The Grievance Redressal Cell (GRC) is an important component of the National Assessment and Accreditation Council (NAAC) accreditation process for colleges in India. The GRC is responsible for addressing complaints and grievances related to academic and non-academic matters from students, faculty, and staff members.

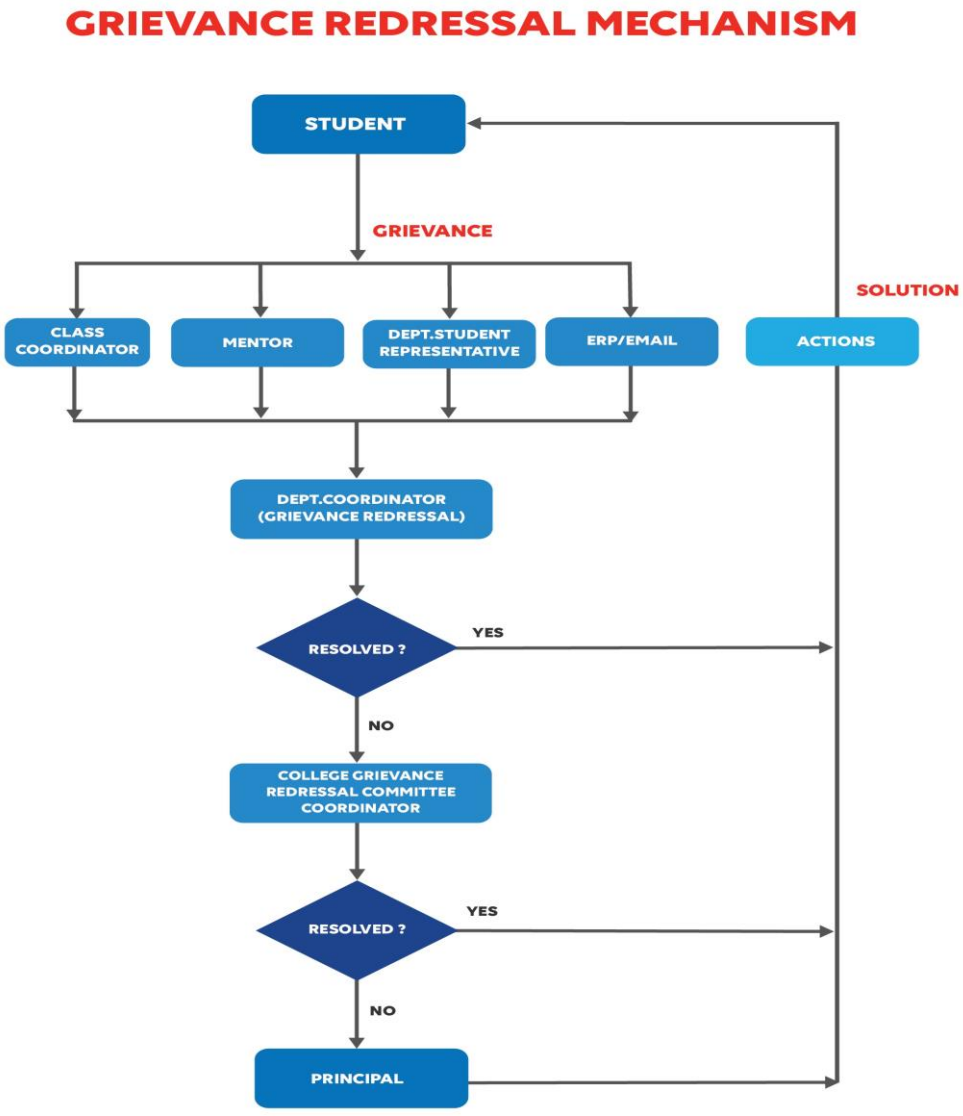
The GRC of the college is an independent and impartial body which is constituted to resolve grievances arising inside the campus. The GRC has a clearly defined structure, functions, and procedures for addressing grievances in a timely and effective manner. The GRCof the college has the authority to receive, investigate, and resolve grievances related to issues such as discrimination, harassment, unfair treatment, and academic matters. The GRC also hasthe power to make recommendations for policy changes and improvements to prevent future grievances.

Objectives

The main objective of the Grievance Redressal Cell (GRC) is to ensure that the college provides a fair and transparent environment for all its stakeholders, including students, faculty,and staff members. Some of the specific objectives of the GRC are:

- To provide a platform for addressing and resolving grievances related to academic and non-academic matters.
- To ensure that grievances are resolved in a timely and effective manner, and that therights of all stakeholders are protected.
- To promote a culture of transparency, accountability, and fairness in the college.
- To create awareness among stakeholders about their rights and responsibilities, and topromote a respectful and inclusive campus environment.
- To make recommendations for policy changes and improvements to prevent futuregrievances and enhance the quality of the college's governance and administration.

Grievance redressal cells play a vital role in ensuring transparency, accountability, and fairness within organizations, promoting a healthy work or service environment, and maintaining the trust of stakeholders. They are an essential part of any organization's commitment to resolving issues and disputes effectively.



If any grievances occur it will processed at four different levels in organization, includes faculty, mentor, department coordinator and grievance redressal committee in which the grievance addressing dependents sensitivity level for the high priority level of grievances which will be forwarded to principal and management level for the addressing of the issues

successfully and action report will be issued to the grievance addressee in safe and secure channel.

A grievance redressal cell, often referred to as a grievance handling or complaint resolution unit, is an important mechanism established within organizations, institutions, or government agencies to address and resolve complaints, concerns, and issues raised by individuals, employees, or stakeholders. The primary purpose of a grievance redressal cell is to provide a structured and transparent process for addressing grievances in a fair and timely manner. Here is a more detailed description of a grievance redressal cell:

1. Purpose: The main purpose of a grievance redressal cell is to provide a platform for individuals to voice their concerns, complaints, or grievances related to various aspects of an organization's operations, services, or conduct of employees. It aims to resolve these issues to maintain trust and satisfaction among stakeholders.

2. Structure: Typically, a grievance redressal cell is a designated unit within an organization or institution responsible for handling grievances. It may consist of trained personnel, often referred to as grievance officers or ombudsmen, who are responsible for receiving, documenting, and investigating complaints.

3. Channels of Communication: Organizations establish various channels through which individuals can submit their grievances. These channels may include dedicated complaint forms, emails, helplines, online portals, or even physical drop-boxes.

4. Confidentiality: Grievance redressal cells often prioritize the confidentiality of complainants to encourage individuals to come forward with their concerns without fear of reprisal. This confidentiality is crucial in protecting those who report issues.

5. Investigation and Resolution: Once a grievance is filed, the cell initiates an investigation or review process to understand the issue, collect relevant information, and analyze the situation. The goal is to identify the root cause of the grievance and determine the appropriate course of action to resolve it.

6. Timely Response: A key aspect of a grievance redressal cell is the commitment to addressing grievances promptly. This helps in preventing the escalation of issues and ensures that complainants do not experience undue delays in obtaining a resolution.

7. Communication with Complainants: The grievance redressal cell communicates with the complainant throughout the process, providing updates on the status of the investigation and the steps taken to resolve the grievance.

8. Redressal Mechanisms: The cell may recommend and implement various redressal mechanisms, which can include corrective actions, policy changes, disciplinary actions, or compensatory measures, depending on the nature of the grievance.

9. Documentation: Proper documentation of each grievance, its investigation, and the actions taken is crucial for accountability, transparency, and record-keeping. This documentation also aids in analysing trends and patterns of grievances.

10. Continuous Improvement: Many organizations use feedback from the grievance redressal process to identify areas for improvement and make necessary changes to prevent similar grievances in the future.

Continuous Internal Evaluation Process

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CONTINIOUS INTERNAL EVALUATION PROCESS

This Continuous Internal Evaluation Process handbook establishes rules and regulations, policies, and procedures towards the conduction of Internal evaluation. It is expected that all faculty & Staff members strictly adhere to the rules and regulations spelled out in this document. The IQAC reserves the right to change, modify or revoke the policies, rules and regulations as when necessary and apply their discretion in specific cases.

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Chapter	Content
Chapter 1	Mechanism of Internal Evaluation
Chapter 2	Assignments
Chapter 3	Evaluation Parameters and weightage ➢ Question papers are set for maintaining secrecy and transparency ➢ Conduction ➢ Assessment

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MECHANISM OF INTERNAL EVALUATION

- Schedule of dates for Continuous Internal Evaluation (CIE) and assignment is given in academic calendar which is displayed well in advance before commencement of semester.
- Evaluation methods comprise of CIE held progressively during the semester and is designed to check and report the periodic performance of the student.
- All the records and data bank of attendance in internal Examinations, Question papers, valued Blue books, summary of marks sheets, are properly maintained by the teachers for academic monitoring/academic audit.
- There is complete transparency in the internal assessment for each assessment method as described below.
    a. Model answers and marking scheme is prepared by every subject teacher before valuation. Class Assessment Test:
    b. After Valuation, marks are displayed on dates mentioned in the academic calendar by faculty members.
    c. Assessment topics are shown to the students. Some questions have specific marks of the valuator for awarding fewer marks.
    d. Assessment topics are shown to the students. Some questions have specific marks of the valuator for awarding fewer marks.

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ASSIGNMENTS

Assignment questions are discussed with students. The students can submit two assignments. Institute strictly adheres to the Continuous Internal Assessment (CIE) plan proposed either in academic calendar or course assessment plan. The sample copy of Institute and department calendar as shown in below where schedule of internal assessment, prelim exam, assignment test, other tool of internal assessment are scheduled.

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Phone: 080- 27625381 Mobile: 7259893093 Email: principal@rljit.in website : www.rljit.in

IQAC

Institute Calendar of Events

Academic Year 2023 - 24 (ODD - Semester)

Week No.	Month	Week Days							No. of Working Days	Events
		Mon	Tue	Wed	Thu	Fri	Sat	Sun		
1	Sep	4	5	6	7	8	9	10	6	4th Sep – Commencement of the I Semester /4th Sep to 14th Sep – Induction Programme for I semester.
2	Sep	11	12	13	14	15	16	17	5	11th Sep-Commencement of Classes for VII Semester /15th Sep-Commencement of Classes for I Semester/16th Sep-Third Saturday.
3	Sep	18	19	20	21	22	23	24	5	18th Sep-Ganesha Chaturthi.
4	Sep/Oct	25	26	27	28	29	30	1	5	28th Sep-Anantha padmanabha vratha/Eid Milad
5	Oct	2	3	4	5	6	7	8	4	2nd Oct-Gandhi Jayanti /7th Oct-First Saturday.
6	Oct	9	10	11	12	13	14	15	6	14th Oct-Mahalaya Amavasya
7	Oct	16	17	18	19	20	21	22	5	21st Oct- Third Saturday.
8	Oct	23	24	25	26	27	28	29	4	23rd Oct-Ayudha Pooja/24th Oct-Vijayadashami/26th, 27th, 30th Oct - Continuous Internal Evaluation - I for VII and I semester.
9	Oct/Nov	30	31	1	2	3	4	5	4	1st Nov-kannada Rajyotsava/2nd Nov- Announcement of CIE-I Attendance and Marks for VII and I Semester/ 4th Nov-First Saturday.
10	Nov	6	7	8	9	10	11	12	6	8th Nov to 9th Nov-Sports Events / 11th Nov-Kannada Rajyotsava Celebration by Student Welfare Dept.
11	Nov	13	14	15	16	17	18	19	4	14th Nov-Deepavali/Balipadyami/18th Nov-Third Saturday.
12	Nov	20	21	22	23	24	25	26	6	25th Nov-Parents Teachers Meeting.
13	Nov/Dec	27	28	29	30	1	2	3	4	27th Nov to 29th Nov - Continuous Internal Evaluation - II for VII and I semester/30th Nov-Kanakadasa Jayanti 2nd Dec-First Saturday.
14	Dec	4	5	6	7	8	9	10	6	7th Dec- Announcement of CIE-II Attendance and Marks for VII and I Semester/7th Dec-Student Welfare Day
15	Dec	11	12	13	14	15	16	17	5	16th Dec-Third Saturday.
16	Dec	18	19	20	21	22	23	24	6	
17	Dec	25	26	27	28	29	30	31	5	25th Dec-Christmas/25th Dec-Alumni Day /28th Dec to 30th Dec - Continuous Internal Evaluation – III for VII and I semester.
18	Jan	1	2	3	4	5	6	7	5	3rd Jan- Announcement of CIE-III Attendance and Marks for VII and I Semester/ 6th Jan-Last Working day for VII and I semester/6th Jan-First Saturday.
19	Jan	8	9	10	11	12	13	14	6	8th Jan to 19th Jan-Practical Examination for VII and I semester.
20	Jan	15	16	17	18	19	20	21	4	15th Jan-Makar Sankranti /20th Jan-Third Saturday.
21	Jan	22	23	24	25	26	27	28	5	22nd Jan to 9th Feb –Theory Examinations for VII semester/ 22nd Jan to 17th Feb – Theory Examinations for I semester / /26th Jan- Republic Day.
22	Jan/Feb	29	30	31	1	2	3	4	5	3rd Feb-First Saturday.
23	Feb	5	6	7	8	9	10	11	6	
24	Feb	12	13	14	15	16	17	18	5	13th Feb- Commencement of VIII semester/ 17th Feb-Third Saturday.
25	Feb	19	20	21	22	23	24	25	6	19th Feb- Commencement of II semester.

INSTITUTE VISION

- To be a Premier Institution by imparting Quality in Technical Education, Professional Training and Research.

INSTITUTE MISSION

- To Provide an outstanding Teaching Learning and Research Environment through innovative Practices in Quality Education
- To develop Leaders with high level of Professionalism to have a career in the Industry, Zeal for Higher Education, focus on Entrepreneurial and Societal activities.

Prepared by

(Dr.Madhu Chandra G)

Verified By

(Dr. Manjunatha B N)

IQAC Coordinator

R. L. Jalappa Institute of Technology

Doddaballapur-561 203.

Approved By

(Dr.P Vijayakarthik)

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Individual Faculty Members set the question papers for their respective courses they are teaching based on the common guidelines given by the department. The papers are submitted to Centralized IA Committee through the IA Co coordinators from the respective department in order to ensure the quality of the question paper.

The quality of the question paper is checked on the basis of:

- Framing of questions according to Cos.
- Use of Blooms Taxonomy for framing the questions
- Mentioning of COs and Cognitive levels
- Framing of new questions on the concepts

Question paper quality for the above mentioned factors are checked and commented from the assigned scrutinizers from the respective departments. The question papers that require modifications are returned to the respective course in-charge to make the necessary modificationsand submit a modified copy of the question paper.

The centralized IA Committee in-charge will discuss with the head of Institutions and choose the question paper from the set of 3 QP's, and the approved question paper will be printed in the examination section.

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The process is shown in the following flow chart

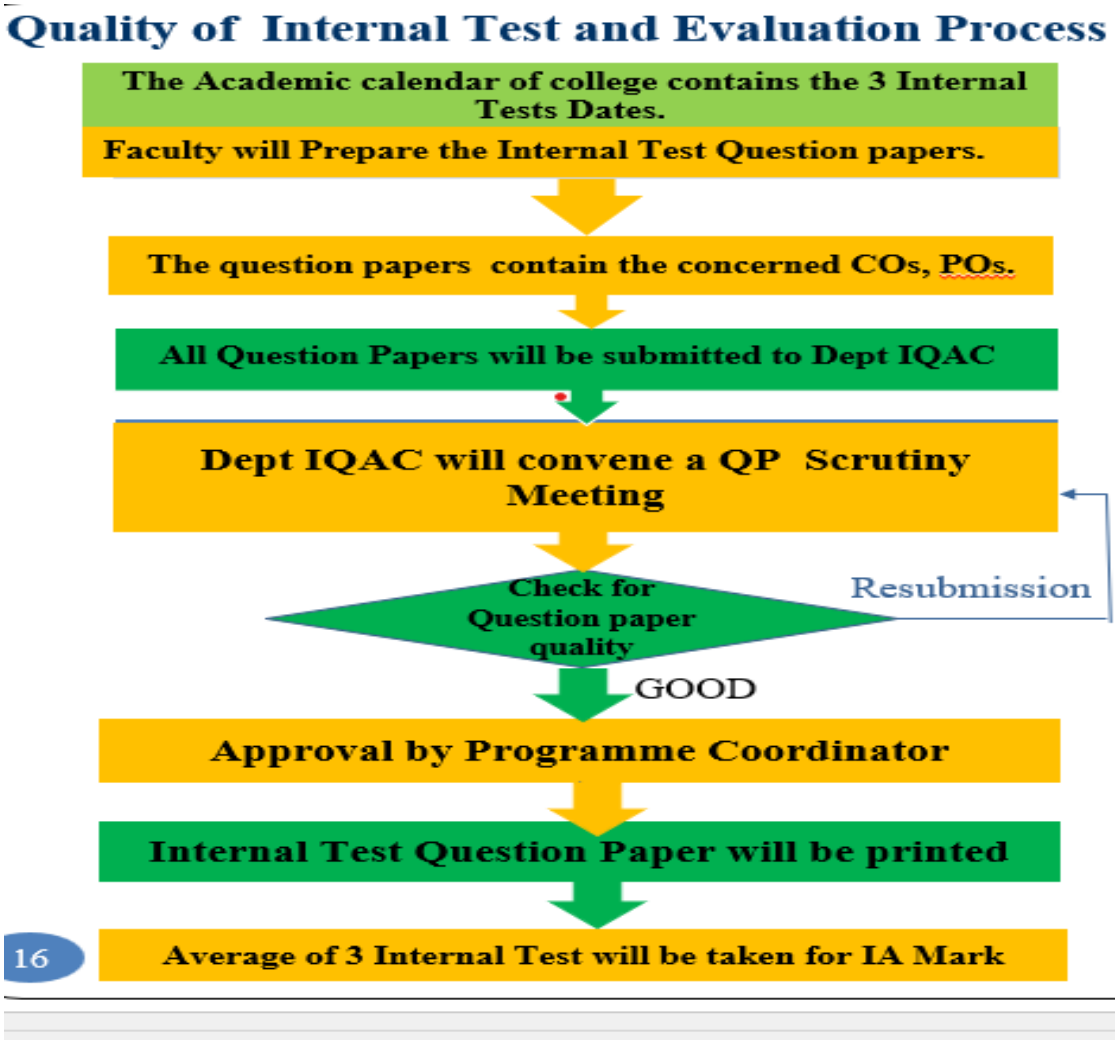

Figure: Quality of Internal Test and Evaluation Process

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The Continuous Internal Assessment (CIE) are conducted at institute Level strictly as per university examination patterns. The remaining Internal Evaluations are conducted as per the course outcome assessment plan. The Department IQAC team is responsible for following activities.

