



KANNUR UNIVERSITY

Functional Requirement Specifications (Draft)

For

Automation of Examination Management System

Abbreviations Used

Abbreviation	Expansion
AR	Assistant Registrar
CBCSS/CCSS	Choice Based Credit Semester System
CE	Continuous Evaluation
CGPA	Cumulative Grade Point Average
CoE	Controller of Examination
CSS	Credit Semester System
CSS	Cascading Style Sheet
DR	Deputy Registrar
ESE	End Semester Evaluation
GPA	Grade Point Average
HTTP	Hyper Text Transport Protocol
ICT	Information and Communication Technology
JR	Joint Registrar
NCC	National Cadet Corps
NSS	National Service Scheme
RFID	Radio Frequency Identification
SGPA	Semester Grade Point Average
SO	Section Officer
SSL	Secure Sockets Layer
VC	Vice Chancellor

About the Kannur University

Kannur University was established by the Act 22 of 1996 of Kerala Legislative Assembly. The University by the name “Malabar University” had come into existence earlier by the promulgation of an Ordinance by the Governor of Kerala, on 9th November 1995. The University was inaugurated on 2nd March 1996 by the then Chief Minister of Kerala, Sri. A.K Antony. The objective of the Kannur University Act 1996 is to establish in the Kerala state, a teaching, residential and affiliating University, promoting the development of higher education in Kasargod and Kannur revenue Districts and the Mananthavady Taluk of Wayanad District.

Kannur University is unique in the sense that it is a multi- campus university with campuses spread over at various locations under its jurisdiction. The Act envisages that the University shall establish, maintain, manage and develop campuses at Kannur, Kasaragod, Nileswaram, Mangattuparamba, Mananthavady, Payyannur, Thalassery and such other places as are necessary for providing study and research facilities to promote advanced knowledge in Science and Technology and other relevant disciplines.

1. Introduction

In University the examinations play an important role in imparting education and knowledge to students. The examination is an instrument to evaluate the knowledge, understanding and learning of students. For Teachers, Examinations provide feedback to evolve their way of teaching.

The proposed system is integrated and automating various activities of the examination system at different administrative levels to bring reliable, efficient, scalable, transparent and robust e-governance solutions

Purpose

This document specifies the requirements for the examination system for Kannur University in detail.

Scope

The scope of this document includes the description of the current and proposed system, the functional and interface requirements and the suggestions to the project implementation.

Overview

This document begins with the explanation of existing system. Section 3.3 details the proposed system of examination system. The functional requirements are detailed in section 4.

2. System Overview

Existing System

The University has witnessed enormous growth in terms of the number of students enrolled, number of courses offered, the number of institutes etc. As a result of this growth, the examination system has become quite complex and complicated. The management of large volumes of student's examination data is a tiresome and tedious job involving different types of data by different administrative line branches. There are several departments involved in the work of the examination process and each process are associated each other. The university has already initiated computerization in the examination.

The automation of one departmental process will not reduce the workload of the examination process, it requires faster and better communication, efficient storage and retrieval and processing of data and exchange and use of information to its users, be they people, groups, businesses, organizations or governments.

Organization structure

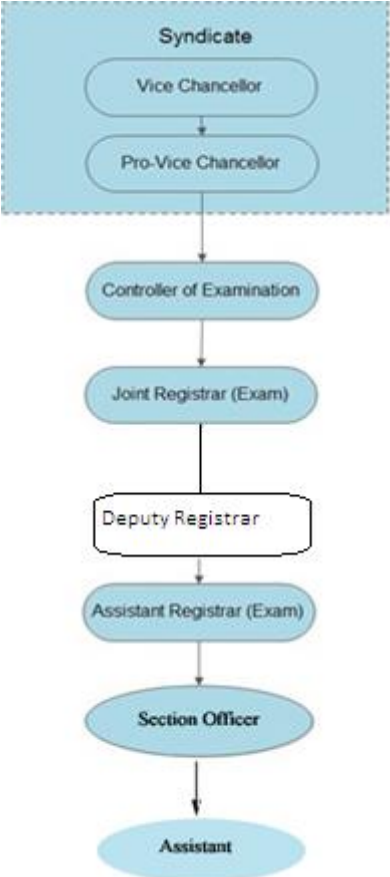


Figure 1: Organization structure

Examination process flow

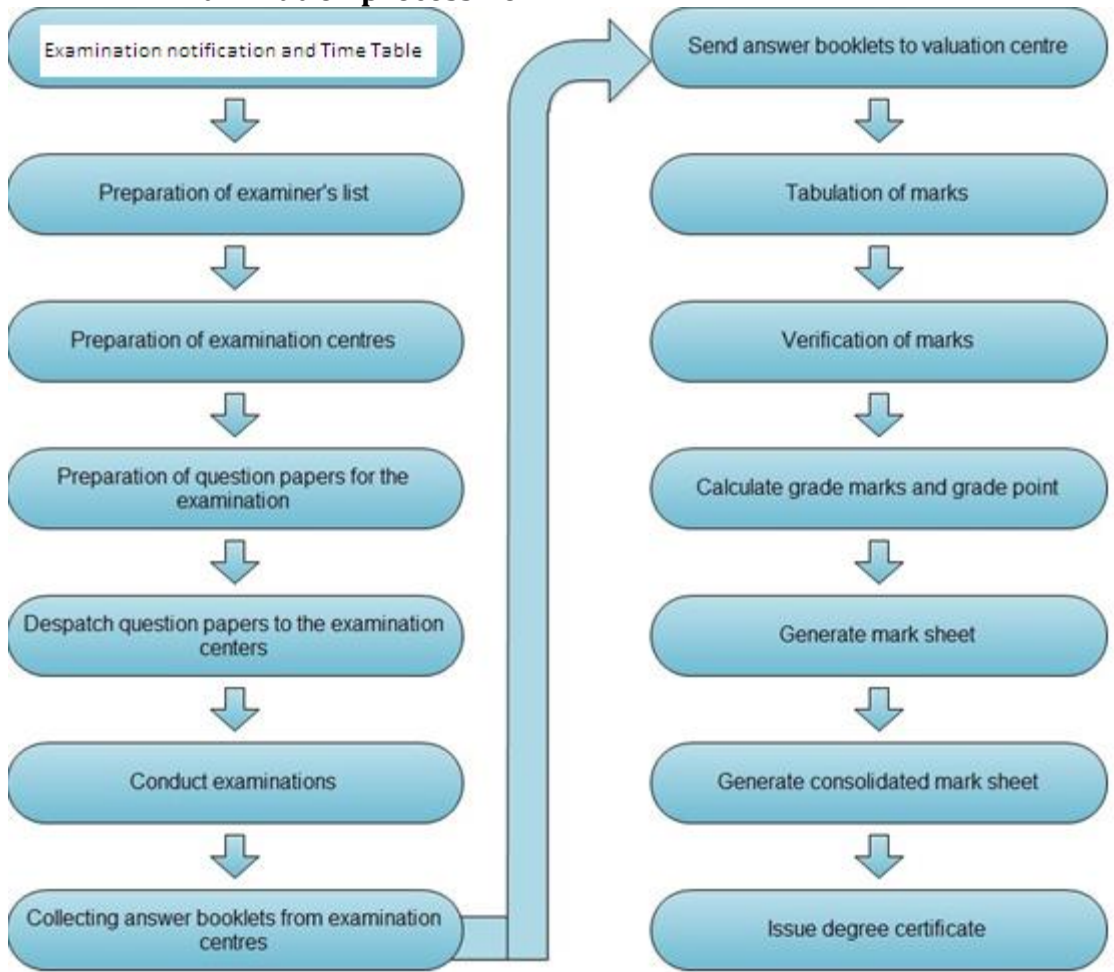


Figure 2: Examination Process flow

Category of degree course schemes

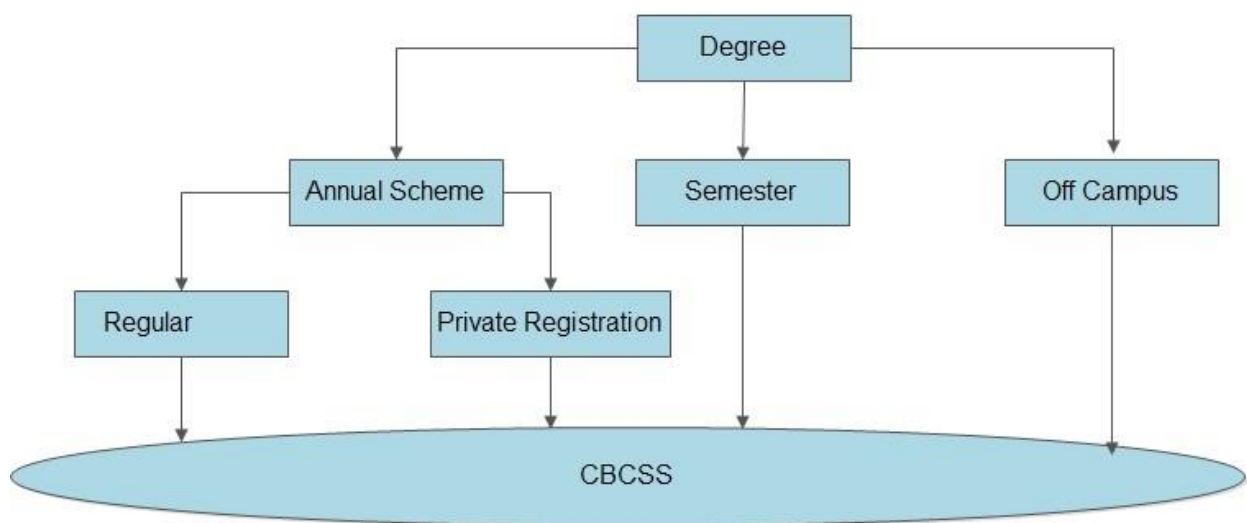


Figure 3: Examination Schemes

Examination System structure

The examination system structure includes various activities involved in the examination system of the University. The below figure illustrates the hierarchical structure of the major activities involved in University examination.

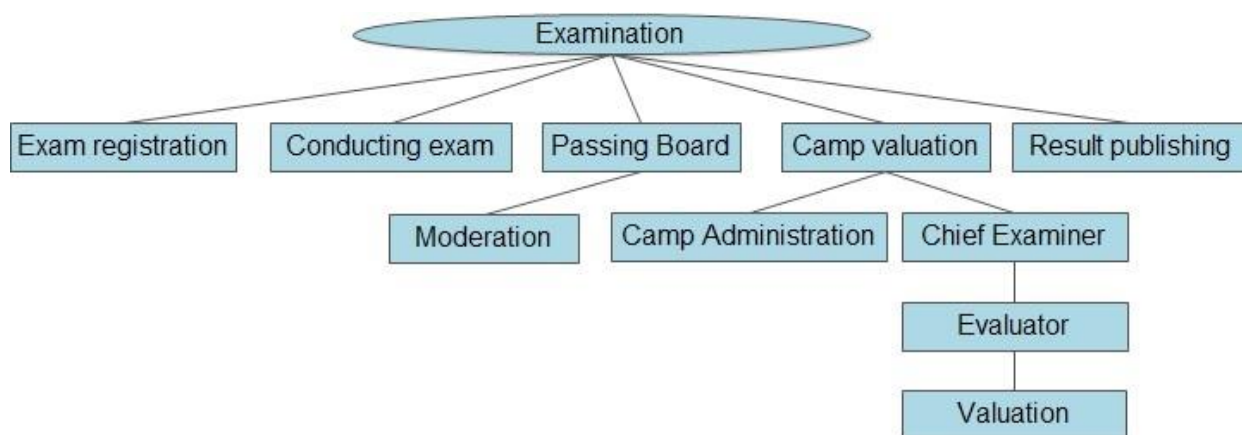


Figure 4: Examination System Structure

Category of Semester System

Choice Based Credit Semester System (CBCSS/CCSS)

Kannur University has implemented choice based credit semester system with grading for all undergraduate programmers from the academic year 2009-2010. The syllabi of all degree courses have been revised to fit into the new system.

The University implements a direct grading system from 2019 onwards. Each course will be based on grade system, in five point scale and the programme will be graded on a 7 point scale. A student should get an overall C grade for a pass for a programme. The CBCSS course shall apply to all regular non-professional undergraduate programmes conducted by the University..

The terminologies used in CBCSS and its definitions are listed below

- 'Academic Week' is a unit of five working days in which distribution of work is organized from day one to day five, with five contact hours of one hour duration on each day. A sequence of 18 such academic weeks constitutes a Semester.
- 'Additional Course' is a course registered by a student over and above the minimum required Courses, the credits earned for which will not be counted for the computation of SGPA and CGPA.

- 'Audit Course' is a Course for which no credits are awarded.
- 'College Co-ordinator' is a teacher nominated by the College Council to co-ordinate the effective running of the Open Courses and Continuous Evaluation undertaken by various departments within the College. He/she shall be nominated to the College level Monitoring Committee.
- 'Common Course' means a Course that comes under the category of Courses, including compulsory English and additional language Courses, a selection of which is compulsory for all students undergoing undergraduate Programmes and also a set of General Courses applicable for LRP Programmes.
- 'Complementary Course' means a Course which would enrich the study of Core Course.
- 'Core Course' means a Course in the subject of specialization within a degree Programme.
- 'Course' means a complete unit of learning which will be taught and evaluated within a Semester.
- 'Credit' is a unit of academic input measured in terms of weekly contact hours/course contents assigned to a Course.
- 'Credit point (P)' is the value obtained by multiplying the Grade Point Average by the Credit.
- 'Cumulative Grade Point Average (CGPA)' is the value obtained by dividing the sum of credit points in all the Courses taken by a student for the entire Programme by the total number of credits. CGPA shall be rounded off to two decimal places. CGPA indicates the broad level of academic performance of a student in a Programme. An overall letter grade (Cumulative Grade) for the entire Programme shall be awarded to a student depending on his/her CGPA.
- 'Department' means any teaching department in a College.
- 'Department Co-ordinator' is a teacher nominated by a Department Council to co-ordinate the Continuous Evaluation undertaken in that Department.
- 'Department Council' means the body of all teachers of a department in a College.
- 'Extra Credits' are additional credits awarded to a student over and above the minimum credits required for a Programme for achievements in co-curricular activities carried out outside the regular class hours, as decided by the University.
- 'Faculty Advisor' means a teacher from the parent department nominated by the Department Council, who will advise the student in the choice of his/her Courses and other academic matters.
- 'Grace Grade' means up-graded grade awarded to Courses in recognition of meritorious achievements in Sports/Arts/NCC/NSS.
- 'Grade' means a letter symbol (e.g. A, B, C, etc.), which indicates the broad level of performance of a student in an answer/Course/ Semester/Programme.
- 'Grade point (G)' is an integer indicating the numerical equivalent of the letter grade.
- 'Grade Point Average (GPA)' means total weighted Grade Points divided by total weights.

- 'Open course' means a course outside the field of his/her specialization, which can be opted by a student.
- 'Parent Department' means the department which offers Core Courses within a degree Programme.
- 'Programme' means a three year Programme of study and examinations spread over six semesters, the successful completion of which would lead to the award of a degree.
- 'Repeat Course' means a Course that will be repeated by a student for want of sufficient attendance. He/she can repeat the Course whenever it is offered again.
- 'Semester' means a term consisting of a minimum of 450 contact hours distributed over 90 working days, inclusive of examination days, within 18 five-day academic weeks.
- 'Semester Grade Point Average (SGPA)' is the value obtained by dividing the sum of credit points (P) obtained by a student in various courses taken in a semester by the total number of credits taken by him/her in that semester. SGPA shall be rounded off to two decimal places.
- 'Weight' is a numerical measure quantifying the comparative range of an answer or the comparative importance assigned to different components like theory and practical, internal and external examinations, Core and Complementary subjects etc.
- 'Weighted Grade Point' is the product of grade points multiplied by weight.
- 'Zero Semester' A Semester in which a student is permitted to opt out due to unforeseen, genuine reasons.

Structure of CBCSS Programme

- Duration: The duration of an undergraduate programme shall be a minimum of 3 years consisting of 6 Semesters. The odd semester shall be held from JUNE to OCTOBER and even semester from DECEMBER to APRIL. Monday to Friday will be working days. The undergraduate programme shall be completed within a minimum of six and maximum of twelve continuous semesters, with provision for zero semesters. If a student does not clear a course within the regular schedule, he/she shall reappear for the course when the course is again offered along with the subsequent batch. If minimum requirements of attendance and Continuous Evaluation are fulfilled, these need not be repeated.
- Courses: The undergraduate programme shall include four types of Courses, viz. Common Courses (A), Core Courses (B), Complementary Courses (C) and Open Courses (D). The minimum number of Courses required for completion of an undergraduate program may vary from 30 to 40, depending on the credits assigned to different Courses.
- Course code: Each course shall have an alphanumeric code, which includes the semester number (1 to 6) in which the Course is offered, the type of the Course (A to D) and the serial number of the Course (01, 02...) and a three letter code representing the nature of the Course, except Common Course. For example, 2A03 represents a

Common Course of serial number 03 offered in the 2nd semester and '2B02PHY' representing second semester Core Course 2 in Physics Programme.

