

# MINI PROJECT LAB

**Project name:**

**Choosing open and professional electives.**

**Project members:**

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**Problem statement:**

- Every elective has a certain maximum number of students who can enroll in it.
- Students need to choose their professional and open electives from the available options also with respect to the number of seats available.
- Thus a portal must be developed where students can choose their electives based on the number of available seats in the particular elective.
- Option to edit the students chosen elective must also be provided. The options can be edited only up to a certain date.

**Features for students:**

- To be provided with a login feature for the portal to see available options of electives based on year and semester.
- To see available options and seats in each elective as well as the respective available faculties and choose from the options. If seats are available, the student's elective is allocated. Else the student is asked to choose another option.
- Students should be allowed to change their choice of electives before a given time.
- If the student hasn't chosen a course within a given time, the course with the most vacant seats will be allotted.
- The courses are displayed as per domains on the basis of past course selection, recommending students to take courses in a similar domain.

**Features for admin:**

- Admin should be able to login and add courses.
- They will be able to send an alert to all teachers to check if they are willing to take the subject/elective.
- Based on the number of teachers willing to take the course, allot the number of Available seats.
- They should be able to alert students to login for course registration.
- Once student's complete selection and lists are finalized, allow admin to email the lists to the students and define a period of time to allow any changes.

### **Features for teachers:**

- Login and allow them to see courses and the curriculum to allow them to choose if they would like to uptake a particular course.
- Once students choose courses, the list of students should be available for the teacher.
- Grant students LMS access from the website itself by creating a .csv file with students information.

### **End users:**

- Teachers and students who opt for professional and open electives.
- Admin who should be able to add courses.

### **What value can we add?**

We can make a user friendly portal for students and teachers to perform the above mentioned activities.

### **How to make the website deployable?**

- Frontend
- Backend -> Database.

# Software Requirements Specifications

## 1. Introduction:

Choosing electives at the college is currently done using google forms without proper information where the student chooses the course without being sure about getting his/her chosen elective and has to wait till the list comes out to find out about the allotted course.

We have decided to implement an Elective Choosing System. This system will be used by students or teachers to check the availability of electives. . The purpose of this document is to analyze and elaborate on the high-level needs and features of the Elective Choosing System. The details of what all are the needs of the Elective Choosing System and if it fulfills these needs are detailed in the use-case and supplementary specifications.

### 1.1 Purpose:

The purpose of the Software Requirements Specification (SRS) document is to describe the external behavior of the Elective Choosing System. Requirements Specification defines and describes the operations, interfaces, performance, and quality assurance requirements of the Elective Choosing System. The document also describes the nonfunctional requirements such as the user interfaces. It also describes the design constraints that are to be considered when the system is to be designed, and other factors necessary to provide a complete and comprehensive description of the requirements for the software. The Software Requirements Specification (SRS) captures the complete software requirements for the system, or a portion of the system. Requirements described in this document are derived from the Vision Document prepared for the Elective Choosing System.

### 1.2 Scope:

The Software Requirements Specification captures all the requirements in a single document. The Elective Choosing System that is to be developed provides the students and teachers of the college with elective information, selection and other facilities. The Elective Choosing System is supposed to have the following features:

- The system lets the admin enter the courses and its details with respect to the year and semester.
- The system provides log in facilities to the users.
- The system displays the courses available to the faculties and asks them if they are interested to teach any elective.
- The system allows the admin to provide the number of seats available based on the number of faculties willing to teach the elective.

- The system provides the student with the electives list and the faculties teaching those elective courses.
- The system lets the student choose the elective they want and allocates the course if seats are available.
- The system lets the student change their elective within a period of time.
- The system also shows the list of students and their details to the faculty teaching the elective.

The features that are described in this document are used in the future phases of the software development cycle. The features described here meet the needs of all the users. The success criteria for the system is based on the level up to which the features described in this document are implemented in the system.

### **1.3 Definitions, Acronyms and Abbreviations**

- PE: Professional Elective
- OE: Open Elective
- SSN: Sri Sivasubramaniya Nadar College of Engineering
- Provided wherever necessary in the document.