- Preparing and displaying time table for all classes of all programs
- Planning of seating arrangement for all students of all programs
- Collection of final question papers from departments and making multiple sets as per requirement.
- Strict vigilance is maintained during examination to avoid copying.

The process of evaluation will be discussed in the class before commencement of the test/exam and is shown in the below figure:

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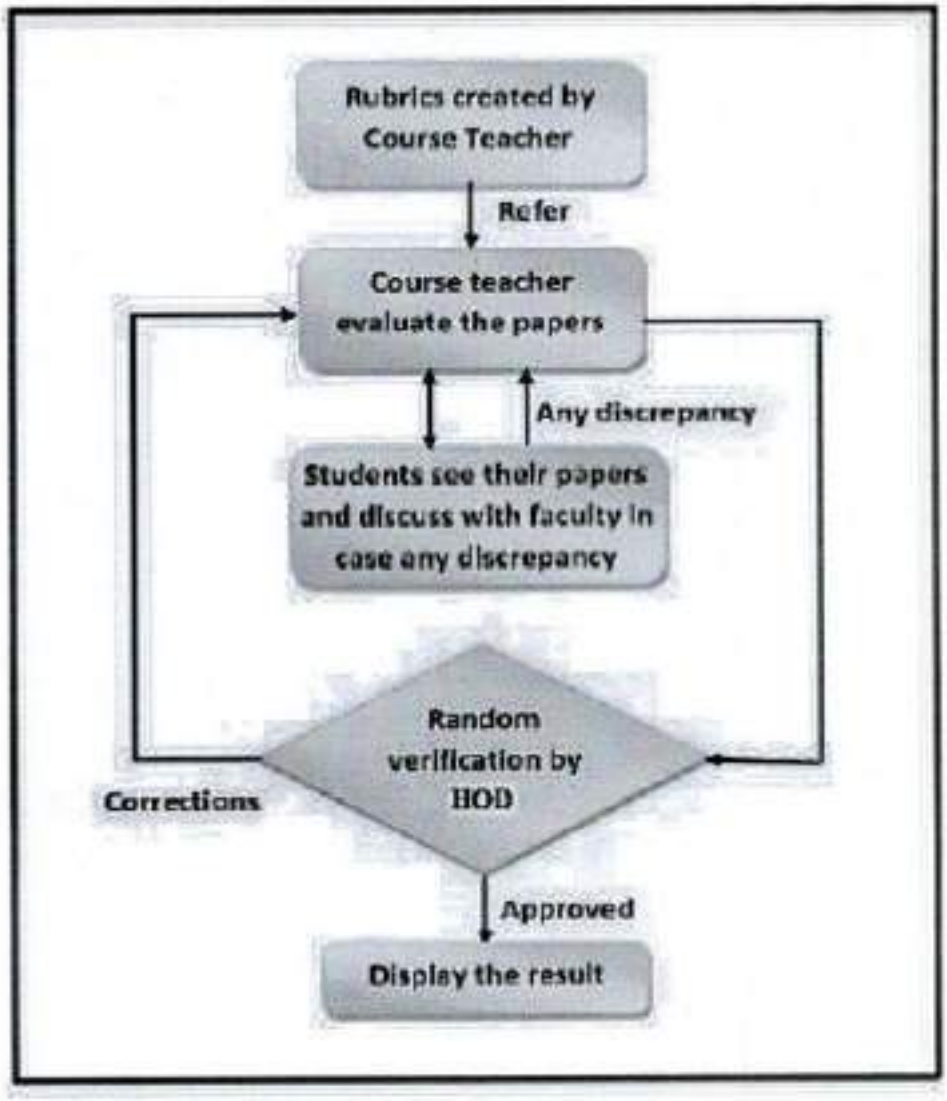

Figure: Process of Evaluation before the commencement of the test

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CIRCULAR

Date: 07/08/2023

It is hereby informed to all the members of Question Paper Scrutiny Committee of ECE department that the question paper scrutiny meeting is scheduled on 10/08/2023 at 10.30am in the ECE Department Office.

Agenda:

1. Scrutinizing the question papers of IVth semester CIE-2.
2. Any other issues related to the CIE question papers.

02/8/23

HoD

Place : Doddaballapur
Date: 07-08-2023

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website : https://rljit.in | email : principal@rljit.in | Fax:080-27625380

Sl. No.	Name	Signature
1.	Dr. Shivaprasad K. M.	
2.	Dr. Anil Kumar C.	
3.	Dr. Harish S.	
4.	Mr. Lokesh R.	
5.	Mrs. Shilpakala V.	
6.	Dr. Kumara Swamy J.	
7.	Dr. Madhuchandra G.	
8.	Mr. Anand Reddy G. M	
9.	Mrs. Aruna R.	
10.	Mr. Madhu N. R.	
11.	Ms. Aarthi V.	
12.	Mr. Manjesh N.	
13.	Mr. Shashidhar S. N.	

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ELECTONICS AND COMMUNICATION ENGINEERING

QUESTION PAPER SCRUTINY COMMITTEE - MINUTES OF MEETING

Meeting Name:	**Question Paper Scrutiny Committee**		
Date of Meeting:	10-08-2023, Thursday	**Time:**	10:30 A.M to 11:00 A.M
Meeting Facilitator:	Dr. Harish S. IQAC Coordinator, ECE Department	**Location:**	HOD Chamber, ECE Department

1. Meeting Agenda

1. Question Paper Scrutiny for CIE-2 with Blooms taxonomy, Cos - POs mapping for 4th Sem.
2. Any other issues.

2. Meeting Attendees

Sl. No.	Name	Designation	Present/ Absent	Signature
1.	Dr. Shivaprasad K. M.	Vice-Principal	Present	
2.	Dr. Anil Kumar C.	Associate Professor & HOD	Present	
3.	Dr. Harish S.	Associate Professor	Present	
4.	Mr. Lokesh R.	Associate Professor	Absent	
5.	Mrs. Shilpakala V.	Associate Professor	Present	
6.	Dr. Kumara Swamy J.	Associate Professor	Present	
7.	Mr. Anand Reddy G. M	Associate Professor	Present	
8.	Mrs. Aruna R.	Assistant Professor	Present	
9.	Mr. Madhu N. R.	Assistant Professor	Absent	
10.	Dr. Madhuchandra G.	Assistant Professor	Present	
11.	Ms. Aarthi V.	Assistant Professor	Present	
12.	Mr. Manjesh N.	Assistant Professor	Present	
13.	Mr. Shashidhar S. N.	Assistant Professor	Present	

3. Proceedings of the Meeting

1) IQAC coordinator welcomed all the faculty.
2) HOD welcomed the Professors from other departments who are invited to check the quality in the CIE-2 Question Papers, which are prepared by the faculty members of ECE for 4th Semester. CIE-2 is scheduled from 17-08-2023 to 18-08-2023.
3) The Question Paper Scrutiny committee has the following faculty members:
   i) Dr. Kumara Swamy J., Associate Professor, Mechanical Department
   ii) Mr. Anand Reddy G. M., Associate Professor, CSE Department
   iii) Mr. Shashidhar S. N., Assistant Professor, Allied Department
4) The Advises given by the above said scrutiny members are:
   i) COs and POs have to be properly mapped.
   ii) Blooms taxonomy should be strictly followed.
   iii) Problem solving type questions can be asked.
   iv) Usage of proper keywords in the question has to be done, so that it can be understood easily to the students.
   v) Once the Scrutiny over then faculty members are requested to do the changes suggested by experts and get signature by department IQAC coordinator and HOD approval.
5) Meeting ends with thanks.

Date: 10-08-2023

IQAC Coordinator

HOD
Dept. of Electronics & Commu Engineering
R.L.Jalappa Institute of Technol
Doddaballapur-561203

CC:
i) HOD, ECE
ii) All staff, ECE
iii) Question Paper Scrutiny committee
iv) IQAC Coordinator

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Examination Reform Policy

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Sl.No	Title	Page. No
1.	**Introduction**	3
2.	**2. Assessment Strategy for Outcomes based Education (OBE)**	5
	2.1 Mapping Program Outcomes (Pos) to Assessment (Examinations)	5
	2.2 Two-step process for bringing Clarity to Pos	5
	2.3 Program Outcomes-Competancies-Performance Indicators (PIs)	7
3.	**3. Improving Structure and Quality of Assessments**	13
	3.1 Bloom's taxonomy for Assessment Design	13
	3.2 Action verbs for Assessment	14
	3.3 Assessment Planning	16
4.	**4. Assessing Higher-order Abilities and Professional Skills**	18
	4.1 Assessing Higher Educational Experiences to teach and Assess	18
	4.2 Using Scoring Rubrics as Assessment tool	19
	4.3 Open-Book Examinations	19

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Globalisation of the world economy and higher education are driving profound changes in engineering education system. There is a continuing need to dynamically adapt to these changes, to ensure that we remain competitive and can respond effectively to the challenges of globalisation. Future engineering graduates not only need to be knowledgeable in his/her discipline but also needs a new set of soft, professional skills and competencies .

In recent years, there have been essential changes in engineering education in terms of what to teach (content) and how to teach (knowledge delivery) and how to assess (student learning).

AICTE has already taken initiation to come out with model curriculum for engineering programs. The digital initiatives of MHRD and AICTE have made available very large number of MOOC courses through SWAYAM, that can help the colleges and teachers to adopt innovative methodologies in the delivery of course.

The present report focusses on the recommendations for reforms in examinations (assessment of student) in the context of emerging landscape of engineering education.

Examinations/student assessments play a very important role in deciding the quality of education. They must not only assess student's achievements (and grades) but also measure whether the desired learning outcomes have been achieved. The achievement of objectives and program outcomes are crucial and needs to be proven through accurate and reliable assessments.

The academic quality of examinations (question papers) in Indian engineering education system has been a matter of concern from a long time. It is widely acknowledged that "assessment drives learning'', what and how students learn depends to a major extent on how they think they will be assessed *2+. The question papers that require simple memory recall will not ensure deep, meaningful learning. High expectations for learning motivate the students to rise to the occasion. The assessment (examination) must embed those high expectations to ensure that the learner is motivated to attain them.

Considering the above imperatives, it is clear that reforms in Examinations are critical for improvement of the quality of Indian engineering education. The most important drivers for reforms in examination system of Indian engineering education are:

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1. Adaptation of Outcome-Based Education Framework

Outcome-based education (OBE)- a performance-based approach has emerged as a major reform model in the global engineering education scenario [3]. The country that wants to be a signatory member of a multinational agreement for the mutual recognition of engineering degrees, i.e. the Washington Accord (WA) must implement OBE. This will be an endorsement that the engineering education system has demonstrated a strong, long-term commitment to quality assurance in producing engineers ready for industry practice in the international scene. Being signatory to the Washington Accord, Indian accreditation agency 'National Board of Accreditation (NBA)' has made it mandatory for engineering institutions to adapt OBE framework for their curriculum design, delivery and assessment. In OBE framework, the educational outcomes of a program are clearly and unambiguously specified. These determine the curriculum content and its organization, the teaching methods and strategies and the assessment process.

Though Indian Universities and Colleges have started adapting OBE framework for their engineering programs, the focus is limited to the curriculum design part, i.e. connecting curriculum components to the program outcomes. Very little attention is being given for connecting examination questions/assessment tools to the program outcomes. The absence of proper mapping between program outcomes and assessment tools lead to the inaccurate and unreliable measurement of attainment of outcomes by the students. This missing connect creates a big gap in the effective adaptation of OBE framework, making the whole exercise futile.

2. Importance of Higher-order Abilities and Professional Skills

In the present examination system, memorization occupies a dominant place. The recall of factual knowledge, though essential to any examination, is only one of several major abilities to be demonstrated by the graduates. The assessment process must also test higher level skills viz. ability to apply knowledge, solve complex problems, analyse, synthesise and design. Further, professional skills like the ability to communicate, work in teams, lifelong learning have become important elements for employability of the graduates [4]. It is important that the examinations also give appropriate weightage to the assessment of these higher-level skills and professional competencies.

Keeping in view of the above challenges and looking at some of the worldwide best practices in assessment, the present report comes up with several recommendations that can be used by Universities/ Colleges to design their assessment strategies.

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ASSESSMENT STRATEGY FOR OUTCOME-BASED EDUCATION

1. Mapping Program Outcomes to Assessment (Examinations)

Graduate attributes (GAs) articulate the generic abilities to be looked for in a graduate of any undergraduate degree program. They form the Program Outcomes (POs) that reflect the skills, knowledge and abilities of graduates regardless of the field of study. This does not mean that POs are necessarily independent of disciplinary knowledge –rather, these qualities may be developed in various disciplinary contexts.

In outcome-based education, a "design down" process is employed which moves from POs to Course Outcomes (COs) and outcomes for individual learning experiences. Outcomes at each successive level need to be aligned with, and contribute to, the program outcomes.

Courses are the building blocks of a program. Teaching strategies, learning activities, assessments and resources should all be designed and organized to help students achieve the learning outcomes at the course level. In the assessment activities, students demonstrate their level of achievement of the course learning outcomes. In a constructively aligned program, the courses are carefully coordinated to ensure steady development or scaffolding from the introduction to mastery of the learning outcomes, leading to achievement of the intended POs. For the effectiveness of the program, the achievement of POs is crucial which needs to be proven through accurate and reliable assessments.

2. Two-step Process for Bringing Clarity to POs

POs give useful guidance at the program level for the curriculum design, delivery and assessment of student learning. However, they represent fairly high-level generic goals that are not directly measurable. Real observability and measurability of the POs at course level is very difficult. To connect high-level learning outcomes (POs) with course content, course outcomes and assessment, there is a necessity to bring further clarity and specificity to the program outcomes [5]. This can be achieved through the following two-step process of identifying Competencies and Performance Indicators (PI).

(1) Identify Competencies to be attained: For each PO define competencies –different abilities implied by program outcome statement that would generally require different assessment measures. This helps us to create a shared understanding of the competencies we want students to achieve. They serve as an intermediate step to the creation of measurable indicators.

Example:

Program Outcome (Attribute 3)

Design:

PO3: Design/Development of Solutions: Design solutions for complex engineering problems and

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design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

Competencies

1. Demonstrate an ability to define a complex, open-ended problem in engineering terms.
2. Demonstrate an ability to generate a diverse set of alternative design solutions.
3. Demonstrate an ability to select the optimal design scheme for further development.
4. Demonstrate an ability to advance an engineering design to the defined end state.

(2) Define Performance Indicators: For each of the competencies identified, define performance Indicators (PIs) that are explicit statements of expectations of the student learning. They can act as measuring tools in assessment to understand the extent of attainment of outcomes. They can also be designed to determine the appropriate achievement level or competency of each indicator so that instructors can target and students can achieve the acceptable level of proficiency.

Example:

For the Competency -2

Demonstrate an ability to generate a diverse set of alternative design solutions

Performance Indicators:

1. Apply formal idea generation tools to develop multiple engineering design solutions
2. Build models, prototypes, algorithms to develop a diverse set of design solutions
3. Identify the functional and non-functional criteria for evaluation of alternate design solutions.

It should be noted that, when we consider the program outcome, it looks like, it can be achieved only in the Capstone project. But if we consider the competencies and performance indicators, we start seeing the opportunities of addressing them (and hence PO) in various courses of the program.