- Credits: An undergraduate programme shall have a minimum of 120 credits. Courses shall be designed by Boards of Studies with a maximum of five credits, depending on the extent of coverage required in different subject areas. The University will work out the equivalence between the number of credits and the number of contact hours, taking into consideration the existing workload for different subjects.
- Core Courses (B): Core Courses offered by the parent department shall include methodology Courses pertaining to the stream, subject of specialization and Informatics relevant to the subject of specialization, one Elective and one Project, provided that Courses taken as part of the Common Courses will not be repeated.
- Complementary Courses (C): Complementary Courses shall be offered by the relevant Department.
- Open Courses (D): A student can opt for two Open Courses from any subject other than the subject of his/her specialization. Open Courses are to be of 2 hours 2 credits during the V & VI Semesters. The number of Open Courses offered by a College will be decided by the College Level Monitoring Committee taking into account the preferences of students and the need to fully utilize the services of existing teachers.
- Additional Courses: A student can register for additional Courses over and above the minimum required courses from among the Courses offered by a College, on the advice of the Faculty Adviser depending on the facilities available in the College.
- Audit Courses: Credit Courses can be registered as Zero Credit Audit Courses by students, on the advice of the Faculty adviser depending on the facilities available in the College concerned.
- The distribution of Common, Core, Complementary and Open courses across six semesters shall be decided by the University.
- The minimum credit requirement for successful completion of the programme are summarized below:

Minimum credit requirement of the Undergraduate programme

Programme duration	6 semesters
Minimum Credits required for successful completion of the programme	120
Minimum credits required for Common Courses	38
Minimum credits required for Core and Complementary Courses	78
Minimum credits required for Open Courses	4

- Grace Grades: Grace Grades shall be awarded in recognition of meritorious achievements in Sports/Arts/NSS/NCC by upgrading grades awarded to Courses to the next higher grade, provided such up-gradation is limited to a maximum of 8 Courses within a year of the programme. Detailed guidelines will be issued by the University in this respect.

- **Extra Credits:** Extra credits may be awarded to a student for achievements in co-curricular activities carried out outside the regular class hours, as decided by the University. These credits shall not be counted while considering the minimum credits (120) for completing the programme. The University shall frame detailed guidelines for the award of co-curricular credits and grades.
- **Attendance:** A student shall be permitted to appear for the semester examination, only if he/she secures not less than 75% attendance in each Semester. Condonation of shortage of attendance for a maximum of 12 days for a maximum of two spells within a programme may be granted as per the existing University rules. A student who is not eligible for such condonation shall repeat the Course along with the subsequent batch.
- **Credit Transfer:** The credits acquired for courses in another University would be accepted on a reciprocal basis subject to UGC norms.

Evaluation of CBCSS Programme

1. The evaluation scheme for each course shall contain two parts:

- Continuous Evaluation (CE)
- End-Semester Evaluation (ESE)

25% weight shall be given for Continuous Evaluation (CE). The remaining 75% weight shall be given for End-Semester Evaluation (ESE).

2. Continuous Evaluation (CE):

Continuous Evaluation (CE) of a course shall be based on periodic written tests, Assignments, Seminars and Attendance.

Components of Continuous Evaluation (Theory)

Component	Weight
Attendance	1
Assignment	1
Seminar/Viva	1
Two test papers	2

Components of Continuous Evaluation (Practicals)

Component	Weight
Attendance	1
Practical Test /Lab Skill	2
Practical Record	1
Viva	1

3. End-Semester Evaluation (ESE):

The End-Semester Evaluation in theory Courses is to be conducted with question papers set by external examiners. Answer papers will be bar coded to ensure confidentiality. The evaluation of the answer scripts shall be done by external examiners on the basis of a well-defined scheme of evaluation. The evaluation shall be done immediately after the examination by holding zonal valuation camps, preferably district-wise. End-semester Evaluation in practical Courses shall be conducted and evaluated by two examiners - one internal and the other external. The duration of both theory and practical examinations shall be decided by the Board of Studies concerned.

4. Improvement:

A student who secures a grade other than E in a Course in a subject is permitted to register within 14 days after the declaration of results for re-examination, for improving the performance if she/he desires so, and can appear for the re-examination in the subsequent chance. 8 The student need not attend classes again to appear for re-examination. The Internal Grade already obtained will be carried forward to determine the new grade in the re-examination. If the candidate fails to appear for the improvement examination after registration, or if there is no change/upgradation in the grade after availing the improvement chance, the grade obtained in the first appearance will be retained. There shall be no improvement chance for the grade obtained for Internal Evaluation. There shall not be more than one improvement chance.

Grading

1. Direct Grading: Both CE and ESE will be carried out using Direct Grading System on a 5-point scale as given below:

Letter Grade	Performance	Grade Points (G)	Grade Range
A	Excellent	4	3.50 to 4.00
B	Very Good	3	2.50 to 3.49
C	Good	2	1.50 to 2.49
D	Average	1	0.50 to 1.49
E	Below Average	0	0.00 to 0.49

In direct grading, each descriptive answer is directly given a letter grade in place of marks, based on an assessment of the quality of the answer. In case of objective type questions, grading is undertaken by bunching them into 4. Thus, if all the 4 answers in the bunch are correct, the bunch can be graded as A; if 3 are correct the Grade is B; if 2 are correct the Grade is C; if 1 is correct the Grade is D; if no answer is correct, the Grade is E.

2. Each course is evaluated by assigning a letter grade (A, B, C, D or E) to that course by the method of direct grading. The Internal (weight=1) and External (weight=3) components of a course are separately graded and then combined to get the grade of the course after taking into account of their weights (See Appendix for details).

3. An aggregate of C grade (when external and internal put together) is required in each course for a pass and also for awarding a degree.
4. A student who fails to secure a minimum grade for a pass in a course is permitted to write the examination along with the next batch.
5. After the successful completion of a semester, Semester Grade Point Average (SGPA) of a student in that semester is calculated using the formula given below. For the successful completion of a semester, a student should pass all courses and score a minimum SGPA of 2.0. However, a student is permitted to move to the next semester irrespective of her/his SGPA.

For instance, if a student has registered for 'n' courses of credits C1 , C2 , ,Cn in a semester and if she/he has scored credit points P1 , P2 , , Pn respectively in these courses, then SGPA of the student in that semester is calculated using the formula.

$$SGPA = \frac{P1 + P2 + \dots + Pn}{C1 + C2 + \dots + Cn}$$

The Cumulative Grade Point Average (CGPA) of the student is calculated at the end of a programme. For the computation of CGPA, only the best performed courses with maximum

credit points (P) alone shall be taken subject to the minimum credits requirements. The CGPA of a student determines the overall academic level of the student in a programme and is the criterion for ranking the students. CGPA can be calculated by the following formula:

$$CGPA = \frac{(SGPA)_1 S_1 + (SGPA)_2 S_2 + \dots + (SGPA)_6 S_6}{S_1 + S_2 + \dots + S_6}$$

Here, (SGPA)_i with i = 1, 2, 3, ..., 6, is the SGPA of the ith semester and S_i is the total credits taken in the ith semester.

SGPA and CGPA shall be rounded off to two decimal places. CGPA determines the broad academic level of the student in a programme and is the index for ranking students. An overall letter grade (Cumulative Grade) for the entire programme shall be awarded to a student depending on her/his CGPA. An overall letter grade (Cumulative Grade) for the whole programme shall be awarded to the student based on the value of CGPA using a 7-point scale given below. For instance, if CGPA of a student turns out to be 3.42, then her/his Cumulative Grade will be B+.

Overall Grade in a Programme

CGPA	Overall Letter Grade
3.80 to 4.00	A+
3.50 to 3.79	A
3.00 to 3.49	B+
2.50 to 2.99	B
2.00 to 2.49	C+
1.50 to 1.99	C
1.00 to 1.49	D

Grade Card

1. The University under its seal shall issue to the students a grade card on completion of each Semester, which shall contain the following information:
 - a. Name of University.
 - b. Name of college.
 - c. Title of undergraduate programme.
 - d. Number of semesters.
 - e. Name and register number of student.
 - f. Code number, Title and Credits of each course registered in the Semester.
 - g. CE & ESE Grades, consolidated Grade, Grade Point Average, letter grade and Credit point (P) in each course opted in each Semester.
 - h. Institutional average of the CE and University average of the ESE in each Course.
 - i. The total credits, total credit points and SGPA in the Semester.
 - j. Details of the audited Courses, if any, taken in the Semester.
2. The Overall Grade Card issued at the end of the final Semester shall contain the details of all Courses taken during the entire programme Semester wise including those taken over and above the prescribed minimum credits for obtaining the degree. Apart from CGPA of the programme, the cumulative grades obtained for Common, Core, Complementary, and Open Courses and the grades obtained for Additional Courses shall be shown separately in the overall grade card.

Award of Degree

The successful completion of all the courses (common, core, complementary and open courses) prescribed for the degree programme with C grade shall be the minimum requirement for the award of the degree.

Choice Based Credit Semester System (CBCSS)

The Post Graduate programmes all under the Choice Based Credit Semester System. The regulations of CBSS are applicable to all regular post-graduate programmes, MA/MSc/MCom, conducted by the affiliated colleges/Institutions (Government/Aided/unaided/ Self-financing)

The terminologies used in CBSS and its definitions are listed below

- 'Academic Committee' means the Committee constituted by the Vice-Chancellor under this regulation to monitor the running of the Post-Graduate programmes under the Credit Semester System.
- 'Programme' means the entire course of study and Examinations.
- 'Duration of Programme' means the period of time required for the conduct of the programme. The duration of the post - graduate programme shall be of 4 semesters.

- 'Semester' means a term consisting of a minimum of 90 working days, inclusive of examination, distributed over a minimum of 18 weeks of 5 working days each.
- 'Course' means a segment of subject matter to be covered in a semester. Each Course is to be designed variously under lectures / tutorials / laboratory or fieldwork / seminar / project / practical training / assignments/evaluation etc., to meet effective teaching and learning needs.
- 'Credit' (Cr) of a course is a measure of the weekly unit of work assigned for that course in a semester.
- 'Course Credit' One credit of the course is defined as a minimum of one hour lecture / minimum of 2 hours lab/field work per week for 18 weeks in a Semester. The course will be considered as completed only by conducting the final examination. No regular student shall register for more than 24 credits and less than 16 credits per semester. The total minimum credits, required for completing a PG programme is 80.
- 'Programme Core course' Programme Core course means a course that the student admitted to a particular programme must successfully complete to receive the Degree and which cannot be substituted by any other course.
- 'Programme Elective course' Programme Elective course means a course, which can be substituted, by equivalent course from the same subject and a minimum number of courses is required to complete the programme.
- 'Programme Project' Programme Project means a regular project work with stated credits on which the student undergo a project under the supervision of a teacher in the parent department / any appropriate research center in order to submit a dissertation on the project work as specified.
- 'Plagiarism' Plagiarism is the unreferenced use of other authors' material in dissertations and is a serious academic offence.
- 'Tutorial' Tutorial means a class to provide an opportunity to interact with students at their individual level to identify the strength and weakness of individual students.
- 'Seminar seminar means a lecture expected to train the student in self-study, collection of relevant matter of the books and Internet resources, editing, document writing, typing and presentation.
- 'Evaluation' means every student shall be evaluated by 25% internal assessment and 75% external assessment.
- 'Repeat course' is a course that is repeated by a student for having failed in that course in an earlier registration.
- 'Improvement course' is a course registered by a student for improving his performance in that particular course.
- 'Audit Course' is a course for which no credits are awarded.
- 'Department' means any teaching Department offering a course of study approved by the University in a college as per the Act or Statute of the University.
- 'Parent Department' means the Department which offers a particular post graduate programme.
- 'Department Council' means the body of all teachers of a Department in a College.
- 'Faculty Advisor' is a teacher nominated by a Department Council to coordinate the continuous evaluation and other academic activities undertaken in the Department.
- 'Course Teacher' means the teacher who is taking classes on the course.
- 'College Co-ordinator means a teacher from the college nominated by the College Council to look into the matters relating to CSS-PG System

- 'Letter Grade' or simply 'Grade' in a course is a letter symbol (A, B, C, D, E) which indicates the broad level of performance of a student in a course.
- Each letter grade is assigned a 'Grade point' (G) which is an integer indicating the numerical equivalent of the broad level of performance of a student in a course.
- 'Credit point' (P) of a course is the value obtained by multiplying the grade point (G) by the Credit (Cr) of the course $P=G \times Cr$.
- 'Weight' is a numerical measure quantifying the comparative range of an answer or the comparative importance assigned to different components like theory and practical, internal and external examinations, core and elective subjects, project and viva-voce etc.
- 'Weighted Grade Point' is grade points multiplied by weight.
- 'Grade Point Average' (GPA) is an index of the performance of a student in a course. It is obtained by dividing the sum of the weighted grade point obtained in the course by the sum of the weights of the Course.
- 'Semester Grade point average' (SGPA) is the value obtained by dividing the sum of credit 4 points (P) obtained by a student in the various courses taken in a semester by the total number of credits taken by him/her in that semester. The grade points shall be rounded off to two decimal places. SGPA determines the overall performance of a student at the end of a semester.
- 'Cumulative Grade point average' (CGPA) is the value obtained by dividing the sum of credit points in all the courses taken by the student for the entire programme by the total number of credits and shall be rounded off to two decimal places.
- 'Grace Grades Points' means grade points awarded to course/s, as per the choice of the student, in recognition of meritorious achievements in NCC/NSS/Sports/Arts and cultural activities.

CBSS Programme Structure

- Students shall be admitted into the postgraduate programme under the faculties.
- The programme shall include two types of courses, Programme Core (PC) courses and Programme Elective (PE) Courses. There shall be a Programme Project (PP) with dissertation to be undertaken by all students. The programme will also include assignments, seminars / practical viva etc., if they are specified in the Curriculum.
- There shall be various groups of programme Elective courses for a program such as Group A, Group B etc. for the choice of students subject to the availability of facility and infrastructure in the institution and the selected group shall be the subject of specialization of the programme.
- Project work shall be completed by working outside the regular teaching hours.
- Project work shall be carried out under the supervision of a teacher in the concerned department.
- A candidate may, however, in certain cases be permitted to work on the project in an industrial / Research Organization on the recommendation of the Supervisor.
- There should be an internal assessment and external assessment of the project work.
- The external evaluation of the Project work is followed by presentation of work including dissertation and Viva-Voce.
- The title and the credit with a grade awarded for the programme project should be entered in the grade card issued by the University.

- Assignments: Every student shall submit one assignment as an internal component of every course with a weightage one. The Topic for the assignment shall be allotted within the 6th week of instruction.
- Seminar Lecture: Every PG student shall deliver one seminar lecture as an internal component of every course with a weightage two. The seminar lecture is expected to train the student in self-study, collection of relevant matter of the books and Internet resources, editing, document writing, typing and presentation.
- Every student shall undergo at least two class tests as an internal component of every course with a weightage one each. The weighted average shall be taken for awarding the grade for class tests.
- The attendance of students for each course shall be another component of internal assessment as prescribed with weightage one.
- No course shall have more than 4 credits.
- A comprehensive Viva - voice shall be conducted at the end semester of the program comprehensive Viva-Voce covers questions from all courses in the programme.

Attendance

- The minimum requirement of aggregate attendance during a semester for appearing the end semester examination shall be 75%. Condonation of shortage of attendance to a maximum of 12 days in a semester subject to a maximum of two times during the whole period of postgraduate program may be granted by the University.
- If a student represents his/her institution, University, State or Nation in Sports, NCC, NSS or Cultural or any other officially sponsored activities such as college union / University union activities, he/she shall be eligible to claim the attendance for the actual number of days participated subject to a maximum of 10 days in a Semester based on the specific recommendations of the Head of the Department and Principal of the College concerned.
- A student who does not satisfy the requirements of attendance shall not be permitted to take the end Semester examinations.

Board of Studies And Courses.

- The PG Board of Studies concerned shall design all the courses offered in the PG program. The Boards shall design and introduce new courses, modify or re-design existing courses and replace any existing courses with new/modified courses to facilitate better exposures and training for the students.
- The syllabus of a course shall include the title of the course, contact hours, the number of credits and reference materials.
- Each course shall have an alpha numeric code number which includes abbreviation of the subject in two letters, the semester number, the code of the course and the serial number of the course ('C' for Program Core course, 'E' for Program Elective course, 'O' for Open Elective course, 'P' for Practicals and 'D' for Project/ Dissertation).