### **1.4 References**

The SRS document uses the following documents as references:

**1.4.1 SSN Information Security Requirements:** To provide security to the system based on the current security system currently used by SSN.

#### **1.4.2 SSN LMS**

## 1.5 Overview

The SRS will provide a detailed description of the Elective Choosing System. This document will provide the outline of the requirements, overview of the characteristics and constraints of the system.

**1.5.1 Section 2:** This section of the SRS will provide the general factors that affect the product and its requirements. It provides the background for those requirements. The items such as product perspective, product function, user characteristics, constraints, assumptions and dependencies and requirements subsets are described in this section.

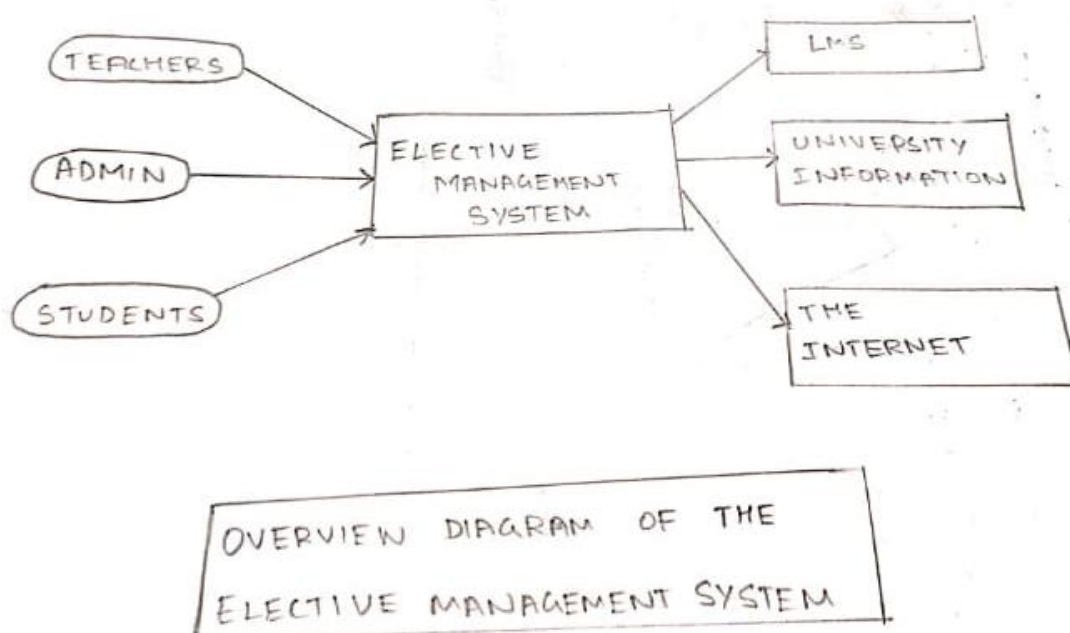
**1.5.2 Section 3:** This section of SRS contains all the software requirements mentioned in section 2 in detail sufficient enough to enable designers to design the system to satisfy the requirements and testers to test if the system satisfies those requirements.

## 2 Overall Description:

- **Product Perspective:**

The Elective Choosing System is a package to be used by colleges to improve the efficiency of elective selection. The Elective Choosing System to be developed benefits greatly to the students and faculties of SSN College of Engineering. The system provides elective information to the students and helps them decide to choose an elective.

The complete overview of the system is as shown in the overview figure below.



The product to be developed has interactions with the user, admin , students and faculties.

The product has to interact with other systems like: Internet and the SSN database.

- **Product Functions:**

The Elective Choosing System provides online real time information about the electives available for the students and its information. The product functions are more or less as described in the product perspective. The functions of the system include the system providing different types of services based on the type of user(admin,student and faculty).

- The student should be provided with the updated information about the electives available.
- Provisions for the faculties to choose the elective they want to teach.
- Provisions for the students to choose the elective they want and change the elective within a given period of time.
- The admin can get the information about the students who have chosen a particular elective.
- The faculties can view the students enrolled in their respective course and give LMS access to them.
- The system uses the University information security requirements to provide the login facility to the users.