Once the above process is completed for the program, the assessment of COs for all the courses is designed by connecting assessment questions (used in various assessment tools) to the PIs. By following this process, where examination questions map with PIs, we get clarity and better resolution for the assessment of COs and POs. The pictorial representation of the process is given in Fig. 1

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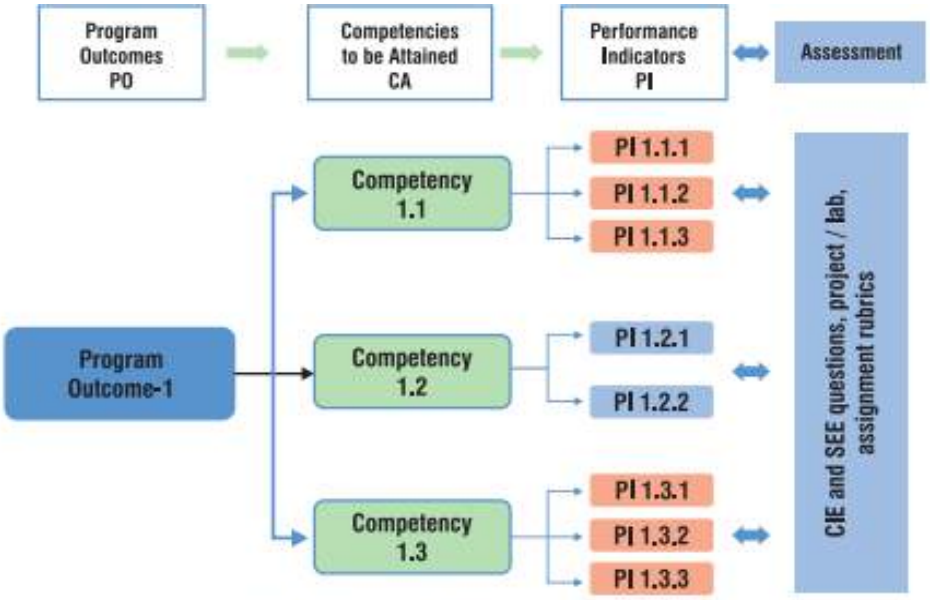

Fig. 1: Connecting POs to Assessment

3. Program Outcomes – Competencies – Performance Indicators

Following table gives the suggestive list of competencies and associated performance indicators for each of the PO in Mechanical Engineering Program.

PO 1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialisation for the solution of complex engineering problems.			
Competency		**Indicators**	
1.1	Demonstrate competence in mathematical modelling	1.1.1	Apply mathematical techniques such as calculus, linear algebra, and statistics to solve problems
		1.1.2	Apply advanced mathematical techniques to model and solve mechanical engineering problems
1.2	Demonstrate competence in basic sciences	1.2.1	Apply laws of natural science to an engineering problem
1.3	Demonstrate competence in engineering fundamentals	1.3.1	Apply fundamental engineering concepts to solve engineering problems
1.4	Demonstrate competence in specialized engineering knowledge to the program	1.4.1	Apply Mechanical engineering concepts to solve engineering problems.
PO 2: Problem analysis: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.			
Competency		**Indicators**	
2.1	Demonstrate an ability to identify and formulate complex engineering problem	2.1.1	Articulate problem statements and identify objectives
		2.1.2	Identify engineering systems, variables, and parameters to solve the problems
		2.1.3	Identify the mathematical, engineering and other relevant knowledge that applies to a given problem

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2.2	Demonstrate an ability to formulate a solution plan and methodology for an engineering problem	2.2.1	Reframe complex problems into interconnected sub-problems
		2.2.2	Identify, assemble and evaluate information and resources.
		2.2.3	Identify existing processes/solution methods for solving the problem, including forming justified approximations and assumptions
		2.2.4	Compare and contrast alternative solution processes to select the best process.
2.3	Demonstrate an ability to formulate and interpret a model	2.3.1	Combine scientific principles and engineering concepts to formulate model/s (mathematical or otherwise) of a system or process that is appropriate in terms of applicability and required accuracy.
		2.3.2	Identify assumptions (mathematical and physical) necessary to allow modeling of a system at the level of accuracy required.
2.4	Demonstrate an ability to execute a solution process and analyze results	2.4.1	Apply engineering mathematics and computations to solve mathematical models
		2.4.2	Produce and validate results through skilful use of contemporary engineering tools and models
		2.4.3	Identify sources of error in the solution process, and limitations of the solution.
		2.4.4	Extract desired understanding and conclusions consistent with objectives and limitations of the analysis

PO 3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

Competency		Indicators	
3.1	Demonstrate an ability to define a complex/ open-ended problem in engineering terms	3.1.1	Recognize that need analysis is key to good problem definition
		3.1.2	Elicit and document, engineering requirements from stakeholders
		3.1.3	Synthesize engineering requirements from a review of the state-of-the-art
		3.1.4	Extract engineering requirements from relevant engineering Codes and Standards such as ASME, ASTM, BIS, ISO and ASHRAE.
		3.1.5	Explore and synthesize engineering requirements considering health, safety risks, environmental, cultural and societal issues
		3.1.6	Determine design objectives, functional requirements and arrive at specifications
3.2	Demonstrate an ability to generate a diverse set of alternative design solutions	3.2.1	Apply formal idea generation tools to develop multiple engineering design solutions
		3.2.2	Build models/prototypes to develop a diverse set of design solutions
		3.2.3	Identify suitable criteria for the evaluation of alternate design solutions
3.3	Demonstrate an ability to select an optimal design scheme for further development	3.3.1	Apply formal decision-making tools to select optimal engineering design solutions for further development
		3.3.2	Consult with domain experts and stakeholders to select candidate engineering design solution for further development
3.4	Demonstrate an ability to advance an engineering design to defined end state	3.4.1	Refine a conceptual design into a detailed design within the existing constraints (of the resources)
		3.4.2	Generate information through appropriate tests to improve or revise the design

PO 4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Competency		Indicators	
4.1	Demonstrate an ability to conduct investigations of technical issues consistent with their level of knowledge and understanding	4.1.1	Define a problem, its scope and importance for purposes of investigation
		4.1.2	Examine the relevant methods, tools and techniques of experiment design, system calibration, data acquisition, analysis and presentation
		4.1.3	Apply appropriate instrumentation and/or software tools to make measurements of physical quantities
		4.1.4	Establish a relationship between measured data and underlying physical principles.

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4.2	Demonstrate an ability to design experiments to solve open-ended problems	4.2.1	Design and develop an experimental approach, specify appropriate equipment and procedures
		4.2.2	Understand the importance of the statistical design of experiments and choose an appropriate experimental design plan based on the study objectives
4.3	Demonstrate an ability to analyze data and reach a valid conclusion	4.3.1	Use appropriate procedures, tools and techniques to conduct experiments and collect data
		4.3.2	Analyze data for trends and correlations, stating possible errors and limitations
		4.3.3	Represent data (in tabular and/or graphical forms) so as to facilitate analysis and explanation of the data, and drawing of conclusions
		4.3.4	Synthesize information and knowledge about the problem from the raw data to reach appropriate conclusions

PO 5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

Competency		Indicators	
5.1	Demonstrate an ability to identify/ create modern engineering tools, techniques and resources	5.1.1	Identify modern engineering tools such as computer-aided drafting, modeling and analysis; techniques and resources for engineering activities
		5.1.2	Create/adapt/modify/extend tools and techniques to solve engineering problems
5.2	Demonstrate an ability to select and apply discipline-specific tools, techniques and resources	5.2.1	Identify the strengths and limitations of tools for (i) acquiring information, (ii) modeling and simulating, (iii) monitoring system performance, and (iv) creating engineering designs.
		5.2.2	Demonstrate proficiency in using discipline-specific tools
5.3	Demonstrate an ability to evaluate the suitability and limitations of tools used to solve an engineering problem	5.3.1	Discuss limitations and validate tools, techniques and resources
		5.3.2	Verify the credibility of results from tool use with reference to the accuracy and limitations, and the assumptions inherent in their use.

PO 6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Competency		Indicators	
6.1	Demonstrate an ability to describe engineering roles in a broader context, e.g. pertaining to the environment, health, safety, legal and public welfare	6.1.1	Identify and describe various engineering roles; particularly as pertains to protection of the public and public interest at the global, regional and local level
6.2	Demonstrate an understanding of professional engineering regulations, legislation and standards	6.2.1	Interpret legislation, regulations, codes, and standards relevant to your discipline and explain its contribution to the protection of the public

PO 7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and the need for sustainable development.

Competency		Indicators	
7.1	Demonstrate an understanding of the impact of engineering and industrial practices on social, environmental and in economic contexts	7.1.1	Identify risks/impacts in the life-cycle of an engineering product or activity
		7.1.2	Understand the relationship between the technical, socio-economic and environmental dimensions of sustainability

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7.2	Demonstrate an ability to apply principles of sustainable design and development	7.2.1 7.2.2	Describe management techniques for sustainable development Apply principles of preventive engineering and sustainable development to an engineering activity or product relevant to the discipline
PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.			
	Competency		**Indicators**
8.1	Demonstrate an ability to recognize ethical dilemmas	8.1.1	Identify situations of unethical professional conduct and propose ethical alternatives
8.2	Demonstrate an ability to apply the Code of Ethics	8.2.1 8.2.2	Identify tenets of the ASME professional code of ethics Examine and apply moral & ethical principles to known case studies
PO 9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.			
	Competency		**Indicators**
9.1	Demonstrate an ability to form a team and define a role for each member	9.1.1 9.1.2	Recognize a variety of working and learning preferences; appreciate the value of diversity on a team Implement the norms of practice (e.g. rules, roles, charters, agendas, etc.) of effective team work, to accomplish a goal.
9.2	Demonstrate effective individual and team operations--communication, problem-solving, conflict resolution and leadership skills	9.2.1 9.2.2 9.2.3 9.2.4	Demonstrate effective communication, problem-solving, conflict resolution and leadership skills Treat other team members respectfully Listen to other members Maintain composure in difficult situations
9.3	Demonstrate success in a team-based project	9.3.1	Present results as a team, with smooth integration of contributions from all individual efforts
PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions			
	Competency		**Indicators**
10.1	Demonstrate an ability to comprehend technical literature and document project work	10.1.1 10.1.2 10.1.3	Read, understand and interpret technical and non-technical information Produce clear, well-constructed, and well-supported written engineering documents Create flow in a document or presentation - a logical progression of ideas so that the main point is clear
10.2	Demonstrate competence in listening, speaking, and presentation	10.2.1 10.2.2	Listen to and comprehend information, instructions, and viewpoints of others Deliver effective oral presentations to technical and non-technical audiences
10.3	Demonstrate the ability to integrate different modes of communication	10.3.1 10.3.2	Create engineering-standard figures, reports and drawings to complement writing and presentations Use a variety of media effectively to convey a message in a document or a presentation

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PO 11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	
Competency	**Indicators**
11.1 Demonstrate an ability to evaluate the economic and financial performance of an engineering activity	11.1.1 Describe various economic and financial costs/benefits of an engineering activity 11.1.2 Analyze different forms of financial statements to evaluate the financial status of an engineering project
11.2 Demonstrate an ability to compare and contrast the costs/benefits of alternate proposals for an engineering activity	11.2.1 Analyze and select the most appropriate proposal based on economic and financial considerations.
11.3 Demonstrate an ability to plan/manage an engineering activity within time and budget constraints	11.3.1 Identify the tasks required to complete an engineering activity, and the resources required to complete the tasks. 11.3.2 Use project management tools to schedule an engineering project, so it is completed on time and on budget.
PO 12: Life-long learning: Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	
Competency	**Indicators**
12.1 Demonstrate an ability to identify gaps in knowledge and a strategy to close these gaps	12.1.1 Describe the rationale for the requirement for continuing professional development 12.1.2 Identify deficiencies or gaps in knowledge and demonstrate an ability to source information to close this gap
12.2 Demonstrate an ability to identify changing trends in engineering knowledge and practice	12.2.1 Identify historic points of technological advance in engineering that required practitioners to seek education in order to stay current 12.2.2 Recognize the need and be able to clearly explain why it is vitally important to keep current regarding new developments in your field
12.3 Demonstrate an ability to identify and access sources for new information	12.3.1 Source and comprehend technical literature and other credible sources of information 12.3.2 Analyze sourced technical and popular information for feasibility, viability, sustainability, etc.

The above table can be used for most of the engineering programs. However, for Computer Science & Engineering/ Information Technology programs it requires some modifications.

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IMPROVING STRUCTURE AND QUALITY OF ASSESSMENTS

For improving the structure and quality of assessment in various engineering programs following points need to be remembered:

1. In Indian engineering education system, written examinations play a major role in assessing the learning and awarding of grades to the student. Universities and colleges give highest weightage to the outcomes of the written examinations in overall grading. Questions raised in the examination/test papers play an important role in defining the level of learning the student is expected to achieve in the courses and hence in the program. Since assessment drives learning, the design of question papers needs to go beyond the mere test of memory recall. They also need to test higher-order abilities and skills.
2. Written examinations assess a very limited range of outcomes and cognitive levels. Particularly in the courses, where course outcomes (COs) cover a broad range of expectations, written examinations alone will not be sufficient to make valid judgements about student learning. A wide range of assessment methods (e.g., term papers, open-ended problem-solving assignments, course/lab project rubrics, portfolios etc.) need to be employed to ensure that assessment methods match with learning outcomes.
3. It is advisable to formulate assessment plans for each of the course in the program that brings clarity to the following:
    a. Alignment of assessment with learning outcome of the course
    b. Level of learning (cognitive) student is expected to achieve
    c. Assessment method to be adapted

The method to align examination questions/assessment to COs and hence POs was discussed in the section-1. The following sections discuss the application of Bloom's taxonomy framework to create the optimal structure of examination papers to test the different cognitive skills.

1. Bloom's Taxonomy for Assessment Design

Bloom's Taxonomy provides an important framework to not only design curriculum and teaching methodologies but also to design appropriate examination questions belonging to various cognitive levels. Bloom's Taxonomy of Educational Objectives developed in 1956 by Benjamin Bloom [6] was widely accepted by educators for curriculum design and assessment. In 2001, Anderson and Krathwohl modified Bloom's taxonomy [7] to make it relevant to the present-day requirements. It attempts to divide learning into three types of domains (cognitive, affective, and behavioural) and then defines the level of performance for each domain. Conscious efforts to map the curriculum and assessment to these levels can help the programs to aim for higher-level abilities which go beyond remembering or understanding, and require application, analysis, evaluation or creation.

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Revised Bloom's taxonomy in the cognitive domain includes thinking, knowledge, and application of knowledge. It is a popular framework in engineering education to structure the assessment as it characterizes complexity and higher-order abilities. It identifies six levels of competencies within the cognitive domain (Fig. 2) which are appropriate for the purposes of engineering educators.

According to revised Bloom's taxonomy, the levels in the cognitive domain are as follows:

Level	Descriptor	Level of attainment
1	Remembering	Recalling from the memory of the previously learned material
2	Understanding	Explaining ideas or concepts
3	Applying	Using the information in another familiar situation
4	Analysing	Breaking information into the part to explore understandings and relationships
5	Evaluating	Justifying a decision or course of action
6	Creating	Generating new ideas, products or new ways of viewing things

Fig. 2: Revised Bloom's Taxonomy

Bloom's taxonomy is hierarchical, meaning that learning at the higher level requires that skills at a lower level are attained.

2. Action Verbs for Assessment

Choice of action verbs in constructing assessment questions is important to consider. Quite often, the action verbs are indicators of the complexity (level) of the question. Over time, educators have come up with a taxonomy of measurable verbs corresponding to each of the Bloom's cognitive levels [8]. These verbs help us not only to describe and classify observable knowledge, skills and abilities but also to frame the examination or assignment questions that are appropriate to the level we are trying to assess.

Suggestive list of skills/ competencies to be demonstrated at each of the Bloom's level and corresponding cues/ verbs for the examination/ test questions is given below:

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Level	Skill Demonstrated	Question cues / Verbs for tests
1. Remember	• Ability to recall of information like facts, conventions, definitions, jargon, technical terms, classifications, categories, and criteria • ability to recall methodology and procedures, abstractions, principles, and theories in the field • knowledge of dates, events, places • mastery of subject matter	list, define, tell, describe, recite, recall, identify, show, label, tabulate, quote, name, who, when, where
2. Understand	• understanding information • grasp meaning • translate knowledge into new context • interpret facts, compare, contrast • order, group, infer causes • predict consequences	describe, explain, paraphrase, restate, associate, contrast, summarize, differentiate interpret, discuss
3. Apply	• use information • use methods, concepts, laws, theories in new situations • solve problems using required skills or knowledge • Demonstrating correct usage of a method or procedure	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, experiment, show, examine, modify
4. Analyse	• break down a complex problem into parts • Identify the relationships and interaction between the different parts of a complex problem • identify the missing information, sometimes the redundant information and the contradictory information, if any	classify, outline, break down, categorize, analyze, diagram, illustrate, infer, select
5. Evaluate	• compare and discriminate between ideas • assess value of theories, presentations • make choices based on reasoned argument • verify value of evidence • recognize subjectivity • use of definite criteria for judgments	assess, decide, choose, rank, grade, test, measure, defend, recommend, convince, select, judge, support, conclude, argue, justify, compare, summarize, evaluate
6. Create	• use old ideas to create new ones • Combine parts to make (new) whole, • generalize from given facts • relate knowledge from several areas • predict, draw conclusions	design, formulate, build, invent, create, compose, generate, derive, modify, develop, integrate

It may be noted that some of the verbs in the above table are associated with multiple Bloom's Taxonomy levels. These verbs are actions that could apply to different activities. We need to keep in mind that it's the skill, action or activity we need students to demonstrate that will determine the contextual meaning of the verb used in the assessment question.