Registration and Admission

- A student shall be permitted to register for the program at the time of admission.
- A student who registered for the course shall complete the course within 4 years.

- There shall be provision for inter collegiate and inter University transfer in 3rd semesters within a period of two weeks from the date of commencement of the semester.
- There shall be provision for credit transfer subject to the conditions specified by the Board of Studies concerned.
- Candidates for admission to the first semester of the PG program through CSS shall be required to have passed an appropriate Degree Examination of Mahatma Gandhi University as specified or any other examination of any recognized University or authority accepted by the Academic council of Mahatma Gandhi University as equivalent thereto.
- The candidate must forward the enrollment form to the Controller of Examinations of the University through the Head of the Institution, in which he / she is currently studying.
- The candidate has to register all the courses prescribed for the particular semester.
- Cancellation of registration is applicable only when the request is made within two weeks from the time of admission.
- Students admitted under this program are governed by the Regulations in force.
- A student who registers for the end semester examination shall be promoted to the next semester.

Examinations

- There shall be a University examination at the end of each semester.
- Practical examinations shall be conducted by the University at the end of each semester.
- Project evaluation and Viva -voce shall be conducted at the end of the programme only.

Evaluation and Grading

- Evaluation: The evaluation scheme for each course shall contain two parts; (a) internal evaluation and (b) external evaluation. 20% weightage shall be given to internal evaluation and the remaining 80% to external evaluation and the ratio and weightage between internal and external is 1:3. Both internal and external evaluations shall be carried out using a Direct grading system.
- Internal evaluation: The internal evaluation shall be based on a predetermined transparent system involving periodic written tests, assignments, seminars and attendance in respect of theory courses and based on written tests, lab skill/records/viva and attendance in respect of practical courses. The weightage assigned to the various components for internal evaluation is as follows.

Components of Internal Evaluation

- Component Weightage
- i) Assignment ----- 1
 - ii) Seminar-----2
 - iii) Attendance ----- 1
 - iv) Two Test papers-- 2

- Grades for Attendance

% of attendance	Grade
>90%	A
Between 85 and 90	B

Between 80 and below 85	C
Between 75 and below 80	D
< 75	E

Direct Grading System

- Direct Grading System based on a 5 - point scale is used to evaluate the performance (External and Internal Examination of students)

Letter Grade	Performance	Grade point (G)	Grade Range
A	Excellent	4	3.5 to 4.00
B	Very Good	3	2.5 to 3.49
C	Good	2	1.5 to 2.49
D	Average	1	0.5 to 1.49
E	Poor	0	0.00 to 0.49

- The overall grade for a program for certification shall be based on CGPA with a 7-point scale given below

CGPA	Grade
3.80 to 4.00	A+
3.50 to 3.79	A
3.00 to 3.49	B+
2.50 to 2.99	B
2.00 to 2.49	C+
1.50 to 1.99	C
1.00 to 1.49	D

- Each course is evaluated by assigning a letter grade (A, B, C, D or E) to that course by the method of direct grading. The internal (weightage =1) and external weightage =3) components of a course are separately graded and then combined to get the grade of the course after taking into account of their weightage.
- A separate minimum of C grade is required for a pass for both internal evaluation and external evaluation for every course.
- A student who fails to secure a minimum grade for a pass in a course will be permitted to write the examination along with the next batch.
- After the successful completion of a semester, Semester Grade Point Average (SGPA) of a student in that semester is calculated using the formula given below. For the successful completion of the semester, a student should pass all courses and score a minimum SGPA of 2.0. However, a student is permitted to move to the next semester irrespective of her/his SGPA.
For instance, if a student has registered for 'n' courses of credits C1, C2....., Cn in a semester and if she/he has scored credit points P1, P2....., Pn respectively in these courses, then SGPA of the student in that semester is calculated using the formula.

$$SGPA = (P1 + P2 + \dots + Pn) / (C1 + C2 + \dots + Cn)$$

$$\text{CGPA} = \frac{[(\text{SGPA})_1 * S_1 + (\text{SGPA})_2 * S_2 + (\text{SGPA})_3 * S_3 + (\text{SGPA})_4 * S_4]}{(S_1 + S_2 + S_3 + S_4)}$$

Where S1, S2, S3, and S4 are the total credits in semester1, semester2, semester3 and semester4

Grade Card

The University under its seal shall issue to the students, a grade card on completion of each semester, which shall contain the following information.

1. Name of the University.
2. Name of college
3. Title of the PG program.
4. Name of Semester
5. Name and Register Number of students
6. Code number, Title and Credits of each course opted in the semester, Title and Credits of the Project Work
7. Internal, external and Total grade, Grade Point (G), Letter grade and Credit point (P) in each course opted in the semester.
8. The total credits, total credit points and SGPA in the semester.

Award of Degree

The successful completion of all the courses with 'C+' grade shall be the minimum requirement for the award of the degree

Overview of Examination System

The examination process contains three different levels, which are student level, college level and University level. In student level, they have to register every examination with their course details with the examination fee. The colleges have to prepare the internal marks, attendance register and practical exam marks and send them to the University. Sometimes colleges will register student's details with examination fee to the University.

The major part of the examination process is carried out by the University and that includes examination time table preparation, question paper settings, examiners list preparation, conduct examination, valuation, tabulation, generates mark list and degree certificate generation.

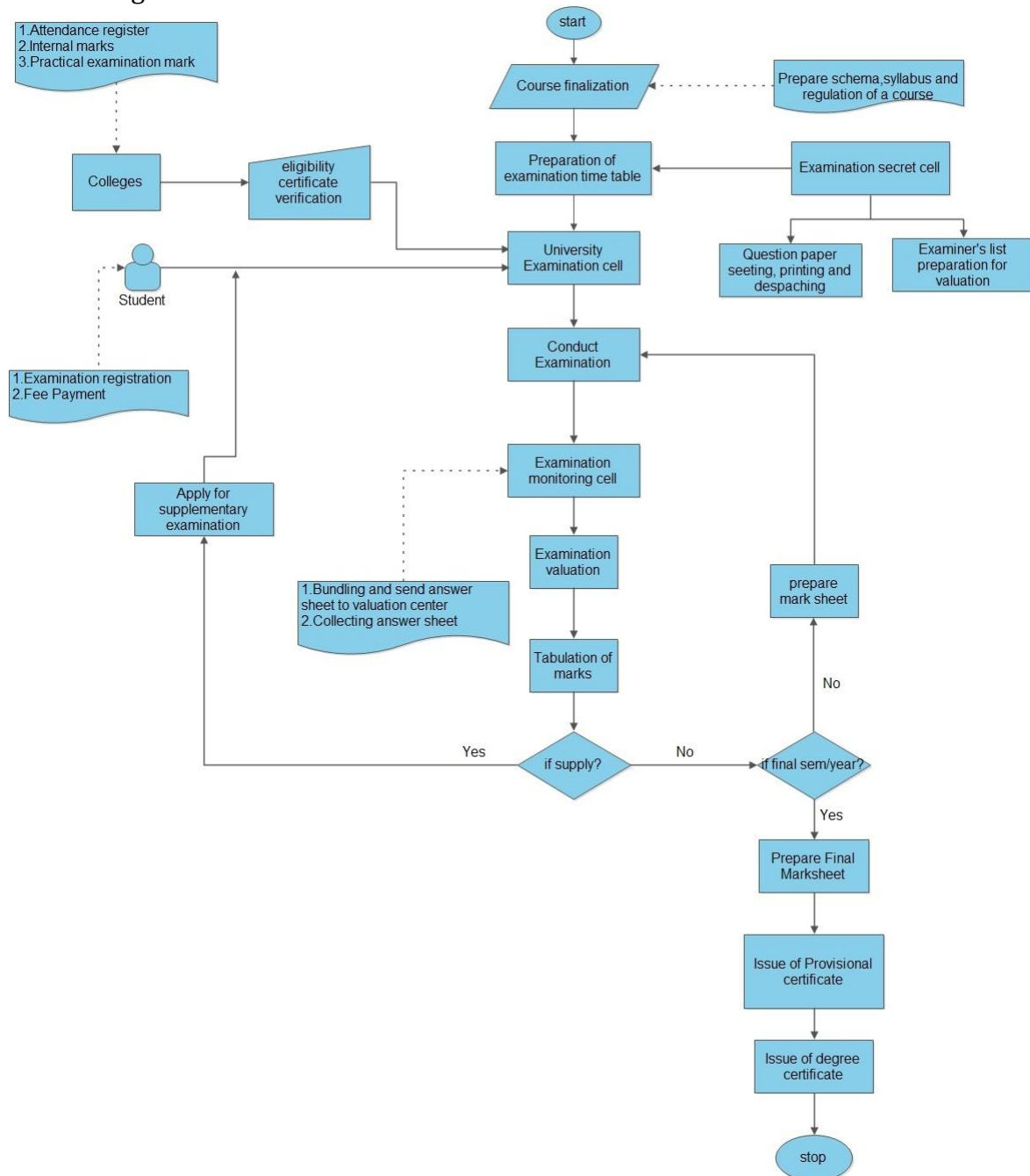


Figure 5: Overview of Examination system

Students Registration

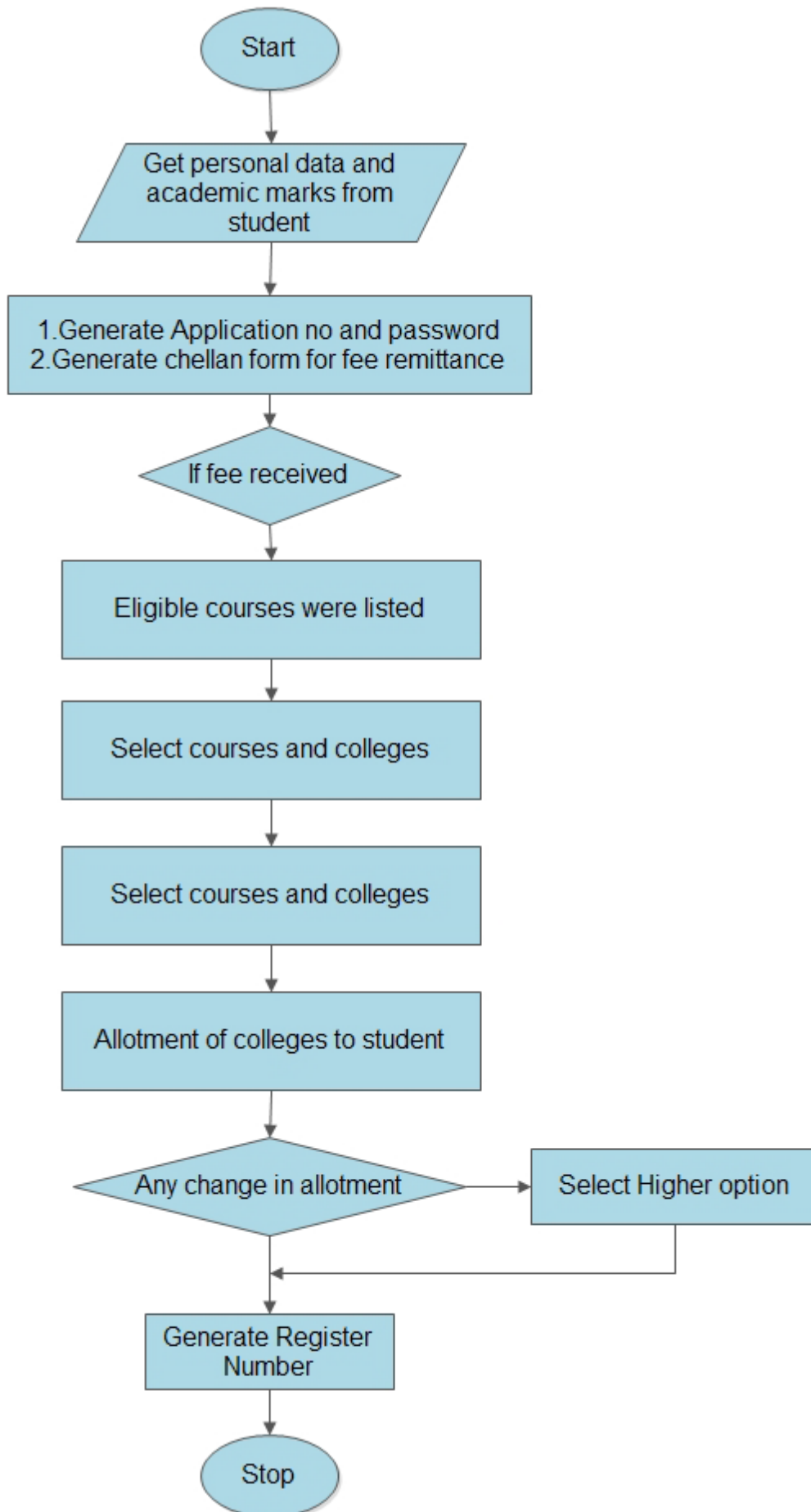
The University allows the candidate to register in three different ways subject to regulations and rules or guidelines followed by the University and those are detailed below.

Regular candidates

The enrollment of such students to the University is being done by either manually or centralized admission programme (CAP). In the manual process, the affiliated colleges are collecting student's details with original certificates and send them to University for verification and enrollment purpose. Examination department checks the enrolled student's eligibility for the applied course and verify the certificates of students. The department has to maintain a register to record all the student details for each affiliated college and it is very time consuming and tedious job for the employees at the University. After enrollment the students will apply for their examination each semester or year to the University with attendance, internal mark and practical examination mark. To track student's details from the register is a slow process and take a long time. The declaration of results also takes a long time; sometimes students are able to get admission to higher studies in the universities.

Some of the universities are following centralised admission programme (CAP) to reduce the workload in the admission process. In CAP students can register their details via online, after the personal and studied courses details entered by students the system will generate bank fee remit form. The fee can be remitted from the recommended bank by the University. After that the system will generate the eligible courses and the affiliated colleges that contain selected course. They can select courses and colleges which they preferred, they can select up to 40 affiliated colleges for their registration. Some of the courses contain credit based system and each subject has different credits that can be reflect their final result. In their course some choice subjects will be there and students can choose any choices of subjects for their course.

Provision for multiple programme enrolment by the same candidate and transfer of credits while switching courses should be provided.



Private Registration

The University allows candidates to register for a University examination in subjects not involving any practical examination without any regular instruction maintained by or affiliated to University. Such candidates have to apply for private registration for the examination. The candidate has to apply a prescribed format along with necessary document and the fee. The registered candidate has to choose an affiliate college for examination.

The registration process requires following details

Duly filled private registration application.

Minimum qualification prescribed by the University

A recognised certificate should provide if the qualifying examination is passed from outside Kerala

The name and date of birth should be correct in the application form and the attached certificate.

Proof of fee remittance

University matriculation

Eligibility certificate

- The candidate's photographs attested by gazetted officers.

Off Campus

The candidates can register through an affiliated franchisee of the University; this franchisee must follow the rules and regulations of the University. Off campus registration is as similar to the private registration. The course does not have the practical examination is coming under this category. The franchisee can be inside the State or outside the State or outside India, the examination is conducted by in the presence of University representatives. The examination pattern will be different from other courses according to the place of the franchisee.

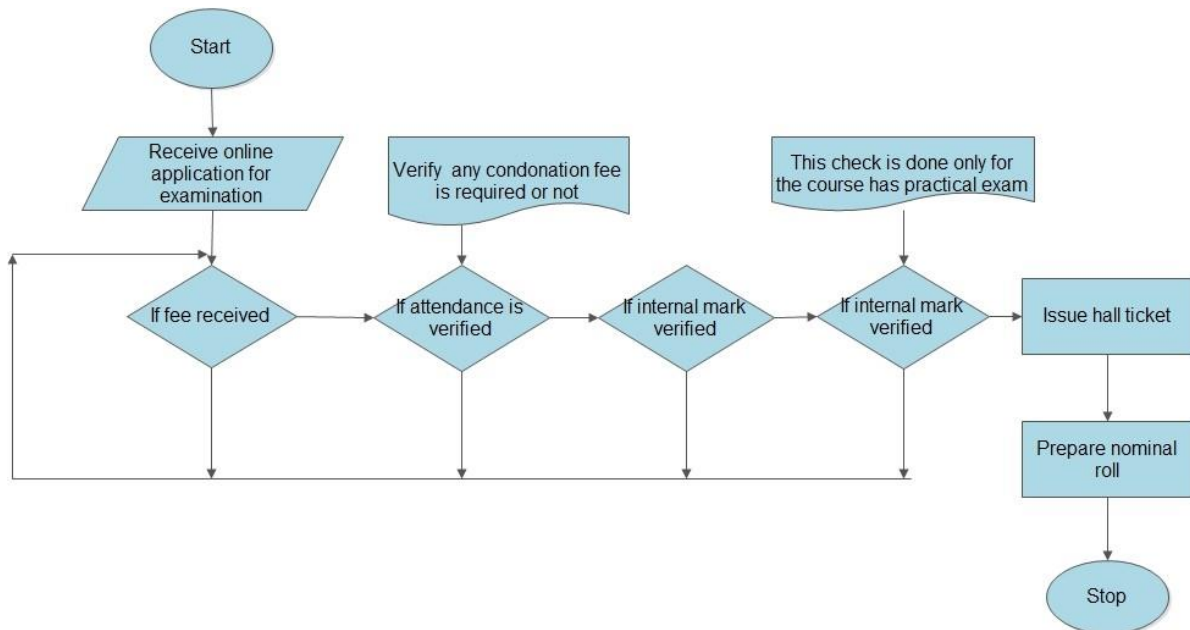
The registration process requires following details

- Duly filled private registration application.
- Minimum qualification prescribed by the University
- A recognised certificate should provided if the qualifying examination is passed from outside Kerala
- The name and date of birth should be correct in the application form and the attached certificate.
- Proof of fee remittance
- University matriculation
- Eligibility certificate
- The candidate's photographs attested by gazetted officers.