- **User Characteristic:**

The users of the system are students, faculties of the university and administrators who maintain the system. The members and the Faculty are assumed to have basic knowledge of the computers and Internet browsing. The administrators of the system to have more knowledge of the internals of the system and is able to rectify the small problems that may arise due to disk crashes, power failures and other catastrophes to maintain the system. The proper user interface, users manual, online help and the guide to install and maintain the system must be sufficient to educate the users on how to use the system without any problems.

- **Constraints:**

- The information of all the users must be stored in a database that is accessible by the Elective Choosing System.
- The university information security system must be compatible with the Internet applications.
- The Elective Choosing System is connected to the university computer and is running all 24 hours a day.
- The users access the Elective Choosing System from any computer that has Internet browsing capabilities and an Internet connection.
- The users must have their correct usernames and passwords to enter into the Elective Choosing System.
- The database used by the Elective Choosing System must be compatible with the interface of the Elective Choosing System.

- **Assumptions and dependencies**

- The users have sufficient knowledge of computers.
- The University computer should have Internet connection and Internet server capabilities.
- The users know the English language, as the user interface will be provided in English
- The product can access the university student database



### **3 Specific Requirements**

This section describes in detail all the functional requirements.

#### **3.1 Functionality**

##### **3.1.1 Logon Capabilities**

The system shall provide the users with logon capabilities.

##### **3.1.2 Mobile Devices**

The Elective Choosing System is also supported on mobile devices such as cell phones.

##### **3.1.3 Alerts**

The system can alert the Faculty or the administrator in case of any problems.

#### **3.2 Usability**

- The system shall allow the users to access the system from the Internet using HTML or its derivative technologies. The system uses a web browser as an interface.

- Since all users are familiar with the general usage of browsers, no specific training is required.

- The system is user friendly and self-explanatory.

#### **3.3 Reliability**

The system has to be very reliable due to the importance of data and the damages incorrect or incomplete data can do.

##### **3.3.1 Availability**

The system is available 100% for the user and is used 24 hrs a day and 365 days a year. The system shall be operational 24 hours a day and 7 days a week.

##### **3.3.2 Mean Time Between Failures (MTBF)**

The system will be developed in such a way that it may fail once in a year.

### **3.3.3 Mean Time to Repair (MTTR)**

Even if the system fails, the system will be recovered back up within an hour or less.

### **3.3.4 Accuracy**

The accuracy of the system is limited by the accuracy of the speed at which the employees of the library and users of the library use the system.

### **3.3.5 Maximum Bugs or Defect Rate**

Not specified.

### **3.3.6 Access Reliability**

The system shall provide 100% access reliability.

## **3.4 Performance**

### **3.4.1 Response Time**

The Splash Page or Information page should be able to be downloaded within a minute using a 56K modem. The information is refreshed every two minutes. The access time for a mobile device should be less than a minute. The system shall respond to the member in not less than two seconds from the time of the request submission. The system shall be allowed to take more time when doing large processing jobs.

### **3.4.2 Administrator/Faculty Response**

The system shall take as less time as possible to provide service to the administrator or the faculty.

### **3.4.3 Throughput**

The number of transactions is directly dependent on the number of users, the users may be the Faculty, students and Admin.

### **3.4.4 Capacity**

The system is capable of handling 250 users at a time.

### **3.4.5 Resource Utilization**

The resources are modified according to the user requirements and also according to the books requested by the users.

## **3.5 Supportability**

The system designers shall take into considerations the following supportability and technical limitations.

### **3.5.1 Internet Protocols**

The system shall comply with the TCP/IP protocol standards and shall be designed accordingly.

### **3.5.2 Information Security Requirement**

The system shall support the SSN information security requirements and use the same standard as the SSN information security requirements.

### **3.5.3 Maintenance**

The maintenance of the system shall be done as per the maintenance contract.

### **3.5.4 Standards**

The coding standards and naming conventions will be as per the American standards.

## **3.6 Design Constraints**

### **3.6.1 Software Language Used**

The languages that shall be used for coding the Online Library System are Active Server Pages (ASP), Java Servlets, Java Server Pages (JSP), HTML, JavaScript, and VBScript. For working on the coding phase of the Online Library System, the Internet Information Services (IIS) Server needs to be installed.