3. Assessment Planning

While using Bloom's taxonomy framework in planning and designing of assessment of student learning, following points need to be considered:

1. Normally the first three learning levels; remembering, understanding and applying and to some extent fourth level analysing are assessed in the Continuous Internal Evaluation (CIE) and Semester End

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Examinations (SEE), where students are given a limited amount of time. And abilities; analysis, evaluation and creation can be assessed in extended course works or in a variety of student works like course projects, mini/ minor projects, internship experience and final year projects.

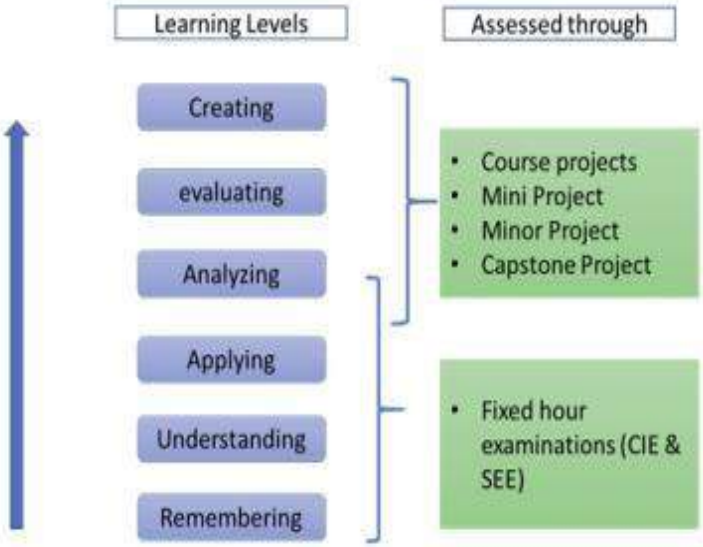

Fig. 3: Assessment methods for different Bloom's cognitive levels

2. Before adopting this framework for reforms in examination system of a University/Institution, it is worthwhile to study the present pattern of assessment in each of the course in the program to gain insight about:

    a) Alignment of assessment questions with course learning outcomes

    b) Whether all the learning outcomes are tested; sometimes some learning outcomes are over tested at the expense of others which may be not tested at all.

    c) Overall weightage in the assessment, to each of Bloom's learning levels

    d) Assessment methods used to adequately assess the content and desired learning outcomes

    Based on the study, improvement priorities for each of the above factors need to be arrived at. The reform process needs to be well planned and implemented through institutional strategy and communicated to all stakeholders particularly to the students.

3. A good and reasonable examination paper must consist of various difficulty levels to accommodate the different capabilities of students. Bloom's taxonomy framework helps the faculty to set examination papers that are well balanced, testing the different cognitive skills without a tilt towards a tough or easy paper perception. If the present examination questions are more focused towards lower cognitive skills, conscious efforts need to be made to bring in application skills or higher cognitive skills in the assessment. It is recommended that at institution/ University level, upper limit need to be arrived for lower order skills (for example, no more than 40% weightage for knowledge-oriented questions). It is important to note that, as nature of every course is different, the weightage for different cognitive levels in the question papers can also vary from course to course.

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ASSESSING HIGHER-ORDER ABILITIES & PROFESSIONAL SKILLS

In the 21st century, professional skills (also known as soft skills, generic skills or transferable skills) have emerged as important attributes of a graduate engineer. Studies show that Industry/ employers around the world value these abilities more than the disciplinary knowledge. This is also reflected in the NBA graduate attributes wherein six out of twelve attributes belong to this category, viz. (1) communication, (2) teamwork, (3) understanding ethics and professionalism, (4) understanding global and societal contexts, (5) lifelong learning, and (6) knowledge of contemporary issues. Further, higher-order cognitive abilities like critical thinking, problem-solving and making informed decisions are also crucial for a graduate to succeed in the emerging world. Though the employers consider these professional skills and higher abilities as important, students are weak in them. The main challenge surrounding them is that they are difficult to assess through existing conventional examination system.

1. Innovative Educational Experiences to Teach and Assess

One of the main obstacles in addressing these outcomes is the limitation of educational experience we create within our engineering programs. Most of the coursework in our programs are oriented towards teaching technical knowledge and skills; hence, the assessment is limited to those abilities. However, acquiring the professional outcomes may not result simply from participation in a particular class or set of classes. Rather, these outcomes are more often acquired or influenced through sources both in and outside the classroom [4].

To address these challenges, comprehensive reforms are needed in the way we design our curriculum, student learning experiences and assessment of the outcomes. Worldwide several attempts are being made to address these challenges. Following are the few educational experiences that are recommended to teach and assess professional outcomes and higher-order cognitive abilities:

- Course projects
- Open-ended experiments in laboratories
- Project-based learning modules
- MOOCs
- Co-Curricular experiences
- Mini / Minor projects
- Final year projects
- Internship experiences
- E-portfolios of student works

2. Using Scoring Rubrics as Assessment Tool

To evaluate the above, student works for attainment of course outcomes and hence POs, it is of

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utmost importance to have reliable methods / proper assessment tools. Rubrics provide a powerful tool for assessment and grading of student work. They can also serve as a transparent and inspiring guide to learning. Rubrics are scoring, or grading tool used to measure a students' performance and learning across a set of criteria and objectives. Rubrics communicate to students (and to other markers) your expectations in the assessment, and what you consider important.

There are three components within rubrics namely (i) criteria / performance Indicator: the aspects of performance that will be assessed, (ii) descriptors: characteristics that are associated with each dimension, and (iii) scale/level of performance: a rating scale that defines students' level of mastery within each criterion.

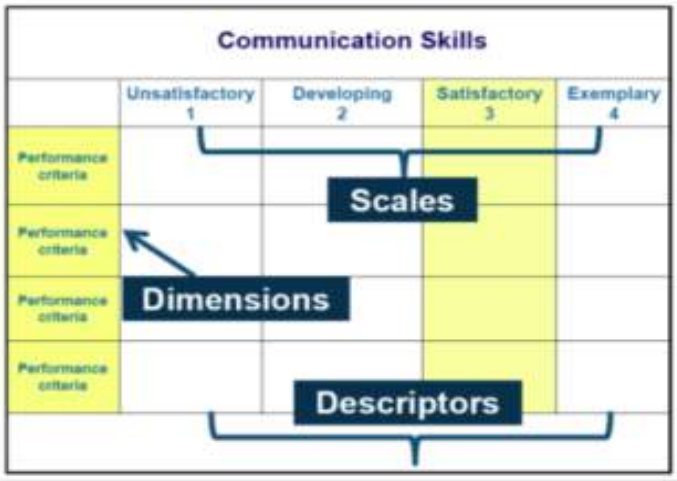

Fig. 4: Examples of Rubrics (Accessed from Rogers 2010)

3. Open-Book Examinations

In the earlier sections it was noted that the traditional written examinations have a significant weakness that they tend to encourage rote learning and more superficial application of knowledge. This deficiency can be overcome by "open-book examination". Open-book examination is similar to time constrained written examinations but designed in a way that allows students to refer to either class notes, textbooks, or other approved material while answering questions. They are particularly useful if you want to test skills in application, analysis and evaluation, i.e. higher levels of Bloom's taxonomy. However, in a program, the courses or the curriculum areas that are best suited to an open-book exam are to be carefully chosen.

Advantages of open-book examinations

1. Less demanding on memory and hence less stressful
2. Questions can emphasise more on problem-solving, application of knowledge and higher-order thinking rather than simple recall of facts.
3. Assessment questions can reflect real-life situations that require comprehension, information retrieval and synthesising skills of the students to solve.

Designing a good open-book examination

- Set questions that require students to do things with the information available to them, rather than to merely locate the correct information and then summarize or rewrite it.
- The questions in open-book exam must take advantage of the format, and give more weightage

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to the application of knowledge, critical thinking and use of resources for solving real complex engineering problems.

- As the nature of questions is complex, it is to be ensured that the students get enough time. Open book test questions typically take longer time compared to traditional examinations. It is advisable either to set less number of questions that encompass 2 or 3 concepts taught or allocate longer duration of time for the examinations.

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Semester End Examination Process

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Belgavi & Recognised by AICTE, New Delhi)
DODDABALLAPUR - 561 203. BENGALURU RURAL DISTRICT, KARNATAKA.

SEMESTER END EXAMINATION PROCESS

Semester End Examination(SEE) process handbook estableshes rules and regulations,policies and procedures towards the conduction of Internal assessment.It is expected that all the faculty & Staff members strictly adhere to the rules and regulations spelled out in this document.the chair person of the committee reserves the right to change,modify or revoke the policies,rules and regulations as and when necessary and apply their discretion in specific cases.

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Visvesvaraya Technological University

"Jnana Sangama", Belagavi - 590 018, Karnataka State

"Visvesvaraya Technological University *Guidelines and norms* for Implementation of Academic Autonomy in Institutions (2018) Amendments in 2022"

Effective from the academic year 2021-22.

(framed under Section 20(w) of VTU Act 1994)

REGISTRAR
Visvesvaraya Technological University
BELAGAVI - 590 018.

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1.0 Short Title and Commencement:

1.1 These shall be called **"Visvesvaraya Technological University *Guidelines and norms* for Implementation of Academic Autonomy in Institutions (2018) Amendments in 2022"** keeping in view the latest Regulations of UGC/AICTE-2021. Applicable from the academic year 2021-22.

1.2 This Guidelines and norms shall be the guiding authority for the Autonomous Colleges to enable them to frame appropriate *Regulations* for implementing the *academic autonomy* granted to them.

1.3 This Guidelines and norms shall come into effect from the date of approval by the Executive Council of the University.

1.4 This Guidelines and norms shall be uniformly applicable to all Autonomous Colleges under the jurisdiction of Visvesvaraya Technological University, Belagavi.

2.0 Definitions:

2.1 "Academic Autonomy" means freedom granted by the University to a College in all aspects of conducting its academic programmes for promoting excellence.

2.2 "Autonomous College" means a College notified as an *autonomous college* by the University as per the prevailing VTU Statutes on Autonomous Colleges and that may be further amended from time to time as per UGC /AICTE Regulations.

2.3 "Commission" means University Grants Commission.

2.4 "Council" means All India Council for Technical Education.

2.5 "Statutes" Means VTU Statutes on Autonomous Colleges (Amended)2022 and further amended from time to time.

2.6 "University" means Visvesvaraya Technological University.

2.7 Teacher" means the teaching staff of the college appointed by following the specified rules of the University, and/or of the council

3.0 Preamble:

A number of Engineering Colleges within the jurisdiction of VTU have been granted the autonomous status, in accordance with the statutes framed in this regard keeping in view the regulations of UGC/AICTE in order to implement the *academic autonomy so that,* they could derive full benefits and be able to meet the 21st century challenges faced by the technical education system in the country, like:

(i) Ever increasing influence of science and technology and their impact on human society.

(ii) Shrinking time scale of new developments and the high rate of obsolescence in

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the older practices.

(iii) Penetration of Information Technology in all sectors of human activity and economic Development.

(iv) Service sector becoming a major avenue for employment of technical professionals and also for economic gains.

(v) Emergence of knowledge as a key driver for the progress of nations and for increasing their influence on the world scenario.

As engineers have to convert these challenges into opportunities, it is expected that the 21st century engineers will be required to have:

- Strong foundation in the basics of mathematics, science and engineering discipline.
- Command over the chosen area of technical specialization.
- Capacity to apply the professional knowledge and skills acquired.
- Good competence to learn a subject on one's own without major external help.
- Expertise in analysis, design, modeling and simulation of complex systems.
- Scaling up, mass production, system operation and maintenance.
- Estimation of costs and time factors in an assignment.
- Ability for rational, logical, orderly and objective thinking.
- Skills in personnel management and human relations, and
- Leadership qualities including spirit of tolerance, patience and team work.

Therefore, in view of the above, it is desirable that each Autonomous College gets fully prepared to take the following steps based on these ***statutes.***

3.0 (a) Academic Norms :

The Autonomous Institutes shall follow University Regulations and notifications for the following as notified from time to time:

a) Research Programmes
b) Postgraduate programmes for award of Degree
c) Undergraduate programmes for award of Degree
d) Undergraduate Degree with Honours / Minors
e) Post Graduate Diploma
f) Post Graduate Certificate

4.0 Academic Programmes:

4.1 (a) Autonomy granted to the College is institutional in nature and hence an Autonomous College shall be free to launch new Degree programmes at Undergraduate (UG)level like B.E., B.Tech., B.Plan., B.Voc. and B. Arch., Postgraduate (PG)level like M. Tech., M. Arch., M.Plan., M.B.A and M.C.A and Research like M.S by Research, Ph.D. all being in the list specified by the AICTE/UGC /

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VTU from time to time after getting approval from the University, AICTE/ UGC/ CoA/ Government of Karnataka and their respective Governing Bodies.

4.1 (b) An Autonomous College shall be free to make changes in the existing / new Degree programmes with the approval of its Academic Council. Such changes could be in the schemes of instruction, syllabi, schemes of examinations and other aspects, while fulfilling the minimum academic standards laid down by the University for the Award of Degrees. The changes so made shall be notified by the Autonomous College concerned at least three months before the commencement of an academic year and the University be kept informed of these changes within a fortnight of such notification

4.1 (c) An Autonomous College shall have the freedom to start Diploma (post- polytechnic Diploma, post-UG and post-PG levels) and/or Certificate programmes with the approval of its Academic Council. The issuance of certificates/diplomas on completion of such programmes shall be made under the seal of the concerned College only.

4.1 (d) An Autonomous College shall also be free to evolve methods for assessing the students' performance, notifying the results, issuing the grade cards/transcripts, migration and other certificates except the Degree Certificates.

4.1 (e) In order to get the various benefits of *academic autonomy*, it is necessary for an Autonomous College to re-structure its various academic programmes based on the *Semester Scheme* by introducing *Credits* for academic activities, bring in *Examination Reforms* for better achievement testing, award *Letter Grades and Numerical Grade Points/ Averages* for students' performance and set appropriate *Passing Standards* in line with the standard set by the University.

4.1 (f) The Autonomous Colleges are required to follow uniform practices for the *Semester Scheme, Credit System, Examinations, Letter Grades and Numerical Grade Points/Averages*, so as to enable their students to avail of horizontal/ vertical mobility and transfer of credits from one Autonomous College to another resulting in related benefits of *academic autonomy*.

4.2 Nomenclatures of Programmes:

4.2 (a) The Autonomous Colleges shall use nomenclatures for their Degree programmes as specified by the UGC in its Notification dated 12th February, 2018 on "Specification of Degrees 2014" as amended from time to time. Besides, the Degree Certificates issued by the University to their awardees shall bear the name of the concerned Autonomous College as well. This will help in maintaining the identity of each programme conducted at the College and also ensuring its accountability.

4.2 (b) In view of the above, nomenclatures and their abbreviations given below, shall continue to be used for the Degree programmes at all Autonomous Colleges under the University

4.2(b)(i) UG Level: Bachelor of Engineering (B.E.) / Bachelor of Technology (B. Tech.), Bachelor of

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Planning (B.Plan)/ Bachelor of Architecture(B.Arch.) / Bachelor of Vocational (B.Voc.). B.E. / B.Tech. (Honors/ Minors)

4.2(b) ii) PG Level: Master of Technology (M. Tech.), Master of Architecture (M. Arch.), Master of Business Administration (M.B.A.), M.Plan. (Master of Planning) and Master of Computer Applications (M.C.A.). Integrated M.Tech.

Besides, the branch/subject of specialization, if any, shall be indicated in brackets after the abbreviation; e.g., B.E. (Mechanical Engineering), M.Tech.(VLSI Design).

4.2(b)(iii) **Research Level: *MS byRresearch and Doctor of Philosophy (Ph.D.).***

4.2 (c) Further, it is necessary that the Diploma and Certificate programmes at Autonomous Colleges shall also be indicated in abbreviated form, like DIP., and CERT with the branch/subject of specialization given in brackets after the abbreviation.

4.3 Programme Duration

4.3 (a) The duration of academic programme shall be the same as that followed by the University regulations and notification/ directions issued from time to time, i.e., three years for B.Voc., *four years* for *B.E./B.Tech./B.Plan., five years* for *B.Arch., two years* for *M.Tech., M. Arch., M.B.A., M.Plan, and M.C.A., one year* for PG *Diploma* and *six months* for PG *Certificate programmes. For research programmes M.S. by Research & Ph.D. as notified in University regulations* and notification/ directions issued from time to time.