Issue of Examination Hall Ticket

After enrollment the student or college has to register for every examination conducted by the University. The college has to send attendance details, internal marks and practical mark to the University for Examination Process. The student or college can either send the details either online or manually to the University examination department. Some of the students may have an attendance shortage in their course time, if there they have to pay

condonation fee to the University with a doctor's certificate along with the principal's letter.



Commencement of Examination

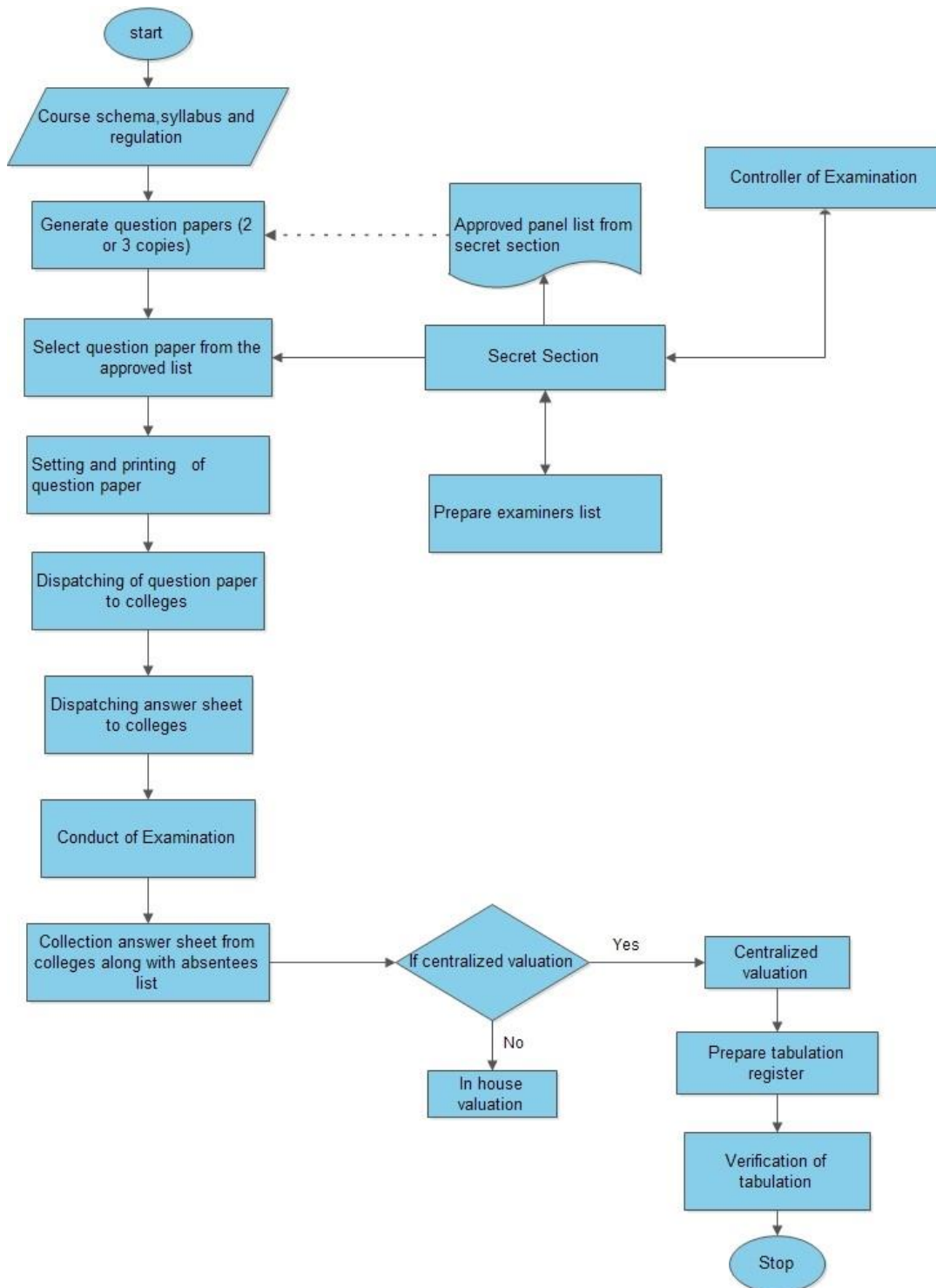
Once the course is approved by the University, a panel selected by the University will prepare the schema, regulations, question paper patterns and syllabus for that course. The secret section controlled by controller of examination will prepare examination time table and send schema, regulations, question paper pattern and syllabus to an expert panel; they will prepare the two or three question paper for the examination. From the approved list question paper the controller of examination will choose one of them for printing. The secret section will dispatch the question paper to colleges based on the nominal roll prepared by the time of examination registration.

Another job of secret section is to prepare an examiner's list and send to the Board of Examination for finalizing the list. The Board of Examination will finalise the list and prepare a list of chief examiners and assistant examiners for the valuation.

Valuation of Examination

Based on the nominal roll of each subject the University will send question papers and answer sheet to their affiliated colleges. The colleges will conduct the examination and after the examination they collect the answer sheets from the students and bundled them based on the registration number. The absentees list will be noted on top each bundle and these bundles were dispatched to either University or centralised valuation camp. The valuation section will arrange answer sheet based on the examiners list prepared by the secret section and put false no on each answer sheet (false no is used to map the original registration number of the answer sheet). The examiner name and the number of copies with absentees list were printed on top of each bundle. These bundles can be distributed by either at the University or in centralised valuation camp in the presence of chief examiner.

The chief examiner will prepare a tabulation register based on the valuation. The assisted examiners will enter the marks against the false no and uploaded to examination wing. The tabulation section will verify this mark by cross checking the tabulation register and generate the mark sheet. In manual process the answer sheet was collected and distributed to each section and the assistant officer of tabulation section will record the marks to exam register. The section officer will verify the register and send to the approval from the higher authority for preparing the mark sheet.



Tabulation and generate mark sheets

After verification of marks in the register or system with tabulation register the mark sheet will be printed. The mark list contains each subjects marks/ grade point, if it is final semester or year the mark sheet contains last semester/year marks along with consolidated marks/grade point of previous academic period. If any student has passed the supplementary examination then a new mark sheet will print with new marks or grade point. For improvement examination a new mark sheet will be printed if there is any change in the marks or grade.

The mark list preparation may depend upon the course schema and regulation. Some course credits based some are not, so the calculation of grade point/marks may vary in different courses.

Moderation

The Board of examiners appointed to conduct of University examinations may recommend the award of moderation of marks by looking certain criteria, they are

- Deficiency in marks for securing pass mark in subject/subjects, semester/semester of examination.
- To increase the number of higher classes in cases where the successful candidate cluster near the lower classes/grades.
- To increase the number of candidates who secure a minimum percentage of marks for higher studies.
- To compensate out of the syllabus question in the examination.

The method of awarding moderation different for each course and the moderation recommended by the Boards shall be affected only with the approval of the Control of Examinations. The assistant shall prepare a tabulation register verified by the section officers; contain a statistical view of results with minimum pass/class mark of each student. This statistical review and the tabulation register will help to decide the moderation marks for Board of Examination.

Grace Marks

The grace marks are awarded to those candidates who are participating in extracurricular activities or special concession given to physically challenged, mentally challenged, deaf, dumb, blind and dysplasia candidates. To get the grace marks students has to apply to University with certificates of items won/participated or medical certificate for special concession along with principal letter. The University authorities will decide the grace mark of each student based on the certificates produced in the claim letter. The grace mark can be given to one subject or every subject in the semester based on the decision of board of examination.

The other benefits for special concerned candidates are getting extra time for examination and service of a scribe or interpreter for their examination.

Degree Certificate

The syndicate is the authority to give degree certificate. Candidates who passed the various examinations conducted by the University become eligible to receive the degree certificates only after the syndicate at a formal meeting held after the date of publication of the results. Separate application has to make for degree certificate. The filled applications shall send to the deputy Registrar at the University in charge of examinations concerned. A separate fee is collected for degree certificate along with the application.

The applications for the degree shall be received only in the Tappal section and from there the application shall be sent to the section dealing with the issue of degree. The amount of fee remitted from the candidate, details of the name of the applicant, examinations passed, registration number, year, month of examination are noted in the registers maintained in the section. The applications registered in the section are sent to the concerned tabulation section dealing with the preparation of the certificates.

The tabulation section will verify the candidate marks with tabulation register and prepare the degree certificate. The prepared degree certificate is verified by section officer and it is being signed by assistant Registrar. The degree certificate signing is done by the vice chancellor.

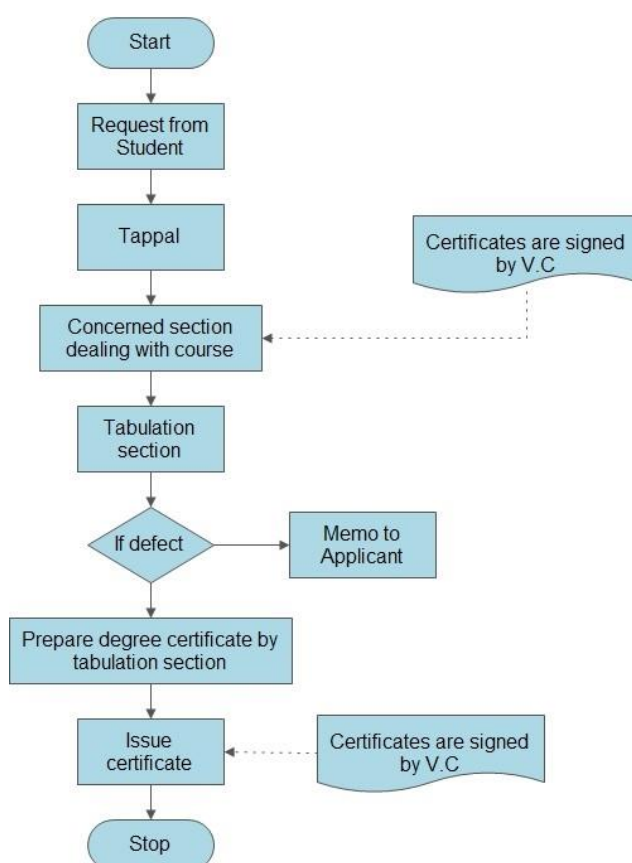


Figure 8: issue of degree certificate

Scrutiny/Revaluation of answer scripts

The University has made a provision for scrutiny / revaluation of answer scripts of candidate who have appeared for the examination and who wish to avail of this facility subject to the following condition

1. Application for scrutiny/revaluation shall be submitted to the controller of examination in the prescribed format.
2. The Candidate can submit applications for scrutiny/revaluation of any one paper or more than one paper of an examination.
3. The prescribed fee for scrutiny/revaluation shall be remitted for considering the application.
4. Application for scrutiny/revaluation shall be submitted on or before the last date prescribed by the University.
5. The last date for receipt of application for scrutiny/revaluation of answer scripts of an examination shall be notified by the University at the time of publication of the result of the examination.

Scope of scrutiny

1. To give an opportunity to the candidate to identify their valued answer scripts of examinations.
2. To arrange the checking of the correctness of the addition of marks awarded to the various answers in the answer scripts.
3. To check whether marks have been awarded to all the answers or parts of the answers in the answer scripts.

No dispute regarding marks already awarded for answers shall be entertained at the scrutiny.

Procedure for processing revaluation of application.

1. The central tappal shall forward the applications for revaluation the respective revaluation section on the date of receipt as far as possible, or later on the next working days.
2. The revaluation section shall not take more than 10 days in any case for forwarding statements to the tabulation section for furnishing details of examiners and for counterfoils.
3. The tabulation section shall give top priority to applications for revaluation and send the filled in revaluation statements and counterfoils to the revaluation sections at the earliest. This shall not take more than 7 days in any case.
4. The call letters/ indent for answer scripts shall be sent to the paper go down. Then go down authority shall send back the counterfoil and answer scripts to the revaluation section.
5. Give indent to the EB section for the allocation of examiners. EB Section allocates Examiners for the specified subjects.

6. Allocate a false number to the answer scripts, change the facing (mark tabulation) sheet of the answer scripts, erase the marks in the answer sheet. And then send to the examiner for revaluation through the dispatch section.
7. After the revaluation if any increase in the mark, the new mark send to the tabulation section for affecting the change in the mark list.
8. If no change in the mark after revaluation, a memo sends to the student with the content no change in the mark in revaluation. This is approved by AR.
9. If a change in the mark after revaluation, a memo is sent to the student, tabulation section with the content change in the mark in revaluation. This is approved by DR.

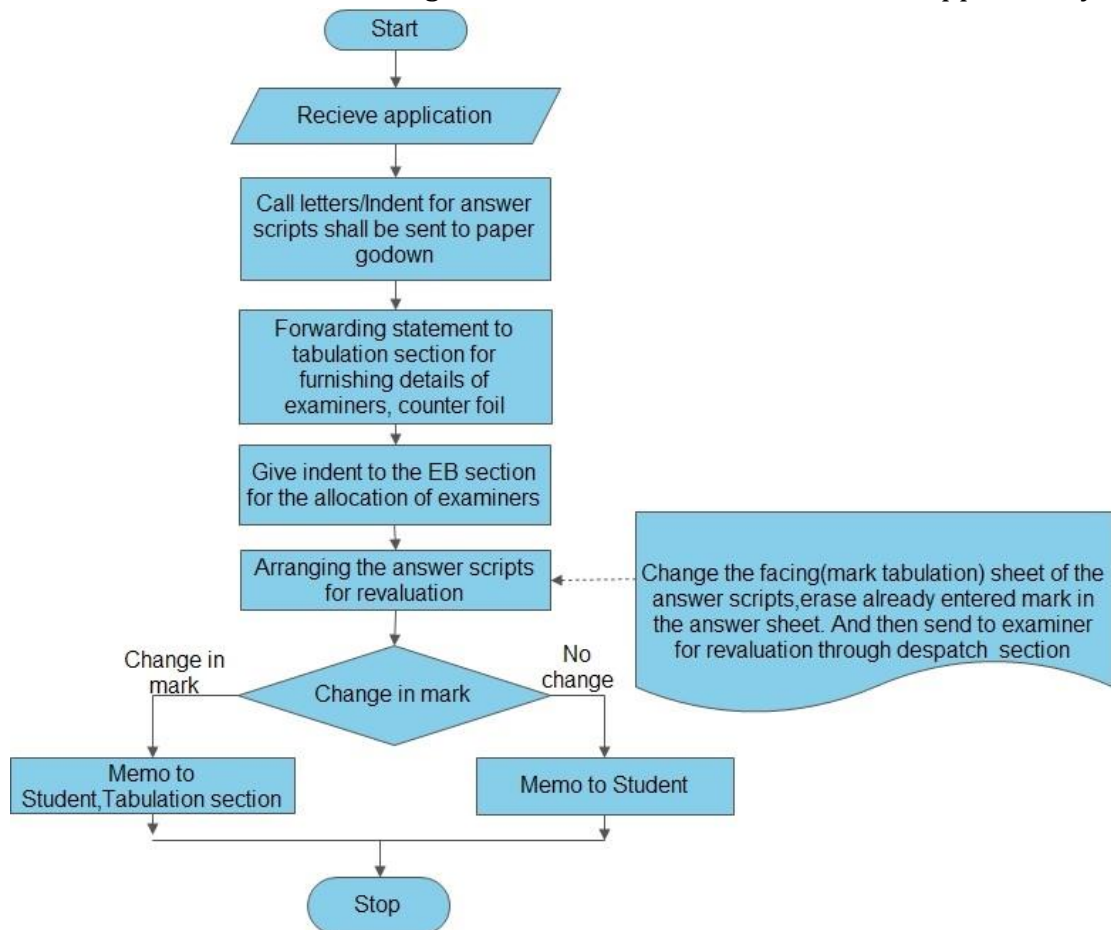


Figure 9: Revaluation process flow

Revaluation rules

1. If the increase is below 5% there is no change.
2. If the increase is 5% and above there is a result
3. If the increase is 10% and above there is a second revaluation
4. Then the average 1st and 2nd revaluation is taken as a result, if the difference between 1st and second revaluation is below 20% and if the average is greater than the original mark by at least 1 mark.
5. If the difference between the average of 1st and second revaluation and original mark is 25% or more then there is an expert committee revaluation.