### 3.6.2 Development Tools

Will make use of the available Java Development Tool kits for working with Java Beans and Java Server Pages. Also will make use of the online references available for developing programs in ASP, HTML and the two scripting languages, JavaScript and VBScript.

### 3.6.3 Class Libraries

Will make use of the existing Java libraries available for JSP and Servlets. Also we need to develop some new libraries for the web-based application. Also will develop new programs using ASP and scripting languages.

### 3.7 Purchased Components

The System Administrator will need to purchase the license for IIS Server. Mostly it is available with Windows Environment. So the system need not purchase any licensing products.

### 3.8 Interfaces

#### 3.8.1 User Interface:

##### Logon Screen Prototype:

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SSN COLLEGE  
OF ENGINEERING

EMAIL

PASSWORD

LOGIN SIGNUP

SSN

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## Dashboard:

DASHBOARD:

OBJECTIVES	CHOOSE ELECTIVE	CHANGE ELECTIVE
<ul style="list-style-type: none"><li>HOME</li><li>CHOOSE ELECTIVE</li><li>CHANGE ELECTIVE</li><li>SETTINGS</li></ul>	<p>COURSE AVAILABLE</p> <ul style="list-style-type: none"><li>→ COURSE 1</li><li>→ COURSE 2</li><li>→ COURSE 3</li><li>→ COURSE 4</li></ul> <p>Recommendations based on past courses</p> <ul style="list-style-type: none"><li>→ COURSE 1</li><li>→ COURSE 2</li></ul> <p>Your Past Courses</p> <p>Domain</p> <ul style="list-style-type: none"><li>COURSE 1</li><li>COURSE 2</li><li>COURSE 3</li></ul>	<p>YOUR CURRENT ELECTIVE</p> <ul style="list-style-type: none"><li>→ COURSE 1</li><li>→ COURSE 2</li><li>→ COURSE 3</li></ul> <p>Last Date for Elective Change:</p> <p>xx/xx/xxxx</p> <p><b>CHANGE ELECTIVE</b></p>

### 3.8.2 Hardware Interfaces

The existing Local Area Network (LAN) will be used for collecting data from the users and also for updating the electives list.

### 3.8.3 Software Interfaces

A firewall will be used with the server to prevent unauthorized access to the system.

### 3.8.4 Communications Interfaces

The Open Electives and Professional electives management system will be connected to the World Wide Web.

## 3.9 Licensing Requirements

The usage is restricted to only the SSN College of Engineering, Computer Science Department who is developing the Open electives and professional electives choosing system.

## 3.10 Legal, Copyright, and Other Notices

Open electives and professional electives choosing system is a trademark of SSN College of Engineering and cannot be used without its consent.

### **3.11 Applicable Standards**

The ISO/IEC 6592 guidelines for the documentation of computer based application systems will be followed.

## **4. Supporting Information**

The use-case storyboards or the user-interface prototypes are not available. The appendices are not to be considered as part of the requirements.

## Use Case Description and Diagrams:

### Use Case Description:

Use Case	Elective Allotment System
Scope	EAS Application
Level	User Goal
Primary Actor(s)	<ol style="list-style-type: none"><li>1. Student</li><li>2. Faculty member</li><li>3. Elective Coordinator</li></ol>
Stakeholders and Interests	<ol style="list-style-type: none"><li>1. Student: The student can log in, sign up and view the subject code, names and syllabus available for the semester. They can choose their top three preferences among that particular semester's electives. They can also view the elective that has been allotted to them.</li><li>2. Faculty Member: The faculty member can choose which subject they want to teach among uploaded subjects. They can view the name list of the students who have been allotted the elective that the faculty member is teaching that semester.</li><li>3. Elective Coordinator: The Elective Coordinator can login and upload the available subjects that particular semester. They can view who the faculty members assigned for each subject are. They can also view the students' name lists for each subject.</li></ol>
Preconditions	<ol style="list-style-type: none"><li>1. All actors interacting with the system must have sufficient knowledge of computers.</li><li>2. The actors must have adequate understanding of the English language.</li></ol>