4.3 (b) As a flexible *credit system* is to be followed for coursework at each Autonomous College, it is to be noted that the programme duration in the case of UG and PG shall also be dictated by the period in which a student earns the prescribed *credits* for the Degree/PG Diploma/Certificate award. Hence, it is possible for an outstanding student to earn the required credits in a shorter time than that ordinarily prescribed for the relevant programme in (a) above. However, in cases, the regulations/ directions notified by the University shall be followed.

4.3(c) The maximum period which a student can take to complete a fulltime academic programme shall be the same as that prescribed by the University from time to time; e.g., double the nominal duration of the programme, i.e., six years for B.Voc., *eight years* for *B.E./B. Tech./B. Plan.*/ Six years for Lateral entry students to B.E./B.Tech., *ten years* for *B.Arch., four years* for *M. Tech./ M. Arch./M.B.A./ M.Plan., M.C.A.. two year* for PG *Diploma* and *one months* for *Certificate programme. Further, minimum and maximum period with respect to MS by Research and Ph.D. shall be as notified in University Regulations.*

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S. No	Programme	Years	
		Minimum	Maximum
1	a) B.Voc. b) *B.E./B. Tech. (Lateral entry)*	3	6
2	*B.E./B.Tech./B. Plan.*	4	8
3	*B.Arch.*	5	10
4	*M. Tech./ M. Arch./M.B.A./ M.Plan., M.C.A.*	2	4
5	*PG Diploma*	1	2
6	*PG Certificate*	6 months	1 year
7	*MS by Research*	As notified in University regulations	
8	*Ph.D*		

Note : The Autonomous Institutes shall follow any other notification issued by the University in this regard from time to time.

4.3 (d) The maximum period for a programme implemented in an Autonomous Colleges shall also be dictated by the fact that a student has to demonstrate the specified minimum academic performance by registering for the prescribed minimum number of *credits* in every semester for continuing with the programme. And, this period can be equal to or smaller than the maximum period indicated as in (d) above.

4.4 Admissions

4.4 (a) ***I] Admissions to UG and PG Programmes:*** The admission of students to various UG, PG and Research Degree programmes listed under Section 4.2 (b), shall be made by the Autonomous Colleges by following the orders issued from Government of Karnataka and University Regulations and directions issued from time to time in this regard.

II] Admissions to Research Programmes:

1. the admission of students for Research Degree programmes at Autonomous Colleges shall be made by the University in the concerned College as per the provisions in the prevailing VTU Regulations governing the Research Programmes, where Autonomy is NOT conferred/ granted for Research Programmes .
2. the admission of students for Research Degree programmes at Autonomous Colleges may be made by the concerned College as per the provisions in the prevailing VTU Regulations governing the Research Programmes where Autonomy is conferred/ granted for Research Programmes .

   However, for doing so, the concerned college has to apply to University separately and satisfy the following conditions:

   i. The institute should have been place in the first 200 ranks of the

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Engineering category of NIRF, amongst all the Engineering and Technology institute in the country for the previous consecutive three years.

ii. At least 80 % of the eligible UG programmes in the institutions should be accredited by NBA, with at least three progremmes, with a minimum score of 675 and also the institute must be accredited by NAAC with minimum 'A' grade.

iii. The institute must have completed two autonomy cycles with NBA accreditation as recommended by UGC.

iv. The institute should have produced at least 40 Ph.D. scholars in the last 10 years.

v. The institute should enroll at least 06 full-time scholars with scholarships every year in line with prevailing VTU's Jnanayana Scheme. The scholarship should be distributed across all the departments for the period of 3 years in line with prevailing VTU's Jnanayana Scheme.

vi. The institute should have at least 40% of it's faculty strength with Ph.D. under their research centres.

vii. Minimum four Research Supervisors, in each of the departmental research center is required.

viii. Institute must comply with UGC guidelines for Autonomous Colleges and sections 4.4(xiii) & 6.1(c). of VTU Statutes on Autonomous Colleges-2011 (Amended 2018) and amended from time to time.

ix. Admission to Ph.D. Program shall be on the basics of valid VTU ETR/GATE/NET/SET score and all the admissions have to be approved by the University .

x. The VTU Regulations governing Ph.D. Programmee, amended from time to time , shall be followed.

xi. Admission to the Ph.D. Programme, shall be as per the norms and Regulations of VTU and all the admissions to be approved by VTU.

xii. Only FULL TIME Ph.D. Scholars with fellowships shall be admitted.

III] Admission to PG Diploma and Certificate programmes: The admission of students to PG Diploma and Certificate programmes shall be made by the Autonomous College on its own, by following the Regulations as notified by the University from time to time. In all such cases, it shall be necessary to follow the statutory provisions of reservation of seats to different categories of candidates made by the government from time to time. University shall be informed of these programmes.

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4.4 (b) There shall be provision for candidates with a polytechnic Diploma or any other qualification approved by the Council and the UGC to join specified UG Degree programmes at the beginning of the second year of the 4-year B.E. / B.Tech. programme as per the prevailing practice in the University.

4.4 (c) **Migration of students:**

Under Graduate Programmes:

(a) Migration of students from one college to another within University shall be governed by the prevailing regulations of the University

(b) Migration from one branch to another branch in the same college or to another college within University shall be governed by the prevailing regulations of the University

Postgraduate Programmes:

There shall not be any transfer or migration from branch to branch or college to college for all PG programmes.

4.4 (d) ***Eligibility Criteria/ Entry level Qualification :*** The eligibility criteria / entry level qualification for admission of students to UG, PG, PG Diploma, PG Certificate, and Research Degree programmes at the Autonomous Colleges shall be the same as those prescribed by the University from time to time.

Note : The Autonomous Institutes shall follow any other notification issued by the University in this regard from time to time.

4.4 (e) The eligibility criteria for admission of students from a non-Autonomous College to an Autonomous College, from one Autonomous College to another Autonomous College and from University scheme at an Autonomous College to its Autonomous scheme, shall be as per prevailing norms of the University.

However, the Autonomous Colleges are free to provide syllabus equivalence for such candidates with the approval of it's Academic Council.

4.4 (f) The eligibility criteria for the admission of students from other Universities (India / Abroad) to an Autonomous College shall be as per the prevailing norms of the University.

However, the Autonomous Colleges are free to provide syllabus equivalence with the approval of it's Academic Council.

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4.5 Semester Scheme

4.5 (a) It is compulsory for all the Autonomous Colleges under the University to adopt the *Semester Scheme* at their UG, PG, PG Diploma and Certificate programmes.

4.5 (b) The breakdown of an academic year for implementing the *Semester Scheme* at Autonomous Colleges is given in Table 1 as a typical example

Table 1: A Typical Breakdown of Academic Year into Semesters (to be in line with the regulations made by university in this regard)	
1. Number of Semesters/Year	Two Main Semesters *(Odd, Even)* and a Supplementary Semester (**Refer Annx I for Supplementary semester**). *(Note: Supplementary Semester is primarily to assist the slow learners and/or repeater students for repeating the courses. However, Autonomous Colleges may use this Semester to arrange Add-On Courses for other students and/or for deputing them for field work and/or internship.)*
2.Semester Durations (Weeks)	Main Semesters *(Odd/Even)*: 19 each. Supplementary Semester: 8.
3. Academic Activities (Weeks)	Main Semester: Registration of Courses- 0.5; Course Work- 15.5; Examination Preparation-1.0; Examinations- 1.0; Declaration of Results- 1.0; *Total: 19.* Supplementary Semester (For Repeat/Add-On Courses): Registration of Courses- 0.1;Course Work- 7.0; Examination Preparation-0.2; Examination-0.2; Declaration of Results-0.5; *Total: 8.* Inter-Semester Recess: After each Main Semester– 2*to 3, flexible.* After Supplementary Semester– *1 to 2, flexible.* Total: 14 (for good students) and 6 (for slow learner students). *(Note: In each Semester, there shall be various provisions for students like, Registration of Courses at the beginning, Dropping of Courses in the middle and Withdrawal from Courses towards the end, all being under the Faculty Members' advice. These facilities are required to ensure proper monitoring of students by Faculty Advisors, leading to their improved learning capabilities and minimizing their chances of failure in the Courses registered.)*
4.Examinations	Continuous Internal Evaluation*(CIE)* and Semester End Examination*(SEE)*, both having equal weightages in the students' performance in Course Work/Laboratory Work and other activities. *(Note: The CIE shall be conducted by the Course Instructor throughout a Semester on dates to be announced in advance and the results made known to the students from time to time. This will be of help to the students to decide on Dropping of Courses or Withdrawal from Courses based on their performance and in consultation with their Faculty Advisors. However, the dates for SEE at all the Autonomous Colleges shall be jointly fixed by them in concurrence with the University without much deviation with regard to University's Academic Calender so as to facilitate the students in the 'transfer of credits'.)*

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Table 1: A Typical Breakdown of Academic Year into Semesters (to be in line with the regulations made by university in this regard)	
5. A Typical Calendar	*1st Main Semester(Odd Semester):* *1st August - 10th December, 19 Weeks.* *Recess: 11th December - 31st December, 3 Weeks.* *2nd Main Semester(Even Semester):* *01th January - 13thMay, 19 Weeks.* *Recess: 14th May - 30th May, (2 Weeks):* *Supplementary Semester:* *01th June - 25th July, 8 Weeks.* *Recess: 26th July-31st July (1 Week).* *Total: 52 Weeks.* *(Note: This calendar is to be used only as an example to assist the Autonomous Colleges to fix their respective calendars in consultation with the University. Specific time periods are to be provided in this calendar for Registration of Courses, Dropping of Courses and Withdrawal from Courses by the Colleges individually. Also, each College to provide for a 3-week Induction Programme for UG students at the beginning of their 1st Semester to meet the requirements of AICTE Model Curriculum for First Year UG students, Nov. 2017)*
6. Other Items	• Care shall be taken by each Autonomous College to ensure that the total number of days for academic work is≥180/year. • Academic schedules prescribed at each College shall be strictly adhered to by it for success of the *Semester Scheme.* • *Supplementary Semester* shall be mainly used by the Colleges for conducting *Repeat Courses* for the benefit of slow learners/ repeaters. • Students having satisfactory CIE and attendance but, failed (F grade) in SEE, need not register for course/s and can appear for SEE as and hwn conducted. • Minimum, Maximum and Average Course loads per Semester shall be the same at all Autonomous Colleges and be fixed by prior consultation with the University.
Note : The Autonomous Institutes shall follow any other notification issued by the University in this regard from time to time.	

5.0 Credit System:

5.1 **General:**

5.1 (a) As the *Credit System* has many advantages over the conventional system of organizing academic programmes, it is necessary to introduce an appropriate *Choice Based Credit System (CBCS)* for the various programmes at Autonomous Colleges under the University.

5.1 (b) In the *Credit System*, the course work of students is unitized and each unit is assigned *one credit* after a

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student completes the teaching-learning process as prescribed for that *unit* and is successful in its assessment. However, there are different definitions followed in academic circles for the size of a *unit* and in turn, for a *credit*. This needs to be given careful consideration at the Autonomous Colleges.

5.1 (c) ***Credit Definition:*** As it is desirable to have uniformity in the definition of *credit* across all Autonomous Colleges under the University, the following widely accepted definition for *credit* shall be followed here. This can provide the good flexibility to the students and also strengthens *CBCS* under the University. Here, *one unit of course work* and its corresponding *one credit*(while referring to a Main Semester) shall be equal to:

1. 1-hour Lecture (L) per week per semester =1 Credit
2. 2 hours Tutorial / (T)per week per semester =1 Credit
3. 2 hours Practical/Laboratory/Drawing (P) per week per semester =1 Credit
4. Four-credit theory courses shall be designed for 50 hours of the Teaching-Learning process.
5. Three-credit theory courses shall be designed for 40 hours of the Teaching-Learning process.
6. Two-credit theory courses shall be designed for 25 hours of the Teaching-Learning process
7. One credit theory course shall be designed for 15 hours of the Teaching-Learning process

The following additional factors may also be noted in this connection:

- *The above figures shall be multiplied by a factor of 2 in the case of the Supplementary Semester, and*
- *Other student activities which are not demanding intellectually or which do not lend to effective assessment, like practical training, study tours, attending guest lectures shall not carry any credit.*

5.1 (d) ***Course Registration:*** A student shall register for course/s (core or elective) to earn *credits* for meeting the requirements of a Degree/ PG Diploma/Certificate programme. Such courses together with their *grades* and the *credits* earned shall be included in the *Grade Card* issued by the College at the end of each semester, like *odd, even, supplementary* and it forms the basis for determining the student's academic performance in that semester.

5.1 (e) ***Audit Courses:*** In Addition, a student can register for courses for *audit* only with a view to supplement his/her knowledge and/or skills. Here also, the student's grades will have to be reflected in the *Grade Card*. But, these shall not be taken into account in determining the student's academic performance in the semester. In view of this, it may not be necessary for the Autonomous College to issue any separate *transcript covering the audit courses* to the registrants at these courses.

5.2 Credit Structure:

5.2 (a) A typical *Credit Structure* for coursework based on the above definition is given in Table 2. This shall be applicable for the coursework of students registered for UG, PG and Research Programmes at the Autonomous Colleges.

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Refers to the Credit Values for different academic activities considered, Credits for the seminar, project phases, project viva-voce and internship shall be as specified in the Scheme of Teaching and Examinations.

Credit Values				
Theory/Lectures (L) (hours/week/ Semester)	Tutorials (T) (hours/week /Semester)	Laboratory/Practical (P) (hours/week /Semester)	Credits (L:T:P)	Total Credits
4	0	0	4:0:0	4
3	0	2	3:0:1	4
2	2	2	2:1:1	4
3	0	0	3:0:0	3
2	2	0	2:1:0	3
2	0	2	2:0:1	3
0	0	6	0:0:3	3
2	0	0	2:0:0	2
1	0	0	1:0:0	1
0	2	0	0:1:0	1
0	1	1	0:0.5:0.5	1
0	0	2	0:0:1	1
NOTE: Activities like practical training, study tour, and participation in Guest lecturers do not carry Credits.				

5.2 (b) ***Major Benefits:*** Major benefits accruing to Autonomous Colleges by adopting the *Credit System* are listed below:

- Quantification and uniformity in the listing of courses for all programmes at a College, like core(hard/soft), electives and project work.
- Ease of allocation of courses under different heads by using their *credits* to meet national / international practices in technical education.
- Convenience to specify the minimum/ maximum limits of course load and its average per semester in the form of *credits* to be earned by a student.
- Flexibility in programme duration for students by enabling them to pace their course load within minimum/maximum limits based on their preparation and capabilities.
- Wider choice of courses available from any department of the same College or even from other similar Colleges, either for *credit* or for *audit*.
- Improved facility for students to optimize their learning by availing of transfer of *credits* earned by them from one College to another.

It is necessary to specify the appropriate eligibility requirements for a Degree/ Diploma/Certificate award based on course work (like UG, PG) by prescribing the total number of *credits* to be earned, as an alternative to specifying the Programme Duration (as indicated in Section 4.3(a)).

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5.3 **Course Load:**

In the planning of Coursework for an academic programme like, UG/PG/ Research Degree, PG Diploma and Certificate at Autonomous Colleges, it is therefore necessary to specify the average Course load for a student per semester as well as its minimum and maximum limits. Here again, uniformity shall be maintained in these parameters across all Autonomous Colleges under the University, so as to benefit the students.

5.3 (a) Looking at the prevailing practices at leading institutions in India and abroad in this respect, taking into account the AICTE Model Curricula for UG Programmes (issued from time to time) and considering the academic strength and capability of an average student, the course load at all Autonomous Colleges under the University shall be fixed at 22 *credits/semester(average level)* with its minimum and maximum limits being set at 16 and 28 *credits* respectively. This pattern shall be followed uniformly at each Autonomous College by making a provision in its time table for the students to register for 22 *credits* on an average in each semester.

5.3 (b) ***Course Flexibility:*** Each Autonomous College shall implement the practices for providing flexibility to its students in their academic programmes and to meet their varied needs.

5.3 (b) (i) ***Faculty Advisor:*** There shall be a *Faculty Advisor System, involving the regular faculty members,* to be established at each Autonomous College with each *Faculty Advisor* being assigned a group of students. The functions of *Faculty Advisor* shall be to:

- Advise the students in the group on all academic matters (like registration of courses, dropping of courses and/or withdrawing from courses),
- Monitor the students' in the group for their individual academic performance,
- Identify students in the group who are slow, average or fast learners to help them pace their studies /learning at the College based on their individual abilities, and
- Serve as a *friend, philosopher and guide* to all of them in the group during their studentship at the College.

5.3 (b) (ii) With the *Faculty Advisory System* in place, a student to be normally permitted to register for the average course load in the first semester. And, based on the performance in the semester and faculty advice, he/she to continue with this load (for average and fast learners) or to reduce it to the minimum permissible (for slow learners) by dropping of/withdrawing from some course(s)/*credits* before the dates prescribed for these. This facility to assist the student to pace the course work, minimize the chances of failure in the course(s) and optimize the learning process.