6. If the difference between 1st and 2nd revaluation is 20% and above then there is a 3rd revaluation
7. Then the result is taken as the average of the original mark and mark nearest to it from 1st 2nd and 3rd revaluation, If the difference between original mark and average is below 25%.
8. If the difference between original mark and average is 25% or more then there is an expert committee revaluation.
9. The marks obtained in expert committee are taken as final.

Issue of other Certificates

Provisional Certificate

A provisional certificate is issued to a candidate during the period of after publication of the results of the examination taken by candidates and before the issue of the original Degree certificate. Application for provisional certificate has to be submitted in the prescribed format in the prescribed form and it shall be accompanied by the document providing remittance of the prescribed fee. All applications for provisional certificates shall be addressed to the Assistant Registrar dealing with the examination concerned.

The assistant of the section officer will prepare the provisional certificate by verifying the tabulation register of the candidate. The section officer will verify the entries of the certificate by verifying the tabulation register and put signs on it. The assistant Registrar sign and issue the provisional certificate.

Issue of duplicate certificates

If the degree certificate issued to the candidate has been irrevocably lost, a duplicate certificate shall be issued subject to the following conditions

- a. An application has to submit along with a fee for the duplicate certificate issue.
- b. An affidavit signed by the candidate and attested by a notary public
- c. In case of regular candidate a letter from principal has to be provided.

Migration certificate

The candidate who undergone a course of study in this University and secure admission to courses of studies in other universities shall be issued migration certificate if they apply for the same with a prescribed fee, provided they have completed the formality of registering as matriculates of this University irrespective of whether they have registered for any examination of this University or not.

The applications of migration certificate shall be processed in the section maintaining the register of matriculates. The applications which then send to the concerned tabulation section for verifying the details of the candidate. The tabulation register is updated with 'migrated' entry. Then the verified application sends back to the section. The section will prepare the migration certificate and signed by deputy Registrar.

Verification of genuineness of certificates and mark lists

The controller of examination is the authorized officer to issue certificates of genuineness of certificates and mark lists issued by the University. If the request for verification is from other universities, foreign embassies, educational agencies or other professional agencies no fee shall be levied for issuing certificates of genuineness. When the verification request reaches at the concerned section the verification report is prepared by section officer and verified by assistant Registrar. The deputy Registrar of the concerned branch is authorized to sign the verification report on behalf of the controller of examination.

Transcript of marks and syllabus

On by request of transcript of mark list along with the prescribed fee, the University can provide transcripts of mark list and syllabus. The transcript is prepared in concerned section by providing details to the tabulation section. The tabulation section gives the report based on the request from the section. The section officers prepare the transcript of marks/ syllabus and forwards to joint Registrar to sign.

Consolidation of marks

The consolidation of mark list is prepared by the concerned section. The consolidated mark list is signed by assistant Registrar.

Assumptions and Dependencies

- All the requirements captured are based on inputs received from interactions with end users during state visits and cutting edge officers workshops
- All the state level requirements have been generalized to have consistency across the application at general University level. Any University specific changes will have to be done as part of the University level customization
- The student registration is done at the academic section. It is a one time process. After verification of certificates a unique identification number will be provided to the candidate. The candidate has to provide this unique id while registering examination.

Proposed System

Information and Communication Technology (ICT) has become a valuable, decisive and critical resource for people, communities, enterprises and organisations it is adopted it as a basic tool for good governance. The educational institutions also increasingly recognize the importance of ICT in education and examination reforms.

The system automates the complete life cycle of Examination Management which includes online registration of examination, examination fee management, marks uploading, hall ticket generation, question bank management, question paper generation, automated evaluation up to processing and publication of results.

This ICT enabled solution shall be great improvement in the speed, reliability, efficiency and accuracy of the entire process of the examination process in Universities. The students are most benefited with the availability of accurate information, timely declaration of

results and timely availability of degree or other certificates. This system eliminates the paper work involved in various departments of the University.

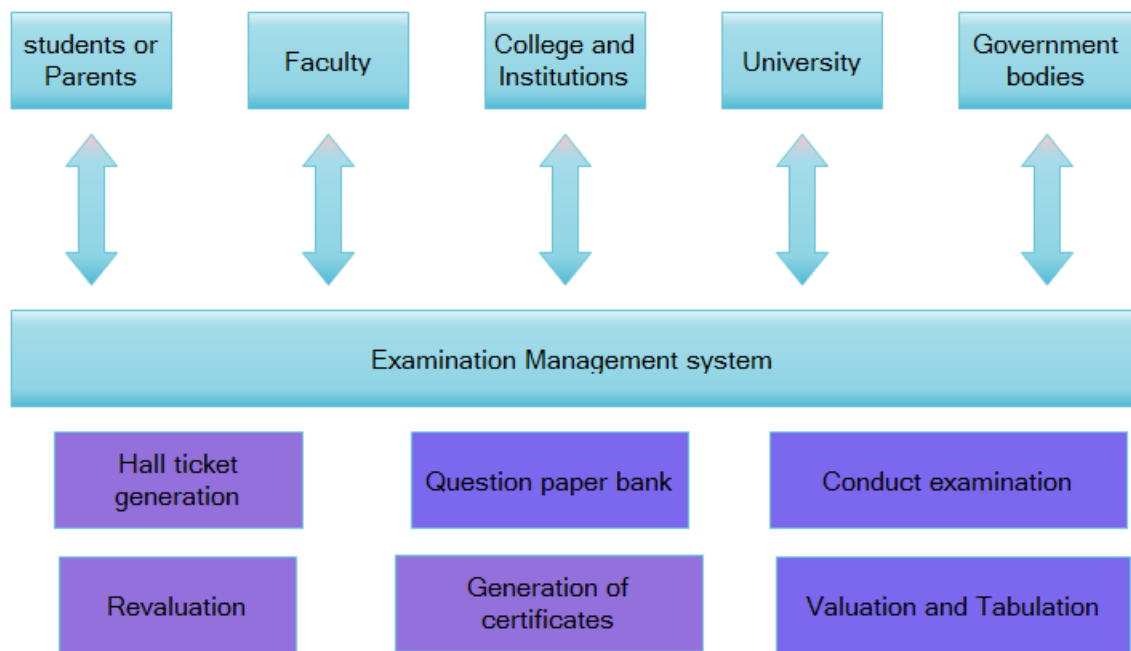


Figure 10: General Architecture of the System

4. Functional Requirement Specification

Sl. No.	Services
1.	Portal Service
2.	Registration for Examination and Hall ticket generation
3.	Generation of question paper bank
4.	Examination
5.	Valuation and Tabulation
6.	Certificate generation
7.	Revaluation

Portal Service

Users Groups	Responsibilities
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Users Groups	Responsibilities
Students	<ul style="list-style-type: none"> • Submit application for exam registration • View exam notification • View University details • Submit application for reevaluation • Submit application for supplementary examination • Submit application for improvement exam • Submit application for certificates • Submit application for transcript of marks • Claim grace marks • View study materials • View syllabus of examination • Online payment
Teachers	<ul style="list-style-type: none"> • Create teacher profiles. • Upload teaching materials • Creation of question bank
Colleges	<ul style="list-style-type: none"> • Upload practical mark details • Upload internal mark details • Upload attendance details of students • Upload students information • Upload faculty details
Public	<ul style="list-style-type: none"> • View affiliated college information • View University notifications

This service will be designed for students to seek University services and for University staff by providing them role/ designation based single sign-on access to all e-University services and access of data/ information across various databases and knowledge base. The various functionalities envisaged for the Student Interface/ Portal Service and its integration requirements with other e-University and Additional Services are given below:

Sl. No.	Functional Requirement Specification
	Student Interface/ Portal Service

1.	Should allow students to access the Students' Services portal via the internet.
2.	Should allow students to search for their request on the basis of Service Request number or user details.
3.	Should allow students to register for examination by giving following details <ul style="list-style-type: none"> a. Category b. Name of the college c. Student name d. Course name e. Scheme f. Semester g. Year h. Certificates for verification i. Examination fee
4.	Should provide a provision to select the subjects for examination
5.	Should provide to select open course subjects
6.	Should provide to select the elective subjects
7.	Should allow students to request for degree certificate The system should capture the following details <ul style="list-style-type: none"> a. Registration number b. Course name c. Name of the student d. Student personal details e. Contact details f. Copy of mark lists g. Fee for degree certificate
8.	Should allow students to register scrutiny/revaluation by giving following details

	<ul style="list-style-type: none"> a. Register number b. Course name c. Scheme d. Semester e. Year f. Subjects for revaluation g. Mark list h. Scrutiny/Revaluation fee
9.	<p>Should allow students to register for improvement examination</p> <ul style="list-style-type: none"> a. Register number b. Course name c. Scheme d. Semester e. Year f. Subjects for improvement g. Improvement examination fee
10.	<p>Should allow students for condonation of attendance by providing the following details</p> <ul style="list-style-type: none"> a. Category of course b. College name c. Name of the student d. Course name e. Scheme f. Condonation fee
11.	<p>Should allow students to request for transcript of marks</p> <p>The system should capture the following details</p> <ul style="list-style-type: none"> a. Registration number b. Course name c. Name of the student d. Student personal details

	<ul style="list-style-type: none"> e. Contact details f. Fee for Transcript of mark
12.	<p>Should allow students to request for transcript of the syllabus</p> <p>The system should capture the following details</p> <ul style="list-style-type: none"> a. Registration number b. Course name c. Name of the student d. Student personal details e. Contact details f. Fee for Transcript of syllabus
13.	<p>Should allow students to request for consolidation of marks</p> <p>The system should capture the following details</p> <ul style="list-style-type: none"> a. Registration number b. Course name c. Name of the student d. Student personal details e. Fee for consolidation of mark
14.	<p>Should allow students to request for a duplicate mark list</p> <p>The system should capture the following details</p> <ul style="list-style-type: none"> a. Registration number b. Course name c. Name of the student d. Student personal details e. Contact details f. Fee for duplicate mark list
15.	<p>Should allow students to request for a duplicate certificate</p> <p>The system should capture the following details</p> <ul style="list-style-type: none"> h. Registration number i. Course name

	<ul style="list-style-type: none"> j. Name of the student k. Student personal details l. Contact details m. Letter from principle n. Affidavit o. Fee for a duplicate certificate
16.	<p>Should allow students to request for special concessions.</p> <p>The concessions are available in following categories</p> <ul style="list-style-type: none"> a. Deaf and dumb b. Blind c. Physically handicapped d. Mentally challenged <p>The system should capture the following details</p> <ul style="list-style-type: none"> a. College name b. Course name c. Name of the student d. Student personal details e. Contact details f. Letter from principle g. Medical board certificate
17.	<p>Should allow students to request for grace marks.</p> <p>The system should capture the following details</p> <ul style="list-style-type: none"> a. College name b. Course name c. Name of the student d. Student personal details e. Contact details f. Letter from principle g. Relevant Certificate for claim
18.	Should display service request and status on the screen based on the students'

	search.
19.	Should allow users to save the status as a PDF and/ or print the status
20.	Should have the facility for students to download various University forms.
21.	Should allow the users to provide comments and feedback on online services.
22.	General Service requests/student Services include genuine certificate verification, NOC (No Objection Certificates), Migration certificate, Request for degree certificate, Transcript of mark list, Complaints/grievances to universities
23.	Should allow users to have dynamic user names and passwords for accessing the system and registration of complaints/ requests ensuring privacy and anonymity of the user.
24.	Should provide facility to the students to view the dynamic content – such as examination dates, Notifications, important news, University announcements
25.	Should have the facility of online payment of different fees like examination fees, fees for various certificates etc.
26.	Should provide users with a help sub Service to educate them on the University services and University rules.
27.	The system should provide users the legal information by publishing IT assets, IT rules, University acts, University orders etc.
28.	Should provide up to date information on the location of the colleges affiliated to each University along with courses offered by each college with the Landmark and the contact details.
29.	The system should provide the user with an Online Help facility <ul style="list-style-type: none"> 1. Frequently Asked Questions on workflow of applications 2. User Manual on procedures to avail University services

	<p>3. Relevant University documents (library)</p> <p>4. Address / contact nos. of University offices</p>
30.	The system must be able to record the IP address of the user
Portal Services for Colleges	
31.	<p>Should provide the functionality to the colleges of registering their college details</p> <ul style="list-style-type: none"> a. Name of the college b. Name of the principal c. College registration Number d. College affiliation details
32.	<p>Should allow periodic uploading of following information of the students at colleges</p> <ul style="list-style-type: none"> a. Student Name and verification details b. College name c. Address of the student d. Course opted by a student
33.	Should provide the college regulations online for ready reference
34.	Should have a provision to download templates of different forms (certificate, requests etc.)
35.	<p>Should allow colleges to enter the attendance details of the students by providing the following details</p> <ul style="list-style-type: none"> a. Starting date of the course b. End date of the course c. Number of working days d. Subject name

	e. Students' attendance
36.	Should provide facility to provide internal marks of students The system should capture the following details a. Name of the college b. Name of the student c. Course of the student d. Internal mark of each subject
37.	Should provide facility to provide practical marks of students The system should capture the following details a. Name of the college b. Name of the student c. Course of the student d. Practical mark of each subject
	- Allow to upload the total no of answer sheets used for examinations of each course& -Details of remittance of fee by candidates having E grants facility subject wise/semester wise - Paper registered may be shown in the nominal roll.
Portal Services for teachers	
38.	Should allow teachers access the portal via the Internet/ Intranet
39.	Should allow teachers to access e-learning materials
40.	Should allow to create teacher profiles
Portal Services for University staff	
41.	Should allow University staff access portal via the Internet/ Intranet

42.	Facility of Single Sign-on and allowing the University staff to log in to the departmental Services through the Portal
43.	The portal should support bi-lingual. English and Malayalam
44.	Should provide role based access to the various Services and sub Services of the proposed solution and other additionally proposed Services to all the University

	Officials.
45.	Should provide the University Officials with the help Service to assist them in using the Portal and other additionally proposed Services
46.	Should provide the Police Officials with the comprehensive Search capability to access any type of information which is desirable for e.g.) e-learning course material, area specific information, college and course information, etc. Search would run on the knowledge base using business intelligence methods
General Requirements	
47.	The system should provide the user with an Online Help facility <ol style="list-style-type: none"> 1. Frequently Asked Questions on workflow of applications 2. User Manual on procedures to avail University services 3. Relevant University documents (library) 4. Address / contact nos. of University offices
48.	Should have a facility to publish press releases / University information
49.	The system should have a space to publish the student's charter which would help students to deal with University by knowing the existing laws of the land, various Government and departmental orders, and guidelines such as those issued by the UGC, etc.
50.	The system should have the facility to publish statistical information of <ol style="list-style-type: none"> a. Students passed for various exams b. Students admitted in various courses c. The subjects chosen students
Other Requirements	
Portal Content Requirements	
51.	In-Portal's Front-end is completely template based and its compatibility with

	various browsers depends on the design implementation. The Default theme supplied with In-Portal distribution is compatible with Microsoft IE version 6.0 and higher, and Firefox version 3.0 and higher, Chrome 4.0 and higher and other popular browsers.
52.	Should provide a mechanism for balancing the user and/or request load across several logical and/or physical servers
53.	Should support RSS feed to publish frequently updated works such as news headlines, audio, and video in a standardized format.
54.	Should support in place editing of content
55.	Should support content creation and workflow management tools
56.	Ability to manage content metadata via the portal
57.	Should support Mass import export tools
58.	Content version support
59.	Integration with a personalization engine to provide personalized content
60.	Ability to provide personalized content based on sophisticated business rules (rules engine) and user profiles
61.	Provide a recommendation engine that drives personalization of related users based on their profile and past behaviour
62.	Provide integration between the personalization engine and a content management platform
63.	Integration with search engine
64.	Provide integration between the personalization engine and the search engine
65.	Log all activities in personalization

- The portal students, provision to view fee due, memos issued fine punishment, imposed etc. may be included. Provision to apply for corrections and editing any data etc.
- In the college portal colleges should be able to view and print details such as result statistics rank statistics for at least 3 academic year for the purpose of submitting for accreditation ranking purpose. Provision to view all the fee to be received by the university including that of students with fee concession and to update the fee once paid after getting reimbursed from govt.
- DCB (showing all demand for fees from admission to completion of degree) and Fee Fund Register could be generated from the system.
- Demand of fee should be automatically generated by the system.
- The system should be able to generate various report/statistics listed below which are required by university and other agencies.
- With respect to the caste details(GEN/OBC/OEC/SC/ST/OTHERS), specially abled, male female transgender , other categories (total and college wise)
- Category of colleges aided/unaided/govt.
- Report of marks scored, passed failed, rank secured etc. by the above categories
- College wise rank result statistics, of each category.
- Provision to generate all the above reports college wise/ programme wise /gender /cast and any other specific category wise.
- Facility to send information and to issue memos to students through sms emails etc.
- Provision to edit the tabulation register with approval from proper authority and to view all edition correction made.

