Software Requirements Specification

for

Summer Term Processing

Version 3.0 approved

16UCC063, 16UCC092, 16UCS139, 16UCS173, 16UCS183

LNMIIT

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Revision History

Name	Date	Reason For Changes	Version
Group 20.1	**27-08-18**	**Initial preparation**	**V 1.0**
Group 20.1	**02-09-18**	**Client suggestions**	**V 2.0**
Group 20.1	**18-11-18**	**Final version**	**V 3.0**

1. Introduction

1.1.Purpose

Purpose of this document is to present a detailed description of Summer term management tool. It will elucidate the purpose, features, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli. This document is intended for both the stakeholders and the developers of the system.

1.2.Document Conventions

The following documentation conventions are followed in preparing this SRS:

a) All keywords related to the summer term processing are formatted in italics.

b) The priority of a requirement is specified at the end of that requirement in curly braces and using the notation {Priority : nn}, where 'nn' is an integer in the range 00 (lowest priority) to 99 (highest priority).

1.3.Intended Audience and Reading Suggestions

The project is a prototype for summer term management tool and it is restricted within the college premises. This has been implemented under the guidance of college professors. This project will be useful for the academic department and as well as to the students.

1.4. Product Scope

This software system will be a Summer term management tool for LNMIIT whose objective is to coordinate the system in summer term and its scope is:

- Maximizing the registrar's, DOAA's and HOD's work efficiency while remaining easy to understand and use.
- Facilitate communication via electronic mail.
- To make fee payment secure.
- To make it easier for the students and faculty to plan their academic schedules.
- It allows course registration

1.5.References

The following references are used in preparing this SRS:

- Minutes-of-the-Meetings between the LNMIIT SWE Course instructor - Prof. Ravi Gorthi and team members of the project, held on dates August 30th 2018 at the Course instructor's office.
- IEEE standards for SRS - https://ieeexplore.ieee.org/document/278253/?denied

2.Overall Description

2.1.Product Perspective

This is a new, self-contained product. A distributed summer term management system stores the following information:

- **Student details:** It includes the personal information of every student (roll no, student name, father's name, mother's name, date of birth, gender, marital status, email id, mobile no. of student, father and mother, blood group, nationality and a photo). Also, it consists of correspondence and permanent address, admission details (date of admission, payment type, state of eligibility, admission batch, whether or not a student is a hosteler, degree, branch, current year and semester of study), fee details such as fee receipt and previous fee deposit records and academic information which includes registered courses till date, previous semester results, time table and attendance record.
- **Faculty details:** It consists of name of faculty, courses in the domain of research area of the faculty, the experience of that faculty in the particular research area, no. of courses undertaken by the faculty and names of the courses undertaken by .faculty

The following diagrams describes the course list proposal, course registration and fee payment procedure of the Summer term management tool for LNMIIT:

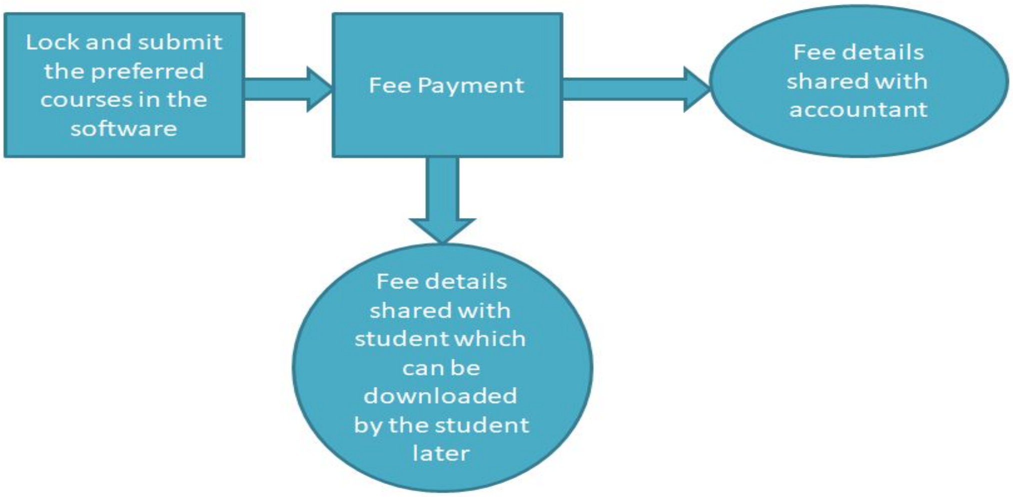
Lock and submit the preferred courses in the software
Fee Payment
Fee details shared with accountant
Fee details shared with student which can be downloaded by the student later