5.3(b) (iii) The student's performance in the first semester shall be the basis for faculty advice on the number of *credits* to be registered in the second (or subsequent) semester, (to be within the minimum/maximum limits of 16/ 28*credits)*. Further, faculty advice and close monitoring will help a slow learner to keep pace with the course work properly by reducing the course load, if required and to minimize the chances of failure in the semester.

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5.3(b) (iv) The above will enable any student to properly plan his/her course load in each succeeding semester, by fixing it to be between≥ *16 and ≤ 28 credit* limits based on faculty advice and his/her academic performance in the previous semester. Faculty advice to be also useful to the student in identifying appropriate elective courses.

5.3 (b) (v) This experience will also help fast learners (or outstanding students) to accelerate their programmes by registering and maintaining up to the maximum *(=28 credits)* course load in each succeeding semester based on their performance in the preceding and the current semesters. *Such students to be able to complete the credit requirements of the programme in a shorter time, like 7 semesters in the case of B.E./B. Tech./B.Plan. like 9 semester in the case of B.Arch. as example.* In cases, the regulations / directions issued by the University shall be followed.

5.3(b) (vi) Similarly, slow learners need to register only for the minimum *(=16)* number of *credits* in each succeeding semester and strive to maintain good performance in all the courses registered and complete the total requirements for theprogramme at a slower pace, say 9 to 10 semesters in all, in the case of B.E./B. Tech. as example. However, the student has to complete the programme within the permitted maximum duration.

5.3(b)(vii) Each Autonomous College may introduce a well-organized *Faculty Advisory System,* effective examinations/assessment system and a comprehensive Academic Calendar prescribing specific dates for each activity (as in Table 1), for achieving positive results.

5.3 (c) The total number of *credits* to be earned by a student to qualify for the Degree/ PG Diploma/Certificate award from each Autonomous College shall be as given in Table 3

Table 3: Total Minimum Number of *Credits* to Qualify for Degree/PG Diploma/Certificate Award

Programme		Normal Duration: Years (Semesters)	Minimum number of *Credits* to be Earned
UG Degree	*B.E./ B. Tech.*	4.0 (8)	*160*
	B.E / B.Tech. (Lateral entry)	3.0 (6)	*120*
	B. Arch.	5.0 (10)	*260 -300(as per COA)*
PG Degree	*M. Tech.*	2.0 (4)	*88*
	M. Arch.	2.0(4)	*100*
	M.B.A.	2.0(4)	*100*
	M.C.A.	2.0(4)	*100*
	M.Plan.	2.0 (4)	*100*
PG Diploma		1.0 (2)	44
Certificate		0.5 (1)	22

Note : The Autonomous Institutes shall follow any other notification issued by the University in this regard from time to time.

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5.3 (d) ***Contact Hours:*** Considering the expectations from engineering professionals with UG, PG and Research Degrees in the 21st century, it is desirable to limit the number of contact hours for students at Autonomous Colleges under the University to 30-35/week. This will be of help to students in getting enough time and opportunity to do better preparation for the courses prescribed for *credit*, to take up *self- study*, to develop their creative talents and abilities and benefitting from the *Add-On* courses and those taken for *audit*. This can also enable them to get ready for challenging and exciting careers ahead. A typical example showing the calculation of *contact hours* based on course *credits* is given in Table 4:

Table 4: Calculation of Contact Hours/Week – An Example

Typical Course Load per Semester

No. of Courses	Credits/ Course	Total Credits	Contact hours per week
Three Lecture Courses	3:0:0	9	9
Two Lecture cum Tutorial Courses	3:1:0	8	10
Two Lecture cum Laboratory Courses	3:0:1	8	10
One Lecture, Laboratory cum Tutorial Course	1:1:1	3	5
	Total	28	34

6.0 Curriculum Framework:

6.1 General Issues:

6.1 (a) Curriculum Framework is important in setting the right direction for a Degree/ PG Diploma/Certificate programme at an Autonomous College, as it takes into account the type and quantum of knowledge necessary to be acquired by a student to qualify for a particular award in his/her chosen branch or specialization area. This will also help in assigning the *credits* for each course, sequencing the *courses* semester-wise and finally arriving at the total number of *courses* to be studied and the total number of *credits* to be earned by a student to fulfill the requirements for the conferment. The Autonomous Colleges shall also take into account the AICTE Model Curricula notified from time to time and follow them so as to be abreast of the national trends in this connection.

6.1 (b) Besides, this also helps in assigning the credits for each course, sequencing the courses semester-wise and finally arriving at the total number of courses to be studied and the total number of credits to be earned by a student to fulfill the requirements for the conferment. The Autonomous Colleges shall also take into account the AICTE Model Curricula notified from time to time and follow them so as to be abreast of the national trends in this connection.

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6.2 **B.E./ B.Tech. Degree Programme**

The Curriculum Framework for a *B.E./B. Tech.*Degree programme is given below as an example. The programme shall include the following Courses.

6.2 (a) ***Recommended Courses:*** These include coursework under the following categories:

- Humanities, Social Sciences, and Management Courses (HSMC)
- Basic Science Courses (BSC)
- Engineering Science Courses (ESC)
- Professional Core Courses (PCC)
- Professional Elective Courses (PEC)
- Open Elective Courses (OEC)
- Integrated Professional Core Courses (IPCC)
- Project Work: Mini-project work and Major Project work
- Seminar
- Internship (INT)
- Non-Credit Mandatory Courses (NCMC)
- Ability Enhancement Courses(AEC)
- Universal Human Values Courses(UHV)

6.2 (b) ***Mandatory Courses (MC) and Other Requirements:*** The UG Degree programmes also require the inclusion of certain courses necessary for familiarity of subjects, like Environmental Studies, Constitution of India, Communication Skills, Chosen Language Knowledge/ Proficiency, NSS, NCC, Sports, Yoga as *Mandatory Courses*. Such courses shall not carry any *credit* for the award of the Degree. A pass in each course during the programme shall be a necessary requirement for the student to qualify for the Degree. Hence, each Autonomous College under the University shall take suitable steps to organize the *Mandatory Courses* as required and to include the student's performance (like, pass or fail) in such course(s) in his/her transcript.

These Mandatory Courses shall be as notified by University from to time to time

6.2 (c) ***Induction Programme and Internships:*** It is necessary to include a 3-week Induction Programme for the first-year B.E./B. Tech. students at the beginning of their 1st Semester, as per the requirements of AICTE in its Model UG Curriculum (Feb. 2018). Besides, there is also a mandatory requirement of Internships to be undertaken by all the UG students as specified by the University from time to time. The Autonomous Colleges shall ensure that both these are fulfilled.

6.2 (d) ***Allocation of Credits for B.E./B. Tech. Degree Programme:*** Looking at the UG Engineering Degree programmes practiced at leading institutions in India and abroad and the need for Indian engineering

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professionals to be able to meet the 21st century challenges, it is necessary for each Autonomous College to follow the breakdown of coursework as given in **Table 5.** It is expected that this breakdown will lead to a highly useful and respectable *B.E./B.Tech.* Degree programme under the University. While it shall be required for all the Autonomous Colleges under the University to follow the percentage range of total number of *credits* allocated under each course category, each College can fix the actual (average) number of *credits* for each category to suit its own needs. On similar lines, the allocation of *credits* can be proposed for *B. Plan./B. Arch.* Degree programme at the Autonomous Colleges under the University.

Structure of Undergraduate Engineering program

Sl. No.	Category	AICTE Breakup of Credits (Total 160)	Proposed Breakup of Credits (Total 160)
1	Humanities and Social Sciences including Management courses	12*	10
2	Basic Science courses	25*	23
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc	24*	20
4	Professional Core Courses	48*	43
5	Professional Elective courses relevant to chosen specialization/branch/ Ability Enhancement Courses	18*	14
6	Open subjects - Electives from other technical, emerging, arts commerce and NCC/NSS subjects/ Ability Enhancement Courses	18*	14
7	Mini and Major Project work /seminar/ Summer Internship and Research /Industrial Internship	15*	32
8	Mandatory Non- Credit Courses [Environmental Sciences, Induction training, Indian Constitution, Universal Human Values, Kannada] . This is as per AICTE. However, University has adopted these courses as Mandatory courses with credits		04
	Total	160*	160

*Minor variation is allowed as per need of the respective discipline (As per report of Expert Committee)

6.2 (e) ***Sequencing of Courses for B.E/B.Tech. Degree:*** The above breakdown of the *B.E./B. Tech.* Degree curriculum shall form the basis for proper sequencing of the coursework for the programmes at all Autonomous Colleges under the University. Based on this, a typical sequencing plan for coursework for *B.E./B.Tech.* Degree programme at Autonomous Colleges is given in Table 6.Autonomous Colleges shall also take into account the provisions in the AICTE Model Curriculum while finalizing the sequencing of courses. A similar sequencing plan can also be proposed for *B. Plan/B. Arch.* Degree programme

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launched at Autonomous Colleges under the University.

Table 6: A Typical Sequencing Plan for the *B.E./B. Tech.* Degree Curriculum	
Semesters	**Course Categories**
I – II	• HSMC, BSC, AEC, and ESC, Common for all Programmes *as per AICTE Model Curriculum.* • MC and Mandatory *Induction Programme (3 weeks).*
III-IV	• HSMC, BSC, AEC, and ESC, Common for all Programmes (to be continued). • IPCC, INT • Also, MC (to be continued, if required). • PCC: In two/three groups (*like Circuit, Non-Circuit).* • Area-wise Orientation, Add-On Courses.
V-VII	• PCC/PEC/OEC, Core and Electives. • IPCC, AEC, HSMC • Branch-wise Orientation, Add-On Courses, Seminar, *Internship.*
VIII	• PEC/OEC, Electives, Project work(PROJ), Dissertation. • Add-On Courses, Seminar, Final wrap-up of Programme.

6.3 PG Degree programmes

Autonomous Colleges under the University may conduct a variety of PG programmes like *M. Tech, M.Plan, M.Arch.,M.B.A, and M.C.A.* Following on similar lines as in Table 5, a typical allocation of *credits* for each of these programmes is now given in Tables 7 to 9. Here, *hard core* includes all compulsory Courses, whereas *soft core* covers a choice to be made from among the suggested compulsory *Courses.* While it is desirable for all the Autonomous Colleges under the University to follow the percentage range of total number of *credits* allocated under each category, the College shall be free to fix the actual (average) number of *credits* under each category. On similar lines, allocation of *credits* can also be proposed for the *M. Arch.* Degree programme at Autonomous Colleges under the University.

Table 7: A Typical Breakdown for the *M. Tech* Degree Curriculum	
Course Category	**Proposed Breakup of Credits**
Core Courses (Hard/Soft)	*22*
Electives (Specialization/Other)	*30*
Project Work	*30*
Industrial Internship, Seminar& Field Work	*06*
Total	88

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Table 8: A Typical Breakdown for the *M.B.A* Degree Curriculum	
Course Category	**Proposed Breakup of Credits**
Core Courses (Hard/Soft)	50
Electives (Specialization/Others)	25
Seminar	05
Field Work/Internship & Project Work	20
Total	100

Table 9: A Typical Breakdown for the *M.C.A.* Degree Curriculum	
Course Category	**Proposed Breakup of Credits**
Core Courses (Hard/Soft/ Labs)	62
Electives (Specialization/Other)	12
Seminar, Mini Project with Lab	04
Industrial Internship and Project Work	22
Total	100

Note : The scheme and norms of University as amended from to time shall be applicable for all the under graduate and postgraduate programme offered in the Autonomous institutions.

6.4 Coursework of Research Degree Programmes:

Autonomous Colleges under the University conducting M S by Research and Ph.D.programmes shall follow the University Regulations in respect of coursework, comprehensive, open seminars, colloquium and online submission of thesis for dual evaluation followed by for the award of these Degrees. The provisions in the most recent version Regulations shall be incorporated suitably in the Regulations of each Autonomous College.

7.0 Suggested Assessment Guidelines:

7.1 **Achievement Testing:**

7.1 (a) The assessment of students' performance in coursework during and/or at the conclusion of a programme has to be done using examinations. In general, an examination may have different objectives, like achievement-testing, prediction-testing, endurance-testing, creativity-testing and testing for ranking.

7.1 (b) In technical education, the assessment has to be preferably of the *achievement- testing* type, so that a student's knowledge, understanding and competence in the courses studied are properly assessed and

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certified. Therefore, Autonomous Colleges under the University are required to introduce proper reforms in the examination system to achieve this goal. The guidelines given below enable the Autonomous Colleges to achieve this goal and gain the confidence and respect of their stake holders, particularly students. Typically *achievement- testing* is done in two parts as follows, both of them being important in assessing a student's achievement

- ***Sessional:*** *Involving* **Continuous Internal Evaluation(CIE),** to be conducted by the course instructor all through the semester. This may include mid-term tests, weekly/ fortnightly class tests, homework assignments, problem solving, group discussions, quiz, seminar, mini-project and other means.

- ***Terminal,*** covering **Semester-End Examination (SEE),** to be conducted by the course instructor jointly with an external examiner at the end of a semester, on dates to be fixed at the College level. This may include a written examination for theory courses and practical/design examination with built-in oral part for laboratory/design courses.

7.1 (c) Both CIE and SEE being equally important in judging the coursework performance of students, they need to be conducted with equal rigour and equal seriousness in the *credit system*. This makes it necessary that both of them are assigned equal (50:50) weightage. And, a student's performance in coursework shall be judged by taking into account the results of both CIE and SEE individually and also together by giving equal weightage for them. This practice shall be followed at all Autonomous Colleges under the University.

7.2 Suggestive Question Papers guidelines:

7.2 (a) ***Question Paper Pattern:*** For an effective *achievement testing* of students in a course, a good question paper needs to be used as the principal tool. This makes it necessary for the question papers used at CIE and SEE to;

- Cover all sections of the course syllabus uniformly.
- Be unambiguous and free from any defects/errors.
- Emphasize knowledge testing, problem solving and quantitative methods.
- Contain adequate data/ other information on the problems assigned, and

Have clear and complete instructions to the candidates.

7.2 (b) ***Question Paper Planning:*** The above requirements make it necessary for a Question Paper to cover the entire syllabus, with a provision for the students to answer questions from the whole syllabus. As students need to be given some choice in the questions included in the Paper, it is necessary for the Question Papers at SEE, in particular, to have built in choice under each module of the syllabus. This factor shall be taken note of and strictly followed by each Autonomous College, while planning of the Question Papers.

7.2 (c) Besides, it is also necessary for the Course syllabi to be drafted properly, be defect-free and also properly given in modular form to enable the setting of good question papers covering the whole

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syllabus. These aspects have to be taken into account, in particular, by the Boards of Studies at Autonomous Colleges under the University.

7.2 (d) ***Typical Question Paper:*** The questions to be included in the Question Papers at CIE and SEE can be of two types as follows and the course instructors as well as the external examiners shall have to be well trained/experienced to set them.

- *Multiple Choice Question,* having each question to be answered by tick marking the correct answer from the choices (commonly four) given against it. Such a question paper to be useful in the testing of knowledge, skills, comprehension, application, analysis, synthesis, evaluation and understanding of the students. However, Question Papers for CIE and SEE to include *no more than* 15-20% of questions of this type.
- *Comprehensive Questions,* having all questions of the regular type to be answered in detail. Such a Question Paper to be useful in the testing of overall achievement and maturity of the students in a course through long questions relating to theoretical/practical knowledge, derivations, problem solving, modeling, simulation, design, application and quantitative evaluation.

7.3 **Examinations:**

7.3 (a) **Maintenance of Standards:** For ensuring a high standard in both CIE and SEE fully meeting the provisions of the University Regulations and being able to declare the results of students' performance at both these in a time bound manner as per their Academic Calendars, each Autonomous College may follow a few suggestions given below for conducting the examinations:

7.3 (a) (i) ***CIE:*** The CIE shall be conducted exclusively by the course instructor. The instructor to spell out the components of CIE to the students in advance, maintain transparency in its operation, declare the evaluation results in time and then return the answer scripts and assignment sheets to them as soon as possible. The instructor to also solve the questions from these test papers during tutorial sessions for the benefit of all the students concerned, especially slow learners.

Every autonomous College will have Moderation Committee for CIE. The Constitution and functions will be same as that defined in University Regulation and directions issued from to time.

7.3 (a) (ii) ***SEE:*** The SEE shall be conducted jointly by the course instructor and an external examiner appointed for this purpose by the Autonomous College. Here, the external examiner to mainly associate with the work of Question Paper setting, because of the difficulties in having him/her for conducting the evaluation of students' answer scripts due to the tight time schedule for the various tasks connected with SEE, as covered in sub-sections (iii) and(iv) below.

7.3(a) (iii) ***SEE Answer Scripts:*** The answer scripts of SEE may be normally evaluated by the course instructor only. But as a healthy step, a Department Committee at each Autonomous College to preferably oversee this task and ensure the quality and standard of evaluation and also of the grades awarded in

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all the cases. The next step to be taken before declaring the results, to include an external review of the SEE conducted.

