheets display reports of softcopies. |
| Request for review and change of grades | **Students:**  1. Request for grade change and review to faculty.  **Faculty/ Course Coordinator:**  1. Check exam papers and other assessments upon request.  2. If change needs to be made, send a grade change request of a specific student to admin.  If not, end the process.  **Admin:**  1. Receive a request to change the grade of a specific student.  2. Change grade of student based on Faculty request. | **Pen and Paper:**  1. May be used to note down key points or marks on the students’ answer sheets. | **Computer/ Phone:**  1. Used for communicating with the faculty. | **IRAS**:  1. Used by the admin for changing the grade. | **IRAS server:**  1. Update student grade data.  **Department Storage:**  1. Update student grade data.  **Registrar’s Office Storage:**  1. Update student grade data. | **Internet:** 1.Email is primarily used for communication.  **Phone:**  1. May be used for communication. |