Success Guarantee	<ol style="list-style-type: none"> <li>1. The students will be able to view the subject they have been allotted.</li> <li>2. The faculty members and elective coordinator will be able to view name lists of the students in each class.</li> <li>3. Each class will satisfy the following constraints. <ol style="list-style-type: none"> <li>a) A class can have a maximum of 70 students.</li> <li>b) A class can have a minimum of 30 students.</li> </ol> </li> <li>4. All students who have filled out their preferences will be allotted a subject that is among their three preferences.</li> </ol>
Main Success Scenario	<ol style="list-style-type: none"> <li>1. Elective Coordinator logs in successfully.</li> <li>2. Elective Coordinator uploads Subject Code, Subject Name and Syllabus of the courses available to the students of each semester.</li> <li>3. The Faculty Member logs in successfully.</li> <li>4. The Faculty Member chooses the subject that they have decided to teach that semester.</li> <li>5. The student logs in successfully.</li> <li>6. The student views all available subjects for the semester along with the syllabus and faculty members.</li> <li>7. The student chooses three preferences of elective.</li> <li>8. The student submits their choice before the deadline.</li> <li>9. After the deadline, the student logs in successfully and sees the allotted subject.</li> <li>10. Faculty member logs in successfully and sees the name list of the class they are going to teach.</li> <li>11. Elective Coordinator logs in successfully and sees all name lists of all electives for the semester.</li> </ol>
Extensions	<ol style="list-style-type: none"> <li>1a. Login Fail. Repeat step 1 until successful.</li> <li>3a. Login Fail. Repeat step 3 until successful.</li> <li>5a. Login Fail. Repeat step 5 until successful.</li> </ol>