7.3 (a) (iv) ***External Review of SEE:*** An external review shall be conducted under the aegis of the Board of Studies/Board of Examiners of the Autonomous College by appointing a panel of experts from outside the College for this purpose aiming at a complete review of SEE operation in the College. This may include such steps as, *question paper review, checking random samples of answer scripts, moderation, analysis of results/grades awarded and other related aspects.* This step to be also necessary for gaining the confidence of the University and of the society at large, on the fairness, transparency and acceptability of the examination practice among the stakeholders. The details of the same shall be properly maintained in the respective autonomous College and shall be submitted to the University as and when asked for.

7.3 (b) ***Attendance Standards:*** All students of Autonomous Colleges under the University shall maintain a minimum attendance of 85% in each course registered. In case of any short fall in this, the Academic Council of the College shall consider the same and may condone the deficiency in special cases up to 10%. Any student failing to meet the above standard of attendance in any course(s) registered may not be allowed to appear for SEE of such course(s). and such course shall be marked as NE (Not eligible to appear for SEE).

The Autonomous Institutes shall follow any other notification issued by the University in this regard from time to time.

7.3 (c) ***Attendance at CIE and SEE:*** Attendance at all examinations, both CIE and SEE of each course registered shall be compulsory for the students and there shall not be any provision for re-examinations. Any student against whom any disciplinary action by the College/University is pending may not be permitted to attend any SEE in that Semester.

7.3 (d) ***Passing Standards:*** High standards shall be maintained in all aspects of the examinations at Autonomous Colleges under the University. For this purpose, each Autonomous College shall follow the *standards of passing* at CIE and SEE for each Course, registered, as given in Tables 10 and 11*(Please see Section B on Grading)*:

Table 10: Passing Standards at Colleges using Relative Grading

Evaluation Method	Passing Standard
Sessional (Continuous Internal Evaluation – formative assessment)	Score: ≥40%
Terminal (Semester End Examination-summative assessment)	Score in (CIE +SEE) leading to the award of Letter Grade ≥ C(5). (covered in Section 8.2(d)). Score ≥ 35%

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Table 11: Passing Standards at Colleges using Absolute Grading	
Evaluation Method	**Passing Standard**
Sessional (Continuous Internal Evaluation)	Score: ≥40%
Terminal (Semester End Examination)	Score: ≥ 35%
Overall Score for passing is ≥ 40%	

Note: The Autonomous Institutes shall follow any other notification issued by the University in this regard from time to time.

7.3 (e) ***Project work Evaluation:*** The evaluation of CIE of the project work shall be based on the progress of the student in the work assigned by the project supervisor periodically evaluated by him/her together with a Departmental Committee constituted for this purpose at each Autonomous College. Seminar presentation, project report(dissertation) and final oral examination conducted by a common Project Evaluation Committee at the College level shall form the SEE of the project work.

7.3 (f) In the case of other requirements, such as seminar, industrial internship, field work, comprehensive viva voce, if any, the assessment shall be made as laid down by the Academic Council of the concerned Autonomous College.

7.3 (g) **There shall be no re-examination for any Course in the *credit system*** to take care of such students:

(i) Who have absented themselves from attending CIE or SEE without any valid reason;

(ii) Who have failed (Grade F) to meet the minimum passing Standard prescribed for CIE and/or SEE;

(iii) Who have been detained for shortage of attendance in any coursework;

(iv) Who have withdrawn (Grade W) from a Course.

Such students shall be required to re-register for the Course(s) and go through CIE and SEE again and obtain a *Grade E or better* (see Tables 10 and 11) in each case. While such students shall have to re-register for the same Course(s) if *hard core*, they can re-register for alternative Course(s) from among the *soft core or elective* Courses, as the case may be. The re-registration shall be possible only when the particular Course is offered again either in a *main (Odd/Even) or a supplementary semester.*

7.3 (g) ***Successive Failures:***

If a student fails to pass a Course even after four attempts, that course is deemed to be exempted for him/her. Then, the student may choose a course of his / her choice with the same number of credits from the pool of courses stipulated by the concerned Board of Studies. The course so selected should not have been studied by the student or to be studied in higher semester/s. The faculty advisor shall guide/advise the student in this regard. The college has to make arrangements for the registration, conduction of CIE for the selected course.

This prevision is given only for two courses (one at a time) during the entire maximum duration of a course.

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However, this is optional and the student can prefer to repeat the same course in which he/she has failed repeatedly.

Note: The Autonomous Institutes shall follow any other notification issued by the University in this regard from time to time.

7.3 (h) ***Monitoring/Assessment for Research Degrees:*** Students registered for Research Degrees at Autonomous Colleges shall be monitored and assessed at each College level by following the prescribed procedure as outlined in the relevant University Regulations Governing the MS by research/Ph.D. Degrees notified from time to time. These provisions may be suitably included in the Regulations of each Autonomous College. This shall be read with 4.4. (a)

8.0 Grading

8.1 General:

8.1(a) In recent years, the grading system has replaced the evaluation of students' performance in a Course based on absolute marks, because of its many advantages. Therefore, Autonomous Colleges under the University shall follow this practice. Here again, it is necessary to maintain uniformity in the grading practices at different Colleges to ensure that the migration of students or transfer of credits among Autonomous Colleges under the University is made easy.

8.1(b) Letter Grade: Course Letter Grade (or simply letter grade or grade) is an index of performance of a student in a said course and refers to a qualitative measure of achievement of a student in each course, based on the percentage range of marks secured in CIE and SEE put together or CIE alone. Grades are denoted by letters O, A+, A, B+, B, C, P and F. The rubrics attached to letter grades are as follows:

O – Outstanding, A+ – Excellent, A – Very Good, B+ – Good, B – Above Average, C – Average, P- Pass and F – Fail. If student remain absent for SEE of any of the course, the letter grade assigned to that course shall be F. NE: If a student fails to satisfy Attendance and / or CIE requirement for course/s then such course/s shall be marked as Not Eligible (NE)" i.e. Not eligible to appear for SEE in that Courses/s.

Letter Grade and corresponding Grade Points on a typical 10 – Point scale

Letter Grade and corresponding Grade Points on a typical 10 – Point scale								
Letter Grade	O Outstanding	A+ Excellent	A Very Good	B+ Good	B Above Average	C Average	P Pass	F Fail
Grade	10	9	8	7	6	5	4	0
% of Marks secured	90-100	80-89	70-79	60-69	55-59	50-54	40-49	0-39

Note: The Autonomous Institutes shall follow

a) Compulsorily follow the above grading pattern as suggested by NSQF. This will fecilitate the migration of the students across instituions/ Universities and also in the implementation of ABC.

b) any other notification issued by the University in this regard from time to time.

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8.1(c) There are different approaches possible for the grouping of raw score (marks). But, the most useful one is based on the computation of statistical measures like mean and standard deviation of the raw score (marks) of all the students attending a Course to separate out the letter grade groups. This approach facilitates relative grading of the students, which has many advantages over the conventional absolute grading, like, freedom from the difficulty level of Question Papers used, absence of personal bias and influence of evaluation norms/standards adopted by the examiner. Hence, this approach may be preferably followed at Autonomous Colleges under the University for awarding letter grades against the raw score (marks) obtained by the students.

8.1(d) Relative Grading: In the relative grading approach, statistical quantities, such as, mean (μ) value and standard deviation(σ) for the raw score (marks) in (CIE + SEE) obtained by the students of a Course shall be evaluated first. And then, the range of marks for each letter grade shall be assigned as follows:

- F grade:$<(\mu\text{-}1)\,\sigma$;
- E grade: $\geq (\mu - 1)\sigma$ to $<(\mu)$;
- D grade: $\geq(\mu)$ to $<(\mu + 1)\sigma$;
- C grade:$\geq(\mu + 1)\,\sigma$ to $<(\mu + 1.5)\sigma$;
- B grade:$\geq(\mu + 1.5)\sigma$ to $<(\mu + 2.0)\sigma$;
- A grade: $\geq (\mu + 2.0)\sigma$ to $< (\mu + 2.5)\sigma$; and,
- S grade: $\geq (\mu + 2.5)\sigma$.

8.1(e) **Absolute Grading:** While it is most desirable to follow the system of relative grading at all the Autonomous Colleges it is noticed that they need specific preparation to introduce this system. Hence, the Colleges may adopt the absolute grading system in the initial years of academic autonomy and take steps to move to relative grading from absolute grading eventually. Such Autonomous Colleges adopting the absolute grading system may prepare proper plans to move to the relative grading system at the earliest. The plans so prepared may be got approved by their respective Academic Councils and implemented soon. The University may be kept informed of this by the College concerned within a fortnight of the change- over of the grading system.

8.2 Grade Points:

8.2 (a) Depending on the letter grades assigned, a student earns certain grade points. As the grading system can have different scales for grade points (like 5, 8, 10.) with more number of points in the scale being desirable for providing higher resolution in the assessment. Moreover, all Autonomous Colleges under the University need to follow the same scale for uniformity in their operations. Hence, the Autonomous Colleges under the University shall follow the 10-point grading system, as given in Table 12 for both the relative grading system and the absolute grading system.

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Letter Grade and corresponding Grade Points on a typical 10 – Point scale

Table – 12 Letter Grade and corresponding Grade Points on a typical 10 – Point scale

Letter Grade	O Outstanding	A+ Excellent	A Very Good	B+ Good	B Above Average	C Average	P Pass	F Fail
Grade	10	9	8	7	6	5	4	0
% of Marks secured	90-100	80-89	70-79	60-69	55-59	50-54	40-49	0-39

Note: The Autonomous Institutes shall follow any other notification issued by the University in this regard from time to time.

8.2 (a)(b) The *grade points* given in Table 12 will help in the evaluation of *credit points* earned by the student in a Course as the *credit points* are equal to the number of credits assigned to the Course multiplied by the *grade points* awarded to the student in that Course. This shall be used in arriving at the *credit index* of the student for that semester, as it is the sum total of all the *credit points* earned by the student for all the Courses registered in that semester.

8.2 (a)(c) ***Earning of Credits:*** A student shall be considered to have completed a Course successfully and earned *credits* if he/she secures an acceptable *letter grade* in the range **O-P**. *Letter grade* F in any Course implies failure of the student in that Course and no *credit* shall be earned.

8.2 (a)(d) ***Transitional Grades:*** The *transitional grades*, such as, 'I', 'W' and 'X' shall be awarded to a student in the following cases. These *grades* need to be converted into one or the other of the *letter grades* (O-F) after the student completes his/her Course requirements, including the examinations.

(i) ***Grade 'I':*** Awarded to a student having satisfactory attendance at classes and meeting the passing standard at CIE in a Course, but remained absent from SEE for valid and convincing reasons acceptable to the College, like:

- Illness or accident, which disabled him/her from attending SEE;
- A calamity in the family at the time of SEE, which required the Student to be away from the College;
- Any other verifiable exigency.

(ii) ***Grade 'W':*** Awarded to a student having satisfactory attendance at classes, but withdrawing from that Course before the prescribed date in a semester as per *faculty advice*.

(iii) Grade 'X': Awarded to a student having high CIE rating (≥ 90) in a Course, but SEE performance observed to be poor, which could result in an overall F Grade in the Course.

8.2 (a)(e) ***Make-up Examination:*** The *Make-up Examination* facility shall be available to the students who may have failed to attend the SEE of one or more Courses in a semester for valid reasons and given the 'I' grade. Students having the 'X' grade shall also be eligible to take advantage of this facility. The Make-up Examination shall be held immediately after announcement of SEE results.

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8.2 (a)(f) All the 'I' and 'X' *grades* awarded to the students shall have to be converted by the Controller of Examination in concurrence with instructors concerned to appropriate *letter grades* and communicated to the College Authorities within *two days* of the respective *Make- Up Examinations*. Any 'I' and 'X' *grades* still not converted within two days after the last scheduled *Make-Up Examinations* shall be automatically converted to 'F' *grade*.

8.2 (a)(g) All the 'W' *grades* awarded to the students shall be eligible for conversion to the appropriate letter *grades* only after the concerned students re-register for these Courses in a main(*Odd/Even*)/supplementary semester and fulfill the passing standards for their CIE and (CIE + SEE)as prescribed at the Autonomous College.

8.2 (a)(h) ***Grade Card:*** Each student shall be issued a *Grade Card* (or transcript) at the end of each semester. While this will have a list of all the Courses registered by a student in the semester together with their *credits*, the *letter grades* with *grade points awarded* in each case and those with *grades 'I', 'W' and 'X'*, only those Courses registered for *credit* and having *grade points* shall be included in the computation of the student's performance, like *SGPA* and *CGPA*. And, the Courses taken for *audit* will not form part of this computation. The results of *mandatory courses*, which are of the *non-credit* type, shall also be reflected in the *Grade Card as PP (for Passed) or NP (for Not Passed)*. It may be noted that each UG student shall have to obtain the *grade* PP in each *mandatory course* to qualify for the Degree award by the University.

8.3 Grade *Point Averages:*

SGPA and CGPA: The *credit index* can be used further for calculating the Semester Grade Point Average *(SGPA)* and the Cumulative Grade Point Average *(CGPA)*, both being important academic performance indices of the student. While *SGPA* is equal to the *credit index* for a semester divided by the total number of *credits* registered by the student in that semester, *CGPA* gives the sum total of *credit indices* of all the previous semesters divided by the total number of *credits* registered in all these semesters. Both the equations together facilitate the declaration of academic performance of a student, at the end of a semester and at the end of successive semesters respectively. *Thus, equations for SGPA and CGPA shall be as per the VTU Regulations for respective programmes notified from time to time. The Autonomous colleges shall not deviate from the same.*

Computation of SGPA and CGPA

The following expressions shall be used to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) respectively:

$$\mathbf{SGPA} = \frac{\sum [CourseCredits \times GradePoints] for all the Courses\ applied\ in\ that\ semester\ excluding\ transisional\ grade}{\sum [CourseCredits] for all\ the\ Courses\ applied\ in\ that\ semester\ excluding\ transisional\ grade}$$

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$$\text{CGPA} = \frac{\sum[\text{CourseCredits} \times \text{GradePoints}] \text{ for all Courses excluding those with F and transisional grades until that semester}}{\sum[\text{CourseCredits}] \text{for all Courses excluding those with Fand transisional grades grades until that semester}}$$

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the grade cards. SGPA and CGPA calculation.

8.4 ***Vertical Progression:***

Vertical progression shall be as per VTU Regulations and notifications for respective programmes notified from time to time. The Autonomous colleges shall not deviate from the same.

8.5 **Class Designation:**

Class Designation shall be as per VTU Regulations and notifications for respective programmes notified from time to time. The Autonomous colleges shall not deviate from the same

8.6 **Conversions of CGPA into Percentage of marks and Class Equivalence**

There is no formula for the conversion of CGPA into the percentage of marks. However, the following table may be referred for the conversion of the CGPA on 10-point scale into the percentage of marks for employment / higher studies, etc.

Percentage = CGPA X 10

Class Equivalence :

Subsequent to the conversion of final CGPA, after successful completion of the Program, into the percentage of marks (M), a graduating student is reckoned to have passed in

(i). First Class with Distinction (FCD) if M≥ 70

(ii). First Class (FC) if 60 ≤M<70

(iii). Second Class (SC) if 50 ≤ M < 60

(iv). Pass Class (P) if 40 ≤ M ≤ 50

8.7 Minimum CGPA of 5 for award of Degree:

(1) Noncompliance of CGPA ≥5.00 at the end of the Program

(A) Students, who have completed all the courses of the Program but do not have a CGPA ≥5.00 at the end of the Program, shall not be eligible for the award of the degree.

(B) In such cases , students shall be permitted to appear again for SEE in course/s [other than Internship, Technical seminar, Project (Mini and Main), and Laboratories] of any Semester/s without the rejection of CIE marks for any number of times, subject to the provision of the maximum duration of the Program to make up the CGPA equal to or greater than 5.00 for the award of the Degree.

(C) In case the student earns improved grade/s in all the reappeared course/s, the CGPA shall be

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calculated considering the improved grade/s. If it is ≥5.00, the students shall become eligible for the award of the degree. If CGPA <5.00, the students shall repeat the procedure.

(D) In case the students earn improved grade/s in some course/s and the same or lesser than the previously earned pass grade/s in the other reappeared course/s, the CGPA shall be calculated considering the improved grade/s and the pass grades earned before the reappearance. If it is ≥5.00, the student shall become eligible for the award of the degree. If CGPA <5.00, the students shall repeat the procedure.

(E) In case the student earns improved grade/s in some courses and fails in the other reappeared course/s, the CGPA shall be calculated by considering the improved grade/s and the previously earned pass grade/s of the reappeared course/s in which the student has failed. If it is ≥5.00, the student shall become eligible for the award of the degree. If CGPA <5.00, the students shall repeat the procedure.

(F) In case the student fails (i.e., earns F grade) in all the reappeared course/s, pass grade/s of the course/s earned by the students before reappearance shall be retained. In such cases, the students shall repeat the procedure.