Figure 1 : Registration and fees payment by students

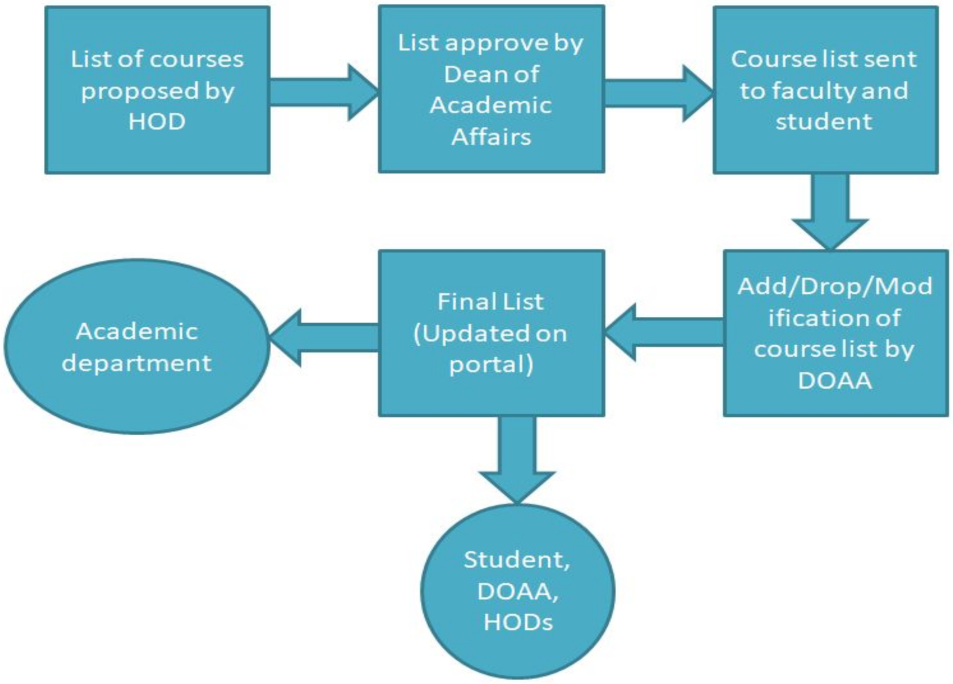
List of courses proposed by HOD
List approve by Dean of Academic Affairs
Course list sent to faculty and student
Add/Drop/Modification of course list by DOAA
Final List (Updated on portal)
Academic department
Student, DOAA, HODs

Figure 2 : Course list proposal

2.2.Product Function

This software package is expected to offer the following services:

- **For HOD:**
  1. Facility to select the courses from their respective department that can be offered in the summer term
  2. Facility to select course faculty for each course.
  3. Facility to approve the final list of courses.
  4. Facility to view grades and marks of all students.
  5. Facility to view timetable of their classes.

- **For DOAA:**
  1. Facility to approve the final list of courses after the approval by HOD
  2. Add, drop and modify courses in list approved by HOD.
  3. Write comments, give suggestions and include exceptions in course list generation.
  4. Facility to view timetable.
  5. Facility to view grades and marks of students

- **For Students:**
  1. Facility to select the courses they want to take in summer term from list of courses provided for registration.
  2. Facility to enroll the courses that are available in the final list of offered courses for summer term.
  3. Facility of Fee Payment after the registration.
  4. Facility to view time table.
  5. Facility to view grade sheet.

- **For Accountant:**
  1. Facility to check the fee status of the enrolled students.