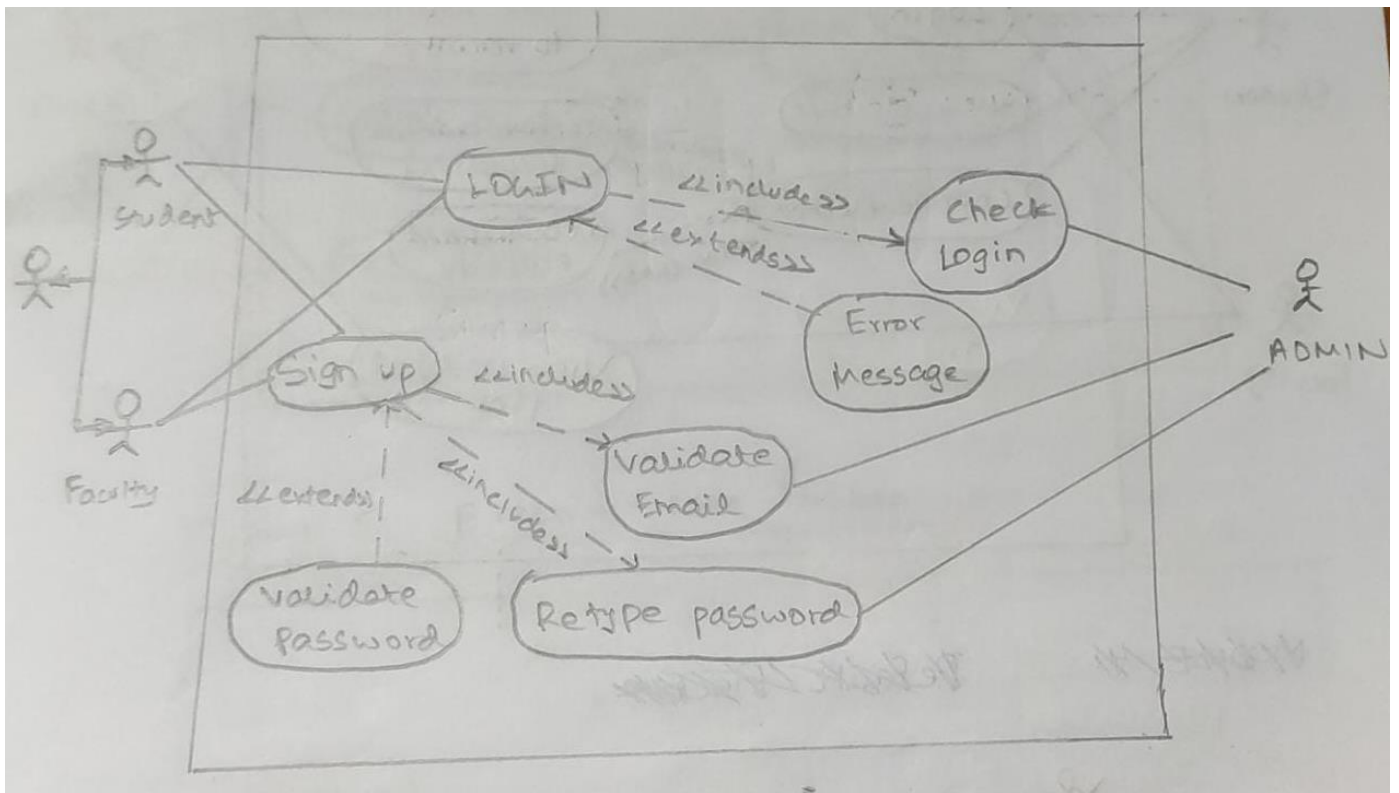


	<p>7a. Students attempt to choose the same subject for more than one preference. Display alert message 'Please choose a different subject.'. Clear the redundant choice.</p> <p>8a. Students fail to submit preferences before the deadline. Continue the process as usual and allot the student an elective such that it fulfils the constraints for each class. Intimate the student that the elective form was not filled in time and under no circumstance will a change be allowed. Display allotted subject as usual.</p>
Special Requirements	Any device (laptop or mobile) with internet facility.
Non-Functional Requirements	Usability, Reliability, Security.
Frequency of Occurrence	This system will be used twice a year.

