Student Performance Monitoring System - Business Rules:

We are working on making a Student Performance Monitoring System for a University.

1. An **Account** is used to log in to our SPMS web application. An **Account** has a name(first name, last name), email address, password(?), account type.
2. An account type can only be one of the following: **Student**, **Employee** or **Accreditor**(IEB/UGC/Ministry of Education). The **Employee** has employeeid, date hired, employee type (faculty or department head or department office staff, etc.), department name. The employee types can be further divided into and must be one of these: **Faculty**, **Department Head**, **Department Office Staff**, **Admin**, **Registrar’s Office**, **Top Management**.
3. A **Student** will have studentId, student type(e.g graduate or undergraduate), cgpa, department, major(s), minor(s), date of admission, potential year for graduation.
4. Each **Student** may register for multiple **Offered Courses**. An **Offered Course** may be registered by multiple **Students**. **Students** can only register for exactly one **Section** of an **Offered Course**. We need to keep track of registration date, grade received, attendance, participation grade, COs achieved and PLOs and their corresponding marks of each **Student** for the particular **Section** of the **Offered Course** that they registered for in a **Semester**. A **Section** has section id, start time, end time, room number, capacity. A **Faculty** may be assigned to multiple **Sections** of multiple  **Offered Courses**. A **Section** will always have one **Faculty** assigned to it.
5. An **Admin** will have roles, tasks, work hours. A **Student** can make multiple **Grade Change Request**. **Grade Change Request** can be made by multiple **Students**. An **Admin** can receive multiple **Grade Change Request**, and **Grade Change Request** will be received by exactly one **Admin**. **Grade Change Request** have requestid, request description, request reason, courseid, student id, semester the course was taken in, student grade, request date. (A feature for future implementation)
6. The University has **Schools** that have multiple **Departments** under it. No **Department** can belong to multiple **Schools**. A **School** has a name used to identify itself uniquely, location, a dean in charge.
7. A **Department** has **Degrees Offered**. **Degrees Offered** will have degreeid, degree title.
8. A **Department** has many **Courses** but a **Course** belongs to exactly one **Departments**. A **Department** has a department name, location, department head. A **Department** can offer certain courses as **Offered Courses** every **Semester**. A **Semester** has multiple **Offered Courses** but **Offered Courses** will belong to only one **Semester** every semester. A **Semester** has semester season(e.g. Autumn, Summer, etc.), year, start date and end date. A **Course** has courseid, course name, course description course prerequisite, course type(major/minor/foundation), credit hour. Each **Course** will have only one **Grading Policy**. **Grading Policy** will have grades, maximum for grade, minimum for grade. A **Grading Policy** will only belong to one **Course**.
9. A **Course** may have multiple other courses as their **prerequisites**, and a course may be a prerequisite of multiple **Courses**.
10. An **Offered Course** can have multiple **Sections** but a **Section** must belong to only one **Offered Course**. An **Offered Course** will have semester offered in(semester season and year), coordinatorid, instructorids, sections. The **Department Office Staff** assigns **Faculty** to **Sections** and **Offered Courses** and appoints **Faculty** to be **Coordinator** and/or **Instructor** for a Course. An **Offered Course** will have exactly one **Coordinator** but a **Coordinator** may be coordinating multiple **Offered Courses**. An **Offered Course** must have at least one **Instructor**, but **Instructors** may belong to multiple **Offered Courses**.
11. A **Department** also has multiple **Department Office Staff** working under it. A **Department Office Staff** will have a role(s), work hours. A **Department Office Staff** may be assigned to manage one or more **Faculty**. A **Faculty** will have specialization(s), years worked, on leave, academic qualifications (i.e. highest degree certificate so far), skills, job post (e.g. adjunct faculty, senior lecturer).
12. A **Section** of an **Offered Course** may have multiple **Course Assessments**. A **Course Assessment** belongs to only one **Section** of an **Offered Course**. A **Course Assessment** must have multiple **Questions** mapped to specific **Course Outcomes**. **Course Assessment** will have course assessment id, course assessment title, total marks. A **Question** will have question number, question description, question total marks, applicable CO. A **Question** may be connected to other **Questions** for doing simple math operations on.
13. An **Offered Course** for a particular **Semester** will have exactly one **Course Assessment Report**. **Course Assessment Report** will have courseAssessmentReportId, document file, uploaded date, uploaded by, document title. SPMS generates *Course Assessment Reports* from the information that the University maintains for an **Offered Course** for every semester and saves the document report in **Course Assessment Report**. The **Faculty** can also upload their own *Course Assessment Report*, but only one for one **Offered Course** in a **Semester**.
14. An **Offered Course** will have one **Grade Distribution**. **Grade Distribution** will have the course outcomes applied to it, threshold percentage, total number of students attempted, number of students passed, and percentage(%).
15. An **Offered Course** for a particular **Semester** will have exactly one **OBE Marksheet**. *OBE Marksheets* are generated through SPMS using all the data uploaded under each **Course Assessment** of each **Section** of an **Offered Course** and saved in **OBE Marksheets**. **OBE Marksheet** will have marksheetId, marksheet title, marksheet generation date, marksheet file.
16. An **Offered Course** for a particular **Semester** will have exactly one **Analysis Report**. *Analysis Reports* are generated through SPMS using all the data uploaded under each **Course Assessment** of each **Section** of an **Offered Course** and saved in **Analysis Report**. **Analysis Report** will have analysisReportId, analysisReporttitle, analysisReportGenerationDate, analysisReportFile.
17. An **Offered Course** for a particular **Semester** will have exactly one **Verdict Report**. *Verdict Reports* are generated through SPMS using all the data uploaded under each **Course Assessment** of each **Section** of an **Offered Course** and saved in the **Verdict Report**. **Verdict Report** will have verdictReportId, verdictReporttitle, verdictReportGenerationDate, verdictReportFile.
18. An **Offered Course** for a particular **Semester** will have a **Course Outline**. A **Course Outline** will belong to only one **Offered Course**. **Course Outline** has course id, course outline document, upload date and uploaded by.
19. An **Offered Course** may have multiple **Course Outcomes**. **Course Outcomes** are assigned to exactly one **Offered Course**. **Course Outcomes** have course outcome id, course outcome description, domain & level connected PLOs. **Program Learning Outcomes** must be assigned on at least one **Course Outcomes**. A **Course Outcome** must be assigned multiple **Program Learning Outcomes**. **Program Learning Outcomes** will have PLOid, PLO title, PLO description, connected PEOs. **Program Learning Outcomes** are assigned to multiple **Program Education Outcome** and PEO are assigned on multiple PLOs. **Program Education Outcome** will have PEOid, PEO title, PEO description.
20. An **Accreditor** may upload one **Accreditation Manual** document for every **Semester**. An **Accreditor** will have institution, role(s), specialization, contact number, email. **Accreditation Manual** will have documentId, document title, document file, upload date, upload time, uploaded by, semester.
21. The **Department Head** can only assign one **Accreditation Manual** document to multiple **Department Office Staff** every **Semester**. Multiple **Department Office Staff** may assign one **Accreditation Manual** to each of the **Instructors**.