Security Requirements	
66.	HTTP redirects to HTTPS. SSL only.
67.	Provide role-based access control to portal resources, including support for automatic propagation and inheritance of privileges throughout the portal taxonomy
68.	Account Lockout is by either no brute force detection or basic request rate throttling.
69.	Pages are securely cached locally
70.	Visitor Counters of the website and web pages separate
71.	Should provide strong password protection
72.	Password Reset is by email plus secret question/answer based reset.
73.	After a failed login (or successful password reset, etc.), do not disclose if the username the use user entered is valid.
74.	Should have a mechanism to prevent phishing
Administration Requirements	
75.	In-Portal's Administrative Console requires Microsoft IE 7.0 or higher or Firefox 3.0 or higher with Java Script enabled, in order to be able to utilize all of its features.
76.	Ability to manage users and group memberships
77.	Ability to manage user/group access control to portal resources, such as pages and portlets.
78.	The portal platform's administration tool must support the ability to

	create/update/delete portal resources, such as pages and portlets
79.	Portal management should be flexible based on policies
Search requirements	
80.	Ability to search structured information repositories, such as databases. For example status of requests, different University orders, different courses, colleges etc.
81.	Ability to search unstructured information repositories, such as documents, images etc.
82.	Support free text searches
83.	Support structured searches driven by metadata
84.	Perform federated searches across multiple indexes
85.	The search engine must provide primitive access control of search results; content the user cannot access does not appear in the search results.

Registration for Examination and Hall Ticket generation

The hall ticket is an entry pass of student in the examination center. The registered University candidate can apply for regular/supplementary examination for their current academic course. After the submission examination fee every student or college will get hall ticket for the examination.

SI NO.	Activities
1.	An interface to register examination <ul style="list-style-type: none"> - Student registration - Colleges - examination registration and verification process - University – verification of the details entered by the student and college, if correct hall ticket and nominal roll are generated.
2.	User management of registration of examination
3.	Secure online fee payment

4.	The examination hall tickets are generated and available on the server <ul style="list-style-type: none"> - The student can enter their login area for getting a soft copy of hall ticket - Provision for print the hall ticket.
5.	Students will get a status on the registered mobile numbers / email ids regularly.

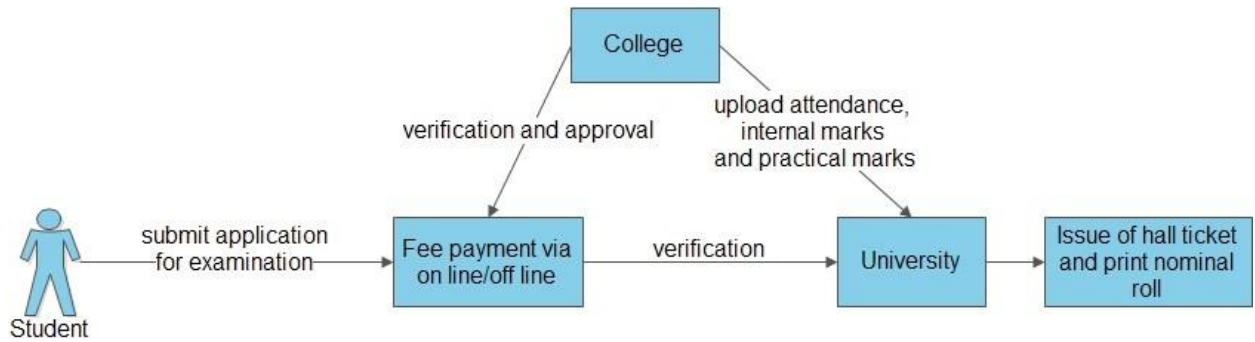


Figure 11: Issue of hall ticket

This system shall automate the hall ticket generation process, thus reducing the errors in hall tickets and speedy processing of hall tickets. This system also reduces the scope of malpractices related to hall ticket tampering, replacement of the photograph in the hall tickets etc.

User Groups	Responsibility
Section officers/ Assistant	<ul style="list-style-type: none"> • Verification of exam application details • Verification of attendance • Verification of fee • Verification of internal mark details • Verification of practical mark • Preparation of hall tickets • Preparation of nominal rolls.
Assistant Registrar	<ul style="list-style-type: none"> • Verification of hall tickets • Verification of nominal rolls

The system should meet the following requirements to capture and process all the data related to the hall ticket generation of examination.

Sl. No.	Functional Requirement Specification
1.	Provision to manage the course details of an enrolled student. <ul style="list-style-type: none"> - Semester or year classification. - Subjects of selected courses.

2.	Provision to register examination for annual scheme students. The following list of categories are in annual scheme <ol style="list-style-type: none"> 1. Regular students 2. Private registration students
3.	Provision to register examination for semester based students
4.	Provision to register examination for off campus students
5.	Provision to verify the attendance of the student.
6.	Provision to verify the fee collected from the student.
7.	Provision to generate hall tickets based on colleges.
8.	Provision to manage the fee collection <ul style="list-style-type: none"> - Online fee payment like Debit card/Credit card/Online Banking. - Offline fee payment like Challan form for recommended bank/ DD in favour of universities.
9.	Provision for generating hall tickets <ul style="list-style-type: none"> - Generate an online version of soft copy of hall tickets - Provide online print options for hall tickets
10.	Provision for generating nominal roll <ul style="list-style-type: none"> - Generate an online version of soft copy of nominal roll - Provide online print options for nominal roll
11.	Provision for generating nominal roll for the students in different categories <ul style="list-style-type: none"> - Regular students - Supplementary examination students - Improvement examination students
12.	The nominal roll should have the following information <ul style="list-style-type: none"> - Roll number - Register number - Name of the student - Signature of the student - Photo of the student
13.	Provision to generate register number of the student. The hall ticket must have <ol style="list-style-type: none"> 1. The register number of the student. 2. The photo of the student 3. The list of subject code and name of the examinations
14.	Provision for generating hall tickets for regular students

15.	Provision for generating hall tickers for supplementary examination students.
16.	Provision for generating hall ticket for improvement examination students.
17.	Provision to generate hall ticket based on colleges.
18.	Should have provision to cancel the hall ticket.
19.	Provision to generate provisional hall tickets.
20.	Provision for change examination centre.

Generation of question paper bank

Once the course is approved by the University, a panel selected by the University will prepare the schema, regulations, question paper patterns and syllabus for that course. The secret section controlled by controller of examination will prepare examination time table and send schema, regulations, question paper pattern and syllabus to an expert panel. This expert panel will prepare the number of questions in the question bank should be at least 100 times the number of questions required in a question paper. The Question bank should be available on the website of the University as well as the libraries of universities and affiliated colleges. But the Question Papers should be kept confidential.

At least one third of the questions in Question bank should be changed every year in every course. Whenever the schema and regulation of course is modified all the question paper in the question bank should be changed. The controller of examination can assign senior faculty from respective subject to create question banks with model answers and grading. These questions and model answers would then be passed to the moderator who would approve it to pass in the database to form the question bank.

For each examination the system should prepare two to three question papers from the database of question bank.

SI NO.	Activities
1.	Question bank configuration
2.	Course configuration
3.	Verification and approval of online registration of authors' of questions.
4.	Approval of author's registration.
5.	Verification and approval of questions prepared by various authors

6.	Save the questions in the question bank.
7.	Payment for selected questions.
8.	Prepare multiple set of question paper configuration
9.	Security configuration

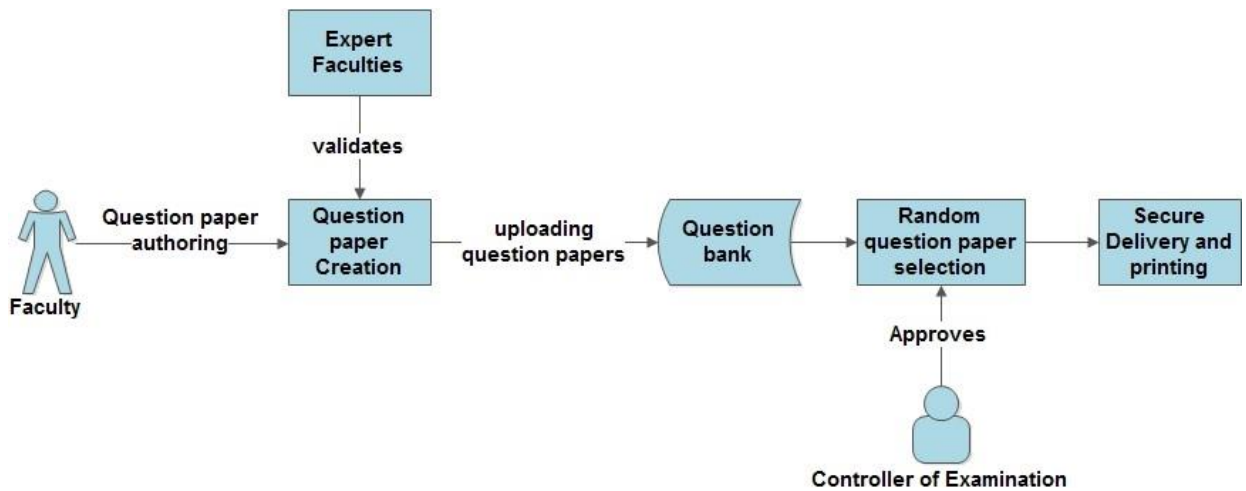


Figure 12: Question Paper Selection

User Groups	Responsibility
Teachers/ faculties	<ul style="list-style-type: none"> • Question paper authoring • Submission of questions • Verification of question paper • Define difficulty of the questions • Validate questions.
Controller of examination	<ul style="list-style-type: none"> • Approval of question papers for examination
Expert faculties	<ul style="list-style-type: none"> • Validate question papers

The system should meet the following requirements to capture and process all the data related to preparing a question bank.

SI NO.	Functional Requirement Specification
1.	Provision for multilevel role based approval system for question bank. (Authors/Expert Teachers/board of examination/Controller of examination)
2.	Provision for configuring a course with its schema and regulation

3.	Provision to change the schema and regulation after approval competent authority.
4.	Provision for registration of authors of questions in question bank. <ul style="list-style-type: none"> - Personal details - Qualification - Academic experience - Subjects of expertise
5.	Provision to view the subjects expertise's and their schema, rules and syllabus
6.	Provision for text editor and formula editor in user interface
7.	Provision for view sample questions of selected course.
8.	Provision to set question type and difficulty level of each question.
9.	Provision for question bank creation and section management as per the course syllabus.
10.	Provision for review and approval of question banks authored by individual authors.
11.	Provision to authorship question of different types like Subjective, objective, fill in the blanks, comprehension type, matching column type, true false type, assertion-reason type, single choice type, multiple choice type of questions etc.
12.	Provision for authoring individual questions as well as bulk uploading of the question
13.	Provision for validation, deletion, modification of questions authored by the authors
14.	Provision for payment processing of question bank authors
15.	Provision to generate of question papers in multiple sets from the question bank
16.	Provision for separate question paper generation system for regular and arrear examination
17.	Provision for encryption of uploaded and generated question papers in the database
18.	Provision for defining the difficulty level of the questions
19.	Should allow the system to pick questions based on difficulty levels.

20.	Should record the system based on login details.
21.	Provision for secure channel for transfer the question papers.

Question paper settings

Appointment of question paper setters are considered as the most important responsibility of the University. So if it's confidential. The question paper setting module handles the appointment of question paper setters with secure access to the system.

SI NO.	Activities
1.	Approval of author's registration.
2.	Verification and approval of questions.
3.	Remuneration details for authors.
4.	Prepare multiple set of question paper configuration
5.	Security configuration

User Groups	Responsibility
Question paper section	<ul style="list-style-type: none"> Record question paper details Record authors details Record question paper bundles Record remuneration details
Controller of examination	<ul style="list-style-type: none"> Monitoring of all activities of question paper setting and bundling process Approval of question paper

SI NO.	Functional Requirement Specification
Question paper settings	
22.	Provision to view a course with its schema and regulation
23.	Provision to consolidate the list of various subjects offered as examination

	paper for all the courses.
24.	Provision to view the list of subjects prepared for the previous year
25.	Verification of names of subjects and codes.
26.	Provision for registration of authors of questions in question bank. <ul style="list-style-type: none"> - Personal details - Qualification - Academic experience - Subjects of expertise
27.	Provision to view the subjects expertise's and their schema, rules and syllabus
28.	Provision for view sample questions of selected course.
29.	Provision to list the paper on which subjects are to be set
30.	Provision to list the question paper setters appointed for the subjects
31.	Provision to set question paper from a question paper bank
32.	Provision to give question paper numbering
33.	Provision to set question type and difficulty level of each question paper.
34.	Provision to approve question paper by the controller of examination
35.	Provision to view approve question paper by passing the board
36.	Provision to record question paper authors

Examination

The examination has a very significant place in a University system. The examination is an instrument to test what the student has learned and retained during their course of study and it organize and integrate knowledge. The examinations are inevitable, without examining the work of students and teachers will neither have the precision and any direction.

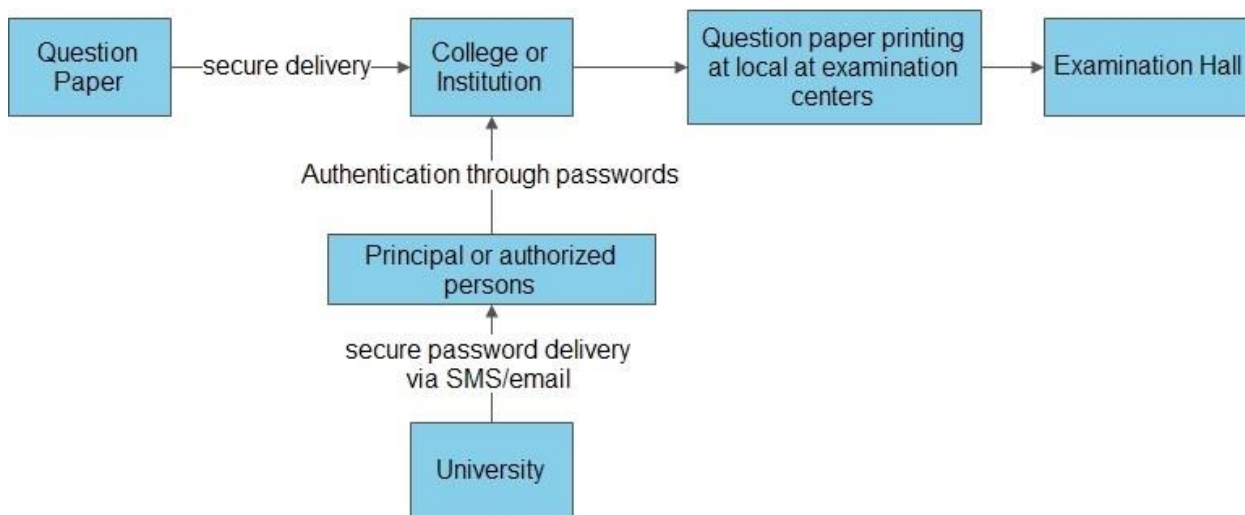


Figure 13: Delivery of Question Papers

The major part of the examination activities are carried out by the University and that includes,

Sl. No	Activities
1.	Preparation of examination timetable <ul style="list-style-type: none"> - Verification of course schema and syllabus - Prepare an examination list with lease conflict with each other. - Check the constraints of each examination
2.	Question paper settings. <ul style="list-style-type: none"> - Prepare an expert teacher list for an examination to generate question paper from question bank. - Each selected teacher can log in to question bank and prepare two or three patterns of question papers with the help of schema, rules and syllabus. - The question paper should be approved by CoE. - Upload the approved question papers to question bank with a unique id for question paper.
3.	Question paper printing There two options for question paper printing Option 1:Offline printing of question paper <ul style="list-style-type: none"> - The authorised person can download the question paper and go for printing. - Bundle the question paper according to nominal roll - The bundle contains a facing sheet with <ul style="list-style-type: none"> • Printed barcode contains details of question code and college code • Printed barcode contains details of nominal roll Id. - Route and vehicle analyse for question paper despatch. - Despatch the question paper according to nominal roll.