## Use Case Diagram:

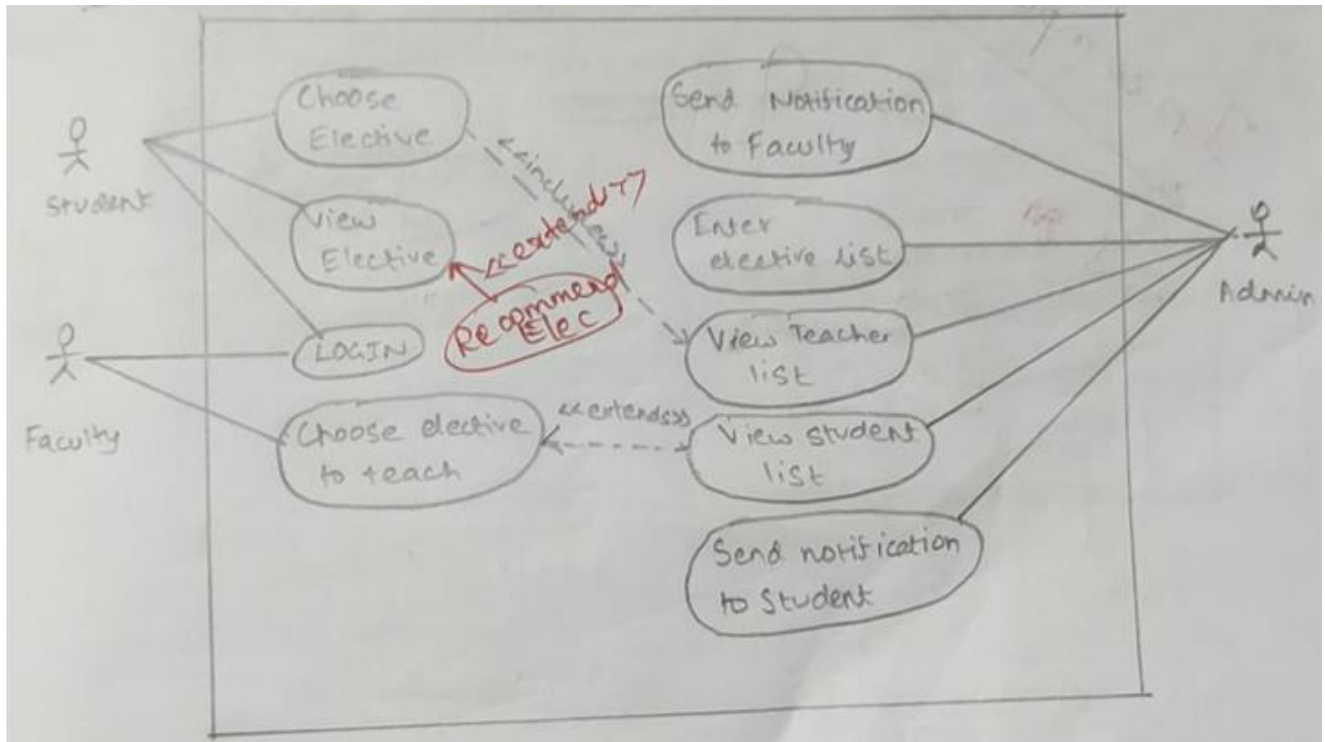
### i. LOGIN PAGE

- The student or faculty member logs into the portal with their details.
- The system checks credentials and logs user in or displays error message if the credentials are wrong.
- If the user is not an existing account holder, system allows them to sign up and validates the user's email and password after it has been retyped.
- The admin performs activities like checking credentials, validating email and passwords.