- **For Assistant Registrar:**
  1. Facility of generating the time table for class, mid term and end term.
  2. Facility of generation of Grade-Sheet.
  3. Facility to view list and enrolled students and their academic details.

- **For Course Faculty:**
  1. Facility to check the time table of their lectures.
  2. Facility to check the list of students enrolled in their courses.
  3. Facility to upload marks for their subject.
  4. Facility to generate grades.

2.3.User Classes and Characteristics

This software will be used by four type of users:

- **HOD:**
  1. Select the courses and course faculty from his/her department that can be offered in summer term.
  2. Propose a list of courses for summer term.
  3. Add, modify or drop course from the initially proposed list.

- **DOAA:**
  1. Manage all the exceptions with respect to the guidelines and rules mentioned in software requirement specification.
  2. Approve list of available courses after it is approved by HOD of a department.
  3. Add, modify and drop courses with comments.

- **Students:**
  1. Students can register for courses which are available for summer term.

2. Fees can be paid for all selected courses from list of available courses.
3. View Time table.
4. View Grade-sheets.

- **Accountant:**
    1. View fee details of the student so they have reading rights only.

- **Assistant Registrar:**
    1. AR can upload the time table.
    2. Add grade-sheet to the student details without modification in the previous one.

- **Course faculty:**
    1. Can view their own time table.
    2. Details of students who have enrolled for their courses.

2.4.Operating Environment

Operating environment for the summer term management tool is as listed below:

- Distributed database
- Client/server system
- Operating System: Windows 10, Ubuntu 16.04
- Database: SQL database, Java
- Platform: JS, NodeJS, Angular JS, HTML5, CSS

2.5. Design and Implementation Constraints

- The software package should be architected as a multi-tier system (separate web-server, application and RDBMS servers) with duplication of each type of server to achieve fault-tolerance.
- If 500 students try to access the server at the same time then it can handle load on both the servers using load balancer.

2.6. User Documentation

- User documentation to guide user through process of add/drop/modification of courses by HOD and DOAA, enrollment for courses, generation of time table and allocation of courses and faculty and new grade sheet generation with updated grades for summer term courses .
- The details of the software:
    1. Inception: Initial Analysis and requirements.
    2. Elaboration: High level design, elaborated analysis.

3. Construction: Test Cases of this software package will be delivered along with software.
4. Transition: Delivering and Maintenance of software.

2.7 Assumptions and Dependencies

- The proposal of the course list by the HOD is done only after the confirmation of the presence of concerned course faculty.

3. External Interface Requirements

Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed. Details of the user interface design should be documented in a separate user interface specification

3.1 User Interfaces

- The set of User Interfaces consists of the four types of users:
  a. Students - Has the rights to edit his/her details, view time table, select courses, pay fee and view fee details.
  b. HOD - Has the rights to select courses and course faculty.
  c. Course faculty -Has rights to view time table and details of students enrolled in his course. He has the rights to add and update the grades of the students enrolled in his course.
  d. DOAA - Has rights to approve list of courses for summer term and add, drop and modify courses along with comments.
- To add, drop and modify different available courses.
- For course registration and fee payment.
- To view time table
- To view grade sheets.

3.2 Hardware Interfaces

NIL.

3.3 Software Interfaces

This software package has an interface with

i) Secure payment API (Application Programming Interface).
ii) API of student data maintenance (as mentioned in Section 2.1).
iii) Grade Sheet generation module.
iv) API of the project on Curriculum Data Maintenance
v) API of the project on Faculty Data Maintenance
vi) Time table generation module

3.4 Communications Interfaces

- This software package should be securely accessible through intranet/internet communication channels (wired or wireless).
- Users will be notified with notifications sent to them.

4. System Features

The requirements of this software package are described per each category of User:

i) All requirements of the students of LNMIIT.
ii) All requirements of HOD of LNMIIT.
iii) All requirements of DOAA.
iv) All requirements of the course faculty.
v) All requirements of Accountant
vi) All requirements of Assistant Registrar.

4.1 Functional Specifications

4.1.1 All the Requirements of the Students of LNMIIT:

1. Description and Priority

   The TBD (to-be-developed) software package should facilitate the students of LNMIIT to:

   a) Add/drop/modify their selected courses before final submission of their choices.
   b) Course registration .
   c) Course enrollment
   c) Fees Payment
   d) Can see their results of previous semesters
   e) Can view their time table.
   f) Modify their individual student details.
   g) View their grade sheet.
   h) Generate fee slip

   Other student details are mentioned in Section 2.1.

The priority of this requirement is 90 (without this facility, remaining functionalities with respect to this software won't work).

2. Stimulus/Response Sequences

Table 1 : Stimulus/ Response with reference to students

Sr. No.	**Stimulus from the student**	**Response from the software**
1.	Course list studied by student and then opting at max three courses according to his/her preference	Final list of courses sent to HOD and add/ drop / modification process takes place
2.	Locking and submitting of the opted courses	Fee Payment Portal is opened and Accounts Department update the students' name in the list containing the fee details.
3.	Student checks his/her result after exams	Grade Sheet is displayed
4.	View time time table	Time table is displayed.
5.	Opting courses from the final list sent by DOAA	The student is asked to lock and submit the choices.
6.	View grade sheet	Grade sheet is displayed
7.	Generate fee slip	A new window with the fee receipt is displayed for download.

4.1.2. All the Requirements of the HOD of LNMIIT:

1. Description and Priority

The TBD (to-be-developed) software package should facilitate the HOD of any of the six departments of LNMIIT to:

a) HOD can approve list of courses which are to be offered during summer term.
b) HOD can propose list by selecting course and course faculty for his department.
c) Add/drop and/modification of courses

d) View time table
e) View marks and grades of students.

2. Stimulus/Response Sequences

The priority of this requirement is 95.

Table 2 : Stimulus/ Response with reference to HOD

S. No.	Stimulus from the HOD	Response from the software
1.	Propose list of courses by HOD (considering addition, modification and dropping of the courses)	Final list of courses is generated and is sent for approval to DOAA.
2.	Selects course and corresponding course faculty	Final list of courses is generated and is sent for approval to DOAA
3.	View time time table	Time table is displayed.
4.	Selects a course from his/her department to view marks and grades of students	The marks and grades of all students for that course is displayed.

4.1.3. All the Requirements of the DOAA of LNMIIT:

1. Description and Priority

The TBD (to-be-developed) software package should facilitate the DOAA of LNMIIT to :

- approve the list of courses which are to be offered during summer term after the approval by HOD.
- Add comments before addition and deletion of courses in proposed list.
- View grades of students and list of students in each department.
- View timetable.

2. Stimulus/Response Sequences

The priority of this requirement is 95.

Table 2 : Stimulus/ Response with reference to DOAA

S. No.	Stimulus from the DOAA	Response from the software
1.	Adding or Dropping of a course with the comments.	Modified list of courses(after add/drop) is again sent to HOD.
2.	Approval of the final course-list.	Display the final-list on the portal.
3.	Adding comments	Comments are added before courses that need to be added or deleted in the proposed list.
4.	A department is selected to view grades.	Displays all the courses in that department.
5.	Selects a course from the list of courses in that department to view grades and list of students.	Grades and list of students of that course is displayed.

4.1.4. All the Requirements of the course faculty of LNMIIT:

1. Description and Priority

   The TBD (to-be-developed) software package should facilitate the course faculty of LNMIIT to:

   - View their time-table and the name and roll number of the student enrolled in their course.
   - Add marks of students enrolled in their class.
   - View time table.

2. Stimulus/Response Sequences

The priority of this requirement is 80.

Table 2 : Stimulus/ Response with reference to course faculty

S. No.	Stimulus from the Course Faculty	Response from the software
1.	View the time table of their classes.	Time-Table is displayed.
2.	View the student’s name and roll number	Display the student’s name and roll number.
3.	Add and update the grades of the students	The updated grades are stored and are reflected when the grade sheet is viewed or downloaded.
4.	Add marks of students enrolled in the class	List of all the students enrolled in that course is displayed where marks can be entered.
5.	View time table	Time table is displayed.

4.1.5. All the Requirements of the accountant of LNMIIT:

1. Description and Priority

   The TBD (to-be-developed) software package should facilitate the accountant of LNMIIT to view the fee details of the registered student.

2. Stimulus/Response Sequences

The priority of this requirement is 80.

Table 2 : Stimulus/ Response with reference to course faculty

S. No.	Stimulus from the Accountant	Response from the software
1.	View the fee detail of a student.	Fee detail of the student is displayed.

4.1.6. All the Requirements of the Assistant Registrar of LNMIIT:

1. Description and Priority

The TBD (to-be-developed) software package should facilitate the Assistant Registrar of LNMIIT to generate and upload the time-table and grade sheet.

2. Stimulus/Response Sequences

The priority of this requirement is 80.

Table 2 : Stimulus/ Response with reference to course faculty

S. No.	Stimulus from the Assistant Registrar	Response from the software
1.	Generating and uploading of the time-table	Time Table is displayed on the portal.
2.	Generating and uploading of the grade-sheet	Grade-sheet is visible to the students..

5. Other Nonfunctional Requirements

5.1 Performance Requirements

Each transaction should have a turn-around time of less than 5 seconds if there are 100 users accessing this software per hour. Each registration of course should be given a session of at maximum of ten minutes.

5.2. Safety Requirements

- Create a backup of all these files on cloud every 4 hours at the time of registration so that student details are available when required.

5.3. Security Requirements

1. The server on which all the data resides will have its own security to prevent unauthorized *write*/*delete* access. There is no restriction on *read* access.
2. Student Details: The students details like the student roll number, course, etc. that student has filled cannot be changed by any other person.
3. Authentication: Authentication is provided by providing a user id and password for every user who is accessing the portal.
4. When the user performs any actions, Authorize him / her to perform the actions allowed for the user and display an error message if found to be not authorized;
5. Use a 64 bit key to encrypt all data of all the transactions transferred to and from the thin client and the server; similarly, encrypt all the data that is stored in the database tables / XML files
6. Payment API has its own encryption protocol which makes the payment secure.

5.4. Other Software Quality Attributes

NIL

5.5. Business Rules

- User must be a registered on software as LNMIIT staff or student.
- **Student Eligibility Criterion :**
    - Only those students can apply for summer term courses who are having F or D or I grade in available courses.
    - Students who have F and I grade will repeat the course.
    - Students who have D grade will improve the course.
- **Faculty Criterion :** Decided by Head of Department.
- At max only three courses from the list of available courses can be chosen by a student in a summer term.
- None of the courses can have less than 10 enrolled students unless approved by DOAA.
- A course faculty may or may not take one or more courses.
- Fee for each registered course is Rs. 10,000 and will be reviewed each year.
- Fee paid by a student may be less than calculated fee if approved by DOAA and can be paid in installments.

6. Other Requirements

NIL

Appendix A: Glossary

Table 1: Glossary

S. No.	TERM	DESCRIPTION
1.	LNMIIT	LNM Institute of Information Technology
2.	HOD	Head of Department. It can be any one of the following six departments - Computer Science, Electronics, Mechanical, Physics, Mathematics and Humanities & Social Sciences depending on the course selected.
3.	Course faculty	It is a division within a university or college comprising one subject area, or a number of related subject area.
4.	Registrar	A registrar is an official in an academic institution who handles student records.
5.	Student	Any person who is currently studying or has been enrolled(for a maximum period of six years) in a Bachelor's or Dual Degree programme at LNMIIT and enrolling for the summer term.
6.	Stakeholder	Any person with an interest in the project offered to him/her and is not a developer.
7.	Database	A structured set of data held in the computer in which the software is running, especially one that is accessible in various ways
8.	Software Requirement Specification	A software requirements specification (SRS) is a description of a software system to be developed.

9.	User	Student, Registrar, Course Faculty, HOD, Dean of Academic Affairs(DOAA), Accountant.
10	DOAA	Dean of Academic Affairs
11	Academic details	University educational outreach

**** END OF SRS ****