	<p>Option 2: Online Printing of question paper.</p> <ul style="list-style-type: none"> - This method is used to overcome the leakage of question papers. - The question paper in the question bank is encrypted and transported over a secure channel to examination centre just one hour before the examination. - Authorised persons in the examination centre will decrypt this question paper and printed.
4.	The examination can also be conducted via online.
5.	<p>Distribution of answer sheets</p> <ul style="list-style-type: none"> - The barcode is printed on the each paper of answer sheet booklet. - The facing sheet contains two portions with barcode. First portion is used for entering marks of each question and the second portion is used for entering student roll no, examination centre, question paper code and date of examination. - Logistic methods used for distributing answer sheets to examination centres.
6.	The examination is conducted at affiliated colleges of the University.

User Groups	Responsibility
Exam Monitoring cell	<ul style="list-style-type: none"> • Question paper distribution • Record question paper bundles • Record the number of collected answer sheet bundles • Record college details • Record details of valuation camps
Controller of examination	<ul style="list-style-type: none"> • Monitoring of all activities of examination process

The system should meet the following requirements to capture and process all the data related to the examination.

Sl. No.	Functional Requirement Specification
1.	Provision for multilevel role based access of examination system
2.	Provision for user management for each section of the examination
3.	Provision for role based authentication for each group.

4.	Provision for maintaining a workbook for each user.
5.	Provision to maintain employee hierarchy to forward the any application/file
Examination time table section	
6.	Provision to view examination notification.
7.	Provision to view all the examination related documents like schema regulation etc.
8.	Provision to view the examination notification list.
9.	Provision to view the number of examination centres.
10.	Provision to view the supplementary examination held at this time.
11.	Provision to view the improvement examination held at this time.
12.	Provision to set examination according to its priority
13.	Provision to view logs of access.
14.	Provision for timely update the status of prepare the examination timetable to CoE
15.	Provision to schedule examination list with lease conflict with each other
16.	Provision to automate the time table preparation by using algorithms.
17.	Provision to schedule the supplementary examination
18.	The system should capable to view all the keywords and with the self-learned intelligence, it can make an automatic schedule of examination.
19.	Provision to approve the examination timetable by CoE.
20.	Provision to view approved timetable by each section.
Conduct of examination	
21.	Provision to make absentees list of each examination.
22.	Provision to enter opened question paper covers

23.	Provision to enter unopened question paper covers
24.	Provision to enter malpracticed students details
Question paper printing–online	
25.	Provision to transport the question papers in the examination centre via secured channel.
26.	Provision to check and compare with a nominal roll of the examination.
27.	Provision to send one time activation code for each examination centre.
28.	Provision to make print the question paper just one hour before the examination.
29.	Provision to prompt secure password and the one time activation code for question paper printing
30.	Provision to decrypt the question paper for printing using secure key. (Send via SMS/email)
31.	Provision to log the printing activities at the examination centre.
Examination monitoring cell University – Manual mode	
32.	A provision to make viewing the nominal roll of each examination
33.	Provision for a logistic approach to distribute of question paper sheets to affiliated colleges.
34.	Provision for a logistic approach to distribute of answer paper sheets to affiliated colleges.
35.	Provision to make the logistic view to understand the route and the number of bundles in each examination center.
36.	Provision for a logistic approach to collect of answer sheets from affiliated colleges.
37.	Provision to view absentee list of examinations

Valuation and Tabulation

The affiliated colleges will conduct the examination and collect the answer sheets from the students and bundled them based on the registration number. The absentees list will be noted on top each bundle and these bundles were dispatched to either University or centralized valuation camp. The valuation section will arrange answer sheet based on the examiners list prepared by the secret section. The examiner name and the number of copies with absentees list were printed on top of each bundle with a bar code. These bundles can be distributed by the presence of chief examiner.

The chief examiner will prepare a tabulation register based on the valuation. The assisted examiners will enter the marks against the barcode and upload the marks to examination wing. The tabulation section will verify this mark by cross checking with the tabulation register and generate the mark sheets.

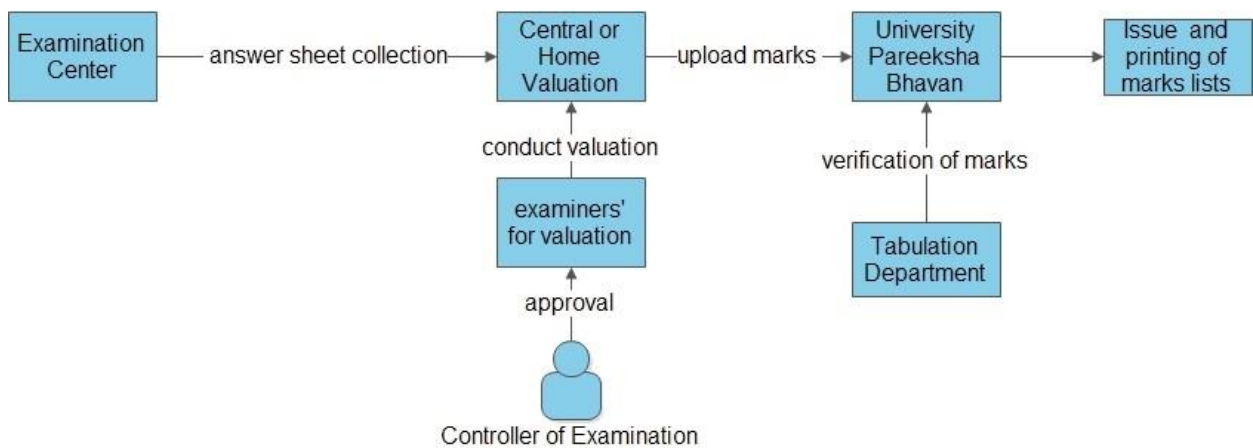


Figure 14: valuation flow

The main activities are

Sl. No.	Activities
1.	Preparation of examiners list preparation of valuation - The examiner list is prepared based on following criteria <ul style="list-style-type: none"> • Seniority level • Subject wise • Rotation based selection of teachers.
2.	The answer sheets are collected from examination centre and the absentees list should be noted on top of each bundle.
3.	Tear off the student registration details from the answer sheets and bundled them based on the examiners list.
4.	Transport bundles to central valuation camp or University

5.	Prepare tabulation register - Tabulation register is verified by the chief examiner
6.	Verification of marks - The verification of marks by each section by referring tabulation register
7.	Submission marks
8.	Mark list preparation - Verification of tabulation - Access rules are defined - Mark list generation - Moderation - Grace mark
9.	If the candidate appears in the final semester / year - Provide a consolidated mark list. - Generate provisional certificate - Approval required for certificate generation (Assistant/SO/AR)

The system should meet the following requirements to capture and process all the data related to valuation.

Sl. No.	Functional Requirement Specification
1.	Provision for entering the student examination absentees from the colleges.
2.	Should allow capturing the question paper bundle details. - College name - Course name - Date of Examination - Subject name - Bundle number - Number of answer sheets in the bundle
3.	Should allow to verify the bundles received by the following details - College name - Course name - Date of Examination - Subject name - Bundle number - Number of answer sheets in each bundle

4.	Should allow to list examiners and the valuation subjects
5.	Provision to view the examiner details
6.	Provision to group examiners based on subjects
7.	Provision to assign examiners for the particular examination
8.	Provision to approve the list of examiners by the controller of examination
9.	Should generate false number for answer sheets
10.	Should allow to map the false number with the registration number
11.	Should define the range of false number for each subject
12.	Should record the following details before giving for the valuation <ul style="list-style-type: none"> - Examiner name - Number of answer sheets provided for the examiner for valuation - The false numbers
13.	Should have provision to configure the programmes under CBCSS.
14.	Should have provision to configure semester for each programme.
15.	Should have provision to configure annual scheme examination.
16.	Should have provision to configure semester based examinations.
17.	Should have provision to configure examination of off campus registration.
18.	Should have provision to configure examination of private registration.
19.	Should have provision to configure courses under each programme.
20.	Should have provision to configure the weight of type of questions.
21.	Should have the ability to configure direct grading system
22.	Should have the ability to calculate weighted grade points.
23.	Should have provision to define the programmes under CSS
24.	Should allow to enter internal marks.
25.	Should allow to enter practical marks.

26.	Should allow to enter the following details for mark entry <ul style="list-style-type: none"> - Course name - The false number - Mark of each subject
27.	Provision for preparing tabulation register <ul style="list-style-type: none"> - Verification required - Authorization is required
28.	Should allow to export tabulation register to XML, excel or pdf format
29.	Provision for preparing the moderation criteria. The following list of students has to be generated based on condone deficiency in <ul style="list-style-type: none"> - Mark for securing a pass - Mark required for attaining Class/Grade
30.	Provision for defining moderation criteria.
31.	Should provide list of students applicable to moderation marks.
32.	Should provide moderation mark to the selected number of students.
33.	Should distribute moderation marks to different subjects of the student.
34.	Should have the provision to withheld the result
35.	Should have the provision to release the result
36.	Provision for verifying the marks entered into the system with tabulation register. <ul style="list-style-type: none"> - Authorisation is required - Verification is required - Tabulation register is required
37.	Provision for generating mark list <ul style="list-style-type: none"> - Unique Id of student - Generate mark list
38.	Provision for defining grace mark criteria
39.	Provision of listing the students claimed for grace mark
40.	Provision for adding grace marks to mark obtained in different subjects.
41.	Provision for configuring credits of the programme.
42.	Provision for configuring Minimum Credits required for successful completion

	of the Programme.
43.	Provision for configuring Minimum credits required from Common Courses
44.	Provision for configuring Minimum credits required for Core and Complementary Courses
45.	Provision for calculation Grade Point of internal examination
46.	Provision for calculation of Grade point of external examination
47.	Provision for calculation of SGPA
48.	Provision for calculation of CGPA
49.	Provision for giving Grades in alphabetical order based on CGPA.
50.	Provision for generating a final mark list <ul style="list-style-type: none"> - Role based access is required - Verification of mark list is required.
51.	Provision for publishing mark list of the students
52.	Should provide statistics of the result with the details given below <ol style="list-style-type: none"> 3. The name of the examination with month and year 4. Number of candidates registered for the year 5. Number of first class 6. Number of second class 7. Number of third class 8. Total number of passes 9. Percentage of pass
53.	Provision for generating a provisional certificate
Grace Mark	
54.	Provision for receiving claims of grace mark from students
55.	Provision for verification of claim request. The following details should be verified <ul style="list-style-type: none"> - Certificates - Approval from college principal
56.	Provision for configuring the grace mark category such as <ul style="list-style-type: none"> - Blind - Deaf - Dumb

	<ul style="list-style-type: none"> - Dyslexia - Arts and sports based on events - Other Extra- curricular activities like NCC, NSS
57.	Provision for distributing marks based on University decisions
Moderation of Marks	
58.	Provision for configuring moderation mark based on University board of examination decisions
59.	Provision for distributing moderation mark for eligible students

Certificate generation

Provisional Certificate

A provisional certificate is issued to a candidate during the period of after publication of the results of the examination taken by candidates and before the issue of the original Degree certificate. Application for provisional certificate has to be submitted in the prescribed format in the prescribed form and it shall be accompanied by the document providing remittance of the prescribed fee. All applications for provisional certificates shall be addressed to the Assistant Registrar dealing with the examination concerned.

The assistant of the section officer will prepare the provisional certificate by verifying the tabulation register of the candidate. The section officer will verify the entries of the certificate by verifying the tabulation register and put signs on it. The assistant Registrar sign and issue the provisional certificate.

SI NO.	Activities
1.	<p>The student can apply for provisional certificate by using their username and password. (During registration the University will provide a username and password for every student).</p> <ul style="list-style-type: none"> - Log in with user id and password - Display the details of the student - Select application for provisional certificate from a list of applications. - The student can enter the details of mark got in a different semester / year - Display the form of e-payment/Challan entry in the certificate - Generate a receipt of application.
2.	<p>Students have to pay the fees online through credit cards / net banking etc. or offline through cash at recommended bank by the University.</p> <p>If the offline payment the student has to enter the details of payment to proceed</p>

	the further steps of the generation of provisional certificate.
3.	Verification of application by respective Assistant Registrar.
4.	Issue the certificate and keep certificate details in database for further reference.

The system should meet the following requirements to capture and process all the data related provisional certificate generation.

Sl. No.	Functional Requirement Specification
1.	Provision for receiving online application. - Verify the application, fee details
2.	Provision for checking the mark obtained in the course - Verification required - Authorization is required
3.	Provision for verifying the marks entered into the system with tabulation register. - Authorization is required - Verification is required - Tabulation register is required
4.	Provision for generating a provisional certificate
5.	Ensure the certificate is available in student login in pdf format
6.	Send the certificate to the student through the despatch section

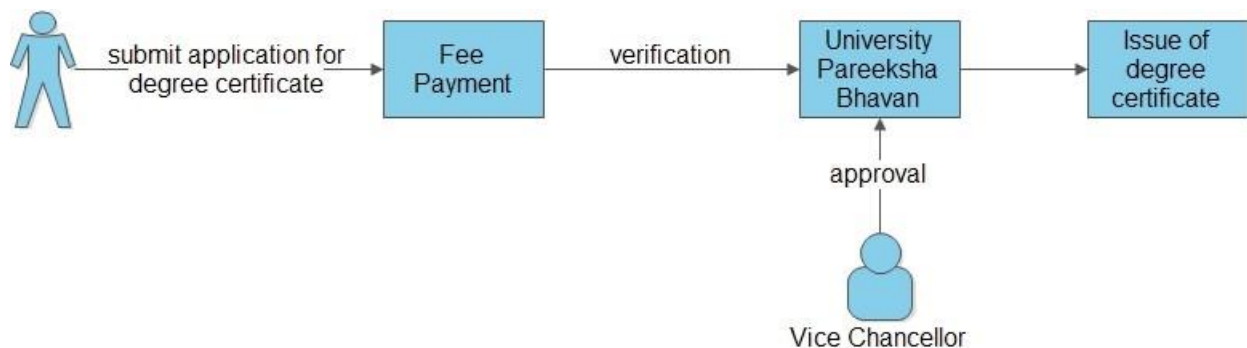
Degree certificate

The syndicate is the authority to give degree certificate. Candidates who passed the various examinations conducted by the University become eligible to receive the degree certificates only after the syndicate at a formal meeting held after the date of publication of the results. Separate application has to make for degree certificate. The filled applications shall send to the deputy Registrar at the University in charge of examinations concerned. A separate fee is collected for degree certificate along with the application.

The tabulation section will verify the candidate marks with tabulation register and prepare the degree certificate. The prepared degree certificate is verified by section officer and it is being signed by assistant Registrar. The degree certificate signing is done by the vice chancellor.

Sl NO.	Activities
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1.	<p>The student can apply for degree certificate by using their username and password. (During registration the University will provide a username and password for every student).</p> <ul style="list-style-type: none"> - Log in with user id and password - Display the details of the student - Select application for degree certificate from a list of applications. - The student can enter the details of mark got in a different semester / year - Display the form of e-payment/Challan entry in the certificate - Generate a receipt of application.
2.	<p>Students have to pay the fees online through credit cards / net banking etc. or offline through cash at recommended bank by the University. If the offline payment the student has to enter the details of payment to proceed the further steps of generation of a degree certificate.</p>
3.	<p>Verification of application by a respective section officer and signed by Assistant Registrar.</p>
4.	<p>Issue the certificate by vice chancellor and keep certificate details in database for further reference.</p>



The system should meet the following requirements to capture and process all the data related to degree certificate generation.

Sl. No.	Functional Requirement Specification
1.	<p>Provision for receiving online application.</p> <ul style="list-style-type: none"> - Verify the application, fee details
2.	<p>Provision for checking the mark obtained in the course</p>

	<ul style="list-style-type: none"> - Verification required - Authorization is required
3.	Provision for verifying the marks entered into the system with tabulation register. <ul style="list-style-type: none"> - Authorization is required - Verification is required - Tabulation register is required
4.	Provision for generating a degree certificate
5.	Ensure the certificate is available in student login in pdf format
6.	Send the certificate to the student through the dispatch section

Issue of duplicate certificates

If the degree certificate issued to the candidate has been irrevocably lost, a duplicate certificate shall be issued subject to the following conditions

- a. An application has to submit along with a fee for the duplicate certificate issue.
- b. An affidavit signed by the candidate and attested by a notary public
- c. In case of regular candidate a letter from principal has to be provided.