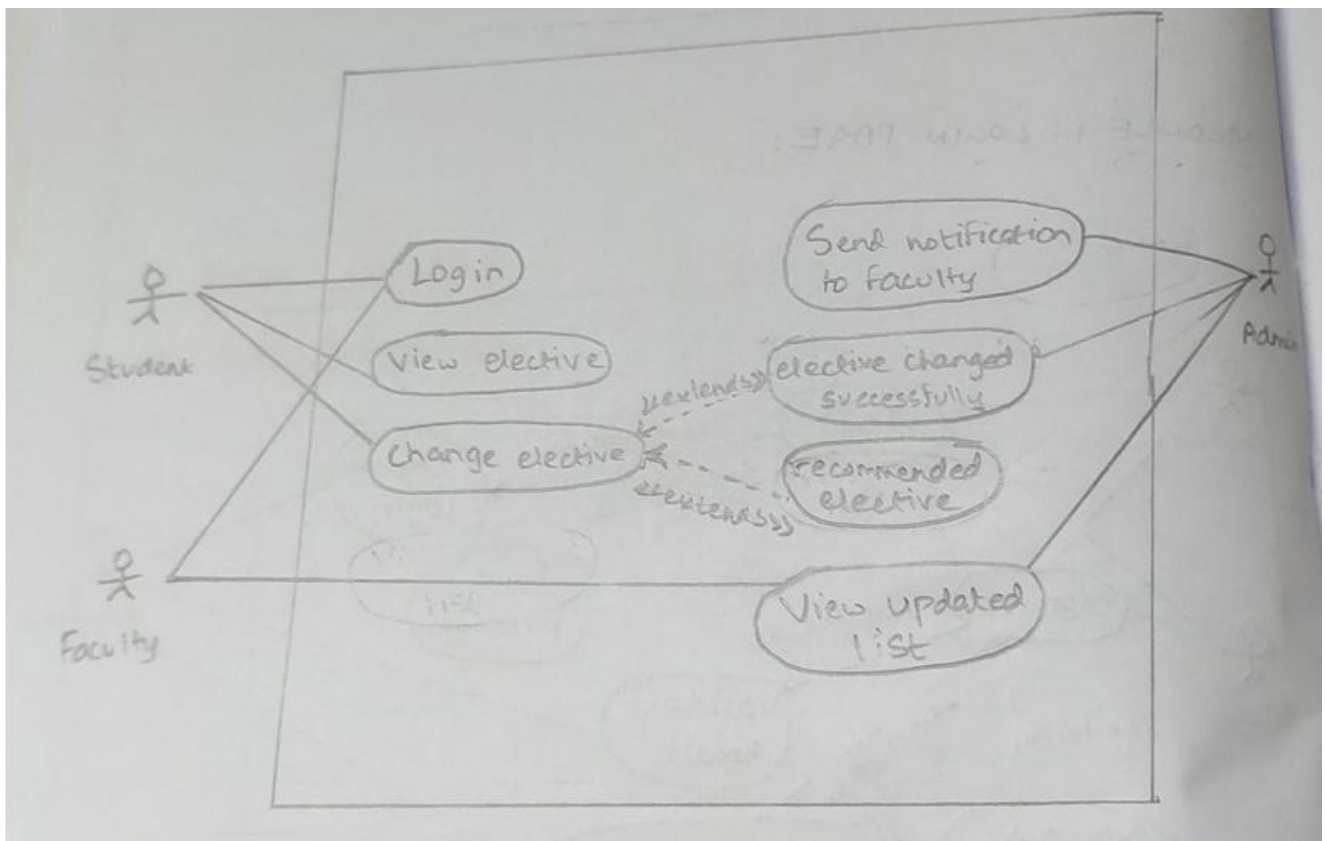
### ii. MAIN SUCCESS SCENARIO

- The student logs in and views the recommendations based on the past courses.
- The student views the full elective list uploaded by the admin and choose the electives from the list.
- Faculty members can login and view the elective list which is uploaded by the admin.
- Faculty members can choose the elective they wish to uptake and view the list of students uploaded by admin after the elective choosing process is completed.
- The admin uploads the list of available electives and notifies the students and faculty to choose their options.
- The admin can view the students and teachers list for the various elective options.



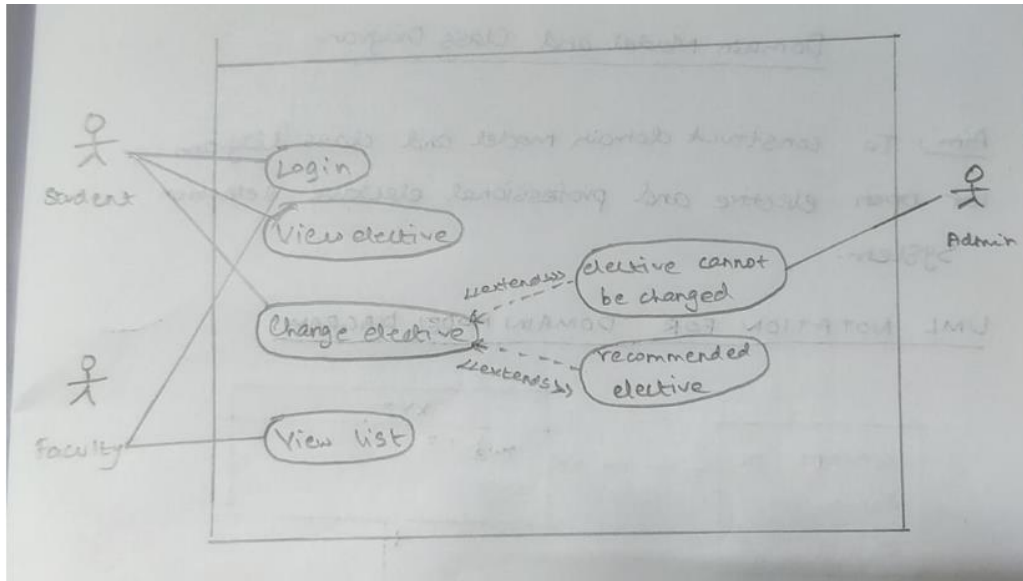
### iii. ALTERNATE SCENARIO 1- ELECTIVE CHANGED SUCCESSFULLY

- Students' login and view their past choice on the dashboard.
- Students can choose to change elective, after which they are presented with the options and recommendations and they choose one.
- Elective is changed successfully.
- The admin notifies the teachers about a change in list of students.
- The faculty members can view the updated list of students in the elective they are teaching.



iv. **ALTERNATE SCENARIO 2- CANNOT CHANGE ELECTIVE**

- Students' login and view their past choice on the dashboard.
- Students can choose to change elective, after which they are presented with the options and recommendations and they choose one.
- Elective is not available so an appropriate message is displayed.
- The faculty members can view the list of students in the elective they are teaching.



v. **ELECTIVE NOT CHOSEN, AUTOMATICALLY ALLOTTED**

- The student logs into the portal and views the recommended options for electives.
- Student can view the multiple elective options available.
- Student exits the portal without choosing an elective.
- Admin chooses an elective for the student based on the number of seats left in the elective options.
- Admin notifies the teachers about the students in each elective.
- Admin notifies the students about electives list.
- Admin/teacher can view the list of students in all the electives.