(G) The student shall obtain written permission from the Controller of Examination of respective College to reappear in SEE to make up the CGPA equal to or greater than 5.00.

9.0 Other Academic Matters:

9.1 Choice Based Credit System:

9.1 (a) It is compulsory to implement a *Choice Based Credit System* for academic programmes at all the Autonomous Colleges under the University. This will be of considerable benefit to the students for customizing their programmes of direct interest to them, developing their individual capabilities and talents and preparing them for exciting careers ahead in the 21st century.

9.1 (b) The Autonomous Colleges shall provide for the following:

(i) Easy access to the Schemes of Instruction, Syllabi, *Credit Structure* of programmes and the Courses being conducted by all students (either in print or in electronic form) so as to assist them in course work planning.

(ii) Institutionalizing the conduct of course work by adopting a centralized time table for all the programmes at a College, with a view to assist the students in customizing their programmes and also optimizing the use of physical facilities.

Establishing a dynamic *Faculty Advisory System* at each College with 5-10 students assigned to an Advisor, for guiding them in planning/implementing their course work in a flexible and effective manner and also monitoring them.

9.2 Time Schedules:

(a) ***Academic Schedules:*** It is necessary to specify various time schedules in the Academic Calendar of each Autonomous College to assist the students and also the faculty. These

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include, dates assigned for registration of courses, dropping of courses and withdrawal from courses. This enables the students to be well prepared, minimize their chances of failure in CIE and/or SEE and take full advantage of the flexibility provided by the *credit system*. Here again, uniformity across the University shall be followed by the Autonomous Colleges in the interest of the students.

(b) ***Registration of Courses:*** Each student of an Autonomous College shall have to register for coursework at the beginning of a semester. The permissible Course load to be either *average number of credits* in the 1stSemester of a programme or to be within the limits of *minimum and maximum credits* prescribed in each later Semester. A period of 2-3 days to be specifically assigned for this event in the Academic Calendar for the students to seek faculty advice, discuss with the course instructors and complete the formalities.

(c) ***Dropping of Courses:*** A specific time period shall be fixed at each Autonomous College, e.g., in the middle of a semester for this purpose to be based on their view to be conducted of students' performance in CIE by the Faculty Advisors concerned. The review to mainly assist the students having poor performance to be facilitated to *drop* the identified course(s) (up to the *minimum credits* specified for the semester) without being mentioned in the *Grade Card*. Such Courses to be re-registered by these students and taken up for study at a later semester in the programme.

(d) ***Withdrawal from Courses:*** A specific time period shall be identified at each Autonomous College towards the end of a semester to help review the students' performance in CIE by the Faculty Advisors, followed by the students having poor performance to *withdraw* from identified course(s) (up to the *minimum credits* specified for the semester) with mention in the *Grade Card* (Grade 'W'). Such Courses to be re-registered by these students and taken up for study at a later semester in the programme.

9.2 Temporary Withdrawal and Readmission:

A student shall be permitted to withdraw temporarily from an Autonomous College under the University on grounds like, prolonged illness, grave calamity in the family or any other serious happening. The withdrawal and readmission shall be as per the regulations / directions issued by the University.

9.3 Rejection of Results :

There shall be a provision for the rejection of total performance of a semester and re-registration for the semester. This shall be done only once in the entire course of studies. However, rejection of performance of 8th semester project work is not permitted.

9.4 Termination from the Programme:

A student shall be required to withdraw from the programme and leave the Autonomous College on the following grounds:

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(i) Absence from classes for more than six weeks at a time in a semester without leave of absence being granted by the competent Authority.

(ii) Failure to meet the standards of discipline as prescribed by the Autonomous College from time to time.

9.5 **Students' Feedback:**

(a) It is necessary for Autonomous Colleges under the University to obtain feedback from students on their course work and various academic activities conducted under the *credit system*. For this purpose, suitable feedback forms shall be devised by the Colleges and the feedback obtained from the students in confidence regularly, by administering the feedback form in print or on-line in electronic form. A Report on the Feedback received and its Action Taken Report shall be uploaded on the College website regularly in a time bound manner and also be forwarded to the University.

(b) The feedback received from the students shall be discussed at various levels of decision making at the Autonomous Colleges and the changes/ improvements, if any, suggested shall be given due consideration for implementation at the Colleges.

9.5 **Recommendations for Degree Award:**

(a) Each Autonomous College shall upload the every SEE results in the University web portal without fail.

(b) Each Autonomous College shall forward its recommendations to the University in respect of students qualifying for UG/PG/ Research Degree Awards based on their success in the examinations/adjudication of theses as the case may be after receiving approval from the Authorities/ Bodies of the College concerned.

(c) The Autonomous College shall also ensure that each such student in (a) has fulfilled all the requirements for the Degree Award.

(d) Only those students recommended for the Degree Award shall be entitled to receive the relevant Provisional Certificates/Transcripts from the College at this stage.

(e) The university reserves the right to withdraw a degree even though it has been granted should there be discovery that the work upon which it was based or the academic records in support of it had been falsified. In such a case the degree will be withdrawn promptly upon discovery of the falsification.

9.6 ***Graduation Ceremony:***

(a) Each Autonomous College shall have its own annual *Graduation Ceremony* for the award of Degrees (Provisional Certificates) to the students completing the prescribed academic and other requirements in each case as per the lists recommended to the University, in prior consultation with the University and by following the provisions in the University Statutes.

(b) Autonomous Colleges may institute Prizes and Awards to meritorious students for being given

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away annually at the *Graduation Ceremony*. This will greatly encourage the students to strive for excellence in their academic activities.

10.0 Other Issues:

10.1 (a) **Quality/Standard:**

The quality/standard of engineering professionals is closely linked with the level of the technical education system. As it is now recognized that these features are essential to develop the intellectual skills and knowledge of the professionals for being able to contribute to the society through productive and satisfying careers as *innovators, decision makers and/or leaders* in the global economy of the 21st century, it becomes necessary that certain improvements are introduced at different stages of their education system.

10.1 (b) These requirements include:

(i) Selective admission of students to a programme, so that merit and aptitude for the chosen technical branch or specialization are given due consideration.

(ii) Faculty recruitment and orientation, so that qualified teachers trained in good teaching methods, technical leadership and students' motivation are available.

(iii) Instructional/Laboratory facilities and related physical infrastructure, so that they are adequate and at the contemporary level.

(iv) Access to good library resources and Information and Communication Technology (ICT) facilities, to develop the student's *self-learning abilities*.

Adequate opportunities and facilities for the development of the student's *aptitudes and attitudes* so that the professionals are conscious of social/other responsibilities.

10.2 Suggested Improvements:

(a) These requirements make it necessary for the Autonomous Colleges to introduce improvements in their operations, like:

(i) Teaching-learning process on modern lines, to provide *Add-On* Courses for *audit*/credit in a number of peripheral areas useful for students' self- development.

(ii) Facilitating the use of MOOCs (Massive Open Online Courses) in the coursework up to a level prescribed by the Council with a view to enable the students to acquire state-of-the-art Science and Technology knowledge.

(iii) Life-long learning opportunities for faculty, students and alumni, to facilitate their dynamic interaction with the society, industries and the world of work.

(iv) Regular updating of the physical infrastructure, laboratories and other academic facilities to be at the contemporary level.

(v) Generous use of ICT and other modern technologies in everyday activities.

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10.3 **Accreditation/Ranking:**

10. 3(a) Each Autonomous College shall get all its eligible UG/PG programmes periodically assessed and accredited by NBA or any other accrediting Body acceptable to the University and ensure that all of them have a high rating as specified by the UGC and University in its Regulations for Autonomous Colleges/as amended from time to time. Besides, each Autonomous College shall ensure that the accreditation ratings are in the validity period.

10. 3(b) Each Autonomous College shall also endeavour to get its performance ranked annually under National Institutional Ranking Framework (NIRF) or any other institutional ranking Body acceptable to the University and take necessary steps to be among the top Colleges nationally.

11 Monitoring :

11.1 IQAC Cell shall be established in College for regular monitoring. The IQAC cell shall have the composition and shall perform functions as defined in University Statutes. The extension of Autonomous Status is subjected to Report of the Peer Team.

11.2 Though Autonomy is granted for the period as notified by the UGC, every year each college/ institute shall upload the data in the University's affiliation portal. There shall visit of University's LIC team every year.

113 All the Autonomous Colleges must submit the Academic calendar to the University without fail.

12 Governance :

Each autonomous College shall have the statutory bodies as defined and function defined in University Statutes.

13 Faculty Student and Faculty cadre ratio:

In is mandatory for an Autonomous Institute shall maintain the teacher student ratio of 1: 15 and need to maintain the cadre ration as per AICTE norms.

14 Annual Returns:

Each Autonomous College under the University shall be required to submit (within four weeks of completing an academic year) an *Annual Return* to the University in the prescribed proforma annexed herewith, providing information on the observance of the above during the previous academic year. The University may issue its *observations and directions* periodically to each Autonomous College based on the data/information provided in its Annual Return and the Autonomous College shall comply with these requirements.

15 Interpretation:

15.1 Any question as to the interpretation of these *Guidelines and norms* shall be decided by the University, whose decision shall be final and binding on the Autonomous Colleges in the matter. The University shall also have the power to issue clarifications to remove any doubt, difficulty or anomaly, which may arise in regard to the implementation of these *Guidelines and norms* .

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15.2 These *Guidelines and norms* should be read as a whole for the purpose of any interpretation.

15.3 In case of any doubt or ambiguity in the interpretation of the above *Guidelines and norms* , the decision of the Vice Chancellor is final.

15.4 The University may change or amend these *Guidelines and norms* at any time and the changes or amendments made shall be applicable to all the autonomous Colleges with effect from the dates notified by the University.

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: Supplementary / Fast Track semester:

- The students who have satisfied CIE and Attendance requirements for the course/s and obtained F grade in SEE are permitted to appear directly in ensuing examination/s as backlog paper/s. The students need not re-register for such course/s in the supplementary/ fast track semester. In case the student wishes to improve CIE/ he/she has to re-register for supplementary / fast track semester as and when offered next.
- The student who obtains required attendance and CIE in supplementary semester, but obtains 'F' grade in SEE, is permitted appear for SEE subsequently as backlog course/s. The student need not repeat course for Attendance and CIE.
- The course/s for which the student does not possess satisfactory attendance and CIE score, shall be marked as NE in the Grade sheet. Such students are not permitted for SEE for the Courses marked as NE in Grade sheet. The students have to re-register only for course/s marked as NE in supplementary/ subsequent semester whenever that course is offered semester and obtain the required CIE and attendance. Subsequently, they are eligible to appear for SEE in such course/s.
- Courses with Transitional Grades Viz "W" , " I", and "X" are also eligible to register in supplementary semester (refer 8.2 (a)(d) for definition of these grades) in case if they wish to improve the score in CIE.
- All courses may not be offered in the Supplementary semester. It is the discretion of the College to offer the courses based on the availability of resources. The Institutes shall notify time table for Supplementary semester well in advance .
- Supplementary Semester is optional; it is for the student to make best use of the opportunity. Supplementary semester is a special semester and the student cannot demand it as a matter of right.
- A student is permitted to register for a maximum of 16 credits in Supplementary / fast track semester.
- A student has to choose those courses which are offered by the Institution in a given Supplementary Semester.
- In the supplementary semester, each course need to be offered for required number of lectures/ tutorial/ laboratory hours as prescribed in the syllabus

When to offer Supplementary semester:

A student of UG programme will have opportunity to register for supplementary semester which is offered after 4th semester for courses from 1st to 4th semester and after 8th semester for courses from 5th to 8th semester. For registering to supplementary semester, the student should complete the Internship/s as notified in the University Regulations / directions. The students opting for supplementary semester between 4th and 5th semester must comply the missed internship requirement in the subsequent semester in the gap between 5th and 6th semester.

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Below said Annexures (are subject revision by the University) should be submitted mandatorily by the end every year. The same shall be verified by the peer committee and submit it's report to University.

(This Proforma to be filled in and returned to the Registrar VTU, Belagavi, *within four weeks* of completion of the previous academic year, both by e-mail and in hard copy form with each page affixed with signature of Principal of respective College.)

1. **General:**
   (a) Name and Address of the College:
   (b) Name of the Principal:
   (c) E-mail ID: Tel. No.: Fax No.:
   (d) Autonomy granted for *(Please tick mark, whichever is applicable)*: UG/PG/Research
   - Cycle of Autonomy :
   - List of Programmes covered (Use only approved abbreviations):
     i) UG
     ii) PG
     iii) Ph.D.
   - New Programmes launched during the year, if any:

   (e) Academic Year Covered:
   (f) Date of the Return:

2. **Information on Students/Courses:**

   (a) :Total No. of *students* admitted in the Autonomous Programmes:

   - UG Level:

     Approved Intake:_____

Year 1	Year 2	Year 3	Year 4	Year 5

   - PG& Research Levels:

     Approved Intake:_____

Year 1	Year 2	Year 3

   (b) Total No. of *Courses/Credits* offered in the Autonomous Programmes:

   - UG Level:

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Main Semester 1 *(Odd)* *Courses/Credits*	Main Semester 2 *(Even)* *Courses/Credits*	Supplementary Semester *Courses/Credits*

Date on which syllabus revision, if any, was approved by the Academic Council: _____

- PG & Research Levels

Main Semester 1 *(Odd)* *Courses/Credits*	Main Semester 2 *(Even)* *Courses/Credits*	Supplementary Semester *Courses/Credits*

Date(s) on which syllabus revision, if any, was approved by the Academic Council: _____

3. **Information of Academic Calender:**

Semester	Starting Date	Dates of SEE	Date of SEE Results	Closing Date	Recess Dates
Odd UG PG& Research					
Even UG PG& Research					
Supplementary UG PG& Research					

Dates on which *Make-Up examinations*, if any, were conducted:
*Odd Semester*_____ *Even Semester*_____ *Supplementary. Semester*_____

4. **Information on Students' Performance:**

(Please include additional columns in the following tables, if required.)

(a) UG- *Odd* Semester:

Course No.						
No. of Students *Registered*						
No. of Students *Dropping*						
No. of Students Not admitted to *SEE*						
No. of Students *Failing*						
No. of Students with Transitional *Grade:* I W X						
% of Students Awarded *Grade:*						
O						
A+						

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A						
B+						
B						
C						
P						

(b) UG-*Even* Semester:

Course No.						
No. of Students *Registered*						
No. of Students *Dropping*						
No. of Students Not admitted to *SEE*						
No. of Students *Failing*						
No. of Students with Transitional *Grade:* I W X						
% of Students Awarded *Grade:*						
O						
A+						
A						
B+						
B						
C						
P						

(c) UG-*Supplementary* Semester:

Course No.						
No. of *Students Registered*						
No. of Students *Dropping*						
No. of Students Not admitted to *SEE*						
No. of Students *Failing*						
No. of Students with Transitional *Grade:* I W X						
% of Students Awarded *Grade:*						
O						
A+						

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A						
B+						
B						
C						
P						

(d) Method of *Grading* employed*(Please tick mark, whichever is applicable)*:

- Absolute Grading:
- Relative Grading:

(e) No. of UG students failing in *mandatory courses*, if any:

[f] PG& Research-*Odd* Semester:

Course No.						
No. of Students *Registered*						
No. of Students *Dropping*						
No. of Students Not Admitted to *SEE*						
No. of Students *Failing*						
No. of Students with Transitional *Grades* I W X						
% of Students Awarded *Grade:*						
O						
A+						
A						
B+						
B						
C						
P						

[g] PG& Research-*Even* Semester:

Course No.						
No. of Students *Registered*						
No. of Students *Dropping*						
No. of Students Not Admitted to *SEE*						
No. of Students *Failing*						
No. of Students with Transitional *Grades* I						

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W X						
% of Students Awarded *Grade:*						
O						
A+						
A						
B+						
B						
C						
P						

(h) PG& Research- *Supplementary* Semester:

Course No.						
No. of Students *Registered*						
No. of Students *Dropping*						
No. of Students Not Admitted to *SEE*						
No. of Students *Failing*						
No. of Students with Transitional *Grades* I W X						
% of Students Awarded *Grade:*						
O						
A+						
A						
B+						
B						
C						
P						

(i) Method of *Grading* employed *(Please tick mark, whichever is applicable):*

- Absolute Grading:
- Relative Grading:

(j) No. of PG& Research students year wise, detained from *vertical progression*, if any:

5. **If *Supplementary Semester* is not arranged,** describe the method followed at the College to enable students with *dropped, withdrawn failed* courses *and/or any other criteria,* to meet the credit requirements for vertical progression:
6. **Any other relevant information** on the functioning of autonomy at the College:

Certificate:

It is certified that the information provided above is true to the best of my knowledge and belief. If required, the records maintained at the College will be made available for the scrutiny of University Authorities.

REGISTRAR
Visvesvaraya Technological University,
BELAGAVI - 590 018.

PRINCIPAL
With seal

PRINCIPAL
R.L. JALAPPA INSTITUTE OF TECHNOLOGY
Kodigehalli, Doddaballapur-561203,Karnataka.