SI NO.	Activities
1.	The student can apply for a duplicate certificate through online. <ul style="list-style-type: none"> - Display form for entering the details of student required for the duplicate certificate. - Display the form of e-payment/Challan entry in the certificate - Generate a receipt of application.
2.	Students have to pay the fees online through credit cards / net banking etc. or offline through cash at recommended bank by the University. If the offline payment the student has to enter the details of payment to proceed the further steps of the generation of duplicate certificate.
3.	Verification of application by a respective section officer and signed by Assistant Registrar.
4.	Issue the certificate in separate format by the controller of examination and keep certificate details in database for further reference.

The system should meet the following requirements to capture and process all the data related to duplicate degree certificate generation.

SI NO.	Functional Requirement Specification
1.	Provision for receiving online application. - Verify the application, fee details
2.	Provision for checking the authorization from institute head
3.	Provision for collecting fees through online
4.	Provision for generating duplicate certificate
5.	Send the certificate to the student through the despatch section

Migration certificate

The candidate who undergone a course of study in this University and secure admission to courses of studies in other universities shall be issued migration certificate if they apply for the same with a prescribed fee, provided they have completed the formality of registering as matriculates of this University irrespective of whether they have registered for any examination of this University or not.

The applications of migration certificate shall be processed in the section maintaining the register of matriculates. The applications which then send to the concerned tabulation section for verifying the details of the candidate. The tabulation register is updated with 'migrated' entry. Then the verified application sends back to the section. The section will prepare the migration certificate and signed by deputy Registrar.

SI NO.	Activities
1.	<p>The student can apply for migration certificate by using their username and password. (During registration the University will provide a username and password for every student).</p> <ul style="list-style-type: none"> - Log in with user id and password - Display the details of the student - Select application for migration certificate from a list of applications. - The student can enter the details which are required for the migration certificate and submit to the head of the institution. - Display the form of e-payment/Challan entry in the certificate. - Head of the institution needs to forward that request to the University. - Generate a receipt of application and send to candidate's email id.

2.	Students have to pay the fees online through credit cards / net banking etc. or offline through cash at recommended bank by the University. If the offline payment the student has to enter the details of payment to proceed the further steps of generation of migration certificate.
3.	Verification of application of the respective section maintaining the Register of Matriculates.
4.	The tabulation register is updated with 'migrated' entry.
5.	When the verified applications are received back in the section, a certificate in the prescribed format shall be prepared and signed by Deputy Registrar.
6.	Keep the certificate details in database for further reference.

The system should meet the following requirements to capture and process all the data related to migration certificate generation.

SI NO.	Functional Requirement Specification
1.	Provision for receiving online applications by head of the institution. - Verify the application
2.	Provision for checking the details given by the applicant
3.	Provision for forwarding the application to the University by the head of the department
4.	Provision for checking application details and fee by the respective section in the University.
5.	If the application is acceptable then generate and send the migration certificate to the applicant.

Verification of genuineness of certificates and mark lists

The controller of examination is the authorized officer to issue certificates of genuineness of certificates and mark lists issued by the University. If the request for verification is from other universities, foreign embassies, educational agencies or other professional agency fee shall be levied for issuing certificates of genuineness. When the verification request reaches at the concerned section the verification report is prepared by section officer and verified by assistant Registrar. The deputy Registrar of the concerned branch is authorized to sign the verification report on behalf of the controller of examination.

SI NO.	Activities
1.	Other universities, foreign embassies, educational agencies or other professional agencies can apply for certificates of genuineness. <ul style="list-style-type: none"> - Select application for certificates of genuineness from a list of applications. - The applicant can enter the details which are required for the certificates of genuineness. - Display the form of e-payment/Challan entry in the certificate. - Submit to the Assistant for verification. - Generate a receipt of application and send to applicant's email id.
2.	The applicant has to pay the fees online through credit cards / net banking etc. or offline through cash at recommended bank by the University. If the offline payment the student has to enter the details of payment to proceed the further steps of generation of genuineness of certificates and mark lists.
3.	If the application details and fee are valid generate a genuine of certificate or mark list and attested by the Registrar and then send to the applicant.

The system should meet the following requirements to capture and process all the data related to the genuineness of mark list generation.

SI NO.	Functional Requirement Specification
1.	Provision for receiving online applications by respective section. <ul style="list-style-type: none"> - Verify the application
2.	Provision for checking application details and fee by the respective section in the University.
3.	Provision for generating the certificate.
4.	Provision for sending a soft copy of certificate to applicant's email id.

Transcript of marks and syllabus

On by request of transcript of mark list along with the prescribed fee, the University can provide transcripts of mark list and syllabus. The transcript is prepared in concerned section by providing details to the tabulation section. The tabulation section gives the report based on the request from the section. The section officers prepare the transcript of marks/ syllabus and forwards to joint Registrar to sign.

SI NO.	Activities
1.	The applicant can apply for Transcript of marks and syllabus <ul style="list-style-type: none"> - Select application for Transcript of marks and syllabus from a list of applications. - The applicant can enter the details which are required for the Transcript of marks and syllabus. - Display the form of e-payment/Challan entry in the certificate. - Generate a receipt of application and send to candidate's email id.
2.	Students have to pay the fees online through credit cards / net banking etc. or offline through cash at recommended bank by the University. If the offline payment the student has to enter the details of payment to proceed the further steps of generation of Transcript of marks and syllabus.
3.	The tabulation section gives the report based on the request from the section.
4.	The section officers generate the transcript of marks/ syllabus and forwards to joint Registrar to sign.
5.	Send to applicant through dispatch section

The system should meet the following requirements to capture and process all the data related to transcript of marks certificate generation.

SI NO.	Functional Requirement Specification
1.	Provision for receiving online applications by respective section. <ul style="list-style-type: none"> - Verify the application
2.	Provision for checking application details and fee by the respective section in the University.
3.	Provision for generating the certificate.
4.	Provision for sending a soft copy of certificate to applicant's email id.

Consolidation of marks

The consolidation of mark list is prepared by the concerned section. The consolidated mark list is signed by assistant Registrar.

SI NO.	Activities
1.	The applicant can apply for consolidation of mark through a University portal <ul style="list-style-type: none"> - Select application for consolidation of mark from a list of applications. - The applicant can enter the details which are required for the consolidation of the mark. - Display the form of e-payment/Challan entry in the certificate. - Generate a receipt of application and send to candidate's email id.
2.	Students have to pay the fees online through credit cards / net banking etc. or offline through cash at recommended bank by the University. If the offline payment the student has to enter the details of payment to proceed the further steps of the generation of consolidation of the mark.
3.	The tabulation section gives the report based on the request from the section.
4.	The section officers prepare the consolidation of mark and forwards to Assistant Registrar to sign.
5.	Send to applicant through dispatch section

Scrutiny/Revaluation of answer scripts

The University has made a provision for scrutiny / revaluation of answer scripts of candidate who have appeared for the examination and who wish to avail of this facility.

SI NO.	Activities
1.	The student can apply for scrutiny/revaluation by using their username and password through a University portal. (During registration the University will provide a username and password for every student). <ul style="list-style-type: none"> - Log in with user id and password - Display the details of the student - Select application for scrutiny/revaluation from a list of applications. - The student can enter the details which are needed for scrutiny/revaluation. (Year/semester, subjects, etc.) - Display the form of e-payment/Chellan entry for the application - Generate a receipt of application.
2.	Students have to pay the fees online through credit cards / net banking etc. or offline through cash at recommended bank by the University.

	If the offline payment the student has to enter the details of payment to proceed the further steps of the generation of the certificate.
3.	Verification of application by Assistant Registrar in revaluation section.
4.	The call letters/ indent for answer scripts shall be sent to the paper go down. The Godown authority shall send back the counterfoil and answer scripts to the revaluation section. (Paper searching can be made efficient by using RF IDs for each paper bundle)
5.	Allocate examiner for revaluation given by examination section.
6.	Allocate a false number/barcode with the code number of the answer scripts, change the facing (mark tabulation) sheet of the answer scripts, erase the marks in the answer sheet. And then send to the examiner for revaluation through the despatch section.
7.	Receive revaluation mark from examiner through the portal.
8.	After the revaluation if any increase in the mark, the new mark sends to the tabulation section for affecting the change in the mark list
9.	If no change in the mark after revaluation, memo (email) sends to the student with the content no change in the mark in revaluation. This is approved by AR.
10.	If a change in the mark after revaluation, a memo (email) is sent to the student, tabulation section with the content change in the mark in revaluation. This is approved by DR.

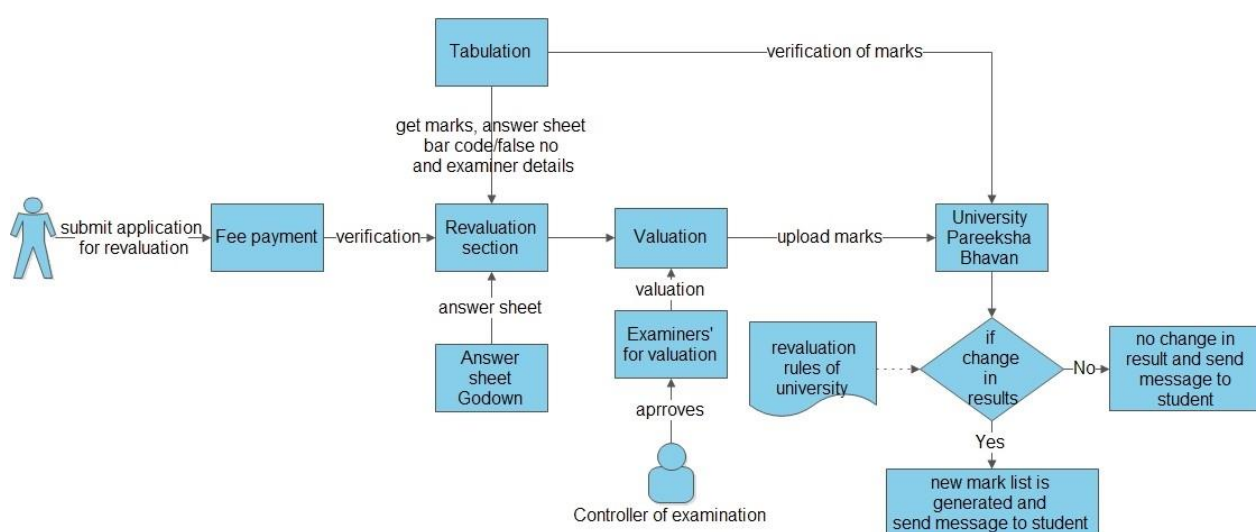


Figure 15: Revaluation Process flow diagram

SI NO.	Functional Requirement Specification
Student	
1.	Provision to login into the system
2.	Provision to select a subject/s for revaluation
3.	Provision to submit application for scrutiny/revaluation via online
4.	Provision to manage the fee collection <ul style="list-style-type: none"> - Online fee payment like Debit card/Credit card/Online Banking. - Offline fee payment like Challan form for recommended bank/ DD in favour of universities.
5.	Provision to view the status of revaluation
University	
6.	Provision to receive revaluation application
7.	Provision for select following details by using revaluation application <ul style="list-style-type: none"> - Subject details - Marks got for each section - Examiner's name - Year /semester details - Answer booklet code.
8.	Provision for allocating false number/barcode to answer scripts.
9.	Provision for allocating examiner for the revaluation of answer scripts.
10.	Provision for indenting answer script from Godown
11.	Provision for searching answer script from Godown
12.	Provision for distributing answer script to different examiners
13.	Provision to make a new facing sheet with barcode/false
14.	Provision to map the false no/barcode with student register id
15.	Provision for collecting revaluation mark from different examiner
16.	Provision for 3 rd valuation if the increase of mark greater than 10% for arts and 15% in science

17.	Provision for informing the applicant about the revaluation status.
18.	Provision for updating tabulation register if a change in mark is greater than 5%
19.	Provision for generating an updated mark list
20.	Provision for approving the mark list by DR.
21.	Provision to send the status of the revaluation application of each student.

5. Recommendations

1. Effective end-to-end use of ICT for reforms in Examinations: Information and communication Technology (ICT) should be effectively used for the management of the examinations system in Universities to usher in greater efficiency, transparency and reliability. Use of ICT shall also lead to improvement in quality of services being provided to the students/colleges/ departments etc. by introducing services through an online web portal, computerized counter at college /University, mobile , help desks , Common Service Centers etc. and online availability of information. The end-to-end integrated examination management system can manage the entire operation of examinations in Universities. The comprehensive examination management solution typically includes modules as follows: Student Registration for Issuance of Hall Tickets, Question Bank/ Question Paper Bank Generation, Secure Delivery of Question Papers, bar code evaluation of Answer Sheets, Results Processing and Publication, Online Application for Reevaluation, Dematting of Degrees and Certificates etc.
Depending on the present status of computerization, the solution may be end-to-end from one service provider or may involve different service providers implementing various modules.
2. Online student registration for examinations to issuance of hall ticket Every University shall adopt ICT for online student registration for examinations and conduct a few pilots for online issuance of hall ticket.
3. Question Bank Creation: The system should suggest that Question Bank approach should be followed by the Universities for setting University examination papers. The universities may decide as per their requirements from among the two approaches.
For ensuring quality and systematic generation of Question, training and orientation needs to be provided to paper setters. The number of questions in the question bank should be at least 100 times the number of questions required in a question paper. The Question bank should be available on the website of the University as well as the libraries of universities and affiliated colleges. The Question papers should be kept confidential.

At least one third of the questions in Question bank should be changed every, whenever the curriculum is modified all the question papers in the Question paper bank should be changed

4. Secure Delivery of Examination Papers: In order to eliminate the threats and challenges faced in the distribution and delivery of Question Papers to the respective institutes, the universities should adopt Information Technology Solution for Secure Delivery of Question Papers.

In this solution, The Question paper once randomly selected/generated from the bank is encrypted and transmitted over secure channel to the examination centers just one hour before the Examination. At the examination center it is decrypted with the key/password and printed. This will overcome the leakage of question papers during transportation and printing.

5. Barcode in each page of the Answer Booklets Some universities may implement this solution on a pilot basis in professional courses. Following this, the government may collate the data on pilot implementation and decide on further action depending on the results of the pilot studies. In this solution, each page of the answer booklets shall contain the unique code of the answer booklet.
6. Results Processing and Publication: The system should suggest that the University should display results online including the complete breakup of marks. Each student shall be able to register on the website and check his/her results. Further, a provision for sending the results by SMS / email to those students who have registered their mobile numbers / emails on the site may also be ensured.
7. Online application for revaluation: The system should suggest that the universities should enable online application for revaluation. Students should be able to apply online for re-evaluation of answer sheets and pay the fees online through credit cards / debit cards / net banking etc. or offline through cash at Challan / DD / Universities Counter / College Counter etc.
8. Online Examinations: The system should suggest that universities shall implement online examinations for internal examinations or as a part of external examinations on a pilot basis in certain courses / examinations.

The examination can be conducted in both ways, if a course contains 6 semesters, each odd semester can be done by offline examination and even semester can be done by online examination.

Many Universities in India have adopted online examinations for entrance tests or University examinations including: BITSAT by BITS Pilani, Manipal University's UGET, CAT by the IIMs, GCET Online by Gujarat Technological University, Delhi University online exams etc. Various large scales internationally recognized examinations like GRE, GMAT, TOEFL etc. are also conducted online at specialized dedicated examinations center in an outsourced manner.

9. Innovations in Exams like Open Book, Take Home etc.: The central goal of Universities is to build knowledge of students and equip them to apply available knowledge to solve problems and make intelligent decisions. The main focus of teaching should shift from rote learning to the application of knowledge.

10. In order to achieve it, it is necessary to reform the way of examinations. The Examinations shouldn't be a test of the memory of students but should test the understanding and application of knowledge by the students. Universities may experiment with these non-traditional types of examinations like Open Book Exams, Take Home Exams etc. in certain subjects on pilot basis
11. Secure Degree certificate printing: The Degree Certificate awarded by a University is an asset of prime importance in an individual's life. Circulation of fake degree certificates is a menace to the society, and a threat to the integrity of both the certificate holder and the educational institution that has been awarded the certificate. So we suggest that the degree certificates should have the secure, tamper resistant and ant copying features. Provision for Printing of Aadhar number and photo of the candidate on the Degree certificate is to be provided.
12. Auto scheduling of examination time table: The system should suggest that automatic scheduling of examination with least conflict with each other.
13. Logistic approach for collecting and distributing of question papers and answer booklets: The examination scheduling and preparation are a continuous task in many of the universities. It is very difficult to distribute question papers to examination center and collection of answer sheet from examination centers. We suggest that the system should provide a logistic approach for collecting and distributing of the question paper and answer sheets. This reduces the time and workload of examination department.
14. Arrangement of answer sheets in Godown: The system should suggest that there should be proper arrangement of answer sheets in Godown. The RFID feature can be used to locate each answer sheet in Godown.
15. The system should be supported **On Screen** evaluation in future if